ATTACHMENT 43 – ***REGION 5 OIL AND HAZARDOUS SUBSTANCES INTEGRATED CONTINGENCY PLAN***

Oil and Hazardous Substances Integrated Contingency Plan

To Report Spills Call the National Response Center

24-hour phone: (800) 424-8802

National Response Center
United States Coast Guard Headquarters
Washington, DC

Regional Response Centers & Emergency Response 24-Hour Emergency Numbers

(312) 353-2318
U.S. Environmental Protection Agency
Region 5
Waste Management Division
Office of Superfund
Emergency and Enforcement Response Branch
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

(216) 522-3984
United States Coast Guard
Ninth Coast Guard District Office
1240 East Ninth Street
Cleveland, Ohio 44199-2060

(504) 589-6225
United States Coast Guard
Eighth Coast Guard District Office
Director of Western Rivers Operations
501 Magazine Street
New Orleans, Louisiana 70130-3396

EPA United States Environmental Protection Agency

Oil and Hazardous Substances Pollution/ Area Contingency Plan

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LETTER OF PROMULGATION

In accordance with the provisions of the Federal Water Pollution Control Act of 1972 as amended by the Clean Water Act of 1977, and Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, a National Oil and Hazardous Substances Contingency Plan was developed by the United States Environmental Protection Agency (U.S. EPA). Section 300.41 of the National Contingency Plan states that Regional Contingency Plans shall be prepared for each standard Federal region. The Region 5 Oil and Hazardous Materials Contingency Plan has been developed with cooperation of all designated Federal Agencies and State governments. This plan provides a mechanism for coordinating responses to releases of oil or hazardous materials within the States of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, and within the Tribal lands of the 31 Federally recognized Native American Tribes in Region 5.

This plan is effective upon receipt and supersedes the previous plans* in their entirety. Changes to this plan will be noted and consecutively numbered. Comments and recommendations regarding this plan should be addressed to U.S. EPA Region 5. Requests for amendments and changes will be addressed during regularly scheduled RRT meetings.

Copies of this plan may be obtained from:

U.S. Environmental Protection Agency
Office of Superfund (HSE-5J)
77 West Jackson Boulevard
Chicago, IL 60604

Richard Karl, Chief Captain Thomas Daley
Emergency Response Branch Chief, Marine Safety Division
U.S. Environmental Protection Agency U.S. Coast Guard
Region 5 Ninth Coast Guard District
Co-Chair, Region 5 RRT Co-Chair, Region 5 RRT

* Note: This plan incorporates and supersedes US EPA Region 5 Inland Plan.

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iii. DEFINITIONS

Area Committee: As provided for by Sections 311(a)(18) and (j)(4) of the Clean Water Act (CWA), means the entity appointed by the President consisting of members from qualified personnel of Federal, State, and local agencies with responsibilities that include preparing an Area Contingency Plan for the area designated by the President. The Area Committee may include ex-officio (i.e., non-voting) members (e.g., industry and local interest groups).

Area Contingency Plan: As provided for by Sections 311(a)(19) and (j)(4) of CWA, means the plan prepared by an Area Committee that is developed to be implemented in conjunction with the NCP and RCP, in part to address removal of a worst case discharge and to mitigate or prevent a substantial threat of such a discharge from a vessel, offshore facility, or onshore facility operating in or near an Area designated by the President.

coastal waters: As defined in the NCP, for the purposes of classifying the size of discharges, the waters of the coastal zone except for the Great Lakes and specified ports and harbors on inland rivers. Precise boundaries are identified in U.S. Coast Guard/U.S. Environmental Protection Agency agreements, Federal Regional Contingency Plans and Area Contingency Plans.

coastal zone: As defined in the NCP, all United States waters subject to the tide, United States waters of the Great Lakes,

specified ports and harbors on inland rivers, waters of the contiguous zone, other waters of the high seas subject to the NCP, and the land surface or land substrata, ground waters, and ambient air proximal to those waters. The term coastal zone delineates an area of Federal responsibility for response action. Precise boundaries are determined by U.S. EPA/USCG agreements and identified in Federal Regional Contingency Plans. No ports or harbors are designated in Region 5.

discharge: As defined by Section 311(a)(2) of CWA, includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under Section 402 of the CWA, discharges resulting from circumstances identified and reviewed and made a part of the public record with respect to a permit issued or modified under Section 402 of the CWA, and subject to a condition in such permit, or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under Section 402 of the CWA, that are caused by events occurring within the scope of relevant operating or treatment systems. For purposes of the NCP, discharge also means substantial threat of discharge.

drinking water supply: As defined by Section 101(7) of CERCLA, means any raw or finished water source that is or may be used by a public water system (as defined in the Safe Drinking Water Act, 42 U.S.C. *et seq.*) or as drinking water by one or more individuals.

economically sensitive areas: Those areas of explicit economic importance to the public that due to their proximity to potential spill sources may require special protection and include, but are not limited to: public water supplies, publicly managed use areas, and Tribal use areas.

Emergency Planning and Community Right-to-Know Act (EPCRA): Title III Section 300. of SARA; created a system of State and local planning agencies for chemical emergencies and provided a way for communities to gain information about potential chemical hazards. EPCRA's mandates cover three main topics: emergency planning, emergency notification requirements, and requirements for reporting hazardous chemical inventories.

environmentally sensitive areas: Areas identified as a priority for protection and special attention during cleanup in the event of a pollution incident. Designations of types of areas considered to be sensitive can be found in 1) the U.S. Fish and Wildlife Annex (Appendix IX) and 2) the Guidance for Facility and Vessel Response Plans Fish and Wildlife and Sensitive Environments, published by Department of Commerce/National Oceanic and Atmospheric Administration. In addition to this definition, Area Committees may include any additional areas determined to be "sensitive." These areas are mapped in Region 5 and are available on paper and CD-ROM as a companion to this Plan. 4202.(a)(4)(B)(ii)

hazardous substance: As defined by section 101(14) of CERCLA, any substance designated pursuant to section 311(b)(2)(A) of the CWA; any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA; any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act [42 U.S. C. 6901 et seq.] has been suspended by Act of Congress); any toxic pollutant listed under section 307(a) of the CWA; any hazardous air pollutant listed under section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture with respect to which the U.S. EPA Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act (TSCA). This term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and does not include natural gas, natural gas liquids, liquified natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and synthetic gas).

inland waters: As defined in the NCP, for the purposes of classifying the size of discharges, means those waters of the United States in the inland zone, waters of the Great Lakes, and specified ports and harbors on inland rivers.

inland zone: As defined in the NCP, means the environment inland of the coastal zone excluding the Great Lakes and specified ports and harbors on inland rivers. The term inland zone delineates an area of Federal responsibility for response action. Precise boundaries are determined by U.S. EPA/USCG agreements and identified in Federal regional contingency plans.

Local Emergency Planning Committee (LEPC): A group of local representatives appointed by the State Emergency Response Commission (SERC) to prepare a comprehensive emergency plan for the local emergency planning district, as required by the Emergency Planning and Community Right-to-know Act (EPCRA), Title III Section 301(c) of SARA.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): As required by section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499, collectively called (CERCLA), and by section 311(d) of the Clean Water Act (CWA), 33 U.S.C. 1321(d), as amended by the Oil Pollution Act of 1990 (OPA), Pub. L. 101-380, the NCP provides nationwide organizational structure and procedures for responding to discharges of oil and releases of hazardous substances, pollutants and contaminants. In Executive Order (E.O.) 12777 (56 FR 54757, October 1991), the President delegated to the Environmental Protection Agency (EPA) the responsibility for the amendment of the NCP in coordination with members of the National Response Team (NRT) as well as the Federal Emergency Management Agency (FEMA) and the Nuclear Regulatory Commission to avoid inconsistent or duplicative requirements in the emergency planning responsibilities of those agencies.

National Pollution Fund Center (NPFC): As defined by Section 7 of Executive Order 12777, the NPFC is the entity established

by the Secretary of the Department of Transportation whose function is the administration of the Oil Spill Liability Trust Fund (OSLTF). This includes access to the OSLTF by Federal Agencies, States, and designated trustees for removal actions and initiation of natural resource damage assessments, as well as claims for removal costs and damages.

Natural Resource Trustees: Officials representing State, Tribal, Federal, and foreign governments who are authorized to act pursuant to section 107(f) of CERCLA, section 311(f)(5) of the CWA, or section 10006 of the OPA when there is injury or threat to natural resources, including their supporting ecosystems, as a result of a release of a hazardous substance or a discharge of oil. Natural resources means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources.

navigable waters: As defined by 40 CFR 110.1, the term navigable waters includes: (a) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; (b) Interstate waters, including interstate wetlands; (c) All other waters such as intrastate lakes, rivers, streams, mudflats, sandflats, and wetlands, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) That are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; (3) That are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as navigable waters under this Section; (e) Tributaries of waters identified in (a) through (d) of this definition, including adjacent wetlands; and (f) Wetlands adjacent to waters identified in (a) through (e) of this definition: Provided, that waste treatment systems (other than cooling ponds meeting the criteria of this paragraph) are not waters of the United States. Water of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal Agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with U.S. EPA.

oil: As defined by Section 311(a)(1) of CWA, means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. Oil, as defined by Section 1001 of OPA means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged oil, but does not include petroleum, including crude oil or any fraction thereof, which is specifically listed or designated as a hazardous substance under paragraphs (A) through (F) of Section 101(14) of CERCLA (42 U.S.C. 9601) and which is subject to the provisions of that Act.

Oil Spill Liability Trust Fund (OSLTF): As defined by the NCP, means the fund established under Section 9509 of the Internal Revenue Code of 1986 (26 U.S.C. Section 9509).

On-Scene Coordinator (OSC): As defined by the NCP, means the Federal official predesignated by U.S. EPA or USCG to coordinate and direct responses, or the government official designated by the lead agency to coordinate and direct removal actions under the NCP. In certain site-specific situations, DOD or DOE may also act as OSC.

Region 5 Integrated Contingency Plan (ICP): Developed to fulfill the requirements of the NCP for both the RCP and Area Contingency Plans (ACP), as well as relevant portions of the Federal Response Plan (FRP), particularly Emergency Support Function #10 for Hazardous Materials (ESF #10)

Regional Oil and Hazardous Substances Pollution Contingency Plan (RCP): As provided for by Section 300.210 (b) of the NCP, and under the auspices of the Regional Response Team (RRT), the RCP is the mechanism for planning and coordinating regional preparedness and response actions for discharges of oil and releases of hazardous substances.

Regional Response Team (RRT): As defined in the NCP, the regional response organization (consisting of a representative from each State in the region and representatives from 15 Federal Agencies) which acts as a regional body responsible for regional planning and coordination of preparedness and response actions involving oil and hazardous materials. The RRT coordinates assistance and advice to the OSC in the event of a major or substantial spill. **State Emergency Response Commission (SERC):** As provided in SARA Section 301.(a), an individual or group of officials appointed by the State governor to implement the provisions of EPCRA (see above). The SERC coordinates and supervises the work of the Local Emergency Planning Committees and reviews local emergency plans annually.

Tribal Emergency Response Commission (TERC): A group of officials appointed by Native American governing bodies to implement the provisions of Title III of SARA.

used oil: Any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.

waste oil: For the purposes of this Plan waste oil is any oil that has been refined from crude oil, or any synthetic oil, that has been physically or chemically contaminated as a result of a spill.

wetlands: Those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs, and similar areas such as sloughs, prairie

potholes, wet meadows, prairie river overflows, mudflats, and natural ponds (40 CFR 112.2[y]).

worst case discharge: As defined by section 311(a)(24) of the CWA, means, in the case of a vessel, a discharge in adverse weather conditions of its entire cargo and, in the case of an offshore facility or onshore facility, the largest foreseeable discharge in adverse weather conditions.

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NCP Crosswalk

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SECTION 1: INTRODUCTION

1.1. INTRODUCTION

This Region 5 Oil and Hazardous Substances Integrated Contingency Plan (ICP) is intended for use by local, Tribal, State, and Federal emergency response personnel as a tool for procuring resources to respond to an oil or hazardous materials incident. It outlines the response mechanisms that would be activated among the various levels of the response community in the event of an emergency situation. It is not intended to displace local emergency response plans, but rather it is intended to coordinate with local plans and build on the mechanisms set forth in State plans.

The Federal On-Scene Coordinator (OSC) is the link between local and State emergency response communities and Federal response efforts.

This ICP outlines:

(a) the types of assistance available to Federal OSCs from Regional Response Team (RRT) member agencies during response actions, and

(b) the cooperative response that should be carried out by OSCs during response actions.

The plan also includes resource information from governmental, commercial, and other sources that may be utilized during a response.

This plan has been organized to follow the structure of the Incident Command System (ICS), as outlined in the Integrated Contingency Plan guidance developed by the National Response Team (NRT), but this will be appended by reference in this plan.

This plan combines the response authorities relevant for both oil and hazardous materials. Although these releases and the related contingency planning are regulated separately under the Oil Pollution Act of 1990 (OPA) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), there is significant overlap in the type and scope of relevant information. In order to minimize confusion and maximize resources, the two plans are combined herein. In order to meet some of the requirements of OPA, subarea plans are being developed separately, but will be referenced in this ICP.

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1.2. PURPOSE AND OBJECTIVE

The purpose of this combined ICP is to fulfill the requirements of Sections 300.210(b) and (c), of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and Section 311(j)(4) of the Clean Water Act (CWA) as well as relevant portions of the Federal Response Plan (FRP), particularly Emergency Support Function #10 Hazardous Materials (ESF #10). The ICP is designed to coordinate timely and effective response among
· local, Tribal, and State officials;
· private industry;
· OSCs;
· Remedial Project Managers (RPMs);
· various Federal Agencies; and
· other organizations
to minimize damage resulting from releases of oil or hazardous substances, pollutants, or contaminants.

The objective of this plan is to describe response protocols and assist in providing a coordinated response capability in the event of a release or spill that poses a threat to the environment or to human health and welfare. The initial actions taken by the OSC and/or other appropriate personnel should be to determine whether proper response actions have already been initiated.

In general, if the party or parties responsible for the release or spill do not take appropriate actions, or if the party or parties responsible for the release or spill are unknown, the local response community or State agencies will become involved. If Federal assistance is requested or required, the OSC shall respond, implement provisions of the NCP and applicable agency guidance, and coordinate activities as outlined in this ICP.

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1.3. AUTHORITY

The RCP is developed pursuant to Section 300.210 of the NCP. The NCP is required by Section 105 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), by Section 311(d) of CWA, as amended by OPA. The

ESF 10 components of this plan are required by the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288), as amended. The RCP is applicable to response actions taken pursuant to the authorities under CERCLA, Section 311 of CWA, and OPA. The NCP requires establishment of RRTs, which are responsible for Regional planning and preparedness activities before response actions, and for providing advice and support to the RRT when activated during a response.

The ACP is required by Section 311(j)(4) of CWA, and is written in conjunction with the NCP and CERCLA.

To accomplish the coordinated planning structure envisioned under OPA, Section 4202(a) of OPA requires the President to designate specific Areas for which Area Committees are established. Each Area Committee, under the direction of an OSC, must prepare and submit to the President for approval an ACP that, in conjunction with the NCP, is adequate to remove a worst case discharge from a vessel or facility operating in or near that Area.

Through Executive Order 12777, the President delegated to the Administrator of the United States Environmental Protection Agency (U.S. EPA) responsibility for designating the Areas and appointing the committees for the inland zone as designated in the NCP. The Administrator further delegated this authority to the U.S. EPA Regional Administrators, and designated the 10 pre-existing RRT areas as the Areas for OPA planning purposes. U.S. EPA Region 5, which consists of Illinois, Indiana, Minnesota, Michigan, Ohio, and Wisconsin, is one Area. Establishment of the Area Committee is required by Section 311(j)(4) of CWA.

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1.4. SCOPE AND PROVISIONS

This ICP:
(a) expands upon planning and response requirements set forth in the NCP,
(b) augments coordination with local and State authorities, and
(c) integrates existing local, Tribal, State, and private sector plans for the Area.

The U.S. EPA Region 5 RCP/ACP has been developed in coordination with the NCP and the United States Coast Guard (USCG) area plans. The Ninth Coast Guard District is covered by eight area contingency plans, seven of which are in Region 5. Each plan covers the coastal zone of the corresponding Marine Safety Office (MSO). Each USCG area contingency plan is developed by an area committee chaired by the respective Coast Guard Captain-of-the-Port.

USCG's eight area contingency plans cover, in part, how to respond to an oil or hazardous substance spill in the coastal zone of the Great Lakes and the connecting channels. This includes the identification, prioritization, and cleanup strategies for sensitive areas; and identification of contractors and equipment.

While U.S. EPA has chosen to combine its Area Contingency Plan for Region 5 into the existing Regional Contingency Plan to produce this joint document, the USCG's seven area contingency plans are separate documents, which are compatible with and may be used in conjunction with this ICP for spills which impact both the inland and coastal zones.

The ACP referred to in this Plan is the U.S. EPA Inland Plan unless otherwise stated. This plan applies to the Region 5 RRT (RRT5) member agencies and covers:

(a) discharge or threats of discharge of oil into or upon navigable waters of the United States and adjoining shorelines or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States;

(b) releases or substantial threats of release of hazardous substances into the environment; and

(c) releases or substantial threats of release of pollutants or contaminants that may present an imminent and substantial danger to public health or welfare in the States of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, and in the lands of the Federally recognized Native American Tribes in Region 5.

The ICP, when implemented in conjunction with other provisions of the NCP, shall be adequate to remove a worst case discharge and to mitigate or prevent a substantial threat of such a discharge.

The RCP portion of this plan covers response for all of Region 5. The ACP portion of this plan covers the inland portion only. Thus, when reading the plan, if the jurisdiction falls in the coastal zone, the spill will fall under the responsibility of the Coast Guard and will only be subject to the RCP components of this plan. If a jurisdiction is in the inland zone, both ACP and RCP components of this plan apply.

Certain groups of counties have been or will be designated as sub areas of the ACP and will be appended to the plan. They are chosen based on criteria for threat (proximity to large bodies of fresh water, number of facilities) and need for greater jurisdictional coordination. They may also contain portions of other adjacent areas to provide for a coordinated plan for spills

affecting certain boundary locations.

See Appendix I for coastal zone boundaries.
See Appendix I for the jurisdictions in Region 5.

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1.5. UPDATING

Section 311(j)(4)(C)(viii) of CWA requires that the ACP be updated periodically by the Area Committee. For national consistency, it has been determined that the ACP will be updated annually for 5 years, starting January 1, 1995, and once every 5 years thereafter. The document may be updated more frequently, as policy changes require.

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1.6. CONSISTENCY WITH STATE, TRIBAL, AND FEDERAL STATUTES

Planning and response protocols and decisions may be subject to existing statutes (e.g., radiological emergencies that involve response by various agencies; disposal restrictions for oiled debris; compliance with the Endangered Species Act; State, Tribal, and Federal authorities to protect cultural and historic resources). RRT representatives will assist the OSC by involving the appropriate regulatory staffs.

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SECTION 2: COMMAND

2.1. INTRODUCTION

It is the policy of the RRT that response actions on non-Federal lands should be monitored or implemented by the most immediate level of government with authority and capability to conduct such activities. The first level of response will generally be the responsible party (RP), followed by local government agencies, followed by State agencies when local capabilities are exceeded. When incident response is beyond the capability of the State response, U.S. EPA or USCG is authorized to take response measures deemed necessary to protect the public health or welfare or the environment from discharges of oil or releases of hazardous substances, pollutants, or contaminants. The need for Federal response is based on evaluation by the Federal OSC.

2.1.1. 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 the local police and fire agencies. At some facilities, the responsible party conducts the response; at other facilities and in transportation incidents where the responsible party may not have the specialized capability to address an incident, public agencies direct the response. 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 commander.

In most States, the role of State agencies in public safety response during the early stages of an incident is to provide technical advice to local commanders as soon as possible. During major incidents, State and Federal authorities may be able to provide additional assistance to the local commander at the spill scene by:
· conducting sampling and analysis of chemicals,
· providing specialized contractors or equipment, or
· providing detailed advice or other supporting functions.

Seldom will State or Federal authorities assume command from a local fire or police commander for short-term, on-site, public-safety-related issues.

2.1.2. Response to Environmental and Health Threats Caused by Spills

A number of State and Federal programs require parties who are responsible for a spill to investigate and remedy all related environmental and health threats. Often these actions include activities on properties owned by third parties or public agencies. The actions usually begin somewhat later than the public safety protection response, but can continue for a much longer period. The actions may include, but are not limited to:
· placing containment and recovery booms and pads,
· sampling runoff and rivers,
· excavating soil,
· sampling smoke,
· performing hydrogeological investigations,
· wildlife rescue and rehabilitation,
· closing drinking water intakes, and
· providing an alternate water supply.

Sometimes a responsible party is unable or unwilling to undertake adequately or quickly 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. Usually this is done through investigation or cleanup contractors using governmental funds, such as State or Federal Superfunds or the Oil Spill Liability Trust Fund (OSLTF). The costs of these direct government actions will usually be recovered later from the responsible party. The decision to assume governmental control of environmental and health followup of an incident is dependent on:
· the ability and willingness of the responsible party to respond effectively,
· the severity of the incident,
· the cost and duration of required actions, and
· the resources available to the various levels of government.

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2.2. INCIDENT COMMAND PROTOCOL/LIAISON

Federal law requires implementation of a site-specific incident command system by the senior emergency response official at all emergencies involving hazardous substances (29 CFR 1910.120 (q) and 40 CFR 311). The specific regulatory language suggests a seniority hierarchy increasing from local to State to Federal levels. Often the senior local or State official assumes command because they are most familiar with the resources immediately available. At the same time, it must be recognized that local, Tribal, State, and Federal responders are charged by law with specific authorities and responsibilities in certain emergency situations that cannot be subsumed. **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 spills of oil or hazardous

substances[1] 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[2] and applied in a broad sense to include all hazard control and mitigation response organizations, including responsible parties; private responders; and local, Tribal, State, and Federal Agencies. Each participating entity is required by Federal law to implement an intra-organizational ICS and integrate it with the overall ICS (29 CFR 1910.120, 40 CFR 311, or 30 CFR 154).

A Unified Command System (UCS) consisting of the responsible party and senior competent local, Tribal, State, and Federal emergency response officials at the site may be the preferred approach to integrating several levels of government into an ICS. A UCS is a type of ICS in which parties with jurisdiction command by agreeing on objective priorities and response strategies.

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2.2.1. Single Jurisdictional Area Affected

When an incident involves and affects only a single geographical jurisdiction (e.g., within the boundaries of a city or county), the organizational structure of the ICS will be determined by the established local contingency plan. It may involve one or more agencies. **In all situations, one person shall act as either Incident Commander (IC) in sole charge of the ICS, or as Operations Chief to 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:

(1) identify themselves to the IC and integrate themselves into the established ICS per the IC's direction, usually as a technical specialist to an operations group supervisor or as an operations group supervisor; or

(2) join the existing Unified Command or request that the IC establish a Unified Command; or

(3)assume the Incident Commander role:
· when required by Federal or State law, or
· when an existing IC agrees to such a transition, or
· when no ICS has been established.

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

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2.2.2. 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 in subsection 2.2.1 (above); or

(2) establish a Unified Command as an encompassing ICS if none exists; or

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

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2.2.3. Local, Tribal, State, and Federal Interaction

When not specifically prescribed, a Unified Command consisting of senior competent local, Tribal, State, and Federal 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 other sections of this RCP/ACP shall take precedence over this protocol.

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2.2.4. Seniority

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

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 assigned overriding authority applicable to the specific incident situation by State or Federal law.

Breadth of responsibility will be considered to increase from the local to the State to the Federal level. **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**.

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2.2.5. Post-Emergency Operations

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

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[1] *The definition of hazardous substances used by the Occupational Safety and Health Administration (OSHA) is broader than the CERCLA definition used throughout this document.*

[2]*One set of common terminology and procedures is vital to the efficient functioning of an ICS in an emergency. The response management system recommended for use in the National Response Team (NRT) Integrated Contingency Plan (ICP) is the ICS of the National Interagency Incident Management System (NIIMS). NIIMS ICS is a nationally recognized system currently in use by numerous local, State, and Federal organizations. USCG has adopted this Unified Command System (UCS) protocol.*

[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.

"NOTE to (q)(3)(i): The `senior official' at an emergency response is the most senior official on the site who has the responsibility for controlling the operations at the site. Initially it is the senior officer on the first-due piece of responding emergency apparatus to arrive on the scene. As more senior officials arrive (e.g., battalion chief, fire chief, State law enforcement official, site coordinator), the position is passed up the line of authority which has been previously established.

[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 response system.
(b) Know how to implement the employer's incident response system.
(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."

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2.3. LOCAL RESPONSE

The focus of local responders is usually directed toward abating immediate public safety threats. The degree of local response will depend upon the training and capabilities of local responders relative to the needs of the specific emergency. In some cases this may be using hazard awareness training knowledge to identify the nature and scope of the hazard. This information is then passed on to State and Federal responders who are activated to address the situation with specific expertise and/or capabilities. Often local agencies take mitigating actions of a defensive nature to contain the incident and protect the public. In many instances, responsible parties or local agencies are capable of aggressive response and quick abatement of immediate hazards. Usually in these cases, local authorities rely on State and Federal responders to assure that cleanup is complete and remediation is technically sufficient.

A major role of local organizations during all emergency incidents is providing security for onscene forces and equipment. For large incidents, help is often requested through State emergency management agencies. This includes establishing local liaison with hospital, emergency services, and police personnel, as well as restricting entrance to hazardous areas to only essential personnel.

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2.4. STATE RESPONSE

The Governor of each State in Region 5 is requested to designate a lead agencythat will direct State-lead response operations.

This agency is responsible for designating the lead State response actions and coordinating/communicating with any other State agencies,as appropriate (NCP 300.180). Each Governor will also designate a representative for the State on the RRT. Each State representative may participate fully in all activities of the RRT. The State RRT representatives are expected to coordinate with the State Emergency Response Commissions (SERCs¾in Wisconsin, the State Emergency Response Board, or SERB) in their States in order to communicate and coordinate preparedness and preresponse planning activities between the State and the RRT. State and local government agencies are encouraged to coordinate with:
· State contingency planning efforts for response to oil and hazardous material events,
· this plan, and
· requirements of SARA Title III.

Section 311(j)(4) of CWA calls for inclusion of local, Tribal, and State representatives on the Area Committee. In U.S. EPA Region 5, this has been only partially accomplished through the designation of the RRT as the Area Committee.

Each State in Region 5 has a State disaster plan and laws that specify that State's authority and organization for a technical response to environmental emergencies. All States can provide technical expertise to assess environmental and public health threats and damage, as well as to advise local responders. In specific circumstances, States may provide additional response capabilities in the form of contractors and funding.

The following are summaries of emergency preparedness measures for lead agencies for each State in Region 5.

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2.4.1. ILLINOIS

2.4.1.1. Emergency Response to Oil Spills and Hazardous Materials Incidents

The Illinois Environmental Protection Agency (IEPA) provides the designated RRT member for Illinois. To prevent and abate environmental pollution, IEPA has various responsibilities for responding to environmental emergencies within the State or its adjoining waters. IEPA is the State's lead agency for developing plans and coordinating action before, during, and after certain emergency situations, including:
· emergencies involving waste management;
· emergencies involving public water supplies;
· spills of oil or hazardous materials upon waters or lands of the State; and
· releases of harmful quantities of toxic substances to the atmosphere.

Within IEPA, the Emergency Response Unit (ERU) of the Office of Chemical Safety has the responsibility for coordinating the agency's response and ensuring appropriate cleanup of any subsequent environmental contamination. ERU collects information about environmental emergencies and responds directly and/or notifies other divisions within IEPA of needed action. Technical expertise is provided to first responders and public officials, addressing such issues as:
· the physical, chemical, and toxicological characteristics of the materials involved;
· effective response and treatment actions; and
· precautions to be taken to prevent further injury or damage to public health or the environment.

2.4.1.2. Other Agencies' Responsibilities and Requirements

(a) Illinois Emergency Management Agency (IEMA): coordination and communications center for Illinois State agencies and is in overall command of emergency government efforts during major multijurisdictional disaster responses. IEMA is also the SERC designated pursuant to SARA Title III.

(b) Illinois Department of Nuclear Safety: incidents involving radioactivity, whether in transport or at nuclear power plants or other facilities.

(c) Illinois Department of Mines and Minerals: initial investigation of incidents involving crude oil and natural gas production sites, unless waters of the state are being impacted (then IEPA).

(d) Illinois State Fire Marshal: incidents involving underground storage tanks (USTs); this responsibility is shared with IEPA. Has the authority to require equipment inspection and testing.

(e) Illinois Commerce Commission: incidents involving railroad transport with respect to authority over the use, movement, and compliance of railroad equipment with U.S. Department of Transportation (DOT) regulations.

> ***The Ilinois 24-hour spill notification number is to the Illinois Emergency Management Agency 217-782-7860 (800-782-7860 in Illinois). The office hours phone is 217-782-3637. After office hours call IEMA to get our Duty Officer.***

(f) Illinois State Police: transportation incidents involving DOT Hazardous Materials, enforcement of DOT shipping regulations, traffic control, and security.

(g) Illinois Department of Conservation: assessment of natural resource damage in incidents involving serious environmental injury, such as fish kills and oiled waterfowl.

Other agencies serve a secondary role and provide technical support and resources as needed; however, they do not generally maintain an emergency response capability for onscene response: the Departments of Agriculture, Public Health, and Energy and Natural Resources; the Office of the Attorney General; and other human service agencies that might be involved with evacuees, should a prolonged incident occur requiring relocation of the general public.

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2.4.2. INDIANA

2.4.2.1. Emergency Response to Oil Spills and Hazardous Materials Incidents

The Indiana Department of Environmental Management (IDEM) provides the designated member of the RRT for Indiana and is the lead agency for the State in addressing spills, providing a 24hour response capability. IDEM must provide technical assistance to the responsible party and the responding personnel and ensure compliance with the Indiana spill regulation and other pertinent State and Federal rules and regulations. Technical assistance takes the form of:
· chemical identification, handling, and hazard information;
· evaluation of the threat to environmental and public safety;
· personal protection recommendations;
· containment and cleanup methods; and
· resource identification and location.

On large spills, or where the spiller fails to respond adequately, IDEM staff respond onsite to assist in the response effort, assuming the role of State OSC if necessary.

During a response, staff of the Emergency Response Section (ERS) of IDEM assume the role of technical advisors and provide onscene assistance to the responsible party, and to individuals or agencies involved in the response. On occasion, ERS staff have assumed a role that would appropriately be called OSC. However, if a structure (e.g., ICS) exists within a local or County jurisdiction that provides an OSC and that OSC is being utilized, ERS staff will provide assistance to that OSC.

Once the immediate threat to public health and the environment has been relieved, the incident is further stabilized and cleaned up under ERS supervision. Rule 327 IAC 26.1, *Spills: Reporting, Containment, and Response*, requires that the spiller report to IDEM and perform a spill response. A spill response means that a spill is contained and free material is removed or neutralized. Disposal of recovered material that is classified as waste is referred by ERS staff to appropriate personnel in the Office of Solid and Hazardous Waste Management. ERS staff may then conduct a followup investigation to ensure that material has been disposed of properly and the cleanup is acceptable.

Spills can be reported 24-hours-a-day at 888-233-7745.

2.4.2.2. Other Agencies' Responsibilities and Requirements

The role of liaison between a spiller and the different program areas of IDEM is perhaps the greatest benefit that ERS can provide to those involved in a spill. This role can also extend to other State agencies and other response organizations. State agencies include:

(a) State Emergency Management Agency (SEMA): SEMA is the lead planning agency for coordinating man-made and natural disasters. SEMA also provides an alternate member for the RRT.

(b) Office of the State Fire Marshal (OSFM): OSFM responds to fire and explosion hazards from hazardous materials incidents.

(c) Office of the Indiana State Chemist (OISC): OISC provides technical guidance regarding agricultural chemical incidents including fertilizers and pesticides. It also conducts investigations of improper application of regulated agricultural chemicals.

(d) Department of Natural Resources (DNR), Fish and Wildlife Division: DNR Conservation Officers conduct investigations to assess damages to natural resources such as fish kills.

(e) DNR, Oil and Gas Division (O & G): DNR O & G regulates oil production facilities, including operation, maintenance, construction, and abandonment of oil wells and associated equipment.

(f) Indiana State Police (ISP): ISP investigates transportation incidents involving DOT hazardous materials, enforces DOT shipping regulations, and provides traffic control and site security.

(g) Indiana State Department of Health (ISDH): ISDH is the lead agency for releases of radiological and etiological materials. They also provide technical guidance to IDEM regarding health issues and advisories.

(h) Indiana Department of Transportation (INDOT): INDOT usually provides traffic control for major transportation incidents involving releases of petroleum and hazardous materials. ERS also coordinates with other program areas within IDEM as well as local response agencies such as fire departments, hazardous materials teams, sheriffs' departments, local emergency planning committees (LEPCs), emergency management agencies, county health departments, and county highway departments.

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2.4.3. MICHIGAN

2.4.3.1. Emergency Response to Oil Spills and Hazardous Materials Incidents

Michigan's representation on RRT5 comes from the Michigan Department of Environmental Quality (MDEQ). MDEQ is the primary environmental emergency response agency in the State in all non-agricultural-related spills. Recent legislation has designated the Michigan Department of Agriculture (MDA) as the primary response organization, in close association with MDEQ, in spills involving agricultural chemicals.

> ***Staff of MDEQ can be notified of oil and hazardous materials incidents via the Pollution Emergency Alert System (PEAS) at (800) 292-4706 (in-state) or (517) 373-7660.***

MDEQ has approximately 19 full-time equivalent field positions available to respond to complaints and environmental emergencies. Most of these positions are located in the nine Field Operations Districts operated by MDEQ, which are situated throughout the State. The primary response role of MDEQ is one of technical advisor. These personnel are responsible for complaint investigation and emergency spill response and generally oversee the environmental aspects of spill containment, control, and mitigation. Appropriately trained staff within MDEQ can provide hands-on response with absorbents and skirt boom if the situation requires this type of response. It is anticipated, however, that all "first responder" response will be conducted by local units of government and the various Hazardous Material Response Teams located throughout the State, although predominantly in the lower third of the peninsula.

Environmental mitigation associated with material spills will generally be conducted by the RP. If the RP cannot be identified or is reluctant to adequately address mitigation needs, the State can hire contractors to perform the mitigation. A limited amount of money is available through funds administered by the MDEQ Environmental Response Division. The State can also access the Federal fund administered under OPA in accordance with Federal guidelines and regulations.

Michigan has a responder immunity act.

MDEQ, in conjunction with the Department of Attorney General, is the designated Natural Resources Trustee for the State.

2.4.3.2. Other Agencies' Responsibilities and Requirements

(a) Michigan State Police (MSP): The MSP Emergency Management Division (EMD) serves as the designated emergency/disaster response coordination agency for the State and as the primary State contact point in the event of a declared disaster resulting in the activation of the State Emergency Management Plan.

(b) Michigan Department of Agriculture (MDA): MDA is the lead agency in spill responses involving agricultural chemicals and/or fertilizers.

(c) Michigan Emergency Response Commission (MERC): MERC is the primary coordination agency and liaison with the local Emergency Planning Commissions throughout the state. MERC is co-chaired by MSP-EMD and MDEQ.

(d) Michigan Department of Natural Resources (MDNR): MDNR is the lead agency for the State in decisions involving fish and wildlife issues during a spill response working cooperatively with the MDEQ State OSC.

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2.4.4. MINNESOTA

2.4.4.1. Emergency Response to Oil Spills and Hazardous Materials Incidents

The Minnesota Pollution Control Agency (MPCA) provides the designated member of RRT5 for Minnesota. MPCA is the primary State responder to spills and other emergencies involving hazardous materials (with the exception of incidents involving pesticides and fertilizers, which are under the jurisdiction of the Minnesota Department of Agriculture). All of the following information describing State emergency response therefore assumes MPCA actions for general hazardous materials incidents, but applies to the Department of Agriculture for all pesticide and fertilizer incidents.

> ***Spills can be reported through the following telephone numbers: 651-649-5451 and 800-422-0798 (in-State long distance).***

MPCA's Emergency Response Team (ERT) includes eight full-time ERT members whose primary duty is to monitor the cleanup of spills and other emergency situations that pollute or threaten to pollute surface or ground water. By default, they also respond to reports of other environmental emergencies (e.g., air releases, illegal hazardous waste disposal, tire dump fires). In addition to receiving release reports, the ERT may perform field inspections at spill sites, provide technical assistance to responsible parties, or carry out enforcement actions for violation of State laws and rules.

If necessary, ERT staff will proceed to the site to provide coordination and assistance in handling the emergency. This may include taking charge of the response if the responsible party is unknown or unavailable. In situations where public safety is the primary consideration, the ERT member does not take charge of the incident, but assists the fire chief or other public safety officials at the scene. This assistance may include emergency waiver or suspension of State laws and rules (e.g., allowing emergency wastewater discharges or burning of a spilled product in order to minimize overall environmental damage). The assistance may also include activation of contractors using State funds.

Minnesota Statute Chapter 115E requires companies handling oil and hazardous substances to act to prevent releases and to be prepared for releases they may have. Chapter 115E requirements are similar to OPA but cover protection of the public's safety and the environment, and pollution of the land, air, and waters of the State. A facility operator is to notify the Emergency Response Commission when their plan is completed, and must supply a copy upon request. ERT staff actively inspect the prevention capabilities and preparedness of major facilities, and will assist facility owners if requested. They conduct enforcement if the preparedness of a facility is found to be inadequate, especially if it contributed to a release or poor response.

Both Minnesota Statute Chapter 115E and State Superfund Chapter 115B contain language providing immunity to those responding to oil or hazardous substance discharges.

2.4.4.2. Other Agencies' Responsibilities and Requirements

The Department of Public Safety Division of Emergency Management (DEM) operates the 24-hour-per-day Duty Officer System to take incident reports for all State agencies. DEM also coordinates the actions of State agencies, including MPCA, Natural Resources, Transportation, Public Safety, and Health. DEM conducts training for State and local responders, and reviews County emergency plans. DEM and the State Fire Marshal contract with a number of local jurisdictions to provide hazardous materials assessment and response teams to the various regions of the State. The Emergency Response Commission conducts the Right-to-Know programs in the State.

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2.4.5. OHIO

2.4.5.1. Emergency Response to Oil Spills and Hazardous Materials Incidents

The Ohio Environmental Protection Agency (OEPA) is the designated representative of RRT5 for Ohio. OEPA is also the State agency charged with investigating releases of oil and hazardous substances from both fixed and mobile facilities. Ohio's spill response program is housed in the Emergency Response Unit (ERU), which is a part of the Division of Emergency and Remedial Response. This unit, which is responsible for receiving reports of releases to all environmental media, uses 15 spill responders to aid in chemical identification, containment, cleanup, public safety, and the identification of responsible parties. If a responsible party cannot be identified or is recalcitrant, the ERU can activate a level-of-effort contractor to initiate actions to contain or clean up the spill.

> ***Spills can be reported 24-hours-a-day at 800-282-9378.***

Ohio has enacted no laws specifically related to responder immunity in environmental emergencies but it has enacted both a Good Samaritan Statute and a "General Duty Clause" that applies to State employees.

2.4.5.2. Other Agencies' Responsibilities and Requirements

Several different State agencies have areas of expertise to contribute during a spill, and in the case of such an event, operate under a cooperative agreement that outlines the activities of the signatory agencies when a spill occurs. These agencies are:
· the Ohio Emergency Management Agency,
· the State Fire Marshal,
· the Department of Highway Safety,
· the Public Utilities Commission,
· the Department of Transportation,
· the Department of Health,
· the Department of Agriculture,
· the Department of Natural Resources, and
· OEPA.

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2.4.6. WISCONSIN

2.4.6.1. Emergency Response to Oil Spills and Hazardous Materials Incidents

The primary agency representative to the RRT for Wisconsin is the Wisconsin Department of Natural Resources (WDNR) and alternate representative agency is from Wisconsin Emergency Management (WEM). WDNR is responsible for developing and updating a State Contingency Plan addressing spill response. The agency is responsible for: receiving notifications of releases; identifying the responsible party; and ensuring that appropriate measures are being taken by the responsible party to address public safety; and contain, clean up, and remediate a release. When a responsible party is unknown, or unable or unwilling to take appropriate actions, a WDNR representative may activate a Zone Contractor to take necessary actions.

WEM administers the Emergency Planning and Community Right-To-Know Act (EPCRA) in the State, and also administers eight Level A Regional Hazardous Materials Response Teams. This agency also coordinates resources for overall emergency management and provides hazardous materials training classes for all levels of responders. WEM operates a 24-hour emergency hotline that has a voice prompt directing spill calls to WDNR. WEM also serves as the lead State agency for consequence management of terrorism events.

2.4.6.2. Other Agencies' Responsibilities and Requirements

(a) The Department of Health and Family Services (DHFS) is responsible for monitoring the effects of chemical spills on public health and for providing assistance to local public health authorities.

Spills can be reported to the WEM 24-hour emergency hotline at 1-800-943-0003

(b) The Department of Agriculture, Trade, and Consumer Protection (DATCP) responds to spills of agrichemicals and coordinates with WDNR on remediation issues.

(c) The Wisconsin State Patrol (WSP) enforces State hazardous materials transportation regulations and can be involved in the initial response to transportation-related spills.

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2.5. NATIVE AMERICAN RESPONSE

The Tribe is the designated natural resource trustee for Native American communities. Response capabilities of Tribes in Region 5 vary. When a Tribal representative is not available or if it is unclear if there are any potential Tribal impacts, the Bureau of Indian Affairs (BIA) should be consulted. Contact with BIA can be facilitated by notifying the DOI RRT representative.

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2.6. FEDERAL RESPONSE

2.6.1. Statutory Authority

Section 104 of CERCLA as amended by SARA gives the Federal government the authority to respond to any hazardous substance released or to a substantial threat of a release into the environment or any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare and to remove or arrange to remove the hazardous substance, pollutant or contaminant or take any other response measure consistent with the NCP which is necessary.

Section 311 of CWA, 33 U.S.C. 1321, gives the Federal Government the authority to respond to a discharge or substantial threat of discharge of oil or a hazardous substance into or upon the navigable waters of the United States, adjoining shorelines, or the waters of the contiguous zone. It gives the President the authority to:
· remove or arrange for removal of a discharge and mitigate or prevent a substantial threat of a discharge at any time;
· direct or monitor all private, local, State, and Federal actions to remove a discharge; and
· if necessary, destroy by whatever means are available a vessel discharging, or threatening to discharge.

This authority is delegated to the Administrator of U.S. EPA, who has delegated it to the Regional Administrators of U.S. EPA, who then delegate that authority to OSCs. If a discharge or threat of discharge poses a substantial threat to public health or the welfare of the United States, the OSC shall direct all private, local, State, and Federal actions to remove the discharge or to mitigate or prevent the threat of discharge.

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2.6.2. Federal OSC Responsibilities

The Federal OSC directs Federal response efforts and coordinates all other Federal efforts at the scene of a discharge or release. The OSC may monitor local, Tribal, State, or private actions to remove a discharge, and may provide technical assistance to local, Tribal, State, or responsible party response personnel.

If a response action is being conducted through local, Tribal, State, or responsible party efforts, the OSC 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 OSC should advise the government agency or responsible party and take appropriate actions to mitigate or remove the threat or discharge.

When the OSC has determined that a discharge poses or may present a substantial threat to public health or welfare, he/she is authorized by the NCP to direct all private, State, or Federal actions to remove the discharge or to mitigate or prevent the threat of such a discharge. In addition, the OSC may remove or arrange for the removal of the discharge or mitigate or prevent the substantial threat of the discharge; and may remove and, if necessary, destroy by whatever means available a vessel discharging, or threatening to discharge, without regard for any other provision of law governing contracting procedures or employment of personnel by the Federal Government (40 CFR 300.322).

Upon receipt of notification of a discharge or release, the OSC is responsible for conducting a preliminary assessment to determine:
(a) threat to human health and the environment;
(b) the responsible party and its capability to conduct the removal; and
(c) feasibility of removal or the mitigation of impact.

OSC responsibilities in the event of a discharge or release include the following:

(a) Coordinate with appropriate Federal Agencies.

(b) Notify the appropriate State and Federal Agencies. OSC notification responsibilities are discussed in further detail in subsection 2.10 of this plan (p. 31).

(c) Determine whether proper response actions have been initiated. If the party responsible for the release or spill does not act promptly in accordance with the directions of the OSC or does not take appropriate actions, or if the party is unknown, the OSC shall respond in accordance with provisions of the NCP and agency guidance, and coordinate activities as outlined in this ICP.

(d)Collect information concerning the discharge or release:
· its source and cause;
· potentially responsible parties;
· the nature, amount, location, direction, and time of discharge;
· pathways to human and environmental exposure;
· potential impact on human health, welfare, and safety, and the environment;
· possible impact on natural resources and property;

· priorities for protecting human health and welfare and the environment; and
· estimated cost for the response.

(e) Coordinate his/her efforts with other appropriate Federal, State, and local agencies.

(f) Consult with and inform the RRT members of reported discharges and releases through Pollution Reports in Message Format (POLREPs). (See Figure 2-1, p. 34)

(g) Consult with the appropriate Regional or District office regarding situations potentially requiring temporary or permanent relocation. In the event of a declared Federal disaster, coordinate with the Federal Emergency Management Agency (FEMA) Federal Coordinating Officer (FCO) as appropriate.

(h) Implement appropriate community relations activities.

(i) Address worker health and safety issues prior to and during a response operation, and comply with all worker health and safety regulations.

(j) Coordinate with the Agency for Toxic Substances and Disease Registry (ATSDR), as deemed necessary, regarding possible public health threats.

(k) Coordinate with the U.S. EPA Office of Radiation and Indoor Air (ORIA) and the Department of Energy (DOE) in emergencies involving radiological hazards.

As requested by the NRT or RRT, the OSC shall submit to the RRT a complete report on the removal operation and the actions taken. The report shall record:
· the situation as it develops,
· the actions taken,
· the resources committed, and
· the problems encountered.

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2.6.3. Regional Response Team (RRT)

The RRT is reponsible for regional planning and preparedness activities, as well as for coordination of assistance and advice to the OSC during site-specific incidents. The Co-Chairs of the Region 5 RRT are the Chief of the Emergency Response Branch, U.S. EPA Region 5; and the Chief of the Marine Safety Division, Ninth Coast Guard District. The RRT membership includes representatives from each State appointed by the Governor, and the designated regional representatives of the following Federal Agencies:
· the Department of Agriculture (USDA),
· the Department of Commerce (DOC),
· the Department of Defense (DOD),
· DOE,
· FEMA,
· the General Services Administration (GSA),
· the Department of Health and Human Services (HHS),
· the Department of the Interior (DOI),
· the Department of Justice (DOJ),
· the Department of Labor (DOL),
· the Nuclear Regulatory Commission,
· the Department of State (DOS),
· the Department of Transportation (DOT),
· USCG, and
· U.S. EPA.

Federal RRT member agencies have duties established by Statute or Executive Order that may apply to Federal response actions following or in prevention of a discharge of oil or a release or threat of release of a hazardous substance, pollutant, or contaminant. The RRT also functions as the Area Committee for Inland Region 5.

The principal components of the RRT are a standing RRT and incident-specific RRTs. The standing RRT consists of designated representatives from each participating Federal Agency listed above and each State. Each incident-specific RRT is formed from the standing team when the RRT is activated for a response, and consists of representatives of appropriate local governments, State agencies, and Federal Agencies.

Each member agency should designate one member and at least one alternate member to the standing RRT. Agencies whose regional subdivisions do not correspond to the standard Federal Regions may designate additional representatives to the standing RRT to ensure appropriate coverage of the standard Federal Region. Federally recognized Native American Tribal governments may arrange for representation on the RRT. Other interested parties may attend and observe RRT meetings. The usual process by which the RRT reaches its decisions is by consensus. However, in instances where a decision is reached by means of a vote, the voting capacity of each Federal member agency and other RRT member organizations is limited to one vote per member agency or organization.

The first Federal official affiliated with an RRT agency to arrive at the scene of a discharge or release, provided they have the proper training, should coordinate activities under the NCP, this RCP/ACP, and agency guidance until the predesignated OSC is available. That Federal official should consult directly with the predesignated OSC regarding any necessary initial actions. Fund-financed operations must be authorized by the OSC prior to implementation.

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2.6.3.1. STANDING RRT

The role of the standing RRT includes communications and procedures planning, coordination, training, evaluation of responses, preparedness, and related activities on a Region- and Area-wide basis. These activities include, but are not limited to the following:

(a) Providing resources, upon request, for response to major discharges or releases inside the Region or outside the Region;

(b) Providing technical assistance for preparedness and conducting and participating in as necessary training and exercises to encourage preparedness activities of the response community within the Region (Region 5 will participate in one exercise per year);

(c) Reviewing and updating the ICP;

(d) Discussing, modifying, and adopting procedures to enhance the various aspects of response coordination between local, Tribal, State, Regional, and Federal response efforts;

(e) Reviewing and commenting, where practicable, on local emergency response plans (required by SARA, Title III). Such reviews are conducted upon the request of a Local Emergency Planning Commission (LEPC), forwarded to the RRT by a SERC. The standing RRT may also review and comment on other issues concerning the preparation or implementation of related response plans;

(f) Providing guidance to Area Committees, as appropriate, to ensure interarea consistency and consistency of individual ACPs with the RCP and NCP;

(g) Reviewing, evaluating, and commenting on Regional and local responses to discharges or releases, and recommending improvements, as appropriate;

(h) Encouraging the State and local response communities to improve preparedness for response;

(i) Planning for use of dispersants, surface collection agents, burning agents, biological additives, or other chemical agents, as appropriate; and, upon request, approving chemicals and techniques for response, following established procedures;

(j) Meeting three times annually, rotating meetings among States, to review response actions, address preparedness and pre-response activities, and consider changes to the RCP;

(k) Providing reports on RRT activities to the NRT twice a year, no later than January 31 and July 31;

(l) Integrating, to the extent possible, ongoing planning and preparedness activities with RRT preparedness initiatives, and all RRT agencies;

(m) Recommending revisions of the NCP to the NRT, based on observations of response operations;

(n) Evaluating the preparedness of the participating agencies and the effectiveness of Federal response to discharges and releases;

(o) Preparing an annual work plan to coordinate emergency response and preparedness activities; and

(p) Coordinating planning and preparedness with RRTs in adjacent Regions.

To carry out the preparedness and planning charge of the RRT, a steering committee, with representatives of Co-Chairs and volunteers from member agencies and States, has been established to identify and facilitate implementation of preparedness and pre-response responsibilities. Work groups will be established as projects and particular work efforts are identified. The necessity of the work groups shall be reevaluated annually.

A list of the current members of the Region 5 standing RRT is provided in Appendix III.

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2.6.3.2 INCIDENT-SPECIFIC RRT

An incident-specific RRT is formed from the standing team each time the RRT is activated for a response. It consists of representatives of local and Tribal governments and the appropriate State and Federal Agencies described in subsection 2.6.3.

Appendix I contains a discussion of the U.S. EPA and USCG jurisdictions in Region 5.

An incident-specific RRT has one Chair, the Regional Co-Chair from the agency providing the Federal OSC/RPM for the response to the incident. The standing RRT Co-Chairs may designate other U.S. EPA and USCG employees to act as Co-Chair. The role of the incident-specific team is determined by the operational requirements of the response to a specific discharge or release. Participation is relative to the technical nature and geographic location of the discharge or release.

The incident-specific RRT Chair coordinates with the RRT membership and the OSC/RPM for the incident to determine the appropriate level of RRT member activation. Member agencies and States participating with the RRT must ensure that designated representatives or alternates can function as resource personnel for the OSC/RPM during incident-specific events.

When activated, members of an incident-specific RRT may:

(a) Provide resources and special or technical expertise;

(b) Provide advice and recommend courses of action for consideration by the OSC;

(c) Advise the OSC/RPM on the duration and extent of Federal response and recommend to the OSC/RPM specific actions to respond to a discharge or release;

(d) Request other Federal, State, or local government or private agencies to provide resources under their existing authorities to respond to a discharge or release or to monitor response operations;

(e) Recommend a change of OSC/RPM to the RRT Co-Chairs, if circumstances warrant (e.g., substantial movement of the pollution into the predesignated area of another OSC lead agency);

(f) Ensure continual communication with the National Response Center (NRC) as significant developments occur; and

(g) Monitor and evaluate reports from the OSC/RPM.

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2.6.3.3. ACTIVATION OF THE INCIDENT-SPECIFIC RRT

An incident-specific RRT will be activated during any discharge or release upon a request from the OSC or from any RRT representative to a Co-Chair of the RRT when a discharge or release:

(a) exceeds the response capabilities available to the OSC in the place where it occurs;

(b) transects State, Regional, or international boundaries;

(c) poses a substantial threat to public health, welfare, or to the environment, or to Regionally significant amounts of property; or

(d) is a worst case discharge.

Requests for RRT activation shall subsequently be confirmed in writing. Local requests for RRT activation must be made through the State RRT member. The various levels of activation can be found in the NCP. An incident-specific RRT activation may take place by telephone or by assembly.

Levels of activation are:

(1) Alert: Notification of RRT members that an incident has occurred.

(2) Standby: Notice to some or all RRT members that their services may be needed and that they are to assume a readiness posture and await further instructions. Notice may be given by phone.

(3) Partial: Notice to selected RRT members that their services are required in response to a pollution incident. The activation notice will specify the services requested and the services that will be required. The initial activation notice may be provided by telephone.

(4) Full: Notice to all RRT members (with the exception of representatives of nonaffected States) that their services are requested in response to a pollution incident. The activation notice will specify the services being requested from each RRT member. The services of some members may be limited to advising the OSC on general matters. The initial activation notice may be provided by telephone.

The RRT can be deactivated by the Chair, when the Chair determines that the OSC no longer requires RRT assistance. The time of deactivation shall be included in a POLREP.

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2.6.4. Federal Agency Responsibilities

The Federal Agencies listed in this section have duties established by statute, executive order, or Presidential directive which may apply to Federal response actions following, or in prevention of, the discharge of oil or release of a hazardous substance, pollutant, or contaminant. Some of these agencies also have duties relating to the rehabilitation, restoration, or replacement of natural resources injured or lost as a result of such discharge or release. It is recognized that Native American authorities, responders, and communities are entitled to the same cooperation and protection arrangements as the States.

Federal Agencies should plan for emergencies and develop procedures for addressing oil discharges and releases of hazardous substances, pollutants, or contaminants from vessels and facilities under their jurisdiction, custody, or control. Appropriate Federal RRT members or their representatives should provide OSCs/RPMs with assistance from their respective agencies, commensurate with agency responsibilities, resources, and capabilities within the Region. During a response action, the members of the RRT should seek to make available the resources of their agencies to the OSC/RPM. Specifically, member Federal Agency responsibilities include the following:

(a) Informing the RRT of changes in the availability of their response resources;

(b) Reporting discharges and releases from facilities or vessels under their jurisdiction or control;

(c) Making necessary information available to the RRT and OSCs; and

(d) Providing representatives to the RRT and otherwise assisting RRT and OSCs in formulating RCPs.

Following is a list of Federal Agencies and their responsibilities and functions.

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2.6.4.1. DEPARTMENT OF AGRICULTURE

The U.S. Forest Service is the designated USDA representative to the RRT. USDA maintains a Regional Emergency Team in each of the 10 Standard Federal Regions to provide liaison and coordination with Federal Agencies operating on a Regional basis. Regional Emergency Teams are composed of representatives of USDA agencies having essential emergency functions at the Regional level. These are:

Forest Services (FS): Responsible for prevention and control of fires in rural areas, in cooperation with State Foresters and appropriate Federal Agencies; and emergency production, availability, and utilization of timber and timber products in cooperation with the Department of Commerce. The agency has capabilities to provide emergency communications systems, specialized aircraft, and human support facilities for large groups of people, and has specially trained incident management teams.

Food and Nutrition Service (FNS): Through the Food Distribution Program, provides food as emergency assistance to disaster victims. In appropriate emergency situations, FNS will authorize State agencies to issue food stamps based on emergency procedure.

Food Safety and Inspection Service (FSIS): Tests meat and poultry products for the presence of violative drugs, chemical residues, and other adulterants.

Agricultural Stabilization and Conservation Service (ASCS): In cooperation with the Forest Service, Soil Conservation Service, and the U.S. Army Corps of Engineers, is responsible for emergency plans and preparedness programs for food processing, storage, and distribution through the wholesale level.

Animal and Plant Health Inspection Service (APHIS): Provides expertise on plant and animal diseases and health.

National Agricultural Statistics Service: Serves as a source of data on crops, livestock, poultry, dairy products, and labor. State Statistical Offices collect and publish local information on these topics.

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2.6.4.2. DEPARTMENT OF COMMERCE

DOC, through the National Oceanic and Atmospheric Administration (NOAA), has three roles within Region 5:

Scientific Support Coordinator (SSC): In accordance with the NCP, the SSC provides scientific advice to support the Federal OSC in 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 (HAZMAT) resources or other Federal, State, or academic networks. This includes considering advice from the trustee agencies (including the NOAA HAZMAT RRT member), and any divergent opinions.

National Resource Trustee: The Secretary of Commerce acts as trustee for natural resources managed or controlled by DOC, including their supporting ecosystems. 40 CFR 300.600(b), (b)(1). Pursuant to the Great Lakes Critical Programs Act of 1990, 33 USC 1268 (Great Lakes Act), and the Great Lakes Water Quality Agreement of 1978, as amended by the Water Quality Agreement of 1987 (Great Lakes Water Quality Agreement), the United States, in part through DOC, manages and/or controls the water and sediments of the Great Lakes System.

The Secretary of Commerce also acts as trustee for natural resources managed or controlled by other federal agencies that are found in, under, or using waters navigable by deep draft vessels, tidally influenced waters, or waters of the contiguous zone, the exclusive economic zone, and the outer continental shelf. Therefore, all federally managed or controlled resources that are found in those waters, such as water and sediments that form navigation channels and that are managed, controlled, and maintained by the Army Corps of Engineers, and the fisheries that are controlled by the Food and Drug Administration through derivation of action levels, fall within DOC trusteeship. Similarly, the water and sediment of the Great Lakes System are within the administrative jurisdiction of the United States, and are federally managed or controlled pursuant to the Great Lakes Act and the Great Lakes Water Quality Agreement.

The Secretary has delegated his authority to act as trustee to the Administrator of NOAA. Pursuant to these delegations, NOAA has trusteeship for the water, sediment, and the biological resources, of the Great Lakes and their supporting ecosystems. The NCP also cites as examples of DOC trusteeship the following natural resources and their supporting ecosystems: migratory birds, anadromous fish, and endangered species and marine mammals. 40 CFR 300.600(b)(1), (b)(2).

Under OPA and the NCP, NOAA has specific responsibilities as a natural resource trustee that include:

(a) Receiving notification of potential or actual spills threatening NOAA resources;

(b) Being consulted on the preparation of the fish and wildlife and sensitive environments annex (this includes concurring on specific countermeasures or removal actions during the contingency planning phase);

(c) Being consulted on removal actions during an incident; and

(d) Implementing damage assessment activities.

All of these activities are intended to minimize impacts and to restore the environment.

RRT Member: Has the primary goal to support the appropriate RRT Co-Chair who supports the Federal OSC by providing advice and resources that will protect the environment effectively, mitigate collateral harm, and facilitate environmental recovery. Carries out this goal by:

(a) serving as an access point to other DOC resources and expertise, usually outside NOAA HAZMAT, that have primary roles in carrying out NOAA's trusteeship role during spills;

(b) representing DOC in carrying out its policy responsibilities (such as trusteeship);

(c) helping the NOAA SSC provide technical assistance, if needed; and

(d) representing NOAA HAZMAT at meetings where the SSC cannot be present.

This member can provide:

· scientific expertise on living aquatic resources for which DOC is responsible;

· current and predicted meteorological, hydrologic, ice, and limnologic conditions;

· charts and maps; and

· communication services to the general public, various levels of government, and the media via its NOAA weather wire and NOAA weather radio systems.

These roles are the responsibility of all DOC representatives, whether from NOAA HAZMAT, NOAA National Marine Fisheries Service (NMFS), or NOAA National Weather Service (NWS).

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2.6.4.3. DEPARTMENT OF DEFENSE

DOD, consistent with its operational requirements, may provide assistance in critical oil and hazardous materials incidents, in the maintenance of navigation channels, and in removal and salvage of navigation obstructions. DOD will provide the OSC and RRT Chair for releases occurring on DOD property or facilities.

U.S. Army Corps of Engineers (USACE): Has specialized equipment and personnel for maintaining navigation channels, for removing navigational obstructions, for accomplishing structural repairs, and for performing maintenance to hydropower electric generating equipment. USACE can also provide design services, perform construction, and provide contract writing and contract administration services for other Federal Agencies.

U.S. Navy Supervisor of Salvage (SUPSALV): Is knowledgeable and experienced in ship salvage, shipboard damage control, diving, and has equipment for salvage-related and open-sea pollution incidents.

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2.6.4.4. DEPARTMENT OF ENERGY

DOE provides the designated OSC/RPM for responses to releases on or from any facility or vessel under its jurisdiction. DOE administers, implements, and coordinates the Federal Radiological Monitoring and Assessment Center (FRMAC). Under the Federal Radiological Emergency Response Plan (FRERP), DOE provides advice and assistance to the RRT regarding the identification of the source and extent of radioactive contamination, and removal and disposal of radioactive releases.

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2.6.4.5. FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA requires the development, evaluation, and exercise of all-hazard contingency plans for all FEMA-funded jurisdictions at the 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.

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2.6.4.6. GENERAL SERVICES ADMINISTRATION

GSA, upon request, provides expedited logistical and telecommunications support to Federal Agencies that are members of the NRT. The support includes, but is not limited to,
· provision of space,
· transportation,
· telecommunications,
· supplies, and
· procurement-related services.

Services may be furnished through GSA personnel who are located at the scene of the oil or hazardous material release, or at their regular duty stations, depending on the specific requirements of the Federal OSC or the emergency situation. Expenses incurred by GSA in providing requested assistance to other agencies must be reimbursed.

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2.6.4.7. DEPARTMENT OF HEALTH AND HUMAN SERVICES

HHS assists with the assessment, preservation, and protection of human health and helps ensure the availability of essential human services. HHS provides technical and nontechnical assistance in the form of advice, guidance, and resources to other Federal Agencies, as well as to State and local governments.

The principal HHS response comes from the U.S. Public Health Service (PHS). Within PHS, the primary response to hazardous materials emergencies comes from ATSDR and the Centers for Disease Control (CDC). Both ATSDR and CDC have 24-hour emergency response capability whereby scientific and technical personnel are available to provide technical assistance to the lead Federal Agency and State and local response agencies on human health threat assessment and analysis, and exposure prevention and mitigation. Such assistance is used in situations requiring evacuation of affected areas, dealing with human exposure to hazardous materials, or advice on mitigation and prevention.

Agency for Toxic Substances and Disease Registry: ATSDR is the lead Federal public health agency for hazardous material incidents under CERCLA. Two ATSDR representatives are assigned to each U.S. EPA Region to assist in U.S. EPA/ATSDR communications. Regional representatives can also assist in emergency response events that involve RRT issues by coordinating with ATSDR headquarters Emergency Response and Consultation Branch and with the CDC RRT representative. Under CERCLA Section 104(i), ATSDR is required to:

(a) establish appropriate disease/exposure registries;

(b) provide medical care and testing of exposed individuals in public emergencies;

(c) develop, maintain, and provide information on health effects of toxic substances;

(d) conduct research to determine relationships between exposure to toxic substances and illness;

(e) develop guidelines, with U.S. EPA, for toxicological profiles for hazardous substances; and

(f) develop educational materials for health professionals related to health effects of toxic substances.

Additionally, ATSDR operates a 24-hour phone line to address public health issues.

Centers for Disease Control and Prevention: CDC takes the lead during oil releases regulated under CWA and OPA. PHS has designated the CDC representative to the RRT. This person is responsible for coordinating all public health responses on the Federal level and for coordinating all responses with State and local health agencies.

Other PHS agencies involved in support during hazardous materials incidents, either directly or through ATSDR/CDC, include the Food and Drug Administration (FDA), the Health Resources and Services Administration, the Indian Health Service, and the National Institutes of Health (NIH).

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2.6.4.8. DEPARTMENT OF THE INTERIOR

DOI can provide information concerning the lands and resources specifically under DOI jurisdiction, as well as offer technical expertise related to geology, hydrology, minerals, fish and wildlife, cultural resources, and recreation resources. Under Executive Order 12580, DOI is designated by the NCP as a Federal Trustee for Natural Resources.

DOI has direct jurisdiction for protection of resources on its own lands, as well as trustee responsibilities for certain natural resources, regardless of location. The DOI natural resource trusteeship that extends beyond DOI site boundaries includes migratory birds, anadromous fish, and endangered/threatened species and their critical habitat.

Bureaus may provide assistance in investigations to evaluate the magnitude and severity of discharges on or affecting facilities or resources under their jurisdiction, and may conduct activities as natural resource trustees as set forth in Subpart G of the NCP.

Bureaus may also provide:

· advice to the OSC/RPM when response operations are being performed that affect land, facilities, or natural resources under their management authority;

· technical assistance in disposal activities; however, lands under the jurisdiction of DOI (including certain municipal landfills) may not be utilized as disposal sites; or

· air and ground transportation support, and maintainenance of communications support.

Within the Department, individual bureaus and offices have specific responsibilities and capabilities as follows:

Office of Environmental Policy and Compliance (OEPC): The Regional Environmental Officer (REO) represents DOI on the RRT, and is responsible for coordinating RRT/DOI activities. The Regional Environmental Assistant (REA) provides support to the REO in planning and emergency response and acts for the REO when unavailable. The Regional Coordinator (RC) provides planning and natural resource damage assessment (NRDA) coordination. OEPC provides a number of services, including:

· presenting the DOI position on chemical countermeasure and in situ burn decisions,

· facilitating technical assistance requests from the OSC,

· supplying administrative details to secure response cost reimbursement approval from the OSC,

· initiation of natural resource damage assessments (NRDAs), and

· coordinating response between DOI Bureaus.

U.S. Fish and Wildlife Service (USFWS): Can provide responders with information concerning migratory birds, Federally listed threatened and endangered species and their designated critical habitat, certain anadromous fish, and certain Federal lands (National Wildlife Refuges, Waterfowl Production Areas, and National Fish Hatcheries), as well as technical assistance

concerning the effects of oil on these resources. In addition, it will help coordinate wildlife rescue and rehabilitation efforts in conjunction with State natural resource trustee(s). The Service is responsible for assessing damages to natural resources as a result of releases of oil or hazardous substances into the environment, and issues Federal Migratory Bird and Eagle Permits to qualified individuals and/or organizations conducting wildlife collection, rescue, and rehabilitation operations related to oil spill incidents.

National Park Service (NPS): Provides expertise on historic, cultural, archeological, architectural, and recreational resources and sites on the National Register of Historic Places. NPS can also provide information on National Parks, National Recreation Areas, National Historic Sites,

DOI Bureaus can be contacted through the Regional Environmental Officer.

National Trails, Lake Shores, National Monuments, and Wild and Scenic Rivers listed on the Nationwide Rivers Inventory (NRI).

U.S. Geological Survey (USGS): Provides advice and information concerning geohydrologic, geologic, and geochemical data; ground and surface water data; and maps. USGS maintains stream flow gauges in every State and can provide historical stream flow information, assist in predicting the time/travel/trajectory of spills, and can collect and analyze surface and groundwater samples.

The Biological Resources Division performs research in support of biological resource management; inventories, monitors, and reports on the status and trends in the nation's biologic resources; and transfers the information gained to resource managers and others concerned with the care, use, and conservation of the nation's natural resources.

Bureau of Indian Affairs (BIA): Responsible for protecting and improving the trust resources of Native American Tribes and facilitating an active role in planning and response for Tribal governments as requested. BIA coordinates activities affecting Native American Tribal lands, and can provide assistance to the OSC in identifying Native American Tribal government officials. BIA can also assist in obtaining access to Tribal land areas as needed for response action and will coordinate with the incident Public Information Office Director to ensure pertinent information is made available to appropriate Tribal authorities on a timely basis.

Bureau of Land Management (BLM): Has expertise in minerals, soils, vegetation, archeology, and wildlife habitat, and may provide advice on response affecting lands or minerals administered by BLM. May also provide advice in the field of oil and gas drilling, production, handling, and transportation by pipeline.

All bureaus of the Department of the Interior may be contacted through the Regional Environmental Officer, the designated member of the RRT.

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2.6.4.9. DEPARTMENT OF JUSTICE

DOJ members of the RRT serve as representatives of the Department of Justice and not as legal counsel to the RRT or its member agencies. Although the DOJ representative to the RRT is not a substitute for member agencies' in-house counsel, the DOJ representative will be able to offer the advice, views, and expertise of the Department with respect to RRT's long-term planning and incident-specific functions.

As a consequence of DOJ's primary role as litigation counsel for the Federal Government and as legal counsel on enforcement and interagency matters, its participation in RRT activities will ordinarily focus on litigation concerns regarding response activities and interagency coordination. The DOJ representative might provide:

· general legal advice;

· review and comment on regional planning and procedural documents; and

· incident-specific assistance, including assigning staff attorneys when an incident may result in litigation or raise difficult issues of interagency coordination.

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2.6.4.10. DEPARTMENT OF LABOR

DOL, through the Occupational Safety and Health Administration (OSHA):

(a) conducts safety and health inspections at hazardous waste sites and during emergencies to ensure that employees are being protected and to determine compliance with its regulations, and

(b) provides the OSC/RPM with advice, guidance, and assistance regarding hazards to persons involved in removal or control of oil or chemical spills, and the precautions necessary to protect such persons' health and safety.

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2.6.4.11. NUCLEAR REGULATORY COMMISSION

The Nuclear Regulatory Commission (NRC) will:

(a) respond, as appropriate, to releases of radioactive materials by its licensees, in accordance with the NRC Incident Response Plan to monitor the actions of those licensees and assure that the public health and environment are protected and adequate recovery operations are instituted;

(b) keep U.S. EPA informed of any significant actual or potential releases in accordance with procedural agreements; and

(c) provide advice to the OSC/RPM when assistance is required in identifying the source or character of other hazardous substance releases where the NRC has licensing authority for activities utilizing radioactive materials.

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2.6.4.12. DEPARTMENT OF STATE

DOS will:

(a) lead in developing joint international contingency plans;

(b) provide assistance in coordination when a pollution release crosses international boundaries or involves foreign flag vessels; and

(c) coordinate requests for assistance from the Government of Canada and U.S. proposals for conducting research at incidents that occur in Canadian waters.

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2.6.4.13. DEPARTMENT OF TRANSPORTATION

DOT, through USCG, provides the Co-Chair of RRT5 and predesignated OSCs for the Great Lakes Coastal Zone and specified ports and harbors in Region 5. DOT also provides expertise regarding transportation of oil or hazardous materials. Through USCG, DOT:

(a) supplies expertise in the domestic/international fields of

· port safety and security;

· marine law enforcement, navigation, and construction; and

· manning, operation, and safety of vessels and marine facilities;

(b) 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 OSC.

DOT, through the Research and Special Programs Administration (RSPA), establishes oil discharge contingency planning requirements for pipelines, transport by rail and containers, or bulk transport of oil.

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2.6.4.14. U.S. ENVIRONMENTAL PROTECTION AGENCY

U.S. EPA provides the Co-Chair of RRT5 and provides OSCs for all inland areas for which an ACP is required under CWA Section 311(j) and for discharges and releases occurring in the inland zone. It also provides RPMs for remedial actions except as otherwise provided, and generally provides the Scientific Support Center for responses in the inland zone.

U.S. EPA is responsible for providing expertise regarding environmental effects of pollution and environmental pollution control techniques. U.S. EPA will also:

· assist USCG in hazardous materials incidents,

· advise the RRT and the OSC of the degree of hazard a particular release poses to public health and safety, and

· coordinate scientific support, including environmental assessment, in inland regions.

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2.7. MULTIREGIONAL RESPONSES

The Federal OSC for a given incident is determined by the point of origin of the release. However, if a discharge or release affects areas covered by two or more RCPs/ACPs, the response mechanisms of both may be affected. In this case, response actions of all Regions concerned shall be fully coordinated as detailed in the RCPs.

There shall be only one OSC at any time during the course of a specific response operation. Should a discharge or release affect two or more areas, U.S. EPA, USCG, DOD, DOE, or other lead agency, as appropriate, shall give prime consideration to the area vulnerable to the greatest threat, in determining which agency should provide the OSC. The RRT shall designate the OSC if the RRT member agencies who have response authority within the affected area are unable to agree on the designation. The NRT shall designate the OSC if members of one RRT or two adjacent RRTs are unable to agree on the designation.

Where USCG has initially provided the OSC for response to a release from hazardous waste management facilities located in the coastal zone, responsibility for response shall shift to U.S. EPA or another Federal Agency, as appropriate.

The OSC/RPM shall be provided by the Region within which the release occurs, or according to preestablished protocols described in the interregional contingency plans and Section 3 of this ICP.

Several interregional agencies have been established that have interests within Region 5 and have roles in response and planning. The agencies vary considerably in their concerns and capabilities. The following is a list of these interregional organizations.

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2.7.1. The Great Lakes Commission

The Great Lakes Commission (GLC) is an interstate compact commission consisting of gubernatorially appointed and legislatively mandated representatives of the eight Great Lakes States (Minnesota, Wisconsin, Illinois, Michigan, Indiana, Ohio, Pennsylvania, and New York). The Commission was formed to promote the informed use, development, and protection of Great Lakes Basin land and water resources through regional coordination, policy development, and advocacy.

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2.7.2. Ohio River Valley Water Sanitation Commission

The Ohio River Valley Water Sanitation Commission (ORSANCO) is an interstate water pollution control agency established in 1948, with membership consisting of representatives from the eight States in the Ohio River Valley (Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia), and a representative from U.S. EPA. The Commission is responsible for operating several programs:

· water quality monitoring of the Ohio River and its major tributaries;

· regulation of wastewater discharge to the Ohio River; and

· investigation of particular water pollution problems.

In addition, ORSANCO assists State environmental agencies, U.S. EPA, and USCG in emergency spill response and notification. ORSANCO maintains a spill notification database on the Ohio River and its tributaries. Specifically, in the event of a spill on the Ohio River or a major tributary, ORSANCO's role is to serve as an interstate communications center, assisting in emergency notification procedures and to coordinate emergency stream monitoring.

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2.7.3. Upper Mississippi River Basin Association

The Upper Mississippi River Basin Association (UMRBA) is an interstate organization formed by the Governors of Illinois, Iowa, Minnesota, Missouri, and Wisconsin to maintain communication and cooperation among the States on matters related to water resources planning and management in the Upper Mississippi Basin. The five States are represented through gubernatorial appointees, and five Federal Agencies have advisory status. As part of its efforts to facilitate cooperative planning, the Association provides support to an ad-hoc Upper Mississippi Spills Coordination Group, which includes representatives of the five State response agencies, as well as U.S. EPA Regions 5 and 7, USCG, USFWS, NOAA, and USACE. The group meets periodically to discuss common problems and coordinate activities to respond to spills on the Upper Mississippi.

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2.8. NATIONAL RESPONSE

2.8.1. National Response Team

The NRT is responsible for oil and hazardous materials spill planning and coordination on the national level. The NRT is made up of representatives of each of 15 Federal Agencies, chaired by U.S. EPA and vice-chaired by USCG. The NRT's responsibilities include:

· evaluating methods of responding to discharges,

· maintaining national preparedness to respond to a major oil discharge, and

· developing procedures, in coordination with the National Strike Force Coordination Center (NSFCC), to ensure the coordination of Federal, State, and local governments.

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2.8.2. Federal Radiological Emergency Response Plan

Response to radiological emergencies is coordinated under the FRERP.

***ORSANCO has developed a spill notification and response plan, which should be used as the operative plan for spills on the Ohio River, and the* ORSANCO Emergency Response Resource Manual.**

UMRBA and the member State and Federal Agencies of the Upper Mississippi Rivers Hazardous Spills Coordination Group have produced the* Upper Mississippi River Spills Response Plan and Resource Manual. *The manual functions as a working contingency plan, to supplement the appropriate State emergency response plans, RCPs, and the NCP. As such, themanual is consistent with the U.S. EPA Region 5 ICP and Region 7 RCP, is in compliance with requirements of the NCP, and should be used as the operative plan for spills on the Mississippi River.

This interagency agreement coordinates the response of various agencies, under a variety of statutes, to a large radiological accident. The lead Federal Agency, defined by the FRERP, activates the FRERP for any peacetime radiological emergency that, based upon the agency's professional judgment, is expected to have a significant radiological effect within the United States, its territories, possessions, or territorial waters; and that could require a response by several Federal Agencies.

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2.8.3. Federal Response Plan

In the event of a declaration of a major disaster by the President, FEMA may activate the Federal Response Plan. An FCO, designated by the President, may implement the Federal Response Plan and coordinate and direct emergency assistance and disaster relief of impacted individuals, businesses, and public services under the Stafford Disaster Relief Act. Planning for disasters is coordinated by FEMA under the Federal Response Plan. The RCP is Emergency Support Function #10 under the Federal Response Plan, along with the FRMAP.

The Federal Response Plan was developed under the Disaster Relief Act of 1974, as amended by the Stafford Disaster Relief Act of 1988. The Federal Response Plan established a foundation for coordinating Federal assistance to supplement State and local response efforts to save lives, protect public health and safety, and protect property in the event of a natural disaster, catastrophic earthquake, or other incident declared a major disaster by the President.

The delivery of Federal assistance is facilitated through twelve annexes, or Emergency Support Functions (ESFs), which describe a single functional area of response activity: Transportation, Communications, Public Works and Engineering, Fire Fighting, Information and Planning, Mass Care, Resource Support, Health and Medical Services, Urban Search and Rescue, Hazardous Materials, Food, and Energy. The Hazardous Materials annex, ESF #10, addresses releases of oil and hazardous substances that occur as a result of a natural disaster or catastrophic event and incorporates preparedness and response actions carried out under the NCP. U.S. EPA serves as the Chair of ESF #10 and is responsible for oversight of all preparedness and response actions associated with ESF #10 activities, only if assigned it by FEMA. All NRT/RRT departments and agencies serve as support agencies to ESF #10.

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2.9. INTERNATIONAL RESPONSE

2.9.1. International Joint Commission

The International Joint Commission (IJC) is a binational organization that was created under the Boundary Waters Treaty of 1909 to advise the governments of the United States and Canada on issues concerning water quality and quantity in the boundary waters between the two nations. The IJC monitors and assesses cleanup progress under the Treaty and advises governments on matters related to the quality of the boundary waters of the Great Lakes system. The Commission consists of six members, three appointed by the President of the United States, and three appointed by the Prime Minister of Canada.

In the event of releases that impact or threaten the international border, the following Canadian government agencies should be notified:

Canadian Coast Guard | (519) 337-6360
Environment Canada | (416) 518-3221
Emergency Preparedness Canada | (613) 991-7000

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2.9.2. Joint Contingency Plan

A Joint Contingency Plan is being developed with Canada for releases of oil and hazardous substances. Several plans will cover the Great Lakes and the inland area.

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2.10. COMMUNICATIONS

2.10.1. Discovery

It is the spiller's responsibility to report all spills. The spiller or responsible party is required to immediately report all releases of oil and hazardous substances into or on navigable water, adjoining shorelines, or the contiguous zone, to the National Response Center (NRC). The NRC will notify the appropriate OSC. If NRC notification is not practicable, the responsible party should notify the U.S. EPA or USCG predesignated OSC and the appropriate State environmental agency.

If U.S. EPA or USCG is the first to be notified of a release or discharge, U.S. EPA or USCG will notify the State and the NRC, the appropriate trustees for natural resources and other RRT members, as stated in Subsection 2.10.2 of this plan. OSC notification of trustees is accomplished through protocols developed via trustee-specific agreements. For spills of significance, if the State or other agency is the first to be notified, they shall notify the appropriate Federal Agencies.

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2.10.2. OSC Notification Responsibilities

As used in this section, "notification" refers to the actions taken by the predesignated Federal OSC to immediately alert appropriate Federal and State agencies of a release. The purpose of this notification is to provide the best available summary of OSC observations and operations, and to allow the notified agency an opportunity to perform some on-scene program function. Usually, the OSC will notify agencies by telephone.

Upon notification from the NRC, the OSC may investigate the report to determine the threat posed to the public health or welfare or to the environment. Notifications are based on the actual or potential size of the spill and the threat posed as outlined in Table 2-1.

OSCs should also ensure that all appropriate public and private interests are kept informed and their concerns considered.

If radioactive substances are present in a release, the U.S. EPA Region 5 Emergency Response Branch should be notified for evaluation and assistance, either directly or through the National Response Center.

2.10.3. Pollution Report Messages (POLREPs)

When conducting Federal removal actions, the OSC will submit POLREPs to the above-mentioned agencies, and include local entities as necessary. As changing conditions warrant, POLREP distribution may be expanded to include additional entities. In the case of an oil release, the OSC will submit a POLREP to the National Pollution Fund Center (NPFC).

Except as noted below, the designated OSC prepares POLREPs for each release occurring within the OSC's area of responsibility. The OSC submits POLREPs to the RRT as significant developments occur. For medium and major releases, these submittals will occur on a daily basis until, in the judgment of the OSC, the response operation and the impact of the release have stabilized. The standard POLREP format is presented as Figure 2-1.

Notification should be made to the NRC duty officer at (800) 424-8802 or (202) 267-2675.

The U.S. EPA Region 5 predesignated OSC can be reached 24 hours a day at (312) 353-2318. The USCG predesignated OSC can be reached at (216) 522-3984 (Ninth District) or (504) 589-6225 (Eighth District).

Appendix III provides communication information (including FAX numbers) for RRT members, OSCs, and other government entities that routinely participate in Federal response activities in Region 5.

FIGURE 2-1: Model Initial POLREP

U.S. ENVIRONMENTAL PROTECTION AGENCY POLLUTION REPORT

I. HEADING

Date:

Subject:

From:

To: , U.S. EPA, OSWER FAX: _____, U.S. EPA ERB FAX: _____

, Chief, U.S. EPA Response Section __ FAX: _____

, Chief, U.S. EPA ESS FAX: _____

, U.S. EPA Office of Public Affairs FAX: _____

, U.S. EPA ORC FAX: _____

, U.S. EPA Enforcement Specialist FAX: _____

, State agency FAX: _____

, USCG, District __ FAX: _____

, U.S. DOI FAX: 215-597-9845

, County official FAX: _____

POLREP No.:

II. BACKGROUND

Site No.:

Delivery Order No.:

Response Authority:

ERNS No.:

CERCLIS No.:

NPL Status:

State Notification:

Action Memorandum Status:

Start Date:

Demobilization Date:

Completion Date:

III. SITE INFORMATION

A. Incident Category

B. Site Description

1. Site location

2. Description of threat

FIGURE 3-1: Model Initial POLREP (cont.)

C. Preliminary Assessment/Site Inspection Results

IV. RESPONSE INFORMATION

A. Situation

1. Current situation

2. Removal activities to date

3. Enforcement

B. Planned Removal Activities

C. Next Steps

D. Key Issues

V. COST INFORMATION

The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

VI. DISPOSITION OF WASTES

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2.10.3.1. Special Cases

Fund Manager: In the event of a Federally funded oil cleanup, the OSC will submit a POLREP to the NPFC.

Worker Safety: If the pollutant is a hazardous substance and Federal or private sector personnel are participating in a "hands-on" removal, the OSC will include the Department of Labor RRT representative in the distribution of POLREPs. (Note: this provision does not extend to the activities of State and local government employees.)

Federal Land Manager: Consistent with spill notification guidelines, when a release impacts Federal lands, the OSC will include the RRT representative of the managing agency in the distribution of POLREPs.

Intrastate Distribution: The State office designated to receive POLREPs from Federal OSCs will perform any further distribution to other elements of government within that State.

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2.10.3.2. Means of Transmission

Facsimile (FAX) is the standard method of transmitting messages between member agencies of RRT5. However, individual agencies and a lead agency may agree to use other means of communication (e.g., E-mail, AUTODIN, TELEX). It is incumbent upon each agency to identify a reliable 24-hour means of receiving POLREPs. Where this has not been done, distribution will be by regular mail.

Where an incident generates substantial interest in the response community and the lead agency experiences a demand for POLREPs beyond the normal RRT distribution, the lead agency may elect to post POLREPs on a commonly accessible computer bulletin board in lieu of direct transmission to individual offices. In such an event, the Ninth Coast Guard District will employ the NOAA RRT System discussed in

subsection 5.4.5 of this plan.

2.10.4. Public Information

In accordance with 40 CFR 300.415(n), the lead agency shall designate a spokesperson who shall:
· inform the community of actions taken,
· respond to inquiries, and
· provide information concerning the response action.

All news releases or statements made by participating agencies shall be jointly coordinated and released through a public information office. The spokesperson shall notify, at a minimum, immediately affected citizens, local and State officials and, when appropriate, emergency management agencies. OSCs may consider use of the RRT to assist in media relations and other community involvement activities. Also, responsible parties may implement community involvement activities.

For response actions lasting less than 30 days, the following apply:

(a) The administrative record file must be maintained at the U.S. EPA Regional Office;

(b) The administrative record must be made available to the public no later than 60 days after initiation of activity at the site, and U.S. EPA must inform the public that it is available for public inspection by placing a notice in a major newspaper; and

(c) No public comment period on the administrative record is required when on-site activity lasts less than 30 days.

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2.11. SAFETY

2.11.1. Worker Health and Safety

U.S. EPA Worker Protection Standards apply to employers of State and local governments whose employees are engaged in hazardous waste operations and emergency response. OSHA regulations apply directly to private and Federal employees and to those State and local government employees in States having OSHA-approved plans. OSHA and U.S. EPA worker protection standards (29 CFR 1910.120 and 40 CFR 11) implement Section 126 of SARA. U.S. EPA's worker protection regulations cover State and local government employees without OSHA-approved plans (reference 300.150 of the NCP).

An employer conducting a cleanup must comply with all the requirements in (b) through (o) of the OSHA standard. The requirements of (b) through (o) of the standard specify a minimum of 24 hours of off-site training. During emergency responses under 29 CFR 1910.120, the employer must comply with 1910.120 (q). If a post-emergency-response cleanup is done on plant property using plant or workplace employees, the employer must comply with the training requirements of 29 CFR 1910.38(a), 1910.134, 1910.120, and other appropriate training made necessary by the tasks they are expected to perform.

Based on experience with the standard (29 CFR 1910.120 [q][11][i]) during oil spills off the coasts of Texas, Alaska, and California, the hazards to employees vary widely in severity of potential injury or illness. For job duties and responsibilities with a low magnitude of risk, fewer than 24 hours of training may be appropriate for post-emergency cleanup workers. It is the expectation of OSHA that though the number of hours of training may vary, a minimum of 4 hours would be appropriate in most situations. Moreover, petroleum spills are unique in that many people who assist in the cleanup may not engage in this activity on a recurring basis. In addition, for maximum protection of the environment, petroleum spills dictate that cleanup must be completed as soon as possible (OSHA Instruction CPL 2-2.251). The DOL RRT representative is responsible for determining site-specific training requirements.

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2.11.2. Safety and Environmental Health Officer

The Ninth and the Eighth Coast Guard District Offices each maintain a billet for a Safety and Environmental Health Officer (SEHO); District Industrial Hygienist). Primary responsibility of the incumbent is to provide occupational safety and health support for USCG Marine Safety personnel. This includes pollution response operations. The SEHO can provide USCG OSCs advice on safety and health matters and can assist on-scene in environmental and medical monitoring activities. Outside normal working hours, OSCs may request the SEHO's services through the District Operations Center.

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2.11.3. Emotional Health Services

Emergency workers often experience delayed reactions to the death and destruction caused by explosion, fire, or oil and chemical releases. No one is immune to the tragedy and mental stress. Responders should be debriefed within 1 week of their return home. It is each member agency's responsibility to ensure that its employees have this type of training. Contact FEMA for materials that address this aspect of emergency response.

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SECTION 3: Operations

3.1. ASSESSMENT/CLASSIFICATION OF DISCHARGE

When the OSC receives a report of a discharge, initial actions include investigating the report to determine the threat posed to human health or welfare of the United States or the environment, the type and quantity of polluting material, and the source of the discharge. The OSC then officially classifies the size (i.e., minor, medium, major) and type (i.e., substantial threat, worst case discharge) of the discharge and determines the course of action to be followed. (See Table 2-1, p. 33)

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3.1.1. Spill of National Significance

A Spill of National Significance (SONS) is a spill that due to:
· severity,
· size,
· location,
· actual or potential impact on the public health and welfare or the environment, or
· the necessary response effort, is so complex that it requires extraordinary coordination of Federal, State, local, Tribal, and responsible party resources to contain and clean up the discharge.

A discharge may be classified as a SONS by the Administrator of U.S. EPA for discharges occurring in the inland zone and the Commandant of the USCG for discharges occurring in the coastal zone. For a SONS in the inland zone, the U.S. EPA Administrator may name a senior Agency official to assist the OSC in communicating with the affected parties and the public and coordinating Federal, State, local, Tribal, and international resources at the national level. This strategic coordination will involve, as appropriate, the NRT, RRT(s), the Governor(s) of affected State(s), and the mayor(s) or other chief executive(s) of local government(s).

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3.1.2. Worst Case Discharge

CWA Section 311(d)(2)(J) requires the ACP to include procedures and standards for removing a worst case discharge of oil, and for mitigating or preventing a substantial threat of such a discharge. A "worst case" discharge for the purposes of this plan will be the catastrophic release as identified in Facility Response Plans (FRPs) submitted to U.S. EPA. Since this is a requirement of

OPA, only oil scenarios will be listed.

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3.2. OPERATIONAL RESPONSE OBJECTIVES

The priority response objective is protection of public health and safety, which includes response worker health and safety. Protection of the environment and public welfare (infrastructure) are also important response objectives, but are subordinate to public and worker safety.

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3.3. DISCHARGE OR RELEASE CONTROL

3.3.1. Actions To Lessen Impact

Defensive actions should begin as soon as possible to prevent, minimize, or mitigate the threat to the public health or welfare or to the environment. Actions may include the following:

(a) Analysis of water samples to determine the source and spread of the contaminants;

(b) Control of the source of the discharge;

(c) Measurements and sampling;

(d) Placement of physical barriers to deter the spread of the oil or to protect sensitive environmental resources through coordination with resource agency specialists;

(e) Control of the water discharged from upstream impoundments; and

(f) If approved, the use of chemicals and other materials to restrain the spread of the oil and mitigate its effects, in accordance with the NCP. Use of chemical agents is not pre-approved in Region 5.

> ***Appendix IV presents a list of facilities by State, city, and name, and the worst case discharge and the water body threatened. Facilities are also cited on the Inland Sensitivity Maps.***

Appropriate actions should be taken to recover the oil or mitigate its effects. Of the numerous chemical or physical methods that may be used, the chosen methods should be the most consistent with protecting the public health and welfare and the environment. **Sinking agents shall not be used.**

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3.3.1.1. General Guidelines for Oil Spills

Shoreline Cleanup Guideline Matrices have been developed for the U.S. EPA Region 5 Area by the RRT. These guidelines address the use of specific countermeasures on various shoreline habitats for four oil types. The shoreline types are listed in relative order of sensitivity. Habitat sensitivity is a function of a range of factors, including:
· degree of exposure to natural removal processes,
· biological productivity and ability to recover following oil exposure,
· human use of the habitat, and
· ease of oil removal.

These correlate directly with the rankings used in the Environmental Sensitivity Index (ESI) atlases published for the U.S. Great Lakes by NOAA.

The classifications developed for these matrices indicate the relative environmental impact expected as a result of implementing the response techniques on a specific shoreline. The relative effectiveness of the technique also has been incorporated into the

matrices, especially where use of the technique would result in longer application and thus greater ecological impacts, or leave higher oil residues in the habitat.

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3.3.1.2. Oil Removal Actions

Selection of appropriate oil spill protection, recovery, and cleanup techniques prior to and following an oil spill is a critical element affecting the spill's environmental impact. To choose techniques that most effectively prevent or minimize adverse ecological impact, it is important to identify techniques that have minimal intrinsic ecological impacts and also are effective in minimizing the impact of the oil. Furthermore, it is important that these response techniques be pre-planned so that in the event of a spill, minimal time be spent preparing for the response.

> ***Shoreline Cleanup Guideline Matrices are included in electronic form in Appendix V.***
>
> ***See* Options for Minimizing Environmental Impacts of Freshwater Spill Response Actions *(American Petroleum Institute [API]/NOAA, 1994), included in electronic form in Appendix VI.***

Refer to Section 3.8 of this plan for details on disposal of recovered oil and contaminated materials.

As stated previously, the OSC directs response efforts and coordinates all other efforts at the scene of a discharge. As part of this effort, and following the required notifications, the OSC should:

(a) collect information about the discharge including source and cause;

(b) identify responsible parties;

(c) obtain technical data including amount, exposure pathways, and time of travel;

(d) determine potential impact on human health and the environment;

(e) determine whether spill poses a substantial threat;

(f) assess impact on natural resources and other property;

(g) determine protection priorities; and

(h) document costs.

OSCs shall consult with the natural resource trustees and appropriate local, Tribal, State, and Federal response agencies on all removal actions. OSCs may designate capable persons from local, State, or Federal agencies to act as their on-scene representatives. FEMA should be notified of all potential major disaster situations.

Properly trained volunteers can be used for such duties during an incident as beach surveillance, logistical support, and bird and wildlife rehabilitation. Such use of volunteers must, however, be approved by the appropriate State, Federal, and Native American fish and wildlife officials. Unless specifically requested by the OSC, these volunteers generally should not be used for physical removal or mitigative activities. If, in the judgement of the OSC, dangerous conditions exist, these volunteers shall be restricted from on-scene operations.

All response actions shall be conducted in accordance with the NCP. Oil recovered in cleanup operations and contaminated materials shall be disposed of in accordance with this ICP and local contingency plans.

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3.3.2. Use of Chemical Agents

The OSC must choose the best method from the available response tools in any incident. The physical recovery and removal of oil is the preferred cleanup technique. Under certain conditions, however, chemical agents can be an effective tool. There are no pre-approved uses of chemical agents in Region 5. If chemical use is considered, the guidelines below are intended to aid the

OSC in making a decision.

U.S. EPA has compiled the NCP Product Schedule, a list of dispersants and other chemicals which the OSC and/or PRP may consider for use during a spill emergency. The Product Schedule does not authorize or pre-approve use of any of the listed products. The OSC may not authorize use of a product that is not listed on the Product Schedule.

The notifications required by the OSC are described in Section 2.10.2.

The USFWS must approve responsible party or OSC requests to allow trained volunteers to capture oiled birds. Federally and State-licensed bird rehabilitators with USFWS oversight may employ properly trained volunteers for bird cleaning activities. Bird handlers should have current tetanus shots.

Physical recovery and removal of oil is preferred.

Sinking agents shall not be used in U.S. EPA Region 5. U.S. EPA Region 5 does not promote the use of dispersants or other oil emulsifiers. The use of:
· surface collecting agents,
· biological additives,
· burning agents, or
· miscellaneous oil spill control agents
on surface waters, particularly near sensitive wetland or water supplies (fresh water systems) must be approved by State and/or Federal Agencies. Such use adds to the potential for serious impact of already released petroleum products. This stance is necessary to protect subsurface water intakes (potable and non-potable).

The Region does recognize, however, that as a last resort, such agents may have some limited applicability. An example of a situation in which chemical use might be considered for reasons other than protection of human life is during the migratory season, when significant migratory bird or endangered species populations are in danger of becoming oiled.

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3.3.2.1. Application Steps for Use of Chemical Spill Control Agent

The OSC may authorize or is authorized to use any chemical product without requesting permission if its use is necessary to prevent or substantially reduce a hazard to human life. The RRT should be notified as soon as practicable. In situations where a human hazard is not present, the OSC must receive the concurrence of:

(a) the RRT Co-Chair, and

(b) the RRT representative(s) of the affected State(s), in consultation with

(c) the DOI RRT member (and, where the Great Lakes are affected, the DOC RRT member, where practicable) before authorizing use of a listed product.

The OSC may consult with the NOAA or EPA Scientific Support Coordinator (SSC) prior to chemical agent application in U.S. EPA Region 5. The NOAA and EPA SSCs provide:
· oil spill modeling results,
· interpretation of ESI maps,
· location of sensitive areas,
· chemical effects, and
· environmental risks.

The OSC will request approval from the RRT to use chemicals on behalf of the spiller. Use of chemicals on a Regional boundary should include the appropriate RRT members of the bordering Region. The RRT shall be notified of any chemical use as soon as practicable.

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3.3.2.2. Chemical Use Checklist

The OSC/RPM will supply the appropriate members of the RRT with the information contained in the checklist. The checklist

provides information concerning the circumstances of the spill, trajectories, environmental resources at risk, and available decision makers with the information necessary to make a decision on the use of chemical agents.

Refer to Appendix VII for the Chemical Use Checklist.

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3.3.3. Use of In Situ Burning in U.S. EPA Region 5

In order to minimize the environmental impacts and facilitate effective cleanup of an oil spill, responders have a limited number of techniques available to them. These include mechanical methods, the use of certain chemical countermeasures, and in situ burning. Under certain specific conditions, in situ burning may offer a logistically simple, rapid, inexpensive, and relatively safe means for reducing the shoreline impacts of an oil spill. Moreover, because a large portion of the oil is converted to gaseous combustion products, the need for collection, storage, transport, and disposal of recovered material can be substantially reduced. In situ burning may be able to remove a large amount of spilled oil before spreading and drifting of the spill fouls shorelines and threatens wildlife. In certain circumstances, such as oil spilled in ice conditions, burning may be the only viable response technique. Authorization of in-situ burning is subject to consultation and concurrence from the State and DOI. Considerations for use should include an analysis of oil location and the potential impact of smoke on downwind populations.

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3.4. DECONTAMINATION

Personnel responding to hazardous substance incidents may become contaminated in a number of ways, including: · contacting vapors, gases, or particulates in the air;
· being splashed by materials while sampling or opening containers;
· walking through puddles of liquids or on contaminated soil; or
· using contaminated instruments or equipment.

Decontamination consists of physically removing contaminants or changing their chemical nature to innocuous substances. The extent of decontamination depends on a number of factors, the most important being the type of contaminants involved.

A decontamination plan should be developed as part of the safety plan for an emergency response. The initial decontamination plan is based on a worst-case situation or assumes no information is available about the incident. Specific conditions (e.g., type of contaminant, amount of contamination, levels of protection required, type of protective clothing worn) are then evaluated, and the initial decontamination plan is modified to adapt as new information about site conditions becomes available. All materials and equipment used for decontamination must be disposed of properly.

In addition to routine decontamination procedures, emergency decontamination procedures must be established. In an emergency, the primary concern is to prevent the loss of life or severe injury to site personnel. If immediate medical treatment is required to save a life, decontamination should be delayed until the victim is stabilized. If decontamination can be performed without interfering with essential lifesaving techniques or first aid, or if a worker has been contaminated with an extremely toxic or corrosive material that could cause severe injury or loss of life, decontamination must be performed immediately. During an emergency, provision must also be made for protecting medical personnel and disposing of contaminated clothing and equipment.

The complete text of* In Situ Burning of Oil as a Response Tool in Region 5, Parts I and II *(January 1996) is presented as Appendix VIII of this Plan.

The OSC is responsible for addressing worker health and safety concerns at a response scene in accordance with 40 CFR Section 300.150.

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3.5. NONRESPONDER MEDICAL NEEDS

3.5.1. Population Protective Actions

Protective actions for human populations are shelter in place, evacuation, or some combination of the two (e.g., evacuate the general population but shelter bedridden patients, jail populations). Guidance is currently being developed by FEMA in conjunction with other Federal Agencies on the decision-making process between evacuation and in-place sheltering. Until that guidance is available, it should be noted that if no decision is made, by default people will be sheltered in place, albeit not as effectively.

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3.5.2. Treatment of Exposed Population

The first priority of response personnel is to assess the health and welfare of individuals involved in the emergency incident. Immediate medical attention is given to seriously injured persons; the hospital is alerted and transportation is requested as necessary.

(a) An initial survey of the area should be performed to determine radiologically contaminated areas and, if possible, to identify an uncontaminated area to which any injured persons can be removed.

(b) Contamination monitoring of all injured persons should be performed in the clean area and appropriate decontamination performed, if necessary.

(c) Seriously injured individuals who cannot be completely decontaminated should be wrapped in blankets to prevent the spread of contamination during transport.

(d) Individuals not completely decontaminated should be tagged to alert medical personnel to their contaminated status. Each tag should include the name of the individual, the injuries identified, the date and time of the incident, suspected contaminants, and the locations and levels of contamination.

(e) Provisions for appropriate testing should be made in all cases of suspected internal contamination of affected individuals or response personnel.

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3.6. WILDLIFE CONSERVATION

The contamination of wildlife by oil has a high public impact which must be recognized by the OSC and members of the RRT. Public interest, inquiries, criticism, and demands for the cleaning of affected wildlife can seriously hamper the OSC's ability to proceed with mitigation of the spill. Early inspection of impacted or potentially impacted areas known to be wildlife habitat should be made by the OSC, and at the first sign of wildlife involvement, the OSC/RPM should contact the DOI representative to RRT5 to request organization and supervision of the wildlife protection efforts. Funding for these efforts will be required either from a responsible party or the pollution fund.

During response to a discharge or release, natural resource trustees and managers may provide technical assistance and expertise on potential effects on fish and wildlife and their habitats, or other sensitive environments that can be found in the affected area. They are familiar with the area or habitats affected and may be able to provide recommendations on the best locations for staging areas, access points, or anchorage. The natural resource trustees and managers may recommend specific habitats where protective measures should be taken and offer advice on response actions. They may assist in the development of a response monitoring plan and subsequent collection of data. Finally, the USFWS and the state wildlife agency can be expected to direct or provide oversight for the protection, rescue, and/or rehabilitation of fish and wildlife.

Additional Information on shelter in place can be found at the following web sites:
http://www.fema.gov/library/hazmatf.htm;
http://www.fema.gov/pte/talkdiz/chemical.htm

Protective measures may include one or more of the following:

· Preventing oil from reaching areas where migratory birds and other wildlife are located by either containing or recovering the oil, or

· Deterring birds or other wildlife from entering areas affected by oil by using wildlife hazing devices or other methods.

If exposure of birds and other wildlife to oil cannot be prevented, an immediate decision will need to be made regarding whether to capture and rehabilitate oiled birds and other wildlife. The DOI has statutory responsibilities for protecting migratory birds and Federally-listed threatened and endangered species. These responsibilities are delegated to the USFWS. If animals other than migratory birds or Federally-listed threatened or endangered species are found injured, the responsible agency would typically be the state wildlife agency. The decision to rescue and rehabilitate oiled wildlife must be made in consultation with the applicable state and Federal natural resource management agencies, since state and Federal permits are required by law. Any wildlife rescue and rehabilitation will be directed or overseen by the USFWS.

Detailed information on procedures, permit requirements, and appropriate contacts is provided in Appendix IX, Fish and Wildlife Annex to the U.S. EPA Region 5 Integrated Contingency Plan.

Tri-State Bird Rescue and Research, Inc., of Wilmington, DE, and International Bird Research and Rehabilitation Center of Berkeley, CA, are the two nationally recognized centers that can assist in planned or emergency training and organization of wildlife conservation efforts. Several regional centers have experience with oiled wildlife. USFWS Regional Pollution Response Coordinators are sources of these and other contacts in the Region.

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3.7. EVIDENCE FOR COST RECOVERY ACTIONS

3.7.1. Sample Collection Procedures

The OSC must observe precautions when collecting and handling liquid samples for analyses, as the character of the sample may be affected by a number of common conditions. Standard agency protocols are to be followed in the collection and shipment of all samples. Reports of laboratory analyses will be forwarded to the appropriate RRT Co-Chair for transmittal to counsel.

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3.7.2. Photographic Records

Conditions should be photographed to show the source and the extent of oil or hazardous material, if possible using both color and black-and-white film. The following information should be recorded on the back of each photographic print:
(a) name and location of vessel or facility;
(b) date and time the photo was taken;
(c) names of the photographer and witnesses;
(d) shutter speed and lens opening; and
(e) type of film used and details of film processing.

> ***A reference manual* Oiled Bird Rehabilitation: A Guide for Establishing and Operating a Treatment Facility for Oiled Birds *has been prepared by Tri-State Bird Rescue and Research, Inc., and is a valuable resource for learning more about all aspects of wildlife conservation. Contact Tri-State Bird Rescue and Research, Inc., at (302) 737-7241.***
>
> ***See Appendix IX for USFWS Regional Pollution Response Coordinator contact information.***

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3.7.3. Chain-of-Custody Record

All samples and other tangible evidence must be maintained in proper custody until orders have been received from competent authority directing their disposition. Precautions should be taken to protect the samples from breakage, fire, altering, and tampering. It is important that a chainofcustody of the samples be properly maintained and recorded from the time the samples are collected until ultimate use at the trial of the case. In this regard, a record of time, place, and name and title of the person collecting the sample, and each person handling same thereafter, must be maintained and forwarded with the sample. Form No. lEPA350051 may be used. U.S. EPA Regional procedures for sample collection, transport and custody are to be used for all samples submitted to the Central Regional Laboratory.

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3.8. WASTE MANAGEMENT

3.8.1. State Disposal and Management

Although the 1992 40 CFR Part 279 rules are not all immediately applicable Region-wide, individual States can enforce the rules as a matter of State law. Illinois, for example, has already promulgated equivalent regulations to 40 CFR Part 279. In addition, some States (e.g., Wisconsin) may prohibit the land disposal of oils.

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3.8.1.1. ILLINOIS

The Illinois Environmental Protection Agency (IEPA) expedites spill residue disposal permitting through its Emergency Action Center in Springfield. Permits are required for open burning and may be prescribed in some cases. Spill residues are considered Special Wastes in Illinois and require permit authorization numbers from IEPA for acceptance for disposal in a landfill. The procedural aspects of such permits can be expedited by IEPA but the technical requirements must be met (i.e., characterizations of the waste and its suitability for acceptance by a particular facility). IEPA maintains a current list of hazardous materials remediation contractors and disposal/treatment facilities, as well as a list of licensed waste haulers.

During office hours, IEPA can issue emergency generator identification numbers (both State and Federal). During non-office hours, IEPA may issue exemptions for procedural requirements when necessary to prevent additional damage to the environment. Out-of-state wastes may require additional review time.

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3.8.1.2. INDIANA

The Indiana Department of Environmental Management **(**IDEM) Emergency Response Section (ERS) facilitates issues related to waste management and disposal. The Indiana Code under Title 13 and Indiana Administrative Code includes laws related to these issues.

Contact the IEPA Duty Officer at: (217) 782-3637 (office) or (217) 782-7860 (both 24-hour numbers).

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3.8.1.3. MICHIGAN

To be written.

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3.8.1.4. MINNESOTA

In Minnesota, disposal options for waste generated from a spill vary, depending on the contaminant and waste media. The Minnesota Pollution Control Agency (MPCA) Emergency Response Team members can assist the responsible party and expedite the necessary approvals for disposal of wastes generated from spills. In some emergency situations, the Team members may grant approval directly. Waste generated from oil spills can be disposed as follows:

(a) Oil-contaminated Water. After removal of free oil, the contaminated water can be stored for later treatment or disposed by discharge with approval to a local wastewater treatment plant, surface water, or on land. In some cases, the water may require

carbon filtration and/or air stripping before discharge.

(b) Oil-contaminated Soil. There are several options—land applying or land farming, composting, and thermal treatment. The MPCA has developed guidance for these options.

(c) Oil-contaminated Debris. Possible options are co-incineration with municipal or industrial solid waste, open burning (permit required), or landfill deposition, depending on the volume, level of contamination, and location of the waste.

(d) Oil-contaminated Sorbent. For heavily saturated sorbent, incineration at a permitted solid waste facility is the only option. In some cases where little waste is generated and the sorbent has little contamination, the material can be wrung out, dried, and landfilled.

(e) Burning Oil Spills. The MPCA ERT is authorized to approve the burning of oil spills with the concurrence of local authorities and the Department of Natural Resources.

All disposal options must be approved by MPCA staff prior to disposal.

General information regarding open burning can be obtained from the Office of Air Management at (317) 233-0178.

During normal business hours, OSHWM phone number is (317) 615-7956. General information can be obtained at (317) 615-7373. General information can be obtained at (317) 615-8670.

The 24-hour contact numbers for the MPCA Emergency Response Team are (612) 649-5451 and (800) 442-0798.

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3.8.1.5. OHIO

The Division of Emergency and Remedial Response OSCs facilitate disposal of soils, spilled product, and contaminated water with the appropriate staff of other Ohio Environmental Protection Agency (OEPA) divisions. The Ohio Revised Code and Administrative Code provide emergency permitting for open burning, recovery, and injection wells, and assigns explosives and hazardous waste emergency generator identification numbers.

(a) Explosives. Under emergency conditions, the OEPA Emergency Response Duty Officer or OSC may grant verbal approval to local officials to detonate explosives. During business hours the responsible party must complete an application with the Central Office Division of Hazardous Waste Management.

(b) Open Burning. The OSC may authorize open burning of hydrocarbons and associated debris if the material and spill site meet established criteria. Any open burning is corrdinated with the local fire department, local health departments (air), and the OEPA Division of Air Pollution Control through the district offices. Requests are handled on a case-by-case basis.

(c) Hazardous Waste Generator Identification Numbers. Emergency Hazardous Waste Generator Identification Numbers are now assigned by the OEPA Division of Hazardous Waste Management during business hours. The Duty Officer and OSC may facilitate this process and help identify possible sites for waste storage and disposal.

(d) Hazardous Material Transporters. The Public Utilities Commission of Ohio (PUCO) registers Hazardous Material Transporters for OEPA. Over 500 companies are registered by the State of Ohio. The PUCO Transportation Division also enforces U.S. DOT's motor carrier safety laws.

(e) Groundwater/Wastewater Discharges. The Division of Public Drinking Water oversees the construction standards for wells. Enhanced recovery, involving shallow injection wells, requires a permit. Recovery wells, which result in a discharge to waters of the State, require best available treatment standards to be met. Recovery systems may require the owner/operator to apply for a permit to install. Typically, activated carbon is used on oil/water separation recovery systems before discharge to waters of the State is allowed. Permit applications are handled by the district office staff.

(f) Other. Treatment options such as on-site treatment or vapor recovery are handled on a case-by-case basis by the OSC.

The Central Office Division of Hazardous Waste Management can be contacted at (614) 644-2917.

The OEPA Division of Hazardous Waste Management can be reached during normal business hours at (614) 728-3778.

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3.8.1.6. WISCONSIN

The Wisconsin Department of Natural Resources rule series, "Investigation and Remediation of Environmental Contamination," includes specific rules on immediate and interim actions (NR 708); management of solid wastes excavated during response actions (NR 718); soil cleanup standards (NR 720); standards for selecting remedial actions (NR 722); remedial and interim action design, implementation, operation, maintenance and monitoring requirements (NR 724); and case closure (NR 726). The cleanup program is decentralized making staff available in the five regional offices for technical assistance. Each regional office has a Spill Coordinator to assist in spill-related technical issues.

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3.8.2. Federal Disposal—Hazardous Materials

In order to ensure proper treatment and disposal of hazardous substances recovered from CERCLA emergency response or removal sites, Section 300.65 of the NCP requires that off-site transport of hazardous substances use only facilities operating under appropriate Federal or State permits or authorization. Hazardous substances removed from such sites may be transferred only to facilities that are operating in compliance with RCRA, TSCA, and all applicable State requirements. These requirements also preclude the use of disposal units that have releases of hazardous wastes or hazardous constituents, or of disposal facilities that have releases which have not been addressed by corrective action.

U.S. EPA issued policies and procedures related to these requirements on November 13, 1987, entitled *Revised Procedures for Implementing Off-site Response Actions* (Office of Solid Waste and Emergency Response [OSWER] Directive 9834.11). Specific OSC roles and responsibilities for implementing the requirements can be found in Section IV of the *Superfund Removal Procedures Manual*, dated February 1988 (OSWER Directive 9360.03B).

The PUCO Transportation Division can be contacted at (614) 466-0351.

The OSC should coordinate closely with the Regional RCRA Off-site Coordinator (RROC), and/or TSCA personnel and the State, as appropriate.

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3.8.3. Federal Management—Oil

The NCP, Appendix E to Part 300, Oil Spill Response, Section 5.4, states that oil recovered in cleanup operations shall be disposed of in accordance with the RCP, ACP, and any applicable laws, regulations, or requirements. RRT and ACP guidelines may identify the disposal plans to be followed during an oil spill response and may address:

· sampling, testing, and classifying of recovered oil and oiled debris;

· segregation and stockpiling of recovered oil and oiled debris

· prior State disposal approvals and permits; and

· routes, methods (e.g., recycle/reuse, on-site burning, incineration, landfilling, etc.), and sites for the disposal of collected oil, oiled debris, and animal carcasses.

The Solid Waste Disposal Act as amended by the Used Oil Recycling Act (1980) and the Hazardous and Solid Waste Amendments (1984) provide the statutory authority for RCRA, as amended regulations applying to recovered oils and oily wastes. In 1992, U.S. EPA promulgated new used oil regulations at 40 CFR Part 279; these regulations incorporate the old used oil fuel requirements formerly codified at 40 CFR 266, Subpart E (1986_1992 CFRs).

The new used oil management standards at 40 CFR Part 279 apply only to "used oil," defined as any oil that has been refined from crude oil, used, and, as a result of such use, contaminated by physical and chemical impurities. If used oil is destined for disposal, the 40 CFR Part 279 regulations reference the RCRA hazardous waste management standards. Mixtures of waste oil

(i.e., spilled, unused product oils) and used oil are regulated as used oil.

Waste oil and oily wastes are subject to the hazardous waste management regulations at 40 CFR Parts 124, 260-266, 268, and 270. Non-hazardous used oil may be disposed of in an industrial or a municipal solid waste landfill (each State may have additional, more stringent requirements), in accordance with 40 CFR 257 and 258.

It is Federal policy to recycle waste and used oils rather than dispose of them. Under the pre-1992 used oil regulations, used oil destined for recycling (in any way other than burning for energy recovery) is exempt from regulation as hazardous waste. The 1992 used oil management standards do address all recycling activities. Recycling waste oils and oily wastes is addressed by applicable hazardous waste management regulations.

Determining which used oil regulations apply to a particular spill is complicated by U.S. EPA's use of different statutory authority for the pre-1992 used oil fuel regulations than for the September 10, 1992, used oil management standards. The pre-1992 used oil regulations are Federally enforceable requirements in all U.S. EPA Region 5 States. The 1992 used oil management standards will become Federally enforceable requirements as the individual States promulgate regulations and become authorized for them. The relationship between 40 CFR 266 Subpart E and 40 CFR Part 279 was clarified in a May 3, 1993 *Federal Register* final rule (58 FR 26420-26426).

For answers to spill cleanup questions, call the RCRA Hotline at (800) 424-9346.

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SECTION 4: PLANNING

SECTION 4: PLANNING

4.1. RESOURCE PROTECTION

Mitigation and cleanup of spills requires a knowledge of resources at risk. Because many source locations and pollution paths are possible, strict prioritization of protection strategies is difficult. However, identification of resources potentially at risk before an incident and discussion of their relative importance are useful processes, both technically and from communications and human standpoints.

Sources of resource information are provided in this section. Planning is the preferred means to identify protection strategies as it reduces time required to implement effective protective measures and improves coordination through prior personal contact between responsible agencies. Where planning has not been completed, early notification and coordination with the appropriate agencies is critical. This section identifies types of resources to be considered for protection.

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4.1.1. Cultural Sites

Identification of culturally sensitive sites in the vicinity of a spill can be accomplished by contacting the State Historic Preservation Officer (SHPO). This individual is generally associated with the State Historical Preservation Office or Society, which may or may not be within a department of State government. Additionally, NPS has responsibility for sites located on Federal lands within the Region and can serve as a liaison to request NPS assistance concerning these resources. Specific procedures and Federal OSC responsibilities are set forth in the *Programmatic Agreement on Protection of Historic Properties During Emergency Response Under the National Oil and Hazardous Substances Contingency Plan*.

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4.1.2. Drinking Water Intakes

One of the major differences between coastal marine spills and freshwater spills (to Great Lakes and inland surface waters) is the potential impact on drinking water supplies. In many cases, users of surface waters do not have an alternate source of supply, nor do they have treatment or monitoring facilities for oil or chemical contamination.

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4.1.3. Environmentally and Economically Sensitive Areas

Environmentally and Economically Sensitive Areas are identified in the Inland Sensitivity Atlases. Information mapped includes:

· species data including Federal and State threatened and endangered species,
· Federal, State, Regional, and privately-owned and managed natural resource areas,
· Tribal Lands,
· Federal, State, Regional, and private designations of natural resource areas (no ownership),
· drinking water intakes,
· industrial water intakes,
· locks and dams,
· marinas and boat accesses, and
· oil storage above 42,000 gallons and oil pipelines.

Owners/operators, in the preparation of their FRPs, should also incorporate locally managed environmentally and economically sensitive area information for inclusion in the FRP.

Additional contacts for resource information are provided in Appendix IX.

A list of cultural site preservation contacts for U.S. EPA Region 5 is provided in Appendix X. These contacts are generally available during business hours only.

Identification of drinking water intakes may be found in the Inland Sensitivity Maps, USCG local Contingency Plans, State Health Departments, and locally in Emergency Management Plans.

Appendix IX, the Fish and Wildlife Annex to the U.S. EPA Region 5 ICP, dentifies and establishes priorities for fish and wildlife resources and their habitats and other important sensitive areas requiring protection from discharges. It provides mechanisms for timely identification of protection priorities during a spill response.

4.1.3.1. FISH, WILDLIFE, AND PLANTS

USFWS Field Response Coordinators are the primary Federal contact for information about migratory birds, endangered and threatened species, and fish and wildlife at risk as a result of spills in the inland and coastal zones.

Each State has fisheries and wildlife biologists, who may be assigned to a Department of Natural Resources or other State agency. These personnel are assigned to geographic areas within a State (district or region) and are listed in Appendix IX. They can also be identified through State emergency response agencies or USFWS Pollution Response Coordinators.

Each State has a Natural Heritage or Natural Features Inventory in computer format. These databases were initiated by The Nature Conservancy and have been turned over to States for management. These inventories incorporate observations of endangered, threatened, and otherwise specially designated species of fish, wildlife, and plants. Some inventories are in computer format; others are hard copy only. Data can be faxed in an emergency. The inventory is generally housed in the State Department of Natural Resources.

In Illinois, the Illinois Department of Natural Resources maintains a natural heritage inventory system. At present, the location information consists of hand-labeled topographical maps. Efforts are underway to input this information to a GIS system so that publication-quality maps can be more readily reproduced. Emergency contact: IEPA (217) 782-3637.

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) can be a source of technical assistance in understanding Native American fish and wildlife management and cultural values. Another source of valuable information is the National Animal Poison Control Center.

Sea Grant Universities and Extension Agents may be a source of local knowledge outside the public sector. These agents have contact with local scientists, fishermen, environmental groups, and other sources that may supplement information provided by regulatory agencies. They can be contacted through the NOAA SSC.

4.1.3.2. PROTECTED HABITAT

Updated information on protected habitat and economically and environmentally sensitive environments is provided in this plan in three separate indices, one for each of the three drainage basins in

Region 5: the Great Lakes Basin, the Mississippi River Basin, and the Ohio River Basin. Each index contains detailed information, in digital format, regarding the environmentally and economically sensitive areas, and Tribal interests. Descriptive information, maps, and emergency contact lists are also included. The text in the indices provides further instructions on accessing the data available on the disks.

A variety of protected areas such as forests, parks, preserves, reserves, and management areas are managed by public or private organizations such as The Nature Conservancy/Heritage Foundation. Additional sources of this information include Federal or State land management agencies, which include the Departments of the Interior, Agriculture, and Commerce at the Federal level and their counterparts at the State and local levels.

The list of current USFWS personnel and their geographic areas of expertise and/or responsibility is provided in Appendix IX.

Following is a list of locations of Nature Conservancy-sponsored inventories of "species of concern." The staff are not response personnel and are available during business hours only:

- Indiana: Indianapolis (317) 232-4052
- Minnesota: St. Paul (612) 331-0750
- Ohio: Columbus (614) 265-6453
- Wisconsin: Madison (608) 266-0924
- Michigan: Lansing (517) 373-1552/9338

The National Animal Poison Control Center can be contacted at: 888-426-4435

The Great Lakes Basin, the Mississippi River Basin, and the Ohio River Basin indices are contained in Appendix XI.

See Appendix IX for listings of protected areas.

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4.2. TRUSTEES FOR NATURAL RESOURCES

CERCLA, CWA, and OPA require the designation of certain Federal, State, and Native American Tribal officials to act on behalf of the public as trustees for natural resources that they manage or protect. Natural resources, as defined in CERCLA Section 101(16) and OPA 1001(20) means land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, any state or local government, or Indian Tribe.

Natural resource(s) trustees are responsible for assessing damages to resources under their jurisdictions resulting from oil spills or release of hazardous substances. Also, agencies are responsible for seeking recovery for losses from responsible parties and for devising and carrying out rehabilitation, restoration, and replacement of injured natural resources. Where more than one natural resource(s) trustee has jurisdiction over a resource, agencies will coordinate and cooperate in carrying out the activities described above (reference NCP 300.600). Damage assessment is controlled by the designated natural resource(s) trustees and not response; however, it is important for natural resource(s) trustees to work with the OSC/RPM to coordinate activities as necessary.

To minimize impacts to natural resources and assist trustees in carrying out their responsibilities, the OSC is required to:

(1) Promptly report actual or potential discharges or releases to those federal, state, and tribal agencies designated as trustees for natural resources;

(2) Consult with trustees and other natural resource managers in determining such impacts and appropriate protective actions;

(3) Coordinate all response activities with trustees and other natural resource managers;

(4) Make available to trustees, documentation and information that can assist the trustees in determining actual or potential natural resource injuries; and

(5) Consult with USFWS on all incidents and response activities that may affect federally-listed threatened or endangered species, or their habitats.

The trustees and other natural resource managers, consistent with procedures specified in the *Fish and Wildlife Annex* (Appendix IX), may provide timely advice on recommended actions concerning resources that are potentially affected by a discharge of oil or release of hazardous substances. This could include providing assistance to the OSC/RPM in identifying and recommending pre-approved response techniques and in predesignating shoreline types and areas.

For U.S. EPA Region 5, the DOI Office of Environmental Policy and Compliance contact is located in Philadelphia, PA, at (215) 597-5378.

See Appendix IX for detailed discussion of trustee responsibilities.

Contact U.S. EPA Emergency Response Team (ERT) at (908) 906-6825 (business hours).

The trustees are authorized to assess monetary damages for resources injured, lost, or destroyed as a result of discharge of oil or releases of hazardous substances. In addition, the trustees are authorized to seek damages from the responsible person(s), and to devise and carry out restoration, rehabilitation and replacement of natural resources. Where more than one trustee has jurisdiction over a resource, these agencies should coordinate and cooperate in carrying out their activities. RRT representatives from trustee agencies serve as contact points.

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4.2.1. Federal Trustees

Unless delegated to an Authorized Official, the Secretary of the Interior is the natural resource trustee for the natural resources managed or controlled by the following DOI Bureaus:

NPS: National parks, national monuments, national historic sites, national recreation areas, and wild and scenic rivers;

USFWS: National wildlife refuges, national fish hatcheries, waterfowl production areas, migratory birds, threatened and endangered species, and anadromous fish.

BLM: Public lands and federally owned minerals (underlying private as well as public lands).

BIA: In cases where the United States acts on behalf of a Native American Tribe, the Secretary of the Interior also acts as trustee for natural resources for which the tribe would otherwise act as trustee, i.e., reservations and other lands or natural resources held in trust for the tribe including off-reservation natural resources).

The Secretary of Agriculture is trustee for the national forests and national grasslands.

The Secretary of Commerce, through the National Oceanic and Atmospheric Administration (NOAA), is trustee for lands under their administration; certain federally listed species; marine mammals; and marine, anadromous, and some Great Lakes fishes.

The Secretary of Defense is trustee for military lands and USACE project lands.

The Secretary of Energy is trustee for DOE lands and facilities.

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4.2.2. State Trustees

The governor of each state has designated state officials to act on behalf of the public as trustees for natural resources. Natural resources under state jurisdiction include all fish, wildlife, and biota including a shared trusteeship with the federal government for certain plants and animals, air, surface water, groundwater, and land.

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4.2.3. Native American Tribal Trustees

The tribal chairman or head of the tribal governing body, or person designated by tribal officials, acts as trustee of natural resources under Native American tribal trusteeship including lands and other natural resources belonging to, managed by, controlled by, or otherwise appertaining to the tribe; or held in trust for the tribe; or belonging to a member of the tribe if subject to a trust restriction on alienation.

State trustees for natural resources within Region 5 are listed in Annex 1 to Appendix IX.

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4.2.4. Functions of Trustees

The DOI Office of Environmental Policy and Compliance manages oil spills,and releases of hazardous substances. This includes supervision of DOI's participation in contingency planning, response activities, technical assistance, and training exercises. In this regard it represents the Department in the NCP, the FRERP, and other Federal response plans for natural and technological hazards on national and regional response teams.

The DOI Office of Environmental Policy and Compliance is the initial contact for notification and for overall coordination of its trustee activities. USFWS is the program manager for endangered species, anadromous fish, and the lands in the National Wildlife Refuge system, and will be among those involved for DOI in spill incidents because of its responsibility for these resources. The Department of the Interior, Department of Defense, Department of Energy, Department of Agriculture, U.S. National Forest Service, National Oceanic and Atmospheric Administration, and Native American Tribes may serve as trustees or co-trustees.

At the time of a spill, the Federal trustees and trustees of affected Stateand Tribal communities will meet and select one agency to act as Lead Administrative Trustee (LAT). They will convene a trustee group to ensure the best possible coordination of natural resource trustee activities such as data gathering, damage assessment, and negotiations with responsible parties.

The trustees may initiate a natural resource damage assessment. The Federal damage assessment regulations for oil discharges mandated under OPA were developed by NOAA and are now final. The regulations developed by DOI under CERCLA and CWA authorities apply to releases of hazardous substances and are in effect and available for trustee guidance and use. The NOAA SSC can serve as the liaison between the OSC and the trustees conducting damage assessment data collection efforts.

Specific natural resource trustee activities which may be expected to begin during a response include, but are not limited to:

(a) convening the trustee group;

(b) developing and implementing initial sampling plans;

(c) establishing the lead administrative trustee;

(d) developing NRDA initiation requests to the OSLTF;

(e) selecting appropriate assessment strategies;

(f) implementing longer-term assessment studies; and

(g) planning and implementing natural resource restoration.

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4.3. FIELD SURVEY TECHNIQUES

4.3.1. Remote Sensing

A variety of land-based remote sensing methods exist which have been successfully used and are commercially available through contractors. Contact U.S. EPA for details and access its contracted resources.

Aerial remote sensing, primarily used for locating pollutants in water, is in its early stages of development. Technologies are similar to land-based systems; however, data acquisition and interpretation are costly and of limited value. The agencies listed below have capabilities and experts that can be consulted regarding the use of these techniques.

EPA Environmental Photographic Interpretation Center (EPIC)
Reston, Virginia | (703) 648-4284; fax: (708) 648-4290
NOAA Satellite Services Division | (301) 7638051 (business hours); (301) 763-8142, x 124
Environment Canada (Emergency Science Division) | (613) 9989622

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4.3.2. Underwater Response

4.3.2.1. UNDERWATER SURVEY EQUIPMENT

The following underwater survey equipment is available to the Region through the U.S. EPA Emergency Response Team (ERT):

Remote-Operated Vehicle (ROV): For use in observing underwater objects from shore or boat (1,000-foot depth limit).

Mesotech Sonar: Mounted on ROV to locate any object above bottom sediments. ROV directed to potential drums by sonar.

Proton Magnetometer: Locates metal objects underwater. Towed behind a boat.

Sediment and Water Sampling Equipment: Provides ability to sample water and sediments at any depth. Analyses performed at ERT's laboratory facilities, Edison, NJ.

20-foot Boston Whaler: Trailerable boat specially designed for underwater electronic surveys and diving operations.

Side-Scan Sonar Survey Equipment: Accurately maps bottom.

4.3.2.2. DIVING CAPABILITIES

ERT Diving Team: Three U.S. EPA-certified divers with Level B-equivalent diving gear.

Commercial (Contract) Divers: For long-term underwater removals, Region 5 uses private diving firms that comply with U.S. EPA's Chapter 10 Diving Safety Regulations.

Various Diving Equipment: Available from any of U.S. EPA's five diving units.

Contact ERT's Unit Dive Officer: 908-906-6825 (business hours). For a list of qualified diving contractors and required equipment modifications, contact Unit Dive Officer, U.S. EPA Region 5 (312-886-4466).

4.3.3. Field Services Section

The Field Services Section, Superfund Division, Region 5, has the ability to perform limited field surveys at hazardous waste sites. The Section has staff and equipment to provide the following services using various techniques and field equipment:

(a) Surface geophysical surveys: using ground-penetrating radar, electromagnetic surveys, magnetometers, seismic refraction, and resistivity measures.

(b) Subsurface geophysical surveys: using seismic tomography, electromagnetic surveys, natural gamma detection, single-point resistivity, spontaneous potential measures, fluid resistivity, and various borehole measures.

(c) Soil/Groundwater samples: using a Geoprobe or similar equipment.

(d) Aerial photography: using a remote control helicopter for low level flights.

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4.4. WEATHER INFORMATION

NOAA's NWS forecast offices are operated 24 hours a day and primarily provide weather forecasts and warnings. In addition, many can provide hydrological information.

The NWS Forecast Office in Cleveland houses a computer weather product database called DMWDS. A password that can be obtained through the Cleveland office allows access to forecasts for all the Great Lakes and raw data (e.g., wind speed and direction) from many reporting stations, including NOAA data buoys throughout the Great Lakes. The NWS offices on the inland rivers provide river velocity information, as well as weather forecasts, warnings, and observations.

The offices listed below are Forecast Offices at which forecasts are prepared. Other NWS offices located throughout the region have access to the same data and can be useful resources.
Cleveland, OH -- (216) 265-2374
Pittsburgh, PA -- (412) 262-1988
Charleston, WV -- (304) 746-0188/89
Romeoville, IL -- (815) 834-0651
Detroit/Pontiac, MI -- (810) 625-4139
Minneapolis, MN -- (612) 361-6671
Milwaukee, WI -- (414) 965-5063
Indianapolis, IN -- (317) 856-0360
Marquette, MI -- (906) 475-5213
Duluth, MN -- (218) 729-6572
Green Bay, WI -- (414) 497-9177

The Field Services Section, Superfund Division, Region 5 can be contacted at (312) 886-3011.

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4.5. MODELS

4.5.1. Water

4.5.1.1. NOAA GREAT LAKES ENVIRONMENTAL RESEARCH LABORATORY (Great Lakes open water)

Surface water models exist for the Great Lakes and interconnecting channels. The open water model for all of the Lakes was produced by NOAA's Great Lakes Environmental Research Laboratory (GLERL) and is housed on their VAX.

Models of near-shore areas and tributaries to the Great Lakes have various levels of detail. Contact with Sea Grant Institutions or USGS is suggested.

4.5.1.2. ReachScan Model

A model for the Mississippi River or Illinois Waterway was developed for U.S. EPA by Versar, Inc., in 1986. The model is called ReachScan, and is also on PC GEMS, a widely used U.S. EPA modeling program. Contact SSC for 24-hour information on pollutant movement in surface waters.

4.5.1.3. NOAA HAZMAT MODELING AND SIMULATION STUDIES BRANCH (MASS)

MASS can provide spill trajectories and information on
· weather,
· currents,
· water levels, and
· oil fate and behavior.

MASS maintains and operates the On-Scene Spill Model (OSSM) for marine spills and can run other available models (such as GLERL's) for the Great Lakes and Inland Rivers.

4.5.1.4. USACE COLD REGIONS RESEARCH ENGINEERING LABORATORY (CRREL) (RIVERS: GENERAL, AND ST. MARY'S, DETROIT—ST. CLAIR, AND OHIO RIVERS SPECIFICALLY); AND ST. LAWRENCE SEAWAY DEVELOPMENT CORPORATION (SLSDC)

Interconnecting channel models have been produced by the USACE CRREL. SLSDC also has a model for the St. Lawrence River. These models are available through USACE and operate on an MSDOS PC. Noncomputerized hydraulic information,

which can be used to calculate travel times along the Great Lakes interconnecting channels, is provided in CANUSLAK.

4.5.1.5.ORSANCO (OHIO RIVER, MAIN STEM ONLY)

Time-of-travel estimations for the main stem of the Ohio River have been modeled by ORSANCO (model does not include the Monongahela and Allegheny tributaries). The model can be run on a MSDOS PC and is available through ORSANCO.

4.5.1.6. USACE DISTRICTS

USACE Districts are a source of information concerning water levels and velocities on the interconnecting channels to the Great Lakes and on the inland rivers.

The open water model for all of the Lakes is accessible to anyone with a modem by contacting (313) 741-2244.

Contact MASS at (206) 526-6317 or via the NOAA SSC for the Great Lakes and Inland Rivers (216) 522-7760).

The contact number for ORSANCO is (513) 231-7719.

(a) USACE's Detroit Office is capable of running trajectory models for the St. Mary's and the Detroit-St. Clair River Systems.

(b) USACE's Buffalo office houses the St. Lawrence River model.

(c) The Rock Island District and the St. Louis District can provide projections of flow on the Mississippi River from Minneapolis to St. Louis and the Illinois Waterway.

(d) The Pittsburgh Office and the Cincinnati Division can provide river flow data and river stage data for the Ohio River.

(e) The Chicago Office can provide river flow information for waterways in the Chicago Metropolitan area: the Chicago, Fox, DuPage, Little Calumet, and Kankakee Rivers.

(f) The St. Paul District's Riverine Emergency Management Model (REMM) can compute travel time between any two points on a river system and optionally can compute the fate of a chemical spill on the system. REMM is a generic program whose data set has been modeled on the Mississippi River headwaters.

4.5.1.7. NWS FORECAST OFFICES

These are secondary sources of river flow information, which can convert flows to velocities at select locations along rivers.

Ohio River—Cincinnati, OH (513) 383-0527

Lower Mississippi River—Slidell, LA (504) 641-4343

North Central—Minneapolis, MN (612) 361-6660

National Ocean Service (NOS), Silver Spring, MD (Water Levels) (301) 713-2902; (301) 713-2902 (business hours)

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4.5.2. Air Dispersion

A variety of air dispersion models are available, some of which are personal-computer-based and some of which require a mainframe computer. Computer-based models are quite useful in response planning; however, their results should be applied with caution. Discussion of output with experts is critical to correct interpretation and limitations. ARCHIE (developed by FEMA, U.S. EPA, and DOT), and NOAA's ALOHA (part of CAMEO), are examples of simple, computer-based planning models.

Detroit (Detroit River/Lake St. Clair/St. Mary's River) (313) 226-6413

Buffalo (St. Lawrence Riv.) (716) 879-4200

Rock Island (Upper Mississippi River, and the Illinois River) (309) 794-5272; (319) 627-4138 (24 hours).

St. Louis (St. Louis to Cairo and lower Illinois) (314) 331-8000

Chicago (Illinois River, defer to Rock Island) (312) 353-8884

REMM (612) 290-5402

Agencies that can run air dispersion models, interpret the output, and provide expert advice during a response include:

NOAA MASS (206) 526-6317;
U.S. EPA ERT (908) 321-6660;
ATSDR (404) 639-0615;
Environment Canada (416) 3461971;

Ontario Ministry of the Environment, Spills Action Center (416) 3253000.

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SECTION 5: LOGISTICS

5.1. SITE SECURITY

Generally, local law enforcement or the responsible party provide site security at the scene of a response. However, the OSC has the authority to provide for site security as necessary.

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5.2. COMMUNICATIONS

5.2.1. Computer Bulletin Boards

Access by other staff to the computer bulletin boards listed below may be arranged through the appropriate RRT member.

5.2.1.1. FIRSTCLASS E-MAIL(NOAA RRT SYSTEM)

NOAA's FirstClass E-mail is an electronic communication network. Through this system, e-mail can be exchanged between RRT and NRT members, contractors, and State and Federal spill response agencies with accounts on the system. Although the capability exists, the effort has been directed at establishing support for the NRT members and the RRT Co-chairs. NRT members and RRT Co-chairs can contact the NRT FirstClass Administrator for information on obtaining an account.

5.2.1.2. ORSANCO

ORSANCO operates an electronic bulletin board, which is available to provide water quality information during spill events in the Ohio River basin. The system is resident on a personal computer and employs Mustang's Wildcat Bulletin Board software. In addition to spillrelated information, ORSANCO posts daily flow data and seasonal water quality data on the Board. There is no charge or formal registration procedure to use the system. Anyone can call and obtain immediate access to whatever is on file.

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5.2.2. NRC Teleconference Service

The National Response Center is capable of establishing a teleconference of up to 60 participants. The system is intended for use in support of emergency response operations, but can be made available on a limited basis for routine matters.

Federal OSCs and RRT chairmen may request a teleconference by contacting the NRC Duty Officer. They may request emergency conferences at any time, but should provide 1-day advance notice whenever possible.

In addition, both FEMA and GSA has a dedicated teleconference system capable of handling 10 participants.

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5.3. TRANSPORTATION (AIR, LAND, WATER)

Generally, government and/or personal vehicles or commercial airlines are utilized as transportation during response incidents. If necessary, charter services may be contracted.

> ***For further information, see the* NOAA HAZMAT FirstClass User's Manual*, dated June 1994, or contact (202) 267-4497.***
>
> ***For information concerning procedures for logging onto the system and for reading reports, contact ORSANCO at (513) 231-7719.***

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5.4. SPECIAL TEAMS AND OTHER ASSISTANCE AVAILABLE TO OSCS/RPMS

Different Federal Agencies can provide special forces that an OSC/RPM can call upon for assistance during an oil spill or hazardous substance release. These special forces are described below. They can be requested through the agency's RRT member.

5.4.1. National Strike Team

The National Strike Team consists of the three USCG Strike Teams, the Public Information Assist Team (PIAT), and the NSFCC, and is available to assist OSCs in both preparedness and response. The Strike Team provides trained personnel and specialized equipment to assist the OSC in training, spill stabilization and containment, and monitoring or directing response actions. The NSFCC can provide coordination support to the OSC and assist in locating spill response resources.

5.4.1.1. ATLANTIC STRIKE TEAM (AST)

AST is a pollution control team equipped and trained to assist in the response to oil or chemical incidents. The AST has personnel on standby to respond to incidents occurring in the Great Lakes and eastern United States. Services available from the AST include:
· technical expertise;
· supervisory assistance;
· cost documentation;
· deployment of salvage and pollution control equipment; and
· training in pollution response techniques.

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5.4.2. U.S. EPA Scientific Support Center

5.4.2.1. U.S. EPA ENVIRONMENTAL RESPONSE TEAM (ERT)

The ERT provides access to special response equipment including decontamination, sampling,, and air monitoring equipment. The ERT has expertise in treatment technology, biology, chemistry, hydrology, geology, and engineering, and can advise the OSC in:
· hazard evaluation and risk assessment,
· multimedia sampling and analysis,
· water supply decontamination and protection,
· safety,
· cleanup techniques and priorities,
· dispersant application, and
· training.

5.4.2.2. RADIOLOGICAL EMERGENCY RESPONSE TEAMS (RERTS) have been established by U.S. EPA ORIA to provide response and support for incidents or sites containing radiological hazards. Expertise is available in:
· radiation monitoring,
· radionuclide analysis,
· radiation health physics, and
· risk assessment.

RERTs can provide on-site support, including mobile monitoring laboratories for radiochemical sampling and analysis. Requests for support may be made 24 hours a day via the National Response Center or directly to the Regional U.S. EPA Radiation Program Manager in the Air and Radiation Division. Assistance is also available from the Nuclear Regulatory Commission, DOE, and other Federal Agencies.

The NSFCC's contact number is (919) 331-6000.

The Atlantic Strike Team's contact number is (609) 7240008.

The ERT's contact number is (908) 321-6740.

The contact number for the NRC's Radiological Emergency Response Team is (800) 424-8802.

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5.4.3. ATSDR/CDC

ATSDR, the lead Federal Agency for hazardous materials incidents, can provide the following experts for consultation and advice:

(1) Within 10 minutes: an emergency response coordinator;

(2) Within 20 minutes: a preliminary assessment team consisting of a toxicologist, chemist, environmental health scientist, physician, and other health personnel as required;

(3) Within 8 hours: an on-site response team (if the incident warrants).

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5.4.4. Navy Supervisor of Salvage

The Navy Supervisor of Salvage and Diving, Office of the Director of Ocean Engineering (SUPSALV), maintains special equipment and trained teams for response to salvage-related oil and hazardous substance incidents. SUPSALV maintains an extensive inventory of oil pollution abatement equipment located primarily at Williamsburg, VA, and Stockton, CA, which is containerized for immediate deployment by air or truck.

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5.4.5. NOAA Scientific Support Coordinator

The NOAA SSC provides scientific support in
· environmental chemistry,
· oil spill trajectories,
· natural resources at risk,
· environmental tradeoffs of countermeasures and cleanup, and
· information management.

OSC requests for SSC support can be made directly to the assigned area SSC, the NOAA HAZMAT program office in Seattle, or the DOC RRT representative.

The SSC may, at the request of the OSC, lead the scientific team and be responsible for providing scientific support for operational decisions and for coordinating on-scene scientific activity. The SSC may also facilitate the OSC's work with the lead administrative trustee for natural resources to ensure coordination between damage assessment data collection efforts and data collected in support of response operations. The SSC can also support RRTs and Area Committees in preparing Regional and area contingency plans and in conducting spill training.

The NOAA SSC serving the Ninth Coast Guard District is located at District Headquarters in Cleveland, Ohio. The NOAA SSC can provide:
· weather forecasts, water levels, and currents;
· spill trajectory forecasts;
· oil observations and overflight maps;
· information management;
· natural resources at risk;
· coordination of the natural resource trustee agencies;
· environmental tradeoffs of countermeasures and cleanup;
· environmental chemistry, including oil fingerprinting;
· health and safety;
· support to RRTs and Area Committees in preparing regional and area contingency plans and conducting spill training and exercises.

The ATSDR/CDC contact number is (404) 639-0615.

NOAA SSC contact numbers are:
usiness hours: (216) 522-7760
24-hour: (206) 526-6317 FAX: (216) 522-7759

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5.4.6. USCG District Response Group

The USCG District Response Groups (DRGs) provide the OSC with technical assistance, personnel, and equipment. The DRG comprises USCG personnel and equipment in the district, and an advisory team that coordinates movement of USCG resources.

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5.4.7. Office of Pipeline Safety

The DOT Office of Pipeline Safety is another resource available to OSCs.

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5.5. NON-FEDERAL CHEMICAL EXPERTISE

Technical and scientific information generated by the local community, along with information from Federal, State, and local governments, should be used to assist the OSC in devising response strategies where effective standard techniques are unavailable. Additional support is available from the organizations listed below.

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5.5.1. Chemical Transportation Emergency Center

The Chemical Transportation Emergency Center (CHEMTREC), a service of the Chemical Manufacturers' Association, provides technical data, coordination of chemical manufacturers, and emergency response information on chemical spills.

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5.5.2. American Petroleum Institute

The American Petroleum Institute (API), 2100 L Street, NW, Washington, DC 20037, is an organization consisting of representatives of the petroleum industry. Technical and operational expertise is available.

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5.5.3. National Pesticide Telecommunication Network

The National Pesticide Telecommunication Network provides information on pesticide-related health/toxicity/minor cleanup to physicians, veterinarians, fire departments, government agencies, and the general public.

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5.5.4. Canadian Transport Emergency Center

For dealing with Canadian shipments, the Canadian Transport Emergency Center (CANUTEC) has technical experts on duty 24 hours for chemical guidance.

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5.5.5. Association of Railroads, Bureau of Explosives

The Bureau of Explosives of the Association of Railroads, Washington, DC, can provide assistance in:
· accident assessment,
· classification of materials,
· environmental impacts,
· methods of cleanup, and
· mechanical evaluations
for incidents involving railroad trains.

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5.6. STATE ORGANIZATIONS

For services listed in this section, contact the appropriate State representative to the RRT.

District 9 Marine Safety Office contact number is (216) 902-6047/8.

District 8 Marine Safety Division contact number is (504) 589-6225.

The Office of Pipeline Safety contact number is (202) 366-4595.

The CHEMTREC 24-hour emergency number is (800) 4249300.

The contact number for API is (202) 682-8000 (business hours only).

The 24-hour number for CANUTEC is (613) 996-6666.

The Bureau of Explosives can be contacted at (202) 639-2222 during normal business hours; 24-hour response is available through CHEMTREC/Bureau of Explosives at (800) 424-9300.

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5.6.1. Illinois

IEPA has six chemists on its emergency response staff and immediate access to four toxicologists and one certified industrial hygienist. Explosive disposal expertise is available commercially in the Chicago area or through the Illinois Secretary of State's Police Bomb Squad, based in Springfield.

IEPA and the Indiana Department of Public Health (IDPH) have human and environmental toxicologists. The University of Illinois supports a 24hour veterinary toxicology hotline. Computer databases for physical, chemical, toxicological, and environmental data are available through government and commercial sources to both IEPA and IDPH.

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5.6.2. Indiana

IDEM has access to the Chemistry Section Chief 24 hours per day for technical advice about hazardous materials releases. In addition, IDEM has access to ISDH staff toxicologists to provide toxicological information and to assess the impact of spills on ingestion, inhalation, or direct contact, and to make recommendations on human health advisories 24 hours per day.

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5.6.3. Michigan

To be written.

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5.6.4. Minnesota

The on-call staff of MPCA are trained in chemical emergency hazards. MPCA toxicologist and Health Risk Assessment staff of the Department of Health can consult on hazards, but are not on call. The State's Duty Officer can reach and activate several local bomb squads throughout the State. MPCA's emergency contractor has staff trained in chemical hazards and industrial hygiene.

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5.6.5. Ohio

In consultation with the Ohio Department of Health Epidemiology Section, toxicological information can be provided and

recommendations can be made on human health advisories concerning spills that may impact water supplies, the food chain, or result in public exposure.

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5.6.6. Wisconsin

The Department of Health and Family Services provides coordination of emergency public health and human services. Emergency public health activities includes technical assistance for hazardous material releases, disease outbreaks, radiological monitoring, natural disasters, and other health emergencies. The Division of Health employs a large number of environmental health professionals, including physicians, toxicologists, environmental health specialists, epidemiologists, public health nurses and public health educators who can be involved as a situation and their expertise warrants.

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5.7. BASIC ORDERING AGREEMENT (BOA) CONTRACTORS

USCG has established Basic Ordering Agreements with a number of commercial environmental remediation contractors. The list of current contractors is available on the following web sites:
· http://www.uscg.mil/mlclant/fdiv/8thdistrict.htm
· http://www.uscg.mil/mlclant/fdiv/9thdistrict.htm

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SECTION 6: FINANCE

6.1. GENERAL

The person or persons responsible for discharges or releases are liable for costs of cleanup. The OSC shall attempt to have the party responsible for the discharge or release voluntarily assume responsibility for containment, removal, and disposal operations. If the OSC determines that the responsible party has caused the discharge of oil or release of hazardous substances, he/she may initiate appropriate response actions established by OPA, CWA, or CERCLA. Action will be initiated by the agency administering the funding mechanism to recover such expenditures from the party responsible for the discharge, if known. The OSC may also issue an Administrative Order, either by consent or unilaterally, to require financially viable responsible parties to conduct the removal action.

Until new guidance is published, all incidents requiring funding must be screened by category:

(a) CWA Section 311(k) for oil only, and

(b) CERCLA for any release or threat of release of a hazardous material as defined by CERCLA.

A U.S. EPA and USCG Headquarters agreement states that response to any potentially hazardous oil and hazardous materials mixture shall be CERCLA-funded. This section addresses U.S. EPA and State access to OPA and CERCLA funding. USCG procedures can be found in USCG ACPs.

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6.2. CERCLA-FUNDED RESPONSES

Two mechanisms exist for funding a response and response-related activities of another Federal Agency other than U.S. EPA:

(a) an agency's Superfund budget, and

(b) an interagency agreement (IAG) authorizing access to the CERCLA Superfund account.

Response operations for hazardous substances or mixture of hazardous materials and oil may be funded from the CERCLA Superfund account. Removal actions shall not continue after $2 million has been obligated or twelve months have elapsed from the date of the initial response, unless U.S. EPA grants an exemption in accordance with Section 104(c)(1) CERCLA, as amended. Additionally, CERCLA-funded action may not be taken in response to a release or threat of a release:

(a) Of a naturally occurring substance in its unaltered form or altered solely through naturally occurring processes or phenomena, from a location where it is naturally found;

(b) From products which are part of the structure of, and result in exposure within, residential buildings or business or community structures;

(c) Into public or private drinking water supplies as a result of system deterioration through ordinary use.

However, U.S. EPA may respond to any release or threat of release if it is determined that it constitutes a public health or environmental emergency and no other person with the authority and capability to respond to the emergency will do so in a timely manner.

The U.S. EPA Superfund Division has been delegated authority to approve actions costing up to $2 million. State and local governments are not authorized to take actions that involve expenditure of CERCLA funds, unless an appropriate contract or cooperative agreement has been established.

The OSC is responsible for identifying whether technical assistance from another agency is necessary, and for making arrangements for that assistance. In addition, OSCs are responsible for initiating and processing any site-specific IAGs necessary for reimbursing Federal Agency participation.

U.S. EPA OSCs may develop, negotiate terms, and award IAGs for site-specific, U.S. EPA-led actions. For these IAGs, the OSC:

(a) defines the scope of work to be performed;

(b) outlines the responsibilities of each agency;

(c) determines the performance period;

(d) identifies primary contacts in each agency;

(e) names contractors and the dollar amounts of any contracts, if applicable;

(f) determines the overall reporting, invoicing, and amendment requirements

(g) prepares four copies of the Interagency Agreement/Amendment (EPA Form 1610-1), and

(h) prepares the commitment notice and the transmittal/decision memorandum.

The OSC then monitors accomplishment of work in accordance with the IAG scope of work.

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6.3. OPA-FUNDED RESPONSES

6.3.1. National Pollution Fund Center (NPFC)

OPA established the Oil Spill Liability Trust Fund (OSLTF) to pay for oil spill cleanups and damages in cases where the responsible party cannot or will not pay for the cleanup. The NPFC currently administers the disbursement of OSLTF money. The NPFC has several responsibilities, including:

(a) providing funding to permit timely removal actions;

(b) initiating Natural Resource Damage Assessments for oil spills;

(c) compensating claimants for damages caused by oil pollution;

(d) recovering costs owed by the responsible parties for oil pollution damages; and

(e) certifying the financial responsibility of vessel owners and operators.

OPA effectively permits other Federal Agencies, the States and Native American Tribes access to the OSLTF for a variety of purposes. The OSLTF can be used following an incident for removal actions and actions necessary to minimize or mitigate damage to the public health or welfare, and natural resources. Access to the OSLTF is partially governed by Section 6002 of OPA, 33 U.S.C. Section 2753. Federal, State, local, or Tribal agencies may get funding for removal costs through the OSC or by submitting a claim to the NPFC.

> *The NPFC can be contacted at (703) 235-4700. Its mailing address is 4200 Wilson Blvd., Ste. 1000 Arlington, VA 22203-1804*

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6.3.2. U.S. EPA Access to OSLTF

Following spill notification, the OSC should:

(a) Contact the appropriate USCG District Office to obtain a Federal Project Number (FPN) for the response;

(b) Obtain approval for the project expenditure ceiling from USCG;

(c) Contact U.S. EPA Region 5 Budget Office in Cincinnati and obtain an account number;

(d) If necessary, initiate proper contracting mechanisms (such as ERCS, BOA, START) to assist in the cleanup effort; and

(e) If necessary, utilize Federal support structure as defined in the NCP. An OSC may obtain assistance from USCG/Strike Teams, NOAA, ERT, etc.

During the actual response, the OSC should:

(a) Document progress through POLREPs, including costs (copies to NPFC, Marine Logistics Command [MLC], District); and

(b) Track costs using U.S. EPA Removal Cost Management System or USCG paperwork.

In the case of a cleanup that lasts 30 days or less, the OSC must submit a cost documentation package within 30 days of cleanup completion.

For cleanups that extend beyond 30 days, the OSC must submit a cost documentation package every 45 days.

The documents to be included in cost documentation package are listed below:
(a) Summary letter,
(b) Personnel costs,
(c) Personnel travel costs,
(d) Other U.S. EPA costs, including U.S. EPA vehicles and equipment,
(e) U.S. EPA contractor costs,
(f) USCG Basic Ordering Agreements (BOAs), and
(g) Other government agency costs (local, State, or Federal).

When the cleanup has been completed, the OSC should write a completion report, which should be sent to the NPFC and to the ERD Division Director. The report should be similar to the OSC report developed at the end of a CERCLA response. The final

POLREP for the response can serve as the completion report, unless the RRT requests a formal report. The report should include:

(a) a summary of the response events, including:
· spill location,
· cause,
· responsible party actions, and
· beginning and ending dates;

(b) an appraisal of the effectiveness of the removal actions taken by:
· the responsible parties,
· Federal Agencies,
· contractors,
· private groups, and
· volunteers; and

(c) recommendations for prevention of future incidents.

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6.3.3. State Access to OSLTF

States can access the OSLTF in three ways:

(a) Direct Access. States must request direct access through the FOSC. State access must be approved by the FOSC. The request must come only from the official designated by the Governor.

A proposal must be submitted to the FOSC and include anticipated funding and scope of work to be taken at the site. Ceiling increases and changes in the scope of work must be approved by the FOSC.

(b) Pollution Removal Funding Authorization (PRFA). The State acts as a contractor to the FOSC on site and can oversee site activities. The State can oversee Federal contractors under a PRFA.

The FOSC will prepare cost documentation and submit to the NPFC. State and other agency rates can be developed in conjunction with the NPFC.

Each agency involved in the spill must have a separate PRFA.

(c) Claims. Costs for spill cleanup can be submitted to the NPFC after the incident if direct access or a PRFA was not used. An FOSC is not involved in the claims process.

The NPFC will determine whether all actions taken at the site were consistent with the NCP.

In accordance with regulations promulgated under Section 1012(d)(1) of OPA, the President, upon the request of a Governor of a State or the individual designated by the Governor, may obligate the OSLTF through the NPFC for payment in an amount not to exceed $250,000 for removal costs consistent with the NCP required for the immediate removal of a discharge, or the mitigation or prevention of a substantial threat of a discharge, of oil. Requests for access to the OSLTF must be made to the OSC by telephone or other rapid means.

The list of current State designees to request OSLTF funds is contained in Appendix XIII, Section 7.

In making a request to access the OSLTF, the person making the request must do the following:

(a) Indicate that the request is a State access request under

33 CFR Part 133;

(b) Give their name, title, department, and State;

(c) Describe the incident in sufficient detail to allow a determination of jurisdiction, including at a minimum:
· the date of the occurrence,
· type of product discharged,

· estimated quantity of the discharge,
· body of water involved, and
· proposed removal actions for which funds are being requested under this part; and

(d) Indicate the amount of funds being requested.

For further information, refer to the USCG Technical Operating Procedures (TOPs) for State Access Under Section 1012 (d)(1) of OPA (NPFC Instruction 16451.1, November 1992), and the Flow Chart, State Access to OSLTF Under Section 1012(d)(1) of OPA, 33 U.S.C. Section 2712. These documents are available through the NPFC.

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6.3.4. Trustee Access to OSLTF

Trustees must obtain OSC approval prior to obtaining reimbursement of removal costs incurred while responding to an oil and/or hazardous substance discharge under the direction of the OSC. If a trustee believes that a Federal response action is necessary to protect natural resources, whether or not the response action has been Federalized, the trustee must notify the OSC in order to assure that any response action taken is authorized and in accordance with the requirements of the NCP, located at 40 CFR Part 300. If natural resource trustees wish to access the OSLTF in order to initiate a natural resource damages assessment, they must work directly with the NPFC, through the Federal Lead Administrative Trustee. In addition, the trustees may submit claims for natural resource damages to the NPFC for payment from the OSLTF.

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6.3.5. Reimbursable Expenses

OPA authorizes payment of "Removal Costs, including the costs of monitoring removal actions, consistent with the National Contingency Plan." This allows payment of incident-specific costs authorized by a Federal OSC, including costs of monitoring a responsible party's cleanup, as well as actual Federal cleanup activities. The fund may pay:

(a) costs of containment and removal of oil from water and shorelines;

(b) costs to prevent, minimize, or mitigate oil pollution where there is a substantial threat of discharge of oil; and

(c) costs of taking other related actions necessary to minimize or mitigate damage to the public health or welfare, including, but not limited to, damage to:
· fish,
· shellfish,
· wildlife,
· public and private property,
· shorelines, and
· beaches.

Examples of incident-specific Federal removal costs payable from the fund include:

· out-of-pocket expenses (e.g. per diem, travel, vehicle mileage costs; replication, transmission, and delivery of reports; rental cars; and field consumable costs),

· contracted costs,

· costs of U.S. EPA technical assistance teams,

· specific salary costs for temporary government employees hired or activated for the duration of the spill response, and

· specific salary costs for Federal employees not ordinarily available for oil spill response.

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6.3.6. Procedures for Reimbursement

To seek reimbursement from the Federal Pollution Fund:

(1) Federal Agencies must submit their reimbursable expenses on Form SF 1080, "Voucher for Transfer between Appropriations and/or Funds," to the OSC for certification.

(2) The OSC will submit certified requests for reimbursements to NPFC within 60 days after completion of the cleanup action (33 CFR 153.417).

(3) The USCG will effect transfer of funds to the agency requesting reimbursement, and prepare a billing for the discharger from information on recoverable expenditures on the USCG form, "Personnel Vehicle and Miscellaneous Cost Accounting Sheet" (available from USCG).

State agencies that do not have a formal agreement must submit a letter to the OSC requesting reimbursement. This letter must include a detailed itemized statement of reimbursable expenditures. Refer to the USCG Marine Safety Manual for additional information.

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6.3.7. Cost Recovery Action

All agencies participating in a Federal response must submit an itemized account of all recoverable costs to the OSC within 60 days of the completion of a cleanup operation.

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6.3.8. Recoverable Costs

The discharger incurs liability up to the discharger's legal limit of liability for all actual costs associated with Federal removal following Federal assumption of response activities. Recoverable costs include:

(a) direct expenditures from the fund (i.e., payment of contractors or vendors);

(b) all reimbursable agency expenses;

(c) all personnel costs, including salaries of response personnel;

(d) equipment costs, including depreciation and maintenance;

(e) administrative overhead; and

(f) pollution removal damage claims.

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6.3.9. Liability Limits

OPA sets limits of liability which apply to all removal costs and damages sought under the act. The limits may be adjusted for inflation every 3 years, based upon the consumer price index. The limits set by OPA are as follows:

(a) Tank vessels: $1,200 per gross ton; $10 million if 3,000 gross tons or greater; $2 million if less than 3,000 gross tons.

(b) Any other vessel: $600 per gross ton or $500,000.

(c) Offshore facility except Deep Water Ports: $75,000,000.

(d) Onshore facility and Deep Water Port: $350,000,000.

There are certain exceptions to these liability limits. The limits do not apply:

(a) if the incident was caused by gross negligence or willful misconduct;

(b) if the incident was a result of a violation of applicable Federal safety, construction, or operating regulations; or

(c) if the responsible party fails to report the incident, provide all reasonable cooperation and assistance required by a response official, or comply with an order issued by the Federal OSC.

In addition, OPA does not preempt State laws regarding liability, so in areas where State law places a higher limit, compensation for damages up to the liability limit established by the State law may be pursued.

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6.4. REIMBURSEMENT TO LOCAL GOVERNMENTS FOR EMERGENCY RESPONSE TO SUBSTANCE RELEASES

Section 123 of CERCLA and Section 1002 (b)(2)(F) of OPA authorize U.S. EPA to reimburse local governments for some and (in rare cases) possibly all of the expenses incurred in carrying out temporary emergency measures in response to hazardous substance threats or releases. These measures or operations are necessary to prevent or mitigate injury to human health or the environment.

The intent of the CERCLA reimbursement provision is to reduce any significant financial burden that may have been incurred by a local government (city, county, municipality, parish, township, town, Federally recognized Native American Tribe, or other official political subdivisions designated by a particular State) that takes the above measures in response to hazardous substance threats. Traditional local responsibilities, such as routine fire fighting, are not eligible for reimbursement. States are not eligible for this program and may not request reimbursement on their own behalf or on the behalf of a political subdivision within a given State (40 CFR Parts 310.20 and 310.30).

> ***An application package can be obtained by contacting the RCRA/Superfund Hotline at U.S. EPA Headquarters at (800) 424-9346. The application package contains detailed, line-by-line instructions for completing the application.***

The following criteria must be met before a request for reimbursement is to be considered:

(a) local government must have had a Title III plan by October 1, 1988.

(b) Response occurred after the effective date of this rule (October 17, 1986).

(c) local government informed U.S. EPA or the NRC as soon as possible, but not more than 24 hours after initiating response.

(d) Response actions were consistent with CERCLA, the NCP, and EPCRA.

(e) The request contains assurances that the response reimbursement does not supplant local funds normally provided for such activities.

(f) The applicant must have first attempted to recover the costs from all known potentially responsible parties (PRPs) and any other possible sources of reimbursement (State funds, insurance companies, etc.). Sixty (60) days must be allowed for the above responsible party to respond by making payment, expressing an intent to pay, or demonstrating willingness to negotiate payment.

CERCLA limits the amount of reimbursement to $25,000 per single response. If several agencies or departments are involved in a response, they must determine among themselves which agency will submit the request for reimbursement. Any request must be received by U.S. EPA within 6 months of the related response action.

Some of the allowable costs may include, but are not limited to, the following:

(a) Disposable materials and supplies acquired and used specifically for the related response.

(b) Employee compensation for response work that is not provided in the applicant's operating budget.

(c) Rental or leasing of equipment.

(d) Replacement costs of equipment contaminated to the extent that it is beyond reuse or repair.

(e) Decontamination of equipment.

(f) Special technical services needed for the response, such as those provided by experts or specialists.

(g) Other special services, such as utilities.

(h) Laboratory analysis costs related to the response.

(i) Costs associated with supplies, services, and equipment procured for a specific evaluation.

A review panel will evaluate each request and will rank the requests on the basis of financial burden. Financial burden is based on the ratio of eligible response costs to the locality's per capita income adjusted for population. If a request is not reimbursed during the review period for which it is submitted, the U.S. EPA reimbursement official has the discretion to hold the request open for a 1-year reconsideration.

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6.5. DOCUMENTATION FOR ENFORCEMENT AND COST RECOVERY

6.5.1. Introduction

The OSC in charge at the scene of a release may be from any one of several agencies. It is necessary, therefore, to establish uniform procedures for notification of counsel and for collection of samples and information consistent with the several phases in Federal response situations. Necessary information and sample collection must be performed at the proper times during Federal involvement in a spill for the purpose of later use in identifying the party responsible for cost recovery.

Time is of great importance, as wind, tide, and current may disperse or remove the evidence and witnesses may no longer be available. Thus, during the response phases, the OSC must take the necessary action to ensure that information, records, and samples adequate for legal and research purposes are obtained and safeguarded for future use.

Section 300.335 of the NCP outlines the types of funds which may be available to address certain oil and hazardous substances discharges. For releases of oil or a hazardous substance, pollutant, or contaminant, the following provisions apply:

(a) During all phases of response, the lead agency shall complete and maintain documentation to support all actions taken under the ACP and to form the basis for cost recovery. In general, documentation shall be sufficient to provide the source and circumstances of release; identity of responsible parties; response action taken; accurate accounting of Federal, State, or private party costs incurred for response actions; and impacts and potential impacts to public health and welfare and the environment. Where applicable, documentation shall state when the NRC received notification of release of a reportable quantity.

(b) The information and reports obtained by the lead agency for OSLTFfinanced response actions shall, as appropriate, be transmitted to the NPFC. Copies can then be forwarded to the NRT, members of the RRT, and others as appropriate.

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6.5.2. Notification

The OSC is responsible for coordinating with counsel in his/her agency. Counsel for the RRT member furnishing the OSC is responsible for notifying other RRT member counsel, as appropriate, of potential enforcement or cost recovery matters related to an incident. The OSC and his/her counsel are responsible, following review and consultation with other RRT members involved in an incident, for notifying a responsible party of any determination under the CWA or CERCLA that the party is not properly accomplishing any response action.

The information and reports obtained by the OSC are to be transmitted to the applicable RRT Co-chair. Copies will then be forwarded to members of the RRT and others, as appropriate. The representative of the agency on the RRT having cost recovery authority will then refer copies of the oil or hazardous materials reports to that agency's respective counsel.

Detailed guidance on preferred procedures can be found in

Enforcement Considerations for Evaluations of Uncontrolled Hazardous Waste Disposal Sites by Contractors, *U.S. EPA, National Enforcement Investigation Center, April 1980.*

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6.5.3. Legal Notice to Suspected Releaser

The owner, operator, or other appropriate responsible person shall be notified of Federal interest and potential action in an oil or hazardous materials release by the agency furnishing the OSC. This notice shall include:

(a) advice of the owner or operator's potential liability for proper response to the release;

(b) the need to perform removal in accordance with existing Federal and State statutes and regulations, this Plan, and the NCP; and

(c) identification of the OSC.

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6.5.4. Oil or Hazardous Materials Release Report

The appropriate information for each oil or hazardous material release should be obtained by the OSC and reported in the appropriate format established by the Emergency Response Division, Washington, DC. The OSC will retain:
· statements of witnesses,
· photographs,
· analyses of samples, and
· related documentation for possible use in enforcement actions. In all major spills, the oil or hazardous material incident report should be completed and forwarded to the RRT Chair.

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APPENDIX I: JURISDICTIONS IN REGION 5

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1. REGIONAL AREAS

Region 5 has been divided into two operational areas, inland and coastal, which correspond to the areas in which U.S. EPA and USCG are responsible respectively for providing OSCs. The coastal operational area consists of the open waters of the Great Lakes, including Lake St. Clair, the interconnecting rivers, major bays, ports, and harbors of the Region 5 States; and the land surface, land substrata, ground water, and ambient air proximal to those waters. The inland operational area includes all other land territory of the six States of Region 5, including each State's inland lakes and rivers. Numerous Native American community reservations and treaty rights areas are also delineated within Region 5.

Two Coast Guard Districts share Federal Region 5. The Ninth Coast Guard District, headquartered in Cleveland, serves the Great Lakes drainage basin. The Eighth Coast Guard District, headquartered in New Orleans, serves the drainage basins of the upper Mississippi and the Ohio Rivers.

Within the Great Lakes coastal zone, the appropriate Captain of the Port (COTP) functions as the predesignated OSC for all oil and hazardous substance releases, subject to a DOT/U.S. EPA redelegation of certain CERCLA response authorities. U.S. EPA performs the following two categories of response actions within the coastal zone: 1) remedial actions for releases originating from facilities, and 2) all response actions for releases originating from hazardous waste management facilities.

The scope of the Eighth Coast Guard District response role is defined by a revised Memorandum of Understanding (MOU), between that District and U.S. EPA Region 5, signed by the Regional Administrator on April 12, 1993. The revised MOU

assigned U.S. EPA as the predesignated OSC for the entire inland zone, including the inland river system within the Eighth Coast Guard District for responding to all discharges of oil and hazardous substances. The USCG would respond for spills from commercial vessels only.

DOD or DOE provides OSCs for all response actions for releases of hazardous substances, pollutants, or contaminants which originate on any facility or vessel under the jurisdiction, custody, or control of DOD or DOE. In the case of a Federal agency other than U.S. EPA, USCG, DOD, or DOE, such agency shall provide OSCs for all removal actions necessitated by releases originating on any facility or vessel under its jurisdiction that are not emergencies.

U.S. EPA or USCG OSCs may be requested to provide technical assistance to the lead agency OSC who is responding to the release or threatened release. In the event of an emergency on Federal agency property, other than DOD or DOE, U.S. EPA or USCG retains response authority and U.S. EPA OSCs may respond and later initiate cost recovery actions against the potentially responsible party.

Definitions of the boundaries of OSC jurisdictions for Region 5 are provided in the following subsections. Where highways are used to delineate the boundary, the roadbed right-of-ways of the highway are included in the inland (U.S. EPA) zone.

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2. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY OSC BOUNDARIES

2.1. U.S. EPA Region 3 OSC Boundaries

U.S. EPA Region 3 will provide OSCs for investigating and responding to releases to the main stem of the Ohio River from the Ohio-Pennsylvania boundary, mile 40.1, to the Kentucky-West Virginia boundary, mile 317.2.

All releases in the above-named stretch of the Ohio River emanating from sources in West Virginia will be handled by U.S. EPA Region 3 personnel; those from sources in Region 5 will be handled by personnel from Region 5.

If either RRT is activated, the Eighth USCG District would be involved along the entire stretch of the Ohio River.

2.2. U.S. EPA Region 4 OSC Boundaries

U.S. EPA Region 4 will provide OSCs for investigating and responding to releases of oil or hazardous materials to the main stem of the Ohio River from the Kentucky-West Virginia boundary, mile 317.2, to its junction with the Mississippi River, mile 981.2.

Releases in the above-named stretch of the Ohio River emanating from shoreline sources in U.S. EPA Region 4 will be handled by personnel of Region 4; those spills from shoreline sources in Ohio, Indiana, and Illinois will be handled by personnel from Region 5.

Region 4 will have the responsibility for ensuring notification of water users downstream of the location of the release, including coordination with ORSANCO, the USCG Eighth District, and COE when a release occurs on the south shoreline or in the main stream of the Ohio River;

Region 5 has a like responsibility, including coordination with ORSANCO, the USCG Eighth District, and COE when a release occurs on the north shoreline of the river.

Either Region, when requested by the other, may assume the functional OSC role for a particular incident. The decision to accept this responsibility will rest with the Region being requested on an incident-specific basis. Boundary lines do not preclude mutual assistance between the two agencies.

2.3. U.S. EPA Region 7 OSC Boundaries

U.S. EPA Region 7 will provide OSCs for investigating and responding to releases to the main stem of the Upper Mississippi River (UMR) when either Iowa or Missouri is the principal first responding State.

U.S. EPA Region 5 will have jurisdiction for such releases within the State of Minnesota and where Minnesota, Wisconsin, or Illinois is the first principal responding State.

When releases to the UMR main stem will result in significant response by more than one State, or when there is uncertainty as to the responding States, Region 7 will provide OSCs for such releases occurring between Cairo, Illinois, and Keokuk, Iowa (miles 0.0 to 354.5), and Region 5 above that point.

For spills from shore facilities and non-waterborne sources, OSCs will be provided by the Region in which the source is located.

2.4. U.S. EPA Region 8 OSC Boundaries

U.S. EPA Region 5 will provide OSCs for investigating and responding to releases to the main stem of the Red River of the North from its origin in Lake Traverse near Browns Valley, Minnesota, to the Canadian border. All spills to the above-named stretch of the Red River emanating from sources in North Dakota and South Dakota will be handled by Region 8 personnel.

South of the Browns Valley area, the boundary between South Dakota and Minnesota involves the headwaters of the Minnesota River flowing southward. Region 5 Spill Response personnel will respond to releases to the main stem of the Little Minnesota River and Big Stone Lake southward to Ortonville, Minnesota.

All releases to the above-named headwaters of the Minnesota River emanating from sources in South Dakota will be handled by Region 8 personnel; releases from sources in Minnesota will be handled by Region 5 personnel.

U.S. EPA Region 8 will provide communications as necessary with the Canadian Province of Manitoba concerning all releases occurring in waters flowing into Canada, including those emanating from Region 5.

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3. NINTH COAST GUARD DISTRICT OSC BOUNDARIES

Eight USCG units provide OSCs for releases occurring within the coastal zone, each serving a specific geographic area. These geographic areas are defined as: the international boundary with Canada, the boundaries between the units (described at 33 CFR 3.45), and the boundary between the inland zone and the coastal zone. In most locations, the boundary between inland and coastal zones follows the near shore areas adjoining the Great Lakes and the interconnecting rivers.

The following subsections detail, for each of the eight units, which tributaries fall within the coastal zone and where a geographic feature, such as a highway, serves as the boundary.

3.1. Marine Safety Office, Chicago, IL

1. Lake Michigan: within limits of COTP Chicago.

2. North Point Marina (Winthrop Harbor, Illinois): Entire marina.

3. Waukegan Harbor: Entire harbor.

4. Wilmette Harbor: From the entrance to the sluice gate.

5. Montrose Harbor (Chicago, Illinois): Entire harbor.

6. Belmont Harbor (Chicago, Illinois): Entire harbor.

7. Diversey Harbor (Chicago, Illinois): Entire harbor.

8. Chicago River: The outer harbor, limited to the waters outside the Chicago Lock and retaining walls, including the waters inside the lock gates.

9. Burnham Park Harbor (Chicago, Illinois): Entire harbor.

10. 59th Street Harbor (Chicago, Illinois): Entire harbor.

11. Jackson Park Harbor (Chicago, Illinois): Entire harbor.

12. Calumet Harbor and River (Chicago, Illinois): From the mouth of the Calumet River south to the north side of O'Brien Lock and Dam, including the waters inside the lock gates. From "The Forks" west to the temporary dike at the south boundary of Lake Calumet.

13. Hammond Marina: Entire marina.

14. Indiana Harbor (East Chicago, Indiana): Upstream to Conrail Railroad Bridge.

15. Pastrick Marina (East Chicago, Indiana): Entire marina.

16. Buffington Harbor (Gary, Indiana): Entire harbor.

17. Gary Harbor (Gary, Indiana): Entire harbor.

18. Burns Harbor (Burns Harbor, Indiana): From the entrance to the south end of deep draft slip.

19. Michigan City Harbor: Entrance to Bascule Bridge.

20. Betsie Lake (Frankfort): Entire lake throughout up to and including the mouth of the Betsie River to Highway M-22 bridge.

21. Arcadia Lake: Entire lake.

22. Portage Lake: Entire lake.

23. Manistee Lake (Manistee): Entire lake throughout up to and including the mouth of the Manistee River to Highway M-55 bridge.

24. Pere Marquette Lake (Ludington): Entire lake throughout up to and including the mouth of the Pere Marquette River to Old U.S. 31 bridge.

25. Pentwater Lake: Entire lake.

26. White Lake: Entire lake.

27. Muskegon/Bear Lake (Muskegon, Michigan): Entire lake throughout up to and including the Muskegon River to the U.S. 31 bridges.

28. Mona Lake: Entire lake.

29. Spring Lake: Entire lake.

30. Grand River: From the mouth to the end of the dredged channel at Buoy #78 (in Ottawa County approximately 17 miles upstream).

31. Pigeon Lake: Entire lake up to the fixed bridge in the intake channel of the J.H. Campbell power plant and on the eastern end up to the fixed bridge of Lakeshore Avenue.

32. Lake Macatawa: Entire lake to the end of the dredged channel marked by buoys #25 and #26 (eastern end of the lake in Holland).

33. Kalamazoo Lake (Douglas/Saugatuck): Entire lake up to and including the Kalamazoo River to the CSX Railroad bridge, approximately 11 miles upstream.

34. Black River (South Haven): From the mouth to the U.S. 31 bridge, approximately 2.6 miles upstream.

35. St. Joseph River (St. Joseph): From the mouth to the Somerleyton bridge, approximately 6.6 miles upstream.

36. Paw Paw River (Benton Harbor): From the mouth to the CSX Railroad bridge, approximately 3.2 miles upstream.

37. Galien River: from the mouth to the Highway 12 bridge, approximately 2 miles upstream.

3.2. Marine Safety Office, Cleveland, OH

1. Ashtabula River (Ashtabula, Ohio): Upstream to East 5th Street.

2. Black River (Lorain, Ohio): Upstream to the turning basin at the National Tube Division of U.S. Steel (river mile 3.0).

3. Conneaut River (Conneaut, Ohio): Upstream to the Bessemer and Lake Erie Railroad Swing Bridge at Pittsburg & Conneaut Dock Comp. (river mile 0.75).

4. Cuyahoga River (Cleveland, Ohio): Upstream to the mouth of Big Creek in the Metropolitan Parks (river mile 7.5).

5. Grand River (Fairport Harbor, Ohio): Upstream to the turning basin at Osborn Concrete and Tank Company.

In addition to the river miles mentioned above, the coastal/inland zone demarcation shall be defined by the boundary on the highway created by State Route 2 from Vermilion to North Perry and then U.S. Route 20 from North Perry to the Ohio/Pennsylvania border. The costal zone being all waters and adjacent shoreline north of this boundary, any incident on the above-mentioned highways will be the responsibility of U.S. EPA but it should be noted that the COTP may be requested to respond as First Federal Official on scene until a U.S. EPA OSC can respond.

3.3. Marine Safety Office, Detroit, MI

1. Lake Huron: From Latitude 44-43' south and east to international boundary.

2. Saginaw Bay: The entire Saginaw Bay.

3. St. Clair River: East to international boundary.

4. Lake St. Clair: East to international boundary.

5. Detroit River: South to Detroit River Light and east to international boundary.

6. Au Gres River (Au Gres, Michigan): Upstream to U.S. 23 Bridge.

7. Au Sable River (Oscoda, Michigan): Upstream to Mill Street Bridge.

8. Bird Creek (Port Austin, Michigan): Upstream to Spring Street Bridge.

9. Belle River (Port Huron, Michigan): Upstream to M-29 Broadway Bridge.

10. Black River (Port Huron, Michigan): Upstream to and including Black River Canal.

11. Clinton River (Harrison Township, Michigan): Up to and including Clinton River Spillway.

12. Ecorse River (Ecorse, Michigan): Upstream to Jefferson Avenue Bridge.

13. Huron River (Rockwood, Michigan): Dixie Highway Bridge 1.8 miles above mouth of rive.

14. Milk River (St. Clair Shores, Michigan): Up to Jefferson Avenue Bridge.

15. Pigeon River (Caseville, Michigan): Upstream to M-25 Bridge.

16. Pine River (St. Clair, Michigan): Upstream to CSX Railroad Bridge.

17. River Rouge (Saginaw and Bay City, Michigan): Upstream to .5 mile above Center Street Bridge in Saginaw.

18. Salt River (Chesterfield Township, Michigan): Upstream to Callens Road Bridge.

19. Sebewaing River (Sebewaing, Michigan): Upstream to M-25 Bridge.

3.4. Marine Safety Office, Duluth, MN

Within Duluth/Superior Harbor, COTP Duluth will assume the responsibility for providing FOSCs in Duluth/Superior Harbor to the mouths of all small tributary rivers and creeks entering into the harbor, plus the St. Louis River serviced by existing patrols and aids to navigation up to the Highway Bridge on Route 23 at Fond du Lac, Minnesota, and the waters of Lake Superior within COTP Duluth.

3.5. Marine Safety Office, Milwaukee, WI

1. All waters of Lake Michigan within COTP Milwaukee's zone.

2. Pike Creek (Kenosha): To the Sixth Avenue Bridge.

3. Root River (Racine): To the Main Street Bridge.

4. Oak Creek (Milwaukee): To its mouth.

5. Kinnickkinnic River (Milwaukee): To the South Kinnickkinnic Avenue Bridge.

6. Menominee River (Milwaukee): To mile 2 (25th Street Bridge)

7. Milwaukee River (Milwaukee): To the North Humboldt Avenue Bridge.

8. Sauk Creek (Port Washingtom): To the Wisconsin Street Bridge.

9. Sheboygan River (Sheboygan): To the Pennsylvania Avenue Bridge.

10. Manitowac River (Manitowac): To the C&NW Railroad Bridge.

11. West Twin River (Two Rivers): To the 16th and Madison Streets Bridge.

12. East Twin River (Two Rivers): To the 22nd Street Bridge.

13. Kewaunee River (Kewaunee): To the Park Street Bridge.

14. Ahnapee River (Algoma): To the 2nd Street Bridge.

15. Fox River (Green Bay): To the State Route 172 Bridge.

16. East River (Green Bay): To the Monroe Avenue Bridge.

17. Oconto River (Oconto): To the turning basin.

18. Menominee River (Marinette, Wisconsin to Menominee, Michigan): To the Dunlap Avenue (Highway 41) Bridge.

3.6. Marine Safety Office, Sault Ste. Marie, MI

1. Lake Superior: The waters, bays, tributaries, and adjoining shoreline of Lake Superior within U.S. territory, eastward from the westernmost boundary of the Area of Operations (AOR) to a line between Point Iroquois running northeast to Gros Cap Reef Light on the International Boundary.

2. St. Mary's River: The waters, bays, tributaries, and adjoining shoreline of the St. Mary's River within U.S. territory, from a line between Point Iroquois and Gros Cap Reef Light southward to a line between Detour Reef Light and Crab Island Shoal Light, including the waters of Potagannissing Bay.

3. Lake Huron: The waters, bays, tributaries, and adjoining shoreline of Lake Huron within U.S. territory, northward from the southernmost boundary of the AOR, west to the Straits of Mackinaw Bridge.

4. Lake Michigan: The waters, bays, tributaries, and adjoining shoreline of Lake Michigan, eastward from the westernmost boundary of the AOR, to the Straits of Mackinaw Bridge.

3.7. Marine Safety Office, Toledo, OH

1. River Raisin (Monroe, Michigan): Upstream to the turning basin (river mile 1.5).

2. Maumee River (Toledo, Ohio): Upstream to the I-75 Bridge.

3. Portage River (Port Clinton, Ohio): Upstream to Highway 163.

4. Sandusky Bay (Sandusky, Ohio): Upstream to Highway 2.

5. Huron River (Huron, Ohio): Upstream to turning basin (mile .5).

6. Lake Erie: The open waters, bays, harbors, and mouths of tributaries within the COTP Toledo zone.

3.8. Ninth Coast Guard District Responses in the Inland Zone

Ordinarily, the Ninth Coast Guard District will not provide the OSC for a release occurring in the inland zone. However, where a Marine Safety Officer responds in the inland zone to a marine casualty or other incident pursuant to USCG port safety and

commercial vessel safety responsibilities, that officer will serve as the First Federal Official On Scene, pending arrival of the predesignated U.S. EPA OSC. In this capacity, that officer will manage any cleanup actions performed by the responsible party and, if necessary, will initiate a Federal removal.

The U.S. EPA Region 5 office may request that the Ninth Coast Guard District provide the OSC for a release in the inland zone, regardless of source, because of the particular circumstances of the incident.

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4. EIGHTH COAST GUARD DISTRICT OSC BOUNDARIES

Agency responsibilities have been reassigned to more clearly reflect the inland and coastal zone delineation. The revised MOU assigns the U.S. EPA as the predesignated OSC for the entire inland zone, including the inland river system within the Eighth District. The previous agreement designating specified ports and harbors as portions of the Coastal Zone is no longer applicable.

If the incident involves a commercial vessel, a transfer operation, or a marine transportation related facility, the USCG will provide the OSC. The Eighth District will assist the predesignated U.S. EPA OSC where there is a discharge or release of oil or hazardous substances, or a threat of such a discharge or release, into or on navigable waters. Upon request by the U.S. EPA OSC, the USCG may act on behalf of U.S. EPA, assuming the functional role and responsibilities of the OSC. If the USCG is the first Federal official on-scene, the USCG will notify the U.S. EPA OSC and act as the OSC until such time as the U.S. EPA OSC arrives.

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APPENDIX II: FEDERALLY RECOGNIZED NATIVE AMERICAN TRIBES IN REGION 5

MICHIGAN TRIBAL CONTACTS

Bay Mills Executive Council
Jeff Parker, Chairman
Route #1
Brimley, MI 49715

Bay Mills Indian Community
Ken Gebhardt, Fisheries Biologist
Route 1
Brimley, MI 49715

Grand Traverse Band of Ottawa & Chippewa
Joseph Raphael, Chairman
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Suttons Bay, MI 49862

Grand Traverse Band of Ottawa & Chippewa
Christine Mitchell, Biological Services Director
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Suttons Bay, MI 49682

Hannahville Indian Community
Jeff Pecotte, Health Administrator
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Hannahville Tribal Council
Kenneth Meshigaud, Chairman

N14911 Hannahville Bl. Rd.
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Keweenaw Bay Indian Community
William Beaver, Environmental Specialist
795 Michigan Avenue
Baraga, MI 49908

Keweenaw Bay Tribal Council
Fred Dakota, President
795 Michigan Avenue
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Lac Vieux Desert Tribal Council
John McGeshick, Chairman
P.O. Box 446
Watersmeet, MI 49969

Lake Superior Chippewa, Lac Vieux Desert Band
George Beck, Environmental Specialist
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Little River Band of Ottawa Indians
Daniel Bailey, Chairman
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Little Traverse Band of Odawa Indians
Frank Ettawageshik, Chairman
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Pokaogon Band of Potawatomi
Joseph Winchester, Chairman
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Dowagiac, MI 49047

Nottawaseppi Huron Potawatomi Band
221 1/2 Mile Road
Fulton, MI 49052

Saginaw Chippewa Indian Tribe
Bill Mrdeza, Tribal Planner
7070 East Broadway Road
Mt. Pleasant, MI 48858

Saginaw Chippewa Tribal Council
Phil Peters, Chairman
7070 East Broadway Road
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Sault Ste. Marie Tribal Council
Bernard Boushcor, Chairman
206 Greenough Street
Sault Ste. Marie, MI 49783

Sault Ste. Marie Tribe
Dan Tadgerson, Environmental Specialist
206 Greenough Street
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Bois Forte Tribal Council
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Fond du Lac Band of Chippewa
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Grand Portage Band of Chippewa
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Leech Lake Band of Chippewa
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Onamia, MN 56359

Mille Lacs Band of Ojibwe
Mike Moilenan, Environmental Specialist
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Minnesota Chippewa Tribe
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Prairie Island Community Council
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Shakopee Mdewakanton Community
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Upper Sioux Board of Trustees
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White Earth Tribe
Eugene McArthur, Chairman
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Bad River Band of Chippewa
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Forest County Potawatomi Community

Phil Shopodock, Chairman
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Crandon, WI 54520

Forest County Potawatomi Community
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Ho-Chunk Nation
Chloris Lowe, Chairman
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Ho-Chunk Nation
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Lac Courte Oreilles Band of Chippewa
Al Trepania, Chairman
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Lac Courte Oreilles Band of Chippewa
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Lac du Flambeau, WI 54538

Lac du Flambeau Band of Chippewa
Dee Allen, Environmental Specialist
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Lac du Flambeau, WI 54538

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Menominee Indian Tribe
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Oneida Business Committee
Deborah Doxtator, Chairperson
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Oneida, WI 54155

Oneida Nation of Wisconsin
Dawn George, Environmental Specialist
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Oneida, WI 54155

Red Cliff Tribal Council
Rose Gurnoe, Chairperson
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Red Cliff Band of Chippewa Indians

Judy Pratt-Shelley, Environmental Specialist
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St. Croix Tribal Council
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St. Croix Band of Chippewa
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Sokaogon Chippewa Community
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Sokaogon Chippewa Community
John Griffin, Environmental Specialist
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Stockbridge-Munsee Community
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Stockbridge-Munsee Community
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TRIBAL LIAISONS

Tribal Environmental Liaison
Steve Dodge
P.O. Box 1030
Keshena, Wisconsin 54135

Tribal Environmental Liaison
Ed Fairbanks
c/o Minnesota Chippewa Tribe
P.O. Box 217
Cass Lake, MN 56633

Tribal Environmental Liaison
Jennifer Manville
3601 Mackinaw Trail
Sault Ste. Marie, MI 49783-9479

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APPENDIX III: CURRENT MEMBERS OF STANDING RRT

Department of Agriculture	
Primary Laura Samudio, Center Manager Fire Operations Aviation and Fire Management USDA Forest Service, Region 9 310 West Wisconsin Avenue Milwaukee, WI 53203	Phone: 414-297-3690 24 hour: 414-297-3690 FAX: 414-297-3642 Email:wieac/r9@fs.fed.us
Department of Commerce	
Primary Martin McHugh NOAA, Office of Response & Restoration 77 West Jackson, SR-6J Chicago, IL 60604-3590	Phone: 312-886-0430 FAX: 312-886-4071 Skypager: 800-759-8888, PIN: 1637623 NOAA Hazmat Duty Officer: 206-526-6317 Email: marty_mchugh@hazmat.noaa.gov
Alternate LCDR Ken Barton NOAA/NOS/ORR/HMRD 7600 Sand Point Way, NE Bin C 15700 Seattle, WA 98115-0070	Phone: 206-526-6326 FAX: 206-526-6329 Skypager: 800-759-7243, PIN: 2168798 NOAA Hazmat Duty Officer: 206-526-6317 Email:
Scientific Support Coordinator LCDR Jason Maddox NOAA/HAZMAT 1240 East 9th Street	Phone: 216-522-7760 FAX: 216-522-7759 HAZMAT Duty Officer: 206-526-6317 Email: jason_maddox_lakessc@hazmat.noaa.gov

Cleveland, OH 44199-2060	
Department of Defense	
Primary Mark Schultz Director, Environmental Department Naval Training Center, Great Lakes Suite 120, Building 1A 201 Decatur Avenue Great Lakes, IL 60088-5600	Phone: 847-688-5999 ext. 40 FAX: 847-688-2319 or 4845 Pager: 800-759-7243 PIN: 811 3783 Email: schultzmr@pwcgl.navfac.navy.mil
Alternate Michael A. Hanson Environmental Department Naval Training Center, Great Lakes Suite 120, Building 1A 201 Decatur Avenue Great Lakes, IL 60088-5600	Phone: 847-688-5999 ext. 48 FAX: 847-688-2319 Email: hansonma@pwcgl.navfac.navy.mil
Department of Energy	
Primary Edward Jascewsky Chief, Health Protection Branch U.S. Department of Energy Radiological Coordination Office 9800 South Cass Avenue Argonne, IL 60439	Phone: 630-252-9660 24 hour: 630-252-4800 FAX: 630-252-2361 Email: edward.jascewsky@ch.doe.gov
Alternate Julie Beck U.S. Department of Energy Radiological Coordination Office 9800 South Cass Avenue Argonne, IL 60439	Phone: 630-252-2260 24 hour: 630-252-4800 FAX: 630-252-2078 Email: julie.beck@ch.doe.gov
Department of Health and Human Services	
Primary Carl Adrianopoli Office of Emergency Preparedness U.S. Public Health Service, Region 5 105 West Adams, 17th floor Chicago, IL 60603	Phone: 312-353-4515 24 hour: 800-SKY-PAGE/Pin: 2376227 FAX: 312-353-0718 Email: CAdrianopoli@hrsa.dhhs.gov
Alternate Clayton G. Koher ATSDR Mail Code: ATSDR-4J 77 West Jackson Blvd. Chicago, IL 60604	Phone: 312-886-0840 24 hour: 708-352-5566 FAX: 312-886-6066 Pager: 888-336-0727 Email: koher.clayton@epa.gov
Department of the Interior	
Primary Michael T. Chezik	Phone: 215-597-5378

U.S. Department of the Interior Office of Environmental Policy and Compliance 244 Custom House 200 Chestnut Street Philadelphia, PA 19106	24 hour: 800-759-8352/Mailbox: 1168849 FAX: 215-597-9845 NOAA Mail: R3DOI Email: michael_chezik@ios.doi.gov
Alternate Darrell R. Robertson U.S. Dept. of the Interior Office of Environmental Policy and Compliance 408 Atlantic Avenue, Room 142 Boston, MA 02210-3334	Phone: 617-223-8565 FAX: 617-223-8569 Pager: 1-888-525-4683 NOAA Mail R1DOI Email: darrell_robertson@ios.doi.gov
Department of Justice	
Primary Steven Ellis U.S. Department of Justice Ben Franklin Station P.O. Box 7611 Washington, DC 20044	Phone: 202-514-3163 24 hour: 202-514-2000 FAX: 202-616-6584 Email: steven.ellis@usdoj.gov
Alternate Leslie Lehnert U.S. Department of Justice P.O. Box 7611 Washington, DC 20044	Phone: 202-514-1761 24 hour: 202-514-2000 FAX: 202-616-6584 Email: leslie.lehnert@usdoj.gov
Department of Labor	
Primary William Wiehrdt Assistant Regional Administrator/Technical Support U.S. Department of Labor/OSHA 230 South Dearborn, Room 3244 Chicago, IL 60604	Phone: 312-353-5977 24 hour: 312-353-2220 FAX: 312-886-5588 Email: wiehrdt-william@dol.gov
Alternate Cynthia Weaver Industrial Hygienist U.S. Department of Labor /OSHA 230 South Dearborn, Room 3244 Chicago, IL 60604	Phone: 312-886-0906 24 hour: 312-353-2220 FAX: 312-886-5588 Email: weaver-cynthia@dol.gov
Department of State (NRT/RRT Representative)	
Primary Robert Blumberg Marine Pollution Officer Department of State Attn: OES/OA, Room 5801 Main State Building 2201 C Street NW Washington, DC 20520	Phone: 202-647-4971 24 hour: 202-647-1512 FAX: 202-647-9099 Email: blumberg@state.gov
Department of Transportation	
United States Coast Guard, Ninth District	

Primary/Region 5 RRT Co-Chair Captain Randolph Helland Chief, Marine Safety Division Commander (m) U.S. Coast Guard, Ninth District 1240 East 9th Street Cleveland, OH 44199-2060	Phone: 216-902-6045 24 hour: 1-800-321-4400 FAX: 216-902-6059 Email:rhelland@d9.uscg.mil
Alternate Robert Lallier Marine Safety Division U.S. Coast Guard Ninth District 1240 East 9th Street Cleveland, OH 44199-2060	Phone: 216-902-6054 24 hour: 1-800-321-4400 FAX: 216-902-6059 Email: rlallier@d9.uscg.mil
Support T.J. Mangoni Marine Safety Division U.S. Coast Guard, Ninth District 1240 East 9th Street Cleveland, OH 44199-2060	Voice: 216-902-6053 24 Hour: 1-800-312-4400 FAX: 216-902-6059 Email: amangoni@d9.uscg.mil
United States Coast Guard, Eighth District	
Primary CDR Ed Stanton Marine Safety Division U.S. Coast Guard, Eighth District Hale Boggs Federal Building 501 Magazine Street New Orleans, LA 70130-3396	Phone: 504-589-6271 or 3656 24 hour: 504-589-6225 FAX: 504-589-4999 Email: estanton@d8.uscg.mil
United States Environmental Protection Agency, Reg. 5	
Primary/Region 5 RRT Co-Chair Richard Karl, Chief Emergency Response Branch U.S. EPA Region 5 77 West Jackson, SE-5J Chicago, IL 60604	Phone: 312-353-9295 24 hour: 312-353-2318 FAX: 312-353-9176 Email: karl.richard@epamail.epa.gov
Alternate Mark Horwitz, Chief Office of Chemical Emergency Preparedness and Prevention U.S. EPA Region 5 77 West Jackson, SC-9J Chicago, IL 60604	Phone: 312-353-9045 24 hour: 312-353-2318 FAX: 312-886-6064 Email: horwitz.mark@epamail.epa.gov
Federal Emergency Management Agency	
Primary Mike Dombroski FEMA Region 5 536 South Clark Street, 6th Floor Chicago, IL 60605	Phone: 312-408-5516 24 hour: 800-311-7021 FAX: 312-408-5222 Email: mike.dombroski@fema.gov
Alternate	Phone: 312-408-

TBA FEMA Region 5 536 South Clark Street, 6th Floor Chicago, IL 60605	24 hour: 202-898-6100 FAX: 312-408- Email:
General Services Administration	
Primary Ronald E. Rennhack Director, Business Services Office 5 ADC DPN 37-5 General Services Administration 230 South Dearborn, Room 3718 Chicago, IL 60604	Phone: 312-353-7050 24 hour: 312-353-0735 FAX: 312-886-9893 Email: ron.rennhack@gsa.gov
Alternate James Czysz Leader, Business Service Center General Services Administration 230 S. Dearborn St., Room 3718 Chicago, IL 60604	Phone: 312-886-7590 FAX: 312-886-9893 Email: jim.czysz@gsa.gov
Nuclear Regulatory Commission	
Primary Thomas Ploski Emergency Response Coordinator Nuclear Regulatory Commission, Region 3 801 Warrenville Road Lisle, IL 60532	Phone: 630-829-9812 FAX: 630-515-1259 24 Hour: 301-816-5100 Email: tjp@nrc.gov
Alternate Roland Lickus State Liaison Officer Nuclear Regulatory Commission, Region 3 801 Warrenville Road Lisle, IL 60532	Phone: 630-829-9960 FAX: 630-515-1096 24 Hour: 301-816-5100 Email: rml2@nrc.gov
Illinois	
Primary James O'Brien, Manager Office of Chemical Safety (MC#29) Illinois EPA 1021 South Grand Avenue East P.O. Box 19276 Springfield, IL 62794-9276	Phone: 217-785-0830 24 hour: 217-782-7860 (IEMA) FAX: 217-782-1431 Email: epa8539@epa.state.il.us
Alternate G. Tod Rowe, Managerv Emergency Response Unit (MC#29) Illinois EPA 1021 South Grand Avenue East P.O. Box 19276 Springfield, IL 62794-9276	Phone: 217-782-3637 Pager: 217-467-2221 24 hour: 217-782-7860 (IEMA) FAX: 217-782-1431 Email: epa8540@epa.state.il.us
Indiana	
Primary	

Max Michael, Section Chief Emergency Response Indiana Dept. of Environmental Mgt. 100 North Senate Avenue P.O. Box 6015 Indianapolis, IN 46206-6015	Phone: 317-308-3049 24 hour: 317-233-7745 Toll Free In State: 888-233-7745 FAX: 317-308-3063 Email:mmichael@dem.state.in.us
Alternate David Crose, Director Technological Hazards Division IN State Emergency Management Agency Indiana Government Center South 302 West Washington St., Room E-208 Indianapolis, IN 46204-2760	Phone: 317-232-3837 24 hour: 800-669-7362 FAX: 317-233-5006 Email: dcrose@sema.state.in.us

Michigan

Primary Thor Strong Emergency Mgt. Coordinator Low Level Radioactive Waste Authority Michigan Dept. of Environmental Quality P.O. Box 30473 Lansing, MI 48909	Phone: 517-335-0430 24 Hour: 800-292-4706 FAX: 517-373-0578 Email: strongt@state.mi.us
Alternate Paul Blakeslee Surface Water Quality Division Field Operations Michigan Dept. of Environmental Quality P.O. Box 30028 Lansing, MI 48909	Phone: 517-335-6873 24 hour: 800-292-4706 FAX: 517-373-9958 Email: blakeslp@state.mi.us
Alternate Mitch Adelman, Chief Site Management Unit #3 Superfund Section Emergency Response Division Michigan Dept. of Environmental Quality P.O. Box 30426 Lansing, MI 48909	Phone: 517-373-8436 24 hour: 800-292-4706 FAX: 517-335-4887 Email: adelmanm@state.mi.us

Minnesota

Primary Stephen J. Lee, Supervisor Emergency Response Team Minnesota Pollution Control Agency 520 Lafayette Road St. Paul, MN 55155	Phone: 651-297-8610 24 hour: 651-649-5451 FAX: 651-297-8321 Email: stephen.lee@pca.state.mn.us
Alternate Kevin C. Leuer Director Minnesota Dept. Of Public Safety Division of Emergency Management 444 Cedar Street, Suite 223 St. Paul, MN 55101	Phone: 651-296-0450 24 hour: 651-296-2233 FAX: 651-296-0459 Email: kevin.leuer@state.mn.us

Ohio

Primary Tim Hickin, Supervisor Emergency Response Unit Ohio Environmental Protection Agency P.O. Box 1049 Columbus, OH 43216-1049	Phone: 614-644-2080 24 hour: 800-282-9378 FAX: 614-644-3250 NOAA Mail: R5OH Email: tim.hickin@epa.state.oh.us
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Wisconsin

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Alternate Mr. Jerry Haberl Wisconsin Dept. of Emergency Management Department of Military Affairs 2400 Wright Street P.O. Box 7865 Madison, Wisconsin 53707	Phone: 608-242-3213 24 Hour: 608-275-8029 (pager) FAX: 608-242-3248 Email: haberj@dma.state.wi.us

Interested Parties

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United States Coast Guard, Ninth District, Marine Safety Offices (MSO's)	
MSO Buffalo Commanding Officer USCG Marine Safety Office 1 Fuhrman Blvd. Buffalo, NY 14203	Phone: 716-843-9570 FAX: 716-843-9571
MSO Chicago Commanding Officer USCG Marine Safety Office 215 West 83rd St., Ste. D Burr Ridge, IL 60521	Phone: 630-986-2155 FAX: 630-986-2120
MSO Cleveland Commanding Officer USCG Marine Safety Office 1055 East 9th Street Cleveland, OH 44114	Phone: 216-522-4405 FAX: 216-522-3290
MSO Detroit Commanding Officer USCG Marine Safety Office 110 Mt. Elliot Ave. Detroit, MI 48207	Phone: 313-568-9580 FAX: 313-568-9581
MSO Duluth Commanding Officer USCG Marine Safety Office 600 S. Lake Street, Canal Park	Phone: 218-720-5286 FAX: 218-720-5258

Duluth, MN 55802	
MSO Milwaukee Commanding Officer USCG Marine Safety Office 2420 S. Lincoln Memorial Drive Milwaukee, WI 53207-1997	Phone: 414-747-7155 FAX: 414-747-7890
MSO/Group Sault Ste. Marie Commanding Officer USCG Marine Safety Office 337 Water Street Sault Ste. Marie, MI 49783-9501	Phone: 906-635-3220 FAX: 906-635-3344
MSO Toledo Commanding Officer USCG Marine Safety Office Federal Building, Room 501 234 Summit Street Toledo, OH 43604	Phone: 419-259-6372 FAX: 419-259-6374

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APPENDIX IV: WORST-CASE DISCHARGES IN U.S.EPA REGION 5

Unknown Location

Facility Name:
City:
State:
FRP ID#: FRP0500216
Worst Case Discharge: 756000

Illinois

Facility Name: Growmark Petroleum Terminal
City: Albany
State: IL
FRP ID#: FRP0500365
Worst Case Discharge: 6900000

Facility Name: Archer Daniels Midland
City: Alton
State: IL
FRP ID#: FRP05A0077
Worst Case Discharge: 398160

Facility Name: Williams Pipe Line Company
City: Amboy
State: IL
FRP ID#: FRP0500193
Worst Case Discharge: 112266

Facility Name: Gatx
City: Argo
State: IL
FRP ID#: FRP0500323
Worst Case Discharge: 5880000

Facility Name: Shell Oil
City: Arlington Heights
State: IL
FRP ID#: FRP0500239
Worst Case Discharge: 5677980

Facility Name: CITGO Petroleum Corporation
City: Arlington Heights
State: IL
FRP ID#: FRP0500183
Worst Case Discharge: 3655113

Facility Name: Arco
City: Arlington Heights
State: IL
FRP ID#: FRP0500188
Worst Case Discharge: 2310000

Facility Name: Mobil
City: Arlington Heights
State: IL
FRP ID#: FRP0500344
Worst Case Discharge: 2867634

Facility Name: Marathon Oil Company
City: Arlington Heights
State: IL
FRP ID#: FRP0500332
Worst Case Discharge: 2167284

Facility Name: Clark Refining & Marketing, Inc.
City: Bartonville
State: IL
FRP ID#: FRP0500190
Worst Case Discharge: 2310000

Facility Name: Shell Oil
City: Bedford Park
State: IL
FRP ID#: FRP0500232
Worst Case Discharge: 4943400

Facility Name: Apex Oil Company
City: Berwyn
State: IL
FRP ID#: FRP0500357
Worst Case Discharge: 3696000

Facility Name: Amoco Oil Company
City: Berwyn
State: IL
FRP ID#: FRP0500161
Worst Case Discharge: 1540476

Facility Name: Clark Refining & Marketing, Inc.

City: Blue Island
State: IL
FRP ID#: FRP0500189
Worst Case Discharge: 0

Facility Name: Martin Oil Marketing, LTD
City: Blue Island
State: IL
FRP ID#: FRP0500361
Worst Case Discharge: 5460000

Facility Name: BTL Industries
City: Blue Island
State: IL
FRP ID#: FRP0500200
Worst Case Discharge: 850000

Facility Name: Bunge Corporation Ca
City: Cairo
State: IL
FRP ID#: FRP05A0411
Worst Case Discharge: 500500

Facility Name: Marathon Oil Company
City: Champaign
State: IL
FRP ID#: FRP0500331
Worst Case Discharge: 3549000

Facility Name: Exxon Company, USA
City: Channahon
State: IL
FRP ID#: FRP0500360
Worst Case Discharge: 1272306

Facility Name: Canal Barge Company, Inc.
City: Channahon
State: IL
FRP ID#: FRP0500187
Worst Case Discharge: 1617000

Facility Name: Great Lakes Terminal
City: Chicago
State: IL
FRP ID#: FRP05A0439
Worst Case Discharge: 1155000

Facility Name: Cargill, Inc. - Oilseeds Div
City: Chicago
State: IL
FRP ID#: FRP05A0402
Worst Case Discharge: 1500

Facility Name: Apex Motor Fuel Company
City: Chicago
State: IL
FRP ID#: FRP0500170
Worst Case Discharge: 61152

Facility Name: Calumet Lubricants Co.
City: Chicago
State: IL
FRP ID#: FRP05A0438
Worst Case Discharge: 462000

Facility Name: Bell Oil Terminal
City: Chicago

State: IL
FRP ID#: FRP05A0090
Worst Case Discharge: 2289569

Facility Name: Stolt-Nielsen
City: Chicago
State: IL
FRP ID#: FRP0500242
Worst Case Discharge: 99624

Facility Name: J.M. Sweeney Co.
City: Chicago
State: IL
FRP ID#: FRP0500369
Worst Case Discharge: 0

Facility Name: Ameropan Tank Terminal
City: Chicago
State: IL
FRP ID#: FRP05A0089
Worst Case Discharge: 2340110

Facility Name: Lockheed
City: Chicago
State: IL
FRP ID#: FRP0500307
Worst Case Discharge: 73700

Facility Name: Support Terminal Services, Inc.
City: Chillicothe
State: IL
FRP ID#: FRP0500275
Worst Case Discharge: 2310000

Facility Name: Olympic Oil, Limited
City: Cicero
State: IL
FRP ID#: FRP0500325
Worst Case Discharge: 1279502

Facility Name: Koppers Ind., Inc.
City: Cicero
State: IL
FRP ID#: FRP05A0397
Worst Case Discharge: 0

Facility Name: Koch Fuels Company, Inc.
City: Cicero
State: IL
FRP ID#: FRP0500335
Worst Case Discharge: 3386880

Facility Name: CITGO Petroleum Corporation
City: Cicero
State: IL
FRP ID#: FRP0500197
Worst Case Discharge: 462000

Facility Name: Chemical Petroleum Exchange, Inc.
City: Cicero
State: IL
FRP ID#: FRP0500184
Worst Case Discharge: 393750

Facility Name: Mobil
City: Cicero
State: IL

FRP ID#: FRP0500347
Worst Case Discharge: 50400

Facility Name: Amoco Oil Company
City: Creve Coeur
State: IL
FRP ID#: FRP0500146
Worst Case Discharge: 1450000

Facility Name: Lauhoff Grain Company
City: Danville
State: IL
FRP ID#: FRP05A0097
Worst Case Discharge: 5510631

Facility Name: Norfolk Southern
City: Decatur
State: IL
FRP ID#: FRP0500301
Worst Case Discharge: 1527000

Facility Name: Amoco Oil Company
City: Des Plaines
State: IL
FRP ID#: FRP0500145
Worst Case Discharge: 4536000

Facility Name: Union Pacific Railroad Company
City: Dolton
State: IL
FRP ID#: FRP05A0409
Worst Case Discharge: 693000

Facility Name: Hicks Oil and Hicksgas, Inc.
City: East Peoria
State: IL
FRP ID#: FRP0500345
Worst Case Discharge: 2418000

Facility Name: Petroleum Fuel & Terminal Company
City: East Saint Louis
State: IL
FRP ID#: FRP0500353
Worst Case Discharge: 4032000

Facility Name: Phillips Pipe Line Company
City: East Saint Louis
State: IL
FRP ID#: FRP0500337
Worst Case Discharge: 8232000

Facility Name: Shell Oil Company
City: Effingham
State: IL
FRP ID#: FRP0500235
Worst Case Discharge: 630000

Facility Name: People Gas Light & Coke Co.
City: Elwood
State: IL
FRP ID#: FRP05A0016
Worst Case Discharge: 6613992

Facility Name: Stepan Co.
City: Elwood
State: IL
FRP ID#: FRP0500269

Worst Case Discharge: 1800000

Facility Name: Phillips Pipe Line Company
City: Forsyth
State: IL
FRP ID#: FRP0500339
Worst Case Discharge: 3360000

Facility Name: Williams Pipeline
City: Franklin Park
State: IL
FRP ID#: FRP0500192
Worst Case Discharge: 152040

Facility Name: Kelly
City: Freeport
State: IL
FRP ID#: FRP0500303
Worst Case Discharge: 800000

Facility Name: Burlington Northern Railroad
City: Galesburg
State: IL
FRP ID#: FRP0500182
Worst Case Discharge: 2622000

Facility Name: National Steel Corporation
City: Granite City
State: IL
FRP ID#: FRP0500302
Worst Case Discharge: 400000

Facility Name: Apex
City: Granite City
State: IL
FRP ID#: FRP0500005
Worst Case Discharge: 6930000

Facility Name: Naval Training Center
City: Great Lakes
State: IL
FRP ID#: FRP0500324
Worst Case Discharge: 1002810

Facility Name: Shell Oil Products Company
City: Harristown
State: IL
FRP ID#: FRP0500240
Worst Case Discharge: 2079000

Facility Name: Clark Refining and Marketing, Inc.
City: Hartford
State: IL
FRP ID#: FRP0500359
Worst Case Discharge: 8477189

Facility Name: Conoco
City: Hartford
State: IL
FRP ID#: FRP05A0407
Worst Case Discharge: 0

Facility Name: Conoco Lubricants
City: Hartford
State: IL
FRP ID#: FRP05A0095
Worst Case Discharge: 0

Facility Name: Illinois Power
City: Havana
State: IL
FRP ID#: FRP0500336
Worst Case Discharge: 20000

Facility Name: Williams Pipeline - N.E.
City: Heyworth
State: IL
FRP ID#: FRP0500191
Worst Case Discharge: 168000

Facility Name: Illinois Central Rr
City: Homestead
State: IL
FRP ID#: FRP0500322
Worst Case Discharge: 1500000

Facility Name: Van Den Bergh Foods
City: Joliet
State: IL
FRP ID#: FRP0500209
Worst Case Discharge: 25000

Facility Name: Mobil
City: Joliet
State: IL
FRP ID#: FRP0500271
Worst Case Discharge: 33390000

Facility Name: Phillips Pipe Line Company
City: Kankakee
State: IL
FRP ID#: FRP0500338
Worst Case Discharge: 2257122

Facility Name: Essex Specialty Products, Inc.
City: Kankakee
State: IL
FRP ID#: FRP0500363
Worst Case Discharge: 22400

Facility Name: Indian Refining Limited Partnership
City: Lawrenceville
State: IL
FRP ID#: FRP0500305
Worst Case Discharge: 89880000

Facility Name: Heritage Environmental Services, Inc.
City: Lemont
State: IL
FRP ID#: FRP0500366
Worst Case Discharge: 402460

Facility Name: Bodie-Hoover Petroleum Corporation
City: Lemont
State: IL
FRP ID#: FRP0500185
Worst Case Discharge: 61600

Facility Name: Uno-Ven
City: Lemont
State: IL
FRP ID#: FRP0500186
Worst Case Discharge: 12474000

Facility Name: Powell Duffryn Terminals, Inc.

City: Lemont
State: IL
FRP ID#: FRP0500299
Worst Case Discharge: 2442000

Facility Name: Korall Corp.
City: Lemont
State: IL
FRP ID#: FRP0500321
Worst Case Discharge: 5308

Facility Name: Texaco
City: Lockport
State: IL
FRP ID#: FRP0500370
Worst Case Discharge: 1050000

Facility Name: Materials Service Corp - Yd 67
City: Lockport
State: IL
FRP ID#: FRP05A0008
Worst Case Discharge: 40000

Facility Name: Sherex Chemical Company, Inc.
City: Mapleton
State: IL
FRP ID#: FRP0500199
Worst Case Discharge: 4000000

Facility Name: Louis Dreyfus Corp
City: Mapleton
State: IL
FRP ID#: FRP0500306
Worst Case Discharge: 29436

Facility Name: Enviropur, Inc.
City: Mccook
State: IL
FRP ID#: FRP05A0437
Worst Case Discharge: 250000

Facility Name: Cnw
City: Melrose Park
State: IL
FRP ID#: FRP0500220
Worst Case Discharge: 1000000

Facility Name: Central Illinois Public Service Company
City: Meredosia
State: IL
FRP ID#: FRP0500171
Worst Case Discharge: 20000

Facility Name: Meredosia Terminal, Inc.
City: Meredosia
State: IL
FRP ID#: FRP0500362
Worst Case Discharge: 1262976

Facility Name: Unocal Pipeline Company
City: Mokena
State: IL
FRP ID#: FRP0500282
Worst Case Discharge: 2100000

Facility Name: Unocal
City: Mokena

State: IL
FRP ID#: FRP0500137
Worst Case Discharge: 672000

Facility Name: Commonwealth Edison Company
City: Morris
State: IL
FRP ID#: FRP0500342
Worst Case Discharge: 23100000

Facility Name: Uno-Ven
City: Mt Prospect
State: IL
FRP ID#: FRP0500281
Worst Case Discharge: 3359160

Facility Name: General Tire Inc.
City: Mt Vernon
State: IL
FRP ID#: FRP05A0070
Worst Case Discharge: 1000000

Facility Name: La Gloria Oil and Gas Company
City: Norris City
State: IL
FRP ID#: FRP0500364
Worst Case Discharge: 2310000

Facility Name: Pekin Energy Com.
City: Pekin
State: IL
FRP ID#: FRP05A0006
Worst Case Discharge: 1386000

Facility Name: Shell Oil
City: Pekin
State: IL
FRP ID#: FRP0500233
Worst Case Discharge: 2711940

Facility Name: International Paper
City: Peoria
State: IL
FRP ID#: FRP0500304
Worst Case Discharge: 55

Facility Name: S.T. Services
City: Peru
State: IL
FRP ID#: FRP0500276
Worst Case Discharge: 2538000

Facility Name: Williams Pipeline
City: Petersburg
State: IL
FRP ID#: FRP0500194
Worst Case Discharge: 170352

Facility Name: Quincy Soybean Co
City: Quincy
State: IL
FRP ID#: FRP05A0096
Worst Case Discharge: 2211000

Facility Name: Pm Ag Products
City: Riverdale
State: IL

FRP ID#: FRP05A0400
Worst Case Discharge: 1320000

Facility Name: Marathon Oil
City: Robinson
State: IL
FRP ID#: FRP0500139
Worst Case Discharge: 10271268

Facility Name: Marathon
City: Robinson
State: IL
FRP ID#: FRP05A0398
Worst Case Discharge: 642054

Facility Name: Marathon Oil Company
City: Robinson
State: IL
FRP ID#: FRP0500333
Worst Case Discharge: 15288

Facility Name: Amoco Oil Company
City: Rochelle
State: IL
FRP ID#: FRP0500147
Worst Case Discharge: 1323000

Facility Name: Clark Refining & Marketing, Inc.
City: Rockford
State: IL
FRP ID#: FRP0500330
Worst Case Discharge: 1470000

Facility Name: Marathon Oil Company
City: Rockford
State: IL
FRP ID#: FRP0500355
Worst Case Discharge: 3705450

Facility Name: Rock Valley Oil & Chemical Co.
City: Rockford
State: IL
FRP ID#: FRP05A0434
Worst Case Discharge: 19000

Facility Name: Shell Oil Company
City: Roxana
State: IL
FRP ID#: FRP0500283
Worst Case Discharge: 12229224

Facility Name: Southern States Asphalt
City: Saint Elmo
State: IL
FRP ID#: FRP0500198
Worst Case Discharge: 1984891

Facility Name: Mobil
City: Sauget
State: IL
FRP ID#: FRP0500343
Worst Case Discharge: 54978000

Facility Name: Owens-Corning Trumbull Asphalt
City: Summit Argo
State: IL
FRP ID#: FRP0500300

Worst Case Discharge: 411600

Facility Name: Emulsicoat, Inc.
City: Urbana
State: IL
FRP ID#: FRP05A0426
Worst Case Discharge: 1015000

Facility Name: Utica Terminal
City: Utica
State: IL
FRP ID#: FRP05A0401
Worst Case Discharge: 4370018

Facility Name: Union Electric
City: Venice
State: IL
FRP ID#: FRP05A0092
Worst Case Discharge: 2767441

Facility Name: Unocal
City: Vernon
State: IL
FRP ID#: FRP0500179
Worst Case Discharge: 1512000

Facility Name: Marathon Oil Company
City: Willow Springs
State: IL
FRP ID#: FRP0500354
Worst Case Discharge: 3224928

Facility Name: Ashland Petroleum Company
City: Willow Springs
State: IL
FRP ID#: FRP0500195
Worst Case Discharge: 2499966

Facility Name: Amoco
City: Wood River
State: IL
FRP ID#: FRP0500144
Worst Case Discharge: 2541651

Facility Name: Amoco Petroleum Products
City: Wood River
State: IL
FRP ID#: FRP0500156
Worst Case Discharge: 31122000

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Indiana

Facility Name: Amoco Oil Company
City: Brookston
State: IN
FRP ID#: FRP0500149
Worst Case Discharge: 756000

Facility Name: Ashland Petroleum Company
City: Clarksville
State: IN
FRP ID#: FRP0500340

Worst Case Discharge: 79254

Facility Name: Phillips Pipe Line Company
City: Clermont
State: IN
FRP ID#: FRP0500049
Worst Case Discharge: 0

Facility Name: Crown
City: Clermont
State: IN
FRP ID#: FRP0500265
Worst Case Discharge: 3074194

Facility Name: Inland Steel/Indiana Harbor Works
City: East Chicago
State: IN
FRP ID#: FRP05A0403
Worst Case Discharge: 1505960

Facility Name: CITGO Petroleum Corporation
City: East Chicago
State: IN
FRP ID#: FRP0500181
Worst Case Discharge: 6172274

Facility Name: Mobil Oil Corporation
City: East Chicago
State: IN
FRP ID#: FRP0500346
Worst Case Discharge: 4747260

Facility Name: LTV Steel Company
City: East Chicago
State: IN
FRP ID#: FRP0500031
Worst Case Discharge: 7100

Facility Name: Phillips Pipe Line Company
City: East Chicago
State: IN
FRP ID#: FRP0500048
Worst Case Discharge: 11004000

Facility Name: Safety-Kleen Oil Recovery Company
City: East Chicago
State: IN
FRP ID#: FRP0500050
Worst Case Discharge: 2693502

Facility Name: Consolidated Railroad Corporation
City: Elkhart
State: IN
FRP ID#: FRP0500259
Worst Case Discharge: 0

Facility Name: Ashland Petroleum Company
City: Evansville
State: IN
FRP ID#: FRP0500154
Worst Case Discharge: 1108800

Facility Name: Itapco
City: Evansville
State: IN
FRP ID#: FRP0500027
Worst Case Discharge: 1386000

Facility Name: Gladieux Refinery, Inc.
City: Fort Wayne
State: IN
FRP ID#: FRP05A0415
Worst Case Discharge: 3147210

Facility Name: Norfolk Southern
City: Frankfort
State: IN
FRP ID#: FRP0500046
Worst Case Discharge: 500000

Facility Name: U.S. Steel
City: Gary
State: IN
FRP ID#: FRP0500168
Worst Case Discharge: 4590600

Facility Name: Amoco Petroleum Products
City: Granger
State: IN
FRP ID#: FRP0500196
Worst Case Discharge: 2782000

Facility Name: Wolf Lake Terminals, Inc.
City: Hammond
State: IN
FRP ID#: FRP05A0011
Worst Case Discharge: 420000

Facility Name: Mobil Oil Corporation
City: Hammond
State: IN
FRP ID#: FRP0500043
Worst Case Discharge: 615384

Facility Name: Marathon Oil Company
City: Hammond
State: IN
FRP ID#: FRP0500034
Worst Case Discharge: 9517200

Facility Name: Clark Refining & Marketing, Inc.
City: Hammond
State: IN
FRP ID#: FRP0500327
Worst Case Discharge: 28980000

Facility Name: Ihb Railroad
City: Hammond
State: IN
FRP ID#: FRP0500221
Worst Case Discharge: 1000000

Facility Name: CITGO Petroleum Corporation
City: Huntington
State: IN
FRP ID#: FRP0500162
Worst Case Discharge: 2959850

Facility Name: Ashland Petroleum Company
City: Huntington
State: IN
FRP ID#: FRP0500148
Worst Case Discharge: 1799532

Facility Name: Gladieux Trading & Marketing Co., L.P.

City: Huntington
State: IN
FRP ID#: FRP05A0416
Worst Case Discharge: 2512840

Facility Name: Sun Co.
City: Huntington
State: IN
FRP ID#: FRP0500059
Worst Case Discharge: 1617000

Facility Name: Marathon Oil Company
City: Indianapolis
State: IN
FRP ID#: FRP0500035
Worst Case Discharge: 0

Facility Name: Allison Engine Comany Plant 5
City: Indianapolis
State: IN
FRP ID#: FRP05A0421
Worst Case Discharge: 0

Facility Name: Marathon Oil Company
City: Indianapolis
State: IN
FRP ID#: FRP0500041
Worst Case Discharge: 3525199

Facility Name: General Motors
City: Indianapolis
State: IN
FRP ID#: FRP05A0422
Worst Case Discharge: 0

Facility Name: Indianapolis Power and Light Company
City: Indianapolis
State: IN
FRP ID#: FRP0500025
Worst Case Discharge: 3720000

Facility Name: Clark Refining and Marketing, Inc.
City: Indianapolis
State: IN
FRP ID#: FRP0500341
Worst Case Discharge: 6720000

Facility Name: Asphalt Materials
City: Indianapolis
State: IN
FRP ID#: FRP05A0425
Worst Case Discharge: 4092993

Facility Name: Shell Oil
City: Indianapolis
State: IN
FRP ID#: FRP0500057
Worst Case Discharge: 5052000

Facility Name: Amoco Oil Company
City: Indianapolis
State: IN
FRP ID#: FRP0500155
Worst Case Discharge: 1470000

Facility Name: Sun Company, Inc.
City: Indianapolis

State: IN
FRP ID#: FRP0500058
Worst Case Discharge: 2541000

Facility Name: Central Soya Co.
City: Indianapolis
State: IN
FRP ID#: FRP05A0419
Worst Case Discharge: 428000

Facility Name: Allison Engine Company
City: Indianapolis
State: IN
FRP ID#: FRP05A0418
Worst Case Discharge: 0

Facility Name: S.T. Services
City: Indianapolis
State: IN
FRP ID#: FRP0500274
Worst Case Discharge: 1687900

Facility Name: Ashland Petroleum Company
City: Indianapolis
State: IN
FRP ID#: FRP0500150
Worst Case Discharge: 1108800

Facility Name: Center Terminal Co.
City: Indianapolis
State: IN
FRP ID#: FRP0500093
Worst Case Discharge: 2310000

Facility Name: Colgate Palmolive
City: Jeffersonville
State: IN
FRP ID#: FRP05A0017
Worst Case Discharge: 368500

Facility Name: Chrylser Corp. Kokomo Complex
City: Kokomo
State: IN
FRP ID#: FRP05A0111
Worst Case Discharge: 320000

Facility Name: Cargill Soybean Proc
City: Lafayette
State: IN
FRP ID#: FRP05A0069
Worst Case Discharge: 900000

Facility Name: Laketon Refining Corporation
City: Laketon
State: IN
FRP ID#: FRP0500030
Worst Case Discharge: 4520000

Facility Name: Indiana Michigan Power
City: Lawrenceburg
State: IN
FRP ID#: FRP0500024
Worst Case Discharge: 128000

Facility Name: American Western Refining, Ltd Prtnrshp
City: Mount Vernon
State: IN

FRP ID#: FRP0500293
Worst Case Discharge: 3360000

Facility Name: Marathon Oil Company
City: Mount Vernon
State: IN
FRP ID#: FRP0500038
Worst Case Discharge: 6300000

Facility Name: Countrymark
City: Mt Vernon
State: IN
FRP ID#: FRP0500349
Worst Case Discharge: 5040000

Facility Name: Countrymark
City: Mt Vernon
State: IN
FRP ID#: FRP0500352
Worst Case Discharge: 80640

Facility Name: Shell Oil
City: Muncie
State: IN
FRP ID#: FRP0500055
Worst Case Discharge: 5082000

Facility Name: Itapco
City: New Albany
State: IN
FRP ID#: FRP0500028
Worst Case Discharge: 1155000

Facility Name: Alcoa
City: Newburgh
State: IN
FRP ID#: FRP05A0235
Worst Case Discharge: 6600000

Facility Name: Indianapolis Power & Lt
City: Petersburg
State: IN
FRP ID#: FRP0500026
Worst Case Discharge: 720000

Facility Name: Conrail
City: Plainfield
State: IN
FRP ID#: FRP0500255
Worst Case Discharge: 1000000

Facility Name: Tanco Terminals, Inc.
City: Portage
State: IN
FRP ID#: FRP0500061
Worst Case Discharge: 2730000

Facility Name: Indiana Michigan Power Company
City: Rockport
State: IN
FRP ID#: FRP0500023
Worst Case Discharge: 2200000

Facility Name: Lakehead Pipe Line Company
City: Schererville
State: IN
FRP ID#: FRP05A0088

Worst Case Discharge: 4200000

Facility Name: La Gloria Oil and Gas Company
City: Seymour
State: IN
FRP ID#: FRP0500169
Worst Case Discharge: 462000

Facility Name: Koch Materials
City: Warsaw
State: IN
FRP ID#: FRP0500167
Worst Case Discharge: 500000

Facility Name: Nipsco
City: Wheatfield
State: IN
FRP ID#: FRP05A0086
Worst Case Discharge: 10500000

Facility Name: Amoco Petroleum Products
City: Whiting
State: IN
FRP ID#: FRP0500180
Worst Case Discharge: 23418780

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Michigan

Facility Name: Total Petroleum, Inc., Alma Refinery
City: Alma
State: MI
FRP ID#: FRP0500065
Worst Case Discharge: 5460546

Facility Name: Amoco Oil Company
City: Bay City
State: MI
FRP ID#: FRP0500003
Worst Case Discharge: 43400

Facility Name: Koch Materials
City: Bay City
State: MI
FRP ID#: FRP0500022
Worst Case Discharge: 13403000

Facility Name: Total Petroleum, Inc.
City: Bay City
State: MI
FRP ID#: FRP05A0003
Worst Case Discharge: 4083450

Facility Name: The Uno-Ven Company
City: Bay City
State: MI
FRP ID#: FRP0500067
Worst Case Discharge: 2320080

Facility Name: Amoco
City: Cheboygan
State: MI
FRP ID#: FRP05A0395

Worst Case Discharge: 1986600

Facility Name: Waterfront Petroleum
City: Dearborn
State: MI
FRP ID#: FRP05A0098
Worst Case Discharge: 0

Facility Name: Nw Dtw Fuel Facility
City: Detroit
State: MI
FRP ID#: FRP05A0087
Worst Case Discharge: 880000

Facility Name: General Motors
City: Detroit
State: MI
FRP ID#: FRP05A0420
Worst Case Discharge: 0

Facility Name: Edwards Oil Service
City: Detroit
State: MI
FRP ID#: FRP05A0109
Worst Case Discharge: 1700000

Facility Name: Sun Co.
City: Detroit
State: MI
FRP ID#: FRP0500063
Worst Case Discharge: 1386000

Facility Name: Shell Oil Company
City: Detroit
State: MI
FRP ID#: FRP0500020
Worst Case Discharge: 5313000

Facility Name: Owens-Corning
City: Detroit
State: MI
FRP ID#: FRP0500047
Worst Case Discharge: 33310

Facility Name: Allied Signal
City: Detroit
State: MI
FRP ID#: FRP0500001
Worst Case Discharge: 1000000

Facility Name: Marathon Oil
City: Detroit
State: MI
FRP ID#: FRP0500037
Worst Case Discharge: 10025400

Facility Name: Detroit Edison Company
City: East China
State: MI
FRP ID#: FRP0500019
Worst Case Discharge: 6283200

Facility Name: National Steel Corporation
City: Ecorse
State: MI
FRP ID#: FRP0500045
Worst Case Discharge: 2555000

Facility Name: Koch Materials
City: Elberta
State: MI
FRP ID#: FRP0500029
Worst Case Discharge: 4389000

Facility Name: Mead Publishing Paper Div.
City: Escanaba
State: MI
FRP ID#: FRP05A0432
Worst Case Discharge: 1000000

Facility Name: Consumer Power Co., D E Karn 3 & 4 Plant
City: Essexville
State: MI
FRP ID#: FRP0500011
Worst Case Discharge: 518400

Facility Name: Shell Oil
City: Ferrysburg
State: MI
FRP ID#: FRP0500178
Worst Case Discharge: 806400

Facility Name: CITGO Petroleum Corporation
City: Ferrysburg
State: MI
FRP ID#: FRP0500013
Worst Case Discharge: 2086207

Facility Name: Lockhart Chemical Company
City: Flint
State: MI
FRP ID#: FRP05A0408
Worst Case Discharge: 1800000

Facility Name: Mobil Oil Corporation
City: Flint
State: MI
FRP ID#: FRP0500042
Worst Case Discharge: 2500000

Facility Name: General Motors
City: Flint
State: MI
FRP ID#: FRP05A0001
Worst Case Discharge: 5000

Facility Name: Construction Resource
City: Gladstone
State: MI
FRP ID#: FRP05A0116
Worst Case Discharge: 2340300

Facility Name: Dod
City: Gladstone
State: MI
FRP ID#: FRP0500070
Worst Case Discharge: 3360000

Facility Name: Shell Oil Company
City: Grand Haven
State: MI
FRP ID#: FRP0500053
Worst Case Discharge: 3774540

Facility Name: Natl Park Service

City: Houghton
State: MI
FRP ID#: FRP05A0406
Worst Case Discharge: 0

Facility Name: CITGO Petroleum Corporation
City: Jackson
State: MI
FRP ID#: FRP0500014
Worst Case Discharge: 2494800

Facility Name: Shell Oil Company
City: Jackson
State: MI
FRP ID#: FRP0500054
Worst Case Discharge: 1386000

Facility Name: K I Sawyer Afb
City: K I Sawyer Afb
State: MI
FRP ID#: FRP05A0066
Worst Case Discharge: 1602383

Facility Name: Total Petroleum, Inc., Lansing Terminal
City: Lansing
State: MI
FRP ID#: FRP0500032
Worst Case Discharge: 1073604

Facility Name: General Motors
City: Livonia
State: MI
FRP ID#: FRP05A0417
Worst Case Discharge: 0

Facility Name: Dow Chemical
City: Ludington
State: MI
FRP ID#: FRP0500021
Worst Case Discharge: 0

Facility Name: Marathon Oil
City: Mackinaw City
State: MI
FRP ID#: FRP0500036
Worst Case Discharge: 1562400

Facility Name: Clark Oil
City: Marshall
State: MI
FRP ID#: FRP0500012
Worst Case Discharge: 3360000

Facility Name: Detroit Edison Company
City: Marysville
State: MI
FRP ID#: FRP0500017
Worst Case Discharge: 18700000

Facility Name: General Motors
City: Michigan
State: MI
FRP ID#: FRP05A0412
Worst Case Discharge: 0

Facility Name: Thompson-McCully Oil Company
City: Monroe

State: MI
FRP ID#: FRP0500064
Worst Case Discharge: 88750

Facility Name: Marathon Oil
City: Mt. Morris
State: MI
FRP ID#: FRP0500033
Worst Case Discharge: 2322054

Facility Name: Amoco Oil Company
City: Napoleon
State: MI
FRP ID#: FRP0500004
Worst Case Discharge: 201600

Facility Name: Detroit Edison Company
City: Newport
State: MI
FRP ID#: FRP0500016
Worst Case Discharge: 900000

Facility Name: Shell Oil
City: Niles
State: MI
FRP ID#: FRP0500177
Worst Case Discharge: 420000

Facility Name: Shell Oil Company
City: Niles
State: MI
FRP ID#: FRP0500056
Worst Case Discharge: 3548160

Facility Name: Marathon Oil
City: Niles
State: MI
FRP ID#: FRP0500039
Worst Case Discharge: 4023936

Facility Name: CITGO Petroleum Corporation
City: Niles
State: MI
FRP ID#: FRP0500015
Worst Case Discharge: 5275809

Facility Name: Marathon Oil
City: North Muskegon
State: MI
FRP ID#: FRP0500040
Worst Case Discharge: 3423000

Facility Name: Delta Fuels Of Michigan
City: Novi
State: MI
FRP ID#: FRP05A0435
Worst Case Discharge: 2756922

Facility Name: Sun Co.
City: Owosso
State: MI
FRP ID#: FRP0500060
Worst Case Discharge: 1848000

Facility Name: James River Paper Corp.
City: Parchment
State: MI

FRP ID#: FRP05A0423
Worst Case Discharge: 1100000

Facility Name: General Motors
City: Pontiac
State: MI
FRP ID#: FRP05A0410
Worst Case Discharge: 0

Facility Name: Detroit Edison
City: River Rouge
State: MI
FRP ID#: FRP0500018
Worst Case Discharge: 5775000

Facility Name: Amoco
City: River Rouge
State: MI
FRP ID#: FRP05A0396
Worst Case Discharge: 1663536

Facility Name: Texaco
City: River Rouge
State: MI
FRP ID#: FRP0500062
Worst Case Discharge: 2000000

Facility Name: Usher Oil Company
City: River Rouge
State: MI
FRP ID#: FRP0500211
Worst Case Discharge: 6000000

Facility Name: Total Petroleum, Inc., Romulus Terminal
City: Romulus
State: MI
FRP ID#: FRP0500066
Worst Case Discharge: 2449860

Facility Name: Shell Oil Company
City: Romulus
State: MI
FRP ID#: FRP0500052
Worst Case Discharge: 3095400

Facility Name: Uno-Ven
City: Romulus
State: MI
FRP ID#: FRP0500068
Worst Case Discharge: 5055582

Facility Name: General Motors
City: Saginaw
State: MI
FRP ID#: FRP05A0413
Worst Case Discharge: 0

Facility Name: BP Oil Company
City: Taylor
State: MI
FRP ID#: FRP0500009
Worst Case Discharge: 2259600

Facility Name: Ashland Petroleum Company
City: Taylor
State: MI
FRP ID#: FRP0500007

Worst Case Discharge: 3401290

Facility Name: Clark Oil
City: Taylor
State: MI
FRP ID#: FRP0500010
Worst Case Discharge: 3150000

Facility Name: Koch Refining Co
City: Taylor
State: MI
FRP ID#: FRP05A0103
Worst Case Discharge: 5027000

Facility Name: Amoco Oil Company
City: Taylor
State: MI
FRP ID#: FRP0500002
Worst Case Discharge: 333900

Facility Name: TOTAL Petroleum, Inc.
City: Traverse City
State: MI
FRP ID#: FRP05A0002
Worst Case Discharge: 2283666

Facility Name: Detroit Edison
City: Trenton
State: MI
FRP ID#: FRP05A0073
Worst Case Discharge: 864024

Facility Name: Mobil Oil Corporation
City: Woodhaven
State: MI
FRP ID#: FRP0500044
Worst Case Discharge: 156821

Facility Name: Gm Powertrain
City: Ypsilanti
State: MI
FRP ID#: FRP05A0110
Worst Case Discharge: 1645250

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Minnesota

Facility Name: Williams Pipeline
City: Alexandria
State: MN
FRP ID#: FRP0500073
Worst Case Discharge: 110040

Facility Name: Northern States Power Company
City: Becker
State: MN
FRP ID#: FRP0500158
Worst Case Discharge: 1000000

Facility Name: Bongards Creameries
City: Bongards
State: MN
FRP ID#: FRP05A0079

Worst Case Discharge: 2418600

Facility Name: Murphy Oil
City: Crookston
State: MN
FRP ID#: FRP05A0074
Worst Case Discharge: 4200000

Facility Name: United Power
City: Elk River
State: MN
FRP ID#: FRP0500165
Worst Case Discharge: 924000

Facility Name: Murphy Oil USA, Inc.
City: Esko
State: MN
FRP ID#: FRP0500159
Worst Case Discharge: 2268000

Facility Name: Eveleth Mines
City: Eveleth
State: MN
FRP ID#: FRP05A0405
Worst Case Discharge: 1193975

Facility Name: Williams Pipeline
City: Eyota
State: MN
FRP ID#: FRP0500077
Worst Case Discharge: 84210

Facility Name: Farmers Union Central Exchange Oil Blend
City: Inver Grove Heights
State: MN
FRP ID#: FRP0500089
Worst Case Discharge: 237625

Facility Name: Northern States Power Company
City: Inver Grove Heights
State: MN
FRP ID#: FRP0500157
Worst Case Discharge: 10000000

Facility Name: Honeymead Products Co.
City: Mankato
State: MN
FRP ID#: FRP05A0100
Worst Case Discharge: 4629000

Facility Name: Northern States Power Company
City: Mankato
State: MN
FRP ID#: FRP0500160
Worst Case Discharge: 1000000

Facility Name: Williams Pipeline
City: Mankato
State: MN
FRP ID#: FRP0500074
Worst Case Discharge: 85050

Facility Name: Williams Pipeline
City: Marshall
State: MN
FRP ID#: FRP0500075
Worst Case Discharge: 63210

Facility Name: Koch Materials
City: Marshall
State: MN
FRP ID#: FRP0500096
Worst Case Discharge: 36000

Facility Name: Burlington Northern Railroad
City: Minneapolis
State: MN
FRP ID#: FRP05A0399
Worst Case Discharge: 2000000

Facility Name: Koch Materials Company
City: Minneapolis
State: MN
FRP ID#: FRP0500095
Worst Case Discharge: 446754

Facility Name: Reichhold Chemicals
City: Minneapolis
State: MN
FRP ID#: FRP0500163
Worst Case Discharge: 230883

Facility Name: Amoco Oil Company
City: Moorhead
State: MN
FRP ID#: FRP0500078
Worst Case Discharge: 1892100

Facility Name: United States Steel
City: Mt. Iron
State: MN
FRP ID#: FRP0500071
Worst Case Discharge: 1512795

Facility Name: Newport Terminal Corp.
City: Newport
State: MN
FRP ID#: FRP0500087
Worst Case Discharge: 31500

Facility Name: Barton Enterprises, Inc.
City: Newport
State: MN
FRP ID#: FRP0500051
Worst Case Discharge: 20000

Facility Name: Archer Daniels Midland
City: Red Wing
State: MN
FRP ID#: FRP05A0082
Worst Case Discharge: 2051282

Facility Name: Amoco Oil Company
City: Roseville
State: MN
FRP ID#: FRP0500081
Worst Case Discharge: 1974000

Facility Name: Westway Trading Corporation
City: Saint Paul
State: MN
FRP ID#: FRP0500072
Worst Case Discharge: 848400

Facility Name: 3M Center

City: Saint Paul
State: MN
FRP ID#: FRP0500174
Worst Case Discharge: 285000

Facility Name: Koch Materials Company
City: Saint Paul
State: MN
FRP ID#: FRP0500097
Worst Case Discharge: 243894

Facility Name: Amoco Oil Company
City: Sauk Centre
State: MN
FRP ID#: FRP0500079
Worst Case Discharge: 674100

Facility Name: Richards Asphalt Company
City: Savage
State: MN
FRP ID#: FRP0500164
Worst Case Discharge: 1000000

Facility Name: Nsp
City: Shakopee
State: MN
FRP ID#: FRP0500153
Worst Case Discharge: 2500000

Facility Name: Interstate Power Company
City: Sherburn
State: MN
FRP ID#: FRP0500092
Worst Case Discharge: 2585000

Facility Name: Koch Fuels
City: Silver Bay
State: MN
FRP ID#: FRP0500094
Worst Case Discharge: 14322

Facility Name: Amoco Oil Company
City: Spring Valley
State: MN
FRP ID#: FRP0500080
Worst Case Discharge: 1281000

Facility Name: St Paul Metro Wastewater Treatment Plant
City: St Paul
State: MN
FRP ID#: FRP0500212
Worst Case Discharge: 440000

Facility Name: Koch Refining
City: St Paul
State: MN
FRP ID#: FRP0500172
Worst Case Discharge: 1167600

Facility Name: Koch Refining
City: St Paul
State: MN
FRP ID#: FRP0500173
Worst Case Discharge: 21168000

Facility Name: 3m
City: St Paul

State: MN
FRP ID#: FRP0500175
Worst Case Discharge: 225625

Facility Name: Hawkins Chemical
City: St Paul
State: MN
FRP ID#: FRP0500372
Worst Case Discharge: 0

Facility Name: Hawkins Chemical
City: St Paul
State: MN
FRP ID#: FRP0500373
Worst Case Discharge: 0

Facility Name: Ford
City: St. Paul
State: MN
FRP ID#: FRP05A0078
Worst Case Discharge: 550000

Facility Name: Uno-Ven
City: St. Paul
State: MN
FRP ID#: FRP0500069
Worst Case Discharge: 5772820

Facility Name: Minneapolis
City: St. Paul
State: MN
FRP ID#: FRP05A0102
Worst Case Discharge: 2270000

Facility Name: Westway Terminal Company
City: St. Paul
State: MN
FRP ID#: FRP05A0099
Worst Case Discharge: 1500000

Facility Name: Williams Pipeline
City: St. Paul
State: MN
FRP ID#: FRP0500076
Worst Case Discharge: 170520

Facility Name: Ashland
City: St. Paul Park
State: MN
FRP ID#: FRP0500082
Worst Case Discharge: 220000

Facility Name: Koch Fuels
City: Taconite Harbor
State: MN
FRP ID#: FRP0500142
Worst Case Discharge: 372288

Facility Name: Koch Fuels
City: Two Harbors
State: MN
FRP ID#: FRP0500143
Worst Case Discharge: 46200

Facility Name: Conoco Inc.
City: Wrenshall
State: MN

FRP ID#: FRP0500254
Worst Case Discharge: 4200000

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Ohio

Facility Name: Monsanto Port Plastics Facility
City: Addyston
State: OH
FRP ID#: FRP0500106
Worst Case Discharge: 1000000

Facility Name: Sun Co.
City: Akron
State: OH
FRP ID#: FRP0500113
Worst Case Discharge: 1386000

Facility Name: Uno-Ven
City: Amlin
State: OH
FRP ID#: FRP0500127
Worst Case Discharge: 6639486

Facility Name: Conrail
City: Ashtabula
State: OH
FRP ID#: FRP0500256
Worst Case Discharge: 1000000

Facility Name: Cleveland Electric
City: Ashtabula
State: OH
FRP ID#: FRP0500260
Worst Case Discharge: 34200

Facility Name: Amoco Oil Company
City: Aurora
State: OH
FRP ID#: FRP0500201
Worst Case Discharge: 1241190

Facility Name: Aurora Terminal & Transportation, Inc.
City: Aurora
State: OH
FRP ID#: FRP0500287
Worst Case Discharge: 2100000

Facility Name: Cleveland Electric
City: Avon Lake
State: OH
FRP ID#: FRP0500261
Worst Case Discharge: 3300500

Facility Name: Norfolk Southern
City: Bellevue
State: OH
FRP ID#: FRP0500290
Worst Case Discharge: 0

Facility Name: Degussa Corp.
City: Belpre
State: OH

FRP ID#: FRP0500268
Worst Case Discharge: 3150000

Facility Name: Shell Chemical Company
City: Belpre
State: OH
FRP ID#: FRP0500245
Worst Case Discharge: 1100000

Facility Name: Ohio Power Company
City: Beverly
State: OH
FRP ID#: FRP0500111
Worst Case Discharge: 1000000

Facility Name: Clark Oil
City: Brecksville
State: OH
FRP ID#: FRP0500279
Worst Case Discharge: 3244542

Facility Name: Marathon Oil
City: Brecksville
State: OH
FRP ID#: FRP0500102
Worst Case Discharge: 4032000

Facility Name: Cardinal Operating Company
City: Brilliant
State: OH
FRP ID#: FRP0500296
Worst Case Discharge: 840000

Facility Name: Coz Terminaling, Inc.
City: Bryan
State: OH
FRP ID#: FRP05A0101
Worst Case Discharge: 840000

Facility Name: Ashland Petroleum Company
City: Canton
State: OH
FRP ID#: FRP0500205
Worst Case Discharge: 14208390

Facility Name: BP Oil Company
City: Canton
State: OH
FRP ID#: FRP0500226
Worst Case Discharge: 999600

Facility Name: Ohio Power Company
City: Cheshire
State: OH
FRP ID#: FRP0500110
Worst Case Discharge: 4400000

Facility Name: Department of Defense
City: Cincinnati
State: OH
FRP ID#: FRP0500266
Worst Case Discharge: 700000

Facility Name: Southside River Rail Corp.
City: Cincinnati
State: OH
FRP ID#: FRP0500250

Worst Case Discharge: 70

Facility Name: Queen City Terminals
City: Cincinnati
State: OH
FRP ID#: FRP0500270
Worst Case Discharge: 1800000

Facility Name: Shell Oil
City: Cincinnati
State: OH
FRP ID#: FRP0500251
Worst Case Discharge: 1663200

Facility Name: Ashland Petroleum Company
City: Cincinnati
State: OH
FRP ID#: FRP0500203
Worst Case Discharge: 3819816

Facility Name: Emery Group
City: Cincinnati
State: OH
FRP ID#: FRP0500085
Worst Case Discharge: 635000

Facility Name: Uno-Ven
City: Cincinnati
State: OH
FRP ID#: FRP0500123
Worst Case Discharge: 1369137

Facility Name: Ashland Petroleum Company
City: Cincinnati
State: OH
FRP ID#: FRP0500131
Worst Case Discharge: 2436000

Facility Name: BP Oil Company
City: Cincinnati
State: OH
FRP ID#: FRP0500218
Worst Case Discharge: 840000

Facility Name: Boswell Oil
City: Cincinnati
State: OH
FRP ID#: FRP0500223
Worst Case Discharge: 2224973

Facility Name: Shell Oil
City: Cleveland
State: OH
FRP ID#: FRP0500252
Worst Case Discharge: 1492260

Facility Name: Sun Co. Cleveland Intnl. Airport
City: Cleveland
State: OH
FRP ID#: FRP05A0115
Worst Case Discharge: 234300

Facility Name: Reilly Industries
City: Cleveland
State: OH
FRP ID#: FRP05A0084
Worst Case Discharge: 100000

Facility Name: LTV Steel
City: Cleveland
State: OH
FRP ID#: FRP0500100
Worst Case Discharge: 10100000

Facility Name: Cleveland Electric
City: Cleveland
State: OH
FRP ID#: FRP0500263
Worst Case Discharge: 5500000

Facility Name: Marathon Oil
City: Cleveland
State: OH
FRP ID#: FRP0500103
Worst Case Discharge: 2402022

Facility Name: Fleet Supplies, Inc.
City: Cleveland
State: OH
FRP ID#: FRP0500088
Worst Case Discharge: 4400000

Facility Name: BP Oil Company
City: Cleveland
State: OH
FRP ID#: FRP0500229
Worst Case Discharge: 1718640

Facility Name: Sun Co.
City: Cleveland
State: OH
FRP ID#: FRP0500114
Worst Case Discharge: 1857240

Facility Name: Uno-Ven
City: Cleveland
State: OH
FRP ID#: FRP0500122
Worst Case Discharge: 4645074

Facility Name: Mobil
City: Cleveland
State: OH
FRP ID#: FRP0500104
Worst Case Discharge: 453200

Facility Name: Ashland
City: Columbus
State: OH
FRP ID#: FRP0500151
Worst Case Discharge: 2173626

Facility Name: BP Oil Company
City: Columbus
State: OH
FRP ID#: FRP0500217
Worst Case Discharge: 2011800

Facility Name: Ashland Petroleum Company
City: Columbus
State: OH
FRP ID#: FRP0500204
Worst Case Discharge: 585677

Facility Name: Sun Company, Inc.

City: Columbus
State: OH
FRP ID#: FRP0500115
Worst Case Discharge: 924000

Facility Name: Shell Oil Company
City: Columbus
State: OH
FRP ID#: FRP0500213
Worst Case Discharge: 2457840

Facility Name: Clark Oil
City: Columbus
State: OH
FRP ID#: FRP0500280
Worst Case Discharge: 3263862

Facility Name: Abitec Corporation
City: Columbus
State: OH
FRP ID#: FRP05A0105
Worst Case Discharge: 272000

Facility Name: Eott
City: Columbus
State: OH
FRP ID#: FRP0500086
Worst Case Discharge: 2200000

Facility Name: Marathon Oil
City: Columbus
State: OH
FRP ID#: FRP0500297
Worst Case Discharge: 3575250

Facility Name: CFI Gulf Oil
City: Columbus
State: OH
FRP ID#: FRP05A0430
Worst Case Discharge: 0

Facility Name: Rickenbacker Airport
City: Columbus
State: OH
FRP ID#: FRP0500286
Worst Case Discharge: 50000

Facility Name: Conrail
City: Columbus
State: OH
FRP ID#: FRP0500258
Worst Case Discharge: 1000000

Facility Name: Certified Oil Company
City: Columbus
State: OH
FRP ID#: FRP0500264
Worst Case Discharge: 2310000

Facility Name: Columbus Southern
City: Conesville
State: OH
FRP ID#: FRP0500278
Worst Case Discharge: 35641

Facility Name: Sun Company, Inc.
City: Dayton

State: OH
FRP ID#: FRP0500116
Worst Case Discharge: 2079000

Facility Name: Shell Oil Company
City: Dayton
State: OH
FRP ID#: FRP0500241
Worst Case Discharge: 2462460

Facility Name: BP Oil Company
City: Dayton
State: OH
FRP ID#: FRP0500215
Worst Case Discharge: 2948400

Facility Name: Uno-Ven
City: Dayton
State: OH
FRP ID#: FRP0500124
Worst Case Discharge: 2421888

Facility Name: Itapco
City: East Liverpool
State: OH
FRP ID#: FRP0500292
Worst Case Discharge: 693000

Facility Name: Hays Oil Co.
City: East Liverpool
State: OH
FRP ID#: FRP0500367
Worst Case Discharge: 30000

Facility Name: Ashland
City: Findlay
State: OH
FRP ID#: FRP0500152
Worst Case Discharge: 2696232

Facility Name: BP Oil Company
City: Grafton
State: OH
FRP ID#: FRP0500228
Worst Case Discharge: 1615740

Facility Name: International Paper
City: Hamilton
State: OH
FRP ID#: FRP05A0009
Worst Case Discharge: 2500

Facility Name: Action Terminals
City: Ironton
State: OH
FRP ID#: FRP05A0072
Worst Case Discharge: 1712357

Facility Name: Aristech Chemical
City: Ironton
State: OH
FRP ID#: FRP0500222
Worst Case Discharge: 0

Facility Name: Allied Signal
City: Ironton
State: OH

FRP ID#: FRP0500207
Worst Case Discharge: 1575000

Facility Name: Marathon Oil
City: Lima
State: OH
FRP ID#: FRP0500298
Worst Case Discharge: 10794000

Facility Name: Eott
City: Lima
State: OH
FRP ID#: FRP0500249
Worst Case Discharge: 3350000

Facility Name: BP Oil Company
City: Lima
State: OH
FRP ID#: FRP0500008
Worst Case Discharge: 403200

Facility Name: BP Oil Company
City: Lima
State: OH
FRP ID#: FRP0500230
Worst Case Discharge: 7720692

Facility Name: Hays Oil Co.
City: Lisbon
State: OH
FRP ID#: FRP0500368
Worst Case Discharge: 25000

Facility Name: Uss/Kobe Steel Company
City: Lorain
State: OH
FRP ID#: FRP05A0433
Worst Case Discharge: 0

Facility Name: Sun Co.
City: Mahoning
State: OH
FRP ID#: FRP0500118
Worst Case Discharge: 462000

Facility Name: Dayton Power & Light
City: Manchester
State: OH
FRP ID#: FRP0500277
Worst Case Discharge: 2788445

Facility Name: Ashland Petroleum Company
City: Marietta
State: OH
FRP ID#: FRP0500202
Worst Case Discharge: 104202

Facility Name: Asphalt Materials
City: Marietta
State: OH
FRP ID#: FRP0500099
Worst Case Discharge: 84000

Facility Name: Asphalt Materials
City: Marietta
State: OH
FRP ID#: FRP05A0428

Worst Case Discharge: 1025000

Facility Name: Itapco
City: Marietta
State: OH
FRP ID#: FRP0500291
Worst Case Discharge: 993300

Facility Name: Asphalt Materials
City: Marietta
State: OH
FRP ID#: FRP05A0427
Worst Case Discharge: 630000

Facility Name: Asphalt Materials
City: Marion
State: OH
FRP ID#: FRP05A0424
Worst Case Discharge: 43390

Facility Name: Shell Oil
City: Mogadore
State: OH
FRP ID#: FRP0500253
Worst Case Discharge: 1986600

Facility Name: Cincinnati Gas and Electric Company
City: Moscow
State: OH
FRP ID#: FRP0500236
Worst Case Discharge: 3015000

Facility Name: Cincinnati Gas and Electric Company
City: New Richmond
State: OH
FRP ID#: FRP0500237
Worst Case Discharge: 2115750

Facility Name: Koch Materials
City: Newark
State: OH
FRP ID#: FRP0500098
Worst Case Discharge: 2167200

Facility Name: Ohio Oil Gathering Corporation
City: Newport
State: OH
FRP ID#: FRP0500109
Worst Case Discharge: 2100000

Facility Name: BP Oil Company
City: Niles
State: OH
FRP ID#: FRP0500227
Worst Case Discharge: 1428000

Facility Name: Koch Materials
City: North Bend
State: OH
FRP ID#: FRP0500295
Worst Case Discharge: 420000

Facility Name: Ashland Petroleum Company
City: North Bend
State: OH
FRP ID#: FRP0500141
Worst Case Discharge: 7983360

Facility Name: Cincinnati Gas and Electric Company
City: North Bend
State: OH
FRP ID#: FRP0500238
Worst Case Discharge: 3116000

Facility Name: The Uno-Ven Company
City: Oregon
State: OH
FRP ID#: FRP0500125
Worst Case Discharge: 9240000

Facility Name: BP Oil Company
City: Oregon
State: OH
FRP ID#: FRP0500214
Worst Case Discharge: 7555800

Facility Name: Asphalt Materials
City: Oregon
State: OH
FRP ID#: FRP05A0429
Worst Case Discharge: 2000000

Facility Name: Sun Company, Inc.
City: Oregon
State: OH
FRP ID#: FRP0500117
Worst Case Discharge: 429030

Facility Name: Lubrizol Petroleum Chemicals Company
City: Painesville Township
State: OH
FRP ID#: FRP0500101
Worst Case Discharge: 1000000

Facility Name: Uniroyal Chemical Co., Inc.
City: Painsville
State: OH
FRP ID#: FRP05A0431
Worst Case Discharge: 158000

Facility Name: Doe
City: Piketon
State: OH
FRP ID#: FRP0500248
Worst Case Discharge: 0

Facility Name: Norfolk & Southern Railway Company
City: Portsmouth
State: OH
FRP ID#: FRP0500284
Worst Case Discharge: 2006004

Facility Name: Tri-State Asphalt Corp
City: Rayland
State: OH
FRP ID#: FRP05A0012
Worst Case Discharge: 715000

Facility Name: Eott
City: Richfield
State: OH
FRP ID#: FRP0500247
Worst Case Discharge: 2530000

Facility Name: Goodyear Tire & Rubber Company

City: Saint Marys
State: OH
FRP ID#: FRP0500285
Worst Case Discharge: 500000

Facility Name: BP Oil Company
City: Sciotoville
State: OH
FRP ID#: FRP0500225
Worst Case Discharge: 5171

Facility Name: Cargill Oilseeds Processing
City: Sidney
State: OH
FRP ID#: FRP05A0015
Worst Case Discharge: 800000

Facility Name: South Point Ethanol
City: South Point
State: OH
FRP ID#: FRP0500210
Worst Case Discharge: 0

Facility Name: Marathon Oil
City: Steubenville
State: OH
FRP ID#: FRP0500294
Worst Case Discharge: 1869000

Facility Name: Uno-Ven
City: Tallmadge
State: OH
FRP ID#: FRP0500130
Worst Case Discharge: 1422876

Facility Name: BP Oil Company
City: Tiffin
State: OH
FRP ID#: FRP0500231
Worst Case Discharge: 1096200

Facility Name: Westway Terminal Co.
City: Toledo
State: OH
FRP ID#: FRP05A0091
Worst Case Discharge: 3500000

Facility Name: Delta Fuels Of Ohio
City: Toledo
State: OH
FRP ID#: FRP05A0436
Worst Case Discharge: 1800000

Facility Name: Gm Powertrain
City: Toledo
State: OH
FRP ID#: FRP05A0414
Worst Case Discharge: 0

Facility Name: Sun Co.
City: Toledo
State: OH
FRP ID#: FRP0500246
Worst Case Discharge: 693000

Facility Name: Stoneco
City: Toledo

State: OH
FRP ID#: FRP05A0085
Worst Case Discharge: 4620000

Facility Name: Seneca Petroleum Corporation, Inc.
City: Toledo
State: OH
FRP ID#: FRP0500121
Worst Case Discharge: 4269455

Facility Name: Clark Oil
City: Toledo
State: OH
FRP ID#: FRP0500234
Worst Case Discharge: 2204790

Facility Name: Emery Air Freight Corporation
City: Vandalia
State: OH
FRP ID#: FRP05A0107
Worst Case Discharge: 4000000

Facility Name: Conrail
City: Walbridge
State: OH
FRP ID#: FRP0500257
Worst Case Discharge: 1000000

Facility Name: Ashland
City: Wellsvelle
State: OH
FRP ID#: FRP0500140
Worst Case Discharge: 4435200

Facility Name: Wellsville Storage And Transport, Inc.
City: Wellsville
State: OH
FRP ID#: FRP0500133
Worst Case Discharge: 12600

Facility Name: Cleveland Electric
City: Willowick
State: OH
FRP ID#: FRP0500262
Worst Case Discharge: 2220000

Facility Name: Dod - Wright
City: Wright-Patterson
State: OH
FRP ID#: FRP05A0018
Worst Case Discharge: 5265000

Facility Name: Marathon Oil
City: Youngstown
State: OH
FRP ID#: FRP0500289
Worst Case Discharge: 2293200

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Wisconsin

Facility Name: Doe
City: Baraboo

State: WI
FRP ID#: FRP0500318
Worst Case Discharge: 824000

Facility Name: Wisconsin Power & Light
City: Beloit
State: WI
FRP ID#: FRP0500136
Worst Case Discharge: 698000

Facility Name: Farmers Union Central
City: Chippewa Falls
State: WI
FRP ID#: FRP0500326
Worst Case Discharge: 2293326

Facility Name: Amoco Oil Company
City: Chippewa Falls
State: WI
FRP ID#: FRP0500308
Worst Case Discharge: 945000

Facility Name: ITAPCO, Inc.
City: Chippewa Falls
State: WI
FRP ID#: FRP0500319
Worst Case Discharge: 1680000

Facility Name: Nicolet Paper Company
City: Depere
State: WI
FRP ID#: FRP0500108
Worst Case Discharge: 0

Facility Name: Wisconsin Power & Light
City: Fond Du Lac
State: WI
FRP ID#: FRP0500138
Worst Case Discharge: 825000

Facility Name: International Paper
City: Fond Du Lac
State: WI
FRP ID#: FRP0500166
Worst Case Discharge: 3750

Facility Name: U.S. Oil Co.
City: Green Bay
State: WI
FRP ID#: FRP05A0093
Worst Case Discharge: 4425667

Facility Name: CITGO Petroleum Corporation
City: Green Bay
State: WI
FRP ID#: FRP0500310
Worst Case Discharge: 3360000

Facility Name: U.S. Oil
City: Green Bay
State: WI
FRP ID#: FRP05A0094
Worst Case Discharge: 2659734

Facility Name: Amoco Oil Company
City: Green Bay
State: WI

FRP ID#: FRP0500309
Worst Case Discharge: 3343200

Facility Name: Mobil
City: Green Bay
State: WI
FRP ID#: FRP0500371
Worst Case Discharge: 4760112

Facility Name: Clark Refining & Marketing, Inc.
City: Green Bay
State: WI
FRP ID#: FRP0500084
Worst Case Discharge: 2310000

Facility Name: Constr. Resource
City: Green Bay
State: WI
FRP ID#: FRP05A0113
Worst Case Discharge: 2300000

Facility Name: Koch Materials/Koch Refining Company
City: Green Bay
State: WI
FRP ID#: FRP0500358
Worst Case Discharge: 2352000

Facility Name: Marathon Oil Company
City: Green Bay
State: WI
FRP ID#: FRP0500314
Worst Case Discharge: 3214134

Facility Name: Koch Refining Company
City: Junction City
State: WI
FRP ID#: FRP0500176
Worst Case Discharge: 1554000

Facility Name: Thilmany
City: Kaukauna
State: WI
FRP ID#: FRP0500091
Worst Case Discharge: 550000

Facility Name: Kohler Company
City: Kohler
State: WI
FRP ID#: FRP05A0076
Worst Case Discharge: 50000

Facility Name: Mobil
City: La Crosse
State: WI
FRP ID#: FRP0500315
Worst Case Discharge: 3511200

Facility Name: Midwest Industrial Fuels, Inc.
City: La Crosse
State: WI
FRP ID#: FRP0500316
Worst Case Discharge: 18270

Facility Name: Northern States Power Company
City: Lacrosse
State: WI
FRP ID#: FRP0500090

Worst Case Discharge: 2000000

Facility Name: Westway Trading Corp
City: Lacrosse
State: WI
FRP ID#: FRP0500134
Worst Case Discharge: 1650000

Facility Name: Van Zeeland Oil
City: Little Chute
State: WI
FRP ID#: FRP0500132
Worst Case Discharge: 331500

Facility Name: Itapco
City: Madison
State: WI
FRP ID#: FRP0500120
Worst Case Discharge: 1848000

Facility Name: Wisconsin Public Service
City: Marinette
State: WI
FRP ID#: FRP05A0062
Worst Case Discharge: 550000

Facility Name: The Uno-Ven Company
City: Mc Farland
State: WI
FRP ID#: FRP0500128
Worst Case Discharge: 3582012

Facility Name: CENEX
City: Mc Farland
State: WI
FRP ID#: FRP0500329
Worst Case Discharge: 2232594

Facility Name: Kerr-McGee Refining Corporation
City: Mc Farland
State: WI
FRP ID#: FRP0500320
Worst Case Discharge: 2310000

Facility Name: CITGO Petroleum Corporation
City: Mc Farland
State: WI
FRP ID#: FRP0500313
Worst Case Discharge: 2310000

Facility Name: U.S. Oil
City: Mcfarland
State: WI
FRP ID#: FRP05A0108
Worst Case Discharge: 3487730

Facility Name: Mobil
City: Mcfarland
State: WI
FRP ID#: FRP0500105
Worst Case Discharge: 2179842

Facility Name: Akrosil
City: Menasha
State: WI
FRP ID#: FRP0500224
Worst Case Discharge: 250

Facility Name: Amoco Oil Company
City: Milwaukee
State: WI
FRP ID#: FRP0500328
Worst Case Discharge: 3834600

Facility Name: Clark Refining & Marketing, Inc.
City: Milwaukee
State: WI
FRP ID#: FRP0500083
Worst Case Discharge: 3360000

Facility Name: Jacobus Petroleum Products, Inc.
City: Milwaukee
State: WI
FRP ID#: FRP05A0013
Worst Case Discharge: 2956000

Facility Name: Constr. Resources
City: Milwaukee
State: WI
FRP ID#: FRP05A0112
Worst Case Discharge: 3053635

Facility Name: CITGO Petroleum Corporation
City: Milwaukee
State: WI
FRP ID#: FRP0500317
Worst Case Discharge: 3276000

Facility Name: Marathon Oil Company
City: Milwaukee
State: WI
FRP ID#: FRP0500311
Worst Case Discharge: 6000708

Facility Name: The Uno-Ven Company
City: Milwaukee
State: WI
FRP ID#: FRP0500129
Worst Case Discharge: 2314704

Facility Name: PTW, Inc.
City: Milwaukee
State: WI
FRP ID#: FRP05A0083
Worst Case Discharge: 3753288

Facility Name: ST Services
City: Milwaukee
State: WI
FRP ID#: FRP0500243
Worst Case Discharge: 3256715

Facility Name: Shell
City: Milwaukee
State: WI
FRP ID#: FRP0500126
Worst Case Discharge: 4620000

Facility Name: U.S. Oil
City: Milwaukee
State: WI
FRP ID#: FRP05A0106
Worst Case Discharge: 3233622

Facility Name: Williams Pipeline

City: Mosinee
State: WI
FRP ID#: FRP0500135
Worst Case Discharge: 140070

Facility Name: Pluswood
City: Oshkosh
State: WI
FRP ID#: FRP0500112
Worst Case Discharge: 3000

Facility Name: Georgia-Pacific Corporation
City: Port Edwards
State: WI
FRP ID#: FRP0500351
Worst Case Discharge: 750000

Facility Name: Acme Die Casting Corp.
City: Racine
State: WI
FRP ID#: FRP0500208
Worst Case Discharge: 7000

Facility Name: Murphy Oil
City: Rhinelander
State: WI
FRP ID#: FRP05A0075
Worst Case Discharge: 2310000

Facility Name: Koch Materials Company
City: Stevens Point
State: WI
FRP ID#: FRP0500348
Worst Case Discharge: 1723355

Facility Name: S.C. Johnson & Son Inc. Waxdale Complex
City: Sturtevant
State: WI
FRP ID#: FRP0500119
Worst Case Discharge: 1142500

Facility Name: Murphy Oil USA, Inc.
City: Superior
State: WI
FRP ID#: FRP0500107
Worst Case Discharge: 10000036

Facility Name: Amoco Oil Company
City: Superior
State: WI
FRP ID#: FRP0500312
Worst Case Discharge: 2814000

Facility Name: Lakehead Pipe Line Company, Inc.
City: Superior
State: WI
FRP ID#: FRP05A0404
Worst Case Discharge: 0

Facility Name: Koch, Marine Fueling Div.
City: Superior
State: WI
FRP ID#: FRP0500350
Worst Case Discharge: 0

Facility Name: Wisconsin Electric Power
City: Union Grove

State: WI
FRP ID#: FRP05A0104
Worst Case Discharge: 1072000

Facility Name: Wisconsin Electric Power Company
City: Watertown
State: WI
FRP ID#: FRP05A0007
Worst Case Discharge: 1500000

Facility Name: Payne & Dolan Waukesha Tank Farm
City: Waukesha
State: WI
FRP ID#: FRP05A0114
Worst Case Discharge: 975042

Facility Name: Wisconsin Public Service
City: Wisconsin Rapids
State: WI
FRP ID#: FRP05A0080
Worst Case Discharge: 515357

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APPENDIX V: SHORELINE CLEANUP GUIDELINE MATRICES

To be included on disk.

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APPENDIX VI: OPTIONS FOR MINIMIZING ENVIRONMENTAL IMPACTS OF FRESHWATER SPILL RESPONSE ACTIONS

by the American Petroleum Institute, and the National Oceanic and Atmospheric Administration

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Abstract

Selecting appropriate protection, response, and cleanup techniques, both before and following an oil spill, affects the ultimate environmental impact and cost resulting from a spill. The American Petroleum Institute (API) and the National Oceanic and Atmospheric Administration (NOAA) jointly developed this guide as a tool for contingency planners and field responders to identify response techniques that have minimal ecological impacts and also minimize the impact of the oil. The guide provides information on 29 response methods and classifies their relative environmental impact for combinations of four oil types and

twelve freshwater environments and habitats. Spill topics of special concern in freshwater settings are also discussed, including public health, conditions under which oil might sink in fresh water, oil behavior in ice conditions, permafrost, and use of firefighting foams.

1.1 Scope and Purpose

Selecting appropriate oil spill protection, recovery, and cleanup techniques, before and following an oil spill, is a critical element affecting the ultimate environmental impact and cost resulting from a spill. It is important to identify techniques that in themselves have minimal intrinsic ecological impact and are also effective in reducing the impact of the oil. Furthermore, these response techniques should be considered before a spill, so that little time needs to be spent preparing for the response during a spill.

The American Petroleum Institute (API) and the National Oceanic and Atmospheric Administration (NOAA) jointly developed this guide as a tool to help contingency planners and field responders evaluate response techniques and choose those that will most effectively prevent or minimize adverse ecological impact. Information is provided to help select response techniques for specific combinations of habitat and oil types. Each technique is evaluated individually for a specific habitat; however, during spill response more than one technique may be used at the same time on one or more habitats.

Reducing the overall ecological impact of a spill event is the primary concern of this guide, and it is applicable for inland, freshwater environments and habitats only. This guide does not address land-only, chemical, or marine spills. It also does not discuss legal or regulatory issues; safety considerations; or guidance on planning, organizing, and conducting a spill response effort. The manual may be customized for specific geographic areas to address special priorities and concerns.

The discussions in this guide reflect primarily the assessment of the environmental impact of the response methods. However, the selected techniques should be effective. They must remove a significant amount of oil from the environment or prevent or reduce oil impact, and they must have acceptable impact on the habitat as compared to leaving the oil alone (natural recovery). Prolonged use of an inefficient technique may be more ecologically detrimental than short-term use of a potentially more intrusive approach (e.g., frequent entry into a marsh to replace sorbents rather than vacuuming pooled oil).

Specific spill conditions will often dictate the response techniques used, and selection always involves tradeoffs. For example, a potentially ecologically damaging, but efficient, cleanup technique could be used to meet site-specific response goals. Also, techniques may be used early in response simply because they can be implemented immediately, rather than waiting until ones with lower impact can be mobilized. A method that has a significant short-term ecological impact, such as in-situ burning, may actually produce the lowest long-term ecological impact because it removes the oil quickly.

1.2 Background

Oil spills into inland waters differ from coastal or marine spills from several perspectives. For instance, inland spills are usually in freshwater habitats. Inland spills are also more frequent than marine spills, and they often involve smaller volumes of oil. Refined product spills are more common in freshwater, while crude oil spills comprise the majority of marine spills. Inland spills have a much higher potential to contaminate water supplies (surface as well as groundwater), to affect areas of concentrated populations, and to impact manmade structures and human activities. In coastal and marine environments, wave and tidal action are important mechanisms for dispersion and transport of oil and in removing oil from shorelines. These mechanisms are less important in freshwater habitats, where currents and floods are more important factors.

The knowledge base for response to oil spills reflects the disparity of information available between marine spill response and freshwater response. The lack of literature and guidelines for inland spill response prompted several efforts to improve this shortcoming. Preparation of this guide began with a workshop sponsored by API on Inland Oil Spills, conducted in Dearborn, Michigan from November 19-21, 1991. The objective of the workshop was to bring together the oil spill response community experienced and/or responsible for responding to freshwater crude oil or petroleum product spills, and to develop strategies through consensus for dealing with spills in different freshwater environments and shoreline habitats. The information from that workshop was the basis for development of this guide. However, the final guidelines presented here are based on the educated and experienced opinions of oil spill experts in industry and government.

1.3 Organization of Guidelines

The guide identifies response methods for twelve primary freshwater habitats (Table 1), which represent various waterways and shoreline types. Each habitat is treated separately in the guide, although the spill responder will be confronted with a variety of habitats.

Table 1. Primary freshwater environments and habitats included in this guide.

Water Environments	***Shoreline Habitats***

Open Water	Bedrock
Large Rivers	Manmade Structures
Small Lakes and Ponds	Sand
Small Rivers and Streams	Vegetated Shorelines
	Mixed Sand and Gravel
	Gravel
	Mud
	Wetlands

Section 2 of the guide includes:

- Response method summary matrices for the four primary water environments and eight shoreline habitats for four general oil types.

Section 3, arranged by water environment and shoreline habitat, contains:

- A detailed description of the environment or habitat; and
- Matrices of response methods in terms of recommended use for each of the four general oil types.

Section 4 of the guide contains detailed descriptions of the response methods listed in the matrices. The following headings are used:

- Objective;
- Description;
- Applicable habitats;
- When to use;
- Biological constraints; and
- Environmental impact.

Section 5 discusses the following special issues of concern in freshwater settings:

- Public health concerns;
- Conditions under which oil might sink;
- Oil behavior under ice conditions;
- Oil behavior and response in permafrost habitats; and
- Firefighting foam.

1.4 Sensitivity of Environments and Habitats

Habitat sensitivity is a function of several factors, including degree of exposure to natural removal processes, biological productivity and ability to recover following oil exposure, human use of the habitat, and ease of oil removal. These factors are used to rank the overall sensitivity of shoreline habitats to spilled oil as part of the Environmental Sensitivity Index (ESI). This guide focuses on one element of environmental sensitivity, namely the sensitivity of habitats to impacts resulting from oil removal. ESI shorelines are grouped according to the oil removal considerations used in this guide. The correlation between the shoreline habitat groupings in this guide and the shoreline rankings in the ESI atlases published for the U.S. Great Lakes is shown in Table 2, the summary tables, and Chapter 3. It should be noted that some groupings include both low and high sensitivity habitats, particularly where both sheltered and exposed habitats are grouped, such as bedrock and manmade structures.

The differences in oil behavior, persistence, and need for cleanup between sheltered and exposed sites are addressed in the discussion of these habitats.

Sensitivity issues of special concern to inland areas include strong seasonal variations in biological productivity and exposure to physical processes, urban areas with extensive manmade structures along the shoreline, and populated areas that are very near shorelines and bodies of water when human-health concerns can dominate cleanup issues. Important seasonal considerations include presence of ice in winter; variations in water level, which greatly influence habitats likely to be exposed to oil, flooding of stranded oil, and natural removal rates; sensitivity of vegetation to direct oiling impact; and use of habitats by migratory birds.

Table 2. Correlation of the shoreline habitats discussed in this guide with the Environ- mental Sensitivity Index (ESI) shoreline rankings for the Great Lakes.

Shoreline Habitats	***ESI Ranking and Description***	
Bedrock	ESI = 1A	Exposed Rocky Cliffs
	ESI = 2	Shelving Bedrock Shores
	ESI = 8A	Sheltered Rocky Shores
Manmade Structures	ESI = 1B	Exposed Solid Seawalls
	ESI = 6B	Riprap Structures
	ESI = 8B	Sheltered Solid Manmade Structures
Sand	ESI = 4	Sand Beaches
Mixed Sand and Gravel	ESI = 3	Eroding Scarps in Unconsolidated Sediment
	ESI = 5	Mixed Sand and Gravel Beaches
Gravel	ESI = 6A	Gravel Beaches
Vegetated Shorelines	ESI = 9A	Sheltered Low Vegetated Banks/Bluffs
Mud	ESI = 9B	Mud Flats
Wetlands	ESI = 10A	Fringing Marshes
	ESI = 10B	Extensive Marshes

1.5 Impact of Response Methods in the Absence of Oil

The following criteria were used to evaluate the *relative impact* of each technique in the absence of oil, primarily due to physical disturbances of mechanical methods and toxic impacts from chemical and biological methods. The results are shown in Table 3. Impacts from use of individual products and equipment types vary. The information provided to evaluate impacts in the absence of oil addresses generic characteristics of the response techniques and does not consider those variations. Additional information on environmental impacts is provided in the discussions of each technique in Section 4.

- *Low* -- Physical damage to the substrate and vegetation is minimal. Toxic impact is likely to be of limited areal extent and short duration. Restabilization or repopulation of the habitat is likely within six months.

Table 3. Relative impact of response methods in the absence of oil.

Water Environment					**Shoreline Habitat**							
Response Method	**Open**	**Small Lakes/Ponds**	**Large Rivers**	**Small Rivers/**	**Bedrock**	**Man-Made**	**Sand**	**Sand and**	**Gravel**	**Vegetated**	**Mud**	**Wetlands**

	Water			Streams				Gravel		Shores		
Physical Response Methods												
Natural Recovery	-	-	-	-	-	-	-	-	-	-	-	-
Booming	L	L	L	L	-	-	-	-	-	-	-	-
Skimming	L	L	L	L	-	-	-	-	-	-	-	-
Barriers/ Berms	-	-	-	H	-	-	-	-	-	-	-	-
Physical Herding	L	L	L	L	-	-	-	-	-	-	-	-
Manual Oil Removal/ Cleaning	L	H	L	M	L	L	L	M	M	H	H	H
Mechanical Removal	L	H	H	H	-	M	M	M	M	H	H	H
Sorbents	L	L	L	L	L	L	L	L	L	L	M	M
Vacuum	L	L	L	L	L	L	L	L	L	M	H	M
Debris Removal	-	L	L	L	L	L	L	L	L	L	M	M
Sediment Reworking	-	H	-	H	-	-	M	M	M	H	H	H
Vegetation Removal	L	H	M	H	-	-	-	-	-	H	-	H
In-Situ Burning	L	M	L	M	L	L	M	M	M	M	H	M
Flooding	-	-	-	-	L	L	L	M	L	L	L	L
Low-Pressure, Cold-Water Flushing	-	-	-	-	L	L	M	L	L	M	H	L
High-Pressure, Cold-Water Flushing	-	-	-	-	L	L	H	H	H	H	H	H
Low-Pressure, Hot-Water Flushing	-	-	-	-	M	L	H	M	M	H	H	H
High-Pressure, Hot-Water Flushing	-	-	-	-	M	L	H	H	H	H	H	H
Steam Cleaning	-	-	-	-	M	L	H	M	M	H	H	H
Sand Blasting	-	-	-	-	H	M	-	-	-	-	-	-
Chemical Response Methods												
Dispersants	L	H	L	H	-	-	-	-	-	-	-	-
Demulsifiers	L	L	L	M	-	-	-	-	-	-	-	-
Visco-Elastic Agents	L	L	M	L	-	-	-	-	-	-	-	-
Herding	L	M	L	H	-	-	-	-	-	-	-	-

Agents												
Solidifiers	L	L	L	L	L	L	M	M	L	M	M	M
Chemical Shoreline Pretreatments	-	-	-	-	I	I	I	I	I	I	I	I
Shoreline Cleaners	-	-	-	-	M	L	M	M	M	I	M	I
Biological Response Methods												
Nutrient Enrichment	L	M	L	L	L	L	L	L	L	L	L	L
Natural Microbe Seeding	I	I	I	I	I	I	I	I	I	I	I	I
L = Low; M = Moderate; H = High; I = Incomplete; "=" = Not applicable for this oil type												

- Moderate -- Physical damage to the substrate and vegetation may occur, with increased erosion potential in sedimentary habitats. Toxic impact is such that restabilization or repopulation of the habitat may take six to twelve months.

- High -- Physical damage to the substrate and vegetation is expected. Erosion potential may be high for the technique. The ecosystem may be adversely affected. Restabilization or repopulation of the habitat may take more than twelve months.

Those techniques that are clearly ineffective or inapplicable for a habitat are indicated with a dash (-). For cases where there is insufficient information to evaluate impact in the absence of oil, an "I" is used.

1.6 Classification of Oil Response Methods

The classifications developed for this guide compare the relative environmental impact of specific response methods for a given environment or habitat and oil type. It should be noted that the methods were compared among themselves, and no one method was used as a standard. The relative effectiveness of a response technique's ability to protect a habitat or remove oil is not explicitly considered. Relative effectiveness is only incorporated into the classification where less effective methods could result in longer application and thus greater ecological impacts, or leave higher oil residues in the habitat.

The classification categories are defined as follows:

A: May cause the least adverse habitat impact
B: May cause some adverse habitat impact
C: May cause significant adverse habitat impact
D: May cause the most adverse habitat impact
I: Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.

Those techniques that are clearly ineffective (e.g., herding agents on heavy oils) or inapplicable for an oil type or habitat (e.g., sand blasting of mud habitats) are indicated with a dash (-).

1.7 Assumptions Used in the Discussion of Methods

This guide was prepared with several assumptions:

Proper Application of Methods

It is assumed that methods will be properly applied by trained personnel. For example, if booms are recommended, these guidelines assume that the booms will be effectively located and correctly deployed. Improper application of almost any technique can render it ineffective or cause additional damage. For general guidance on application, see the publications listed in Appendix A. In cases where instruction for using a protection or cleanup method may be habitat-specific, see Section 4.

Evaluation of Relative Impact of Methods

Each method was evaluated independently for each habitat. In an actual response, however, the methods cannot be evaluated in isolation from each other. Specific spill conditions will often dictate the need for different techniques for the same water environment or shoreline habitat. For example, a high degree of oiling or low exposure to natural removal processes may require

a more intrusive technique to accelerate recovery in specific areas. The sensitivity of adjacent habitats may lead to the decision not to use an appropriate method because of the likelihood of secondary impact caused by cleanup of nearby sites. Finally, from an operational perspective, it may be necessary to use available methods early during a spill, rather than waiting for equipment or materials to arrive or teams to be trained in use of a less damaging technique.

Relative Effectiveness of Methods

The relative effectiveness of response methods to protect habitats and remove oil is a key consideration when selecting from various response methods. Although this guide attempts to consider only the environmental impact, effectiveness was incorporated into the discussion of methods in three ways.

First, those methods thought to be totally ineffective or inapplicable for an environment or habitat were not even listed in the habitat-specific matrices. For example, barrier/berms are not listed on the open-water matrices, and mechanical removal is not listed on the bedrock matrices.

Second, those methods that were clearly ineffective or inapplicable for a specific oil type within a habitat matrix were designated with a dash (-). Examples include using solidifiers on heavy oils in open water and emulsion-treating agents on gasoline products.

Third, those methods that are feasible, but likely to leave a significant amount of oil at the end of treatment, are given a lower classification. Often this change in effectiveness is associated with oil type, e.g., low-pressure, cold-water flushing is given a lower classification for heavy oil than medium oil because of its lower efficiency at oil removal. Similarly, methods such as manual and mechanical oil removal and sediment reworking that would have little effect on gasoline, which tends to evaporate quickly, are given lower classifications because the impact of the methods are not balanced by benefits from removing the oil.

Restrictions for Using Response Methods

Restrictions related to safety, weather, spill size, or regulatory constraints cover a wide spectrum of scenarios. It is thus impractical to discuss every possible situation or combination of factors in a set of guidelines. Some of this information, if appropriate, is included in the discussion under each habitat (Section 3) or in the descriptions of each method (Section 4). Many other considerations can come into play, such as worker safety and aesthetic, social, and economic impacts. Specific safety issues dealing with responding to gasoline spills are reflected in the tables. It should be noted that the using chemical methods will require approvals from state and/or Federal regulatory agencies.

1.8 Classification of Oil Types

Inland oil spills can involve a wide range of crude oils and refined products. The type of oil spilled is a key consideration in developing response and cleanup strategies. Oil properties important in characterizing oil types include:

Flash point -- Highly volatile oils, which evaporate rapidly after a release, may pose significant fire risks to responders. Often, the safest option is to allow the product to evaporate. Evaporation is an important mechanism for removing the spill from the water or shore because it lessens the need for cleanup and concern for associated impacts. Highly volatile oils completely evaporate in one to two days.

Specific gravity/API gravity -- Oils with a specific gravity greater than 1.00 (API gravity of less than 10) will sink in fresh water. However, those with a specific gravity of 0.95 or higher (API gravity less than 17.5) are also at risk of sinking once they become mixed with suspended sediments. When these oils have stranded on a shoreline, sediment incorporated from the shoreline can cause sinking if it is eroded from the shoreline.

Viscosity -- Viscosity controls both the rate that oil spreads on water and its likely depth of penetration into thesubstrate once on shore. Low-viscosity oils spread rapidly into thin sheens, increasing the surface area and making recovery difficult. They readily penetrate into sediments and debris. Viscous oils can be so thick that they do not spread, particularly when spilled on cold water. They are more likely to coat rather than penetrate shorelines.

Emulsion formation -- Under certain conditions, oil slicks will form a water-in-oil emulsion often called "chocolate mousse." This material can contain up to 80 percent water and can be many orders of magnitude more viscous than the spilled oil. There is no simple qualitative measure of the tendency to form emulsions. Emulsions are stabilized by natural or added surfactants, or compounds that act like surfactants, in the spilled oil. Gasoline does not emulsify, while diesel can quickly emulsify. Many crude oils can form stable emulsions. When an emulsion is formed, the oil changes in appearance and viscosity, becoming much more difficult to address from a spill-response perspective: the fluid is more viscous and hard to pump, and the volume has increased by a factor of four to five.

Adhesion -- The ease with which spilled oil can be physically removed from surfaces, usually by water flushing or vacuum, is an important factor in planning cleanup operations. The range of response methods needed for shoreline cleanup will depend largely on whether stranded oil adheres to substrate and response equipment. However, adhesion is a poorly defined parameter that is difficult to predict.

We use an oil classification scheme based on these properties to define four categories of oil. Characteristics of the four general types are provided below (Table 4), along with representative oils. Weathering tends to change the physical and chemical properties of oil, usually making it more viscous and cleanup techniques less effective. Methods used during the initial response should be re-evaluated as time elapses and as the oil changes in character. To some extent, this re-evaluation may be achieved by using the four tables for oil types in sequence, thus simulating the weathering process. Extremely heavy oils or those that are solid at ambient temperatures, such as asphalt, are not addressed below but are discussed as a special consideration in Section 5.

Table 4. The four types of oil used in this guide and their characteristics.

Gasoline Products

- Very volatile and highly flammable (flash point near 100F/40C)
- High evaporation rates
- Narrow cut fraction with no residues
- Low viscosity; spread rapidly to a thin sheen
- Specific gravity less than 0.80
- High acute toxicity to biota
- Do not emulsify
- Will penetrate substrate; nonadhesive

Diesel-like Products and Light Crude Oils (No. 2 fuel oil, jet fuels, kerosene, West Texas crude, Alberta crude)

- Moderately volatile (flash point varies 100-150F/40-65C)
- Refined products can evaporate to no residue
- Crude oils do have a residue after evaporation is completed
- Low- to moderate viscosity; spread rapidly into thin slicks
- Specific gravity of 0.80-0.85; API gravity of 35-45
- Moderate to high acute toxicity to biota; product-specific toxicity related to type and
- concentration of aromatic compounds
- Can form stable emulsions
- Tend to penetrate substrate; fresh spills are not adhesive
- Stranded light crudes tend to smother organisms

Medium-grade Crude Oils and Intermediate Products (North Slope crude, South Louisiana crude, No. 4 fuel oil, IFO 180, lube oils)

- Moderately volatile (flash point higher than 125F/50C)
- Up to one-third will evaporate in the first 24 hours
- Moderate to high viscosity
- Specific gravity of 0.85-0.95; API gravity of 17.5-35
- Variable acute toxicity, depending on amount of light fraction
- Can form stable emulsions
- Variable substrate penetration and adhesion
- Stranded oil tends to smother organisms

Heavy Crude Oils and Residual Products (Venezuela crude, San Joaquin Valley crude, Bunker C, No. 6 fuel oil)

- Slightly volatile (flash point greater than 150F/65C)
- Very little product loss by evaporation
- Very viscous to semisolid; may become less viscous when warmed
- Specific gravity of 0.95-1.00; API gravity of 10-17.5
- Low acute toxicity relative to other oil types
- Can form stable emulsions
- Little penetration of substrate likely, but can be highly adhesive
- Stranded oil tends to smother organisms

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2.0 Summary of Response Methods and Habitats

Tables 6 through 13 provide overviews of the physical, chemical, and biological response methods for four different oil types as

applied to all water environments and shoreline habitats. Detailed information regarding specific habitats is provided in Section 3. Users of this guide should consult the matrices and summaries in Section 3 for descriptions of assumptions and circumstances applicable to the various methods. We encourage you to refer to Section 4 for more information on each response method. Also, the references listed in Appendix A can provide valuable, detailed information on specific topics or applications.

It is important to note that the classifications primarily reflect the likely relative environmental impact resulting from properly implementing a response method within each habitat. However, when there are overriding effectiveness or safety issues associated with a specific oil type or habitat, these methods have been classified as "not applicable" and are denoted with a dash (-) on the matrices. In the case of response to gasoline-type spills, many methods have been classified as "not applicable" because of the fire hazard to the responders. Although responders have used many of these methods at gasoline spills to protect resources or clean up the spill, discussion of the spill-specific circumstances that made their use possible are beyond the scope of this document.

Natural recovery is included in the tables since natural processes can be adequate, on their own, to remediate impact from an oil spill. It also presents no added environmental stress due to human spill response activities. Therefore, natural recovery is often classified as having the least adverse habitat impact in the summary tables.

Since there is little information regarding the environmental impact of in-situ burning, chemical treatment, and biodegradation enhancement in freshwater habitats, the evaluation and discussion are based on the best available knowledge on how they work and any past use. In most cases this knowledge results from past experience with marine spills. Where there is too little information to evaluate a technique (e.g., chemical shoreline pretreatment), an "I", for insufficient information, is used in the tables.

Spill response techniques described in this guide for inland water habitats include protection, recovery, and cleanup methods. The main objective of protection is keeping oil out of a habitat, or reducing the amount of oil that enters. Recovery consists of removal of floating oil from the water surface. Cleanup consists of removal of stranded oil. Frequently, these methods may be used for several response phases, such as deploying boom for protection or for containing oil washed off a river bank during cleanup.

Table 5. Key to ESI codes used in Tables 7, 9, 11, and 13.

ESI No.	*Shoreline Type*
1A	**Exposed rocky cliffs**
1B	**Exposed solid seawalls**
2	**Shelving bedrock shores**
3	**Eroding scarps in unconsolidated sediments**
4	**Sand beaches**
5	**Mixed sand and gravel beaches**
6A	**Gravel beaches**
6B	**Riprap structures**
7	**Exposed tidal flats (not present in Great Lakes)**
8A	**Sheltered rocky shores**
8B	**Sheltered, solid, manmade structures**
9A	**Sheltered vegetated low banks/bluffs**
9B	**Sheltered vegetated low banks/bluffs**
10A	**Sheltered vegetated low banks/bluffs**
10B	**Freshwater swamps (woody vegetation)**

Table 6. Gasoline Products: Summary of relative environmental impact from response methods for spills in water

environments.

Water Environment				
Response Method Water	**Open Rivers**	**Large Lakes/Ponds**	**Small Lakes/Ponds**	**Small Rivers/Streams**
Physical Response Methods				
Natural Recovery	**A**	**A**	**A**	**A**
Booming - Containment	**-**	**-**	**-**	**-**
Booming - Deflection/Exclusion	**A**	**A**	**A**	**A**
Skimming	**-**	**-**	**-**	**A**
Barriers/Berms	**-**	**-**	**-**	**B**
Physical Herding	**B**	**B**	**C**	**B**
Manual Oil Removal/Cleaning	**-**	**-**	**-**	**-**
Mechanical Oil Removal	**-**	**-**	**-**	**-**
Sorbents	**-**	**-**	**-**	**-**
Vacuum	**-**	**-**	**-**	**-**
Debris Removal	**-**	**-**	**-**	**-**
Sediment Reworking	**-**	**-**	**-**	**-**
Vegetation Removal	**-**	**-**	**-**	**-**
In-Situ Burning	**-**	**-**	**B**	**C**
Flooding	**-**	**-**	**-**	**-**
Low-Pressure, Cold-Water Flushing	**-**	**-**	**-**	**-**
High-Pressure, Cold-Water Flushing	**-**	**-**	**-**	**-**
Low-Pressure, Hot-Water Flushing	**-**	**-**	**-**	**-**
High-Pressure, Hot-Water Flushing	**-**	**-**	**-**	**-**
Steam Cleaning	**-**	**-**	**-**	**-**
Sand Blasting	**-**	**-**	**-**	**-**
Chemical Response Methods				
Dispersants	**D**	**D**	**D**	**D**
Emulsion Treating Agents	**-**	**-**	**-**	**-**
Visco-Elastic Agents	**-**	**-**	**-**	**B**
Herding Agents	**D**	**D**	**B**	**D**
Solidifiers	**D**	**D**	**D**	**B**
Chemical Shoreline Pretreatment	**-**	**-**	**-**	**-**
Shoreline Cleaning Agents	**-**	**-**	**-**	**-**
Biological Response Methods				

Nutrient Enrichment	-	-	-	-
Natural Microbe Seeding	-	-	-	-

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"=" Not applicable for this oil type.

Table 7. Gasoline Products: Summary of relative environmental impact from response methods for spills in shoreline habitats.

Shoreline Habitat								
Response Method	**Bedrock**	**Man-Made**	**Sand**	**Sand and Gravel**	**Vegetated Gravel**	**Shores**	**Mud**	**Wetlands**
Equivalent ESI No.*	**1A,2,8A**	**1B,6B,8B**	**4**	**3,5**	**6A**	**9A**	**9B**	**10A,B**
Physical Response Methods								
Natural Recovery	A	A	A	A	A	A	A	A
Booming	-	-	-	-	-	-	-	-
Skimming	-	-	-	-	-	-	-	-
Barriers/Berms	-	-	-	-	-	-	-	-
Physical Herding	-	-	-	-	-	-	-	-
Manual Oil Removal/Cleaning	-	-	D	D	D	D	D	D
Mechanical Oil Removal	-	D	D	D	D	D	D	
Sorbents	B	B	-	-	-	-	B	C
Vacuum	-	-	-	-	-	-	-	-
Debris Removal	-	-	-	-	-	-	-	-
Sediment Reworking	-	-	D	D	D	D	D	D
Vegetation Removal	-	-	-	-	-	D	-	D
In-Situ Burning	-	-	-	-	-	-	C	B
Flooding	B	B	B	A	A	B	B	B
Low-Pressure, Cold-Water Flushing	B	B	B	B	A	B	D	B
High-Pressure, Cold-Water Flushing	B	B	D	C	C	D	D	D
Low-Pressure, Hot-Water Flushing	-	-	D	D	D	D	D	D
High-Pressure, Hot-Water Flushing	-	D	D	D	D	D	D	D

Steam Cleaning	-	-	-	-	-	-	-	-
Sand Blasting	-	-	-	-	-	-	-	-
Chemical Response Methods								
Dispersants	-	-	-	-	-	-	-	-
Emulsion Treating Agents	-	-	-	-	-	-	-	-
Visco-Elastic Agents	-	-	-	-	-	-	-	-
Herding Agents	-	-	-	-	-	-	-	-
Solidifiers	-	B	-	-	-	-	D	D
Chemical Shoreline Pretreatment	-	-	-	-	-	-	I	I
Shoreline Cleaning Agents	-	-	-	-	-	-	-	-
Biological Response Methods								
Nutrient Enrichment	-	-	-	-	-	-	-	-
Natural Microbe Seeding	-	-	-	-	-	-	-	-

***Key to ESI codes in Table 5 on page 14.**
The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.;
B = May cause some adverse habitat impact;
C = May cause significant adverse habitat impact;
D = May cause the most adverse habitat impact;
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time; or
"-" = Not applicable for this oil type.

Table 8. Diesel-Like Oils: Summary of relative environmental impact from response methods for spills in water environments.

Water Environment				
Response Method	**Open Water**	**Large Rivers**	**Small Lakes/Ponds**	**Small Rivers/Streams**
Physical Response Methods				
Natural Recovery	A	A	B	B
Booming	A	A	A	A
Skimming	A	A	B	B
Barriers/Berms	-	-	-	A
Physical Herding	B	B	B	B
Manual Oil Removal/Cleaning	-	-	C	C
Mechanical Oil Removal	-	-	C	C
Sorbents	B	B	A	A
Vacuum	A	A	A	A
Debris Removal	-	B	B	B

Sediment Reworking	-	-	-	-
Vegetation Removal	B	B	B	B
In-Situ Burning	A	B	B	B
Flooding	-	-	-	-
Low-Pressure, Cold-Water Flushing	-	-	-	-
High-Pressure, Cold-Water Flushing	-	-	-	-
Low-Pressure, Hot-Water Flushing	-	-	-	-
High-Pressure, Hot-Water Flushing	-	-	-	-
Steam Cleaning	-	-	-	-
Sand Blasting	-	-	-	-
Chemical Response Methods				
Dispersants	B	C	D	D
Emulsion Treating Agents	B	B	I	I
Visco-Elastic Agents	B	B	B	B
Herding Agents	B	D	B	D
Solidifiers	B	B	B	B
Chemical Shoreline Pretreatment	-	-	-	-
Shoreline Cleaning Agents	-	-	-	-
Biological Response Methods				
Nutrient Enrichment	-	-	I	I
Natural Microbe Seeding	-	-	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact;
B = May cause some adverse habitat impact;
C = May cause significant adverse habitat impact;
D = May cause the most adverse habitat impact;
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time; or
"-" = Not applicable for this oil type.

Table 9. Diesel-Like Oils: Summary of relative environmental impact from response methods for spills in shoreline habitats.

Shoreline Habitat								
Response Method	**Bedrock**	**Man-Made**	**Sand**	**Sand and Gravel**	**Vegetated Gravel**	**Shores**	**Mud**	**Wetlands**
Equivalent ESI No.*	**1A,2,8A**	**1B,6B,8B**	**4**	**3,5**	**6A**	**9A**	**9B**	**10A,B**
Physical Response Methods								
Natural Recovery	A	A	A	A	A	A	A	A

Booming	-	-	-	-	-	-	-	-
Skimming	-	-	-	-	-	-	-	-
Barriers/Berms	-	-	-	-	-	-	-	-
Physical Herding	-	-	-	-	-	-	-	-
Manual Oil Removal/Cleaning	B	A	B	B	B	B	D	D
Mechanical Oil Removal	-	-	B	C	D	C	D	D
Sorbents	A	A	A	A	A	A	A	A
Vacuum	B	B	B	B	B	B	C	B
Debris Removal	A	A	A	A	A	B	B	B
Sediment Reworking	-	-	B	B	B	D	D	D
Vegetation Removal	-	-	-	-	-	B	-	C
In-Situ Burning	B	B	-	-	-	B	C	B
Flooding	A	A	A	A	A	A	A	A
Low-Pressure, Cold-Water Flushing	A	A	B	A	A	A	C	A
High-Pressure, Cold-Water Flushing	B	A	D	C	B	C	D	D
Low-Pressure, Hot-Water Flushing	C	B	C	C	C	D	D	D
High-Pressure, Hot-Water Flushing	D	B	D	D	D	D	D	D
Steam Cleaning	D	C	-	D	D	-	-	-
Sand Blasting	D	C	-	-	-	-	-	-
Chemical Response Methods								
Dispersants	-	-	-	-	-	-	-	-
Emulsion Treating Agents	-	-	-	-	-	-	-	-
Visco-Elastic Agents	-	-	-	-	-	-	-	-
Herding Agents	-	-	-	-	-	-	-	-
Solidifiers	B	B	B	-	-	D	D	D
Chemical Shoreline Pretreatment	I	I	I	I	I	I	I	I
Shoreline Cleaning Agents	-	B	-	-	-	I	D	I
Biological Response Methods								
Nutrient Enrichment	C	C	B	B	B	B	I	I
Natural Microbe Seeding	I	I	I	I	I	I	I	I

***Key to ESI codes in Table 5 on page 14.**
The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact.; B = May cause some adverse habitat impact; C = May cause significant adverse habitat impact; D = May cause the most adverse habitat impact; I = Insufficient Information - impact or effectiveness of the

method could not be evaluated at this time; or "-" = Not applicable for this oil type.

Table 10. Medium Oils: Summary of relative environmental impact from response methods for spills in water environments.

Water Environment				
Response Method	**Open Water**	**Large Rivers**	**Small Lakes/Ponds**	**Small Rivers/Streams**
Physical Response Methods				
Natural Recovery	B	B	C	C
Booming	A	A	A	A
Skimming	A	A	A	A
Barriers/Berms	-	-	-	A
Physical Herding	B	B	B	B
Manual Oil Removal/Cleaning	-	B	C	C
Mechanical Oil Removal	-	B	C	C
Sorbents	B	B	A	A
Vacuum	A	A	A	A
Debris Removal	-	B	B	B
Sediment Reworking	-	-	-	-
Vegetation Removal	B	B	B	B
In-Situ Burning	A	B	B	B
Flooding	-	-	-	-
Low-Pressure, Cold-Water Flushing	-	-	-	-
High-Pressure, Cold-Water Flushing	-	-	-	-
Low-Pressure, Hot-Water Flushing	-	-	-	-
High-Pressure, Hot-Water Flushing	-	-	-	-
Steam Cleaning	-	-	-	-
Sand Blasting	-	-	-	-
Chemical Response Methods				
Dispersants	B	C	D	D
Emulsion Treating Agents	B	B	I	I
Visco-Elastic Agents	B	B	B	B
Herding Agents	B	D	B	D
Solidifiers	B	B	B	B

Chemical Shoreline Pretreatment	-	-	-	-
Shoreline Cleaning Agents	-	-	-	-
Biological Response Methods				
Nutrient Enrichment	I	I	I	I
Natural Microbe Seeding	I	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact;
B = May cause some adverse habitat impact;
C = May cause significant adverse habitat impact;
D = May cause the most adverse habitat impact;
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time; or
"-" = Not applicable for this oil type.

Table 11. Medium Oils: Summary of relative environmental impact from response methods for spills in shoreline habitats.

Shoreline Habitat								
Response Method	**Bedrock**	**Man-Made**	**Sand**	**Sand and Gravel**	**Vegetated Gravel**	**Shores**	**Mud**	**Wetlands**
Equivalent ESI No.*	**1A,2,8A**	**1B,6B,8B**	**4**	**3,5**	**6A**	**9A**	**9B**	**10A,B**
Physical Response Methods								
Natural Recovery	A	B	B	B	B	B	A	A
Booming	-	-	-	-	-	-	-	-
Skimming	-	-	-	-	-	-	-	-
Barriers/Berms	-	-	-	-	-	-	-	-
Physical Herding	-	-	-	-	-	-	-	-
Manual Oil Removal/Cleaning	B	B	A	A	B	B	C	C
Mechanical Oil Removal	-	-	B	B	C	C	D	D
Sorbents	A	A	A	A	A	B	A	A
Vacuum	B	B	B	B	B	B	B	B
Debris Removal	A	A	A	A	A	B	B	B
Sediment Reworking	-	-	B	B	B	D	D	D
Vegetation Removal	-	-	-	-	-	B	-	C
In-Situ Burning	B	B	B	B	B	B	C	B
Flooding	B	B	A	A	A	A	A	A
Low-Pressure, Cold-Water Flushing	A	A	B	A	A	A	C	A
High-Pressure, Cold-Water Flushing	B	A	D	C	B	C	D	D
Low-Pressure, Hot-Water Flushing	B	B	C	C	C	D	C	D

High-Pressure, Hot-Water Flushing	C	B	D	D	D	D	D	D
Steam Cleaning	D	C	-	D	D	-	-	-
Sand Blasting	D	C	-	-	-	-	-	-
Chemical Response Methods								
Dispersants	-	-	-	-	-	-	-	-
Emulsion Treating Agents	-	-	-	-	-	-	-	-
Visco-Elastic Agents	-	-	-	-	-	-	-	-
Herding Agents	-	-	-	-	-	-	-	-
Solidifiers	B	B	B	B	B	D	C	D
Chemical Shoreline Pretreatment	I	I	I	I	I	I	I	I
Shoreline Cleaning Agents	B	B	B	B	B	I	D	I
Biological Response Methods								
Nutrient Enrichment	C	C	B	B	B	B	I	I
Natural Microbe Seeding	I	I	I	I	I	I	I	I

***Key to ESI codes in Table 5 on page 14.**
The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.;
B = May cause some adverse habitat impact;
C = May cause significant adverse habitat impact;
D = May cause the most adverse habitat impact;
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time; or
"-" = Not applicable for this oil type.

Table 12. Heavy Oils: Summary of Relative Environmental Impact from Response Methods for spills in water environments.

Water Environment				
Response Method	**Open Water**	**Large Rivers**	**Small Lakes/Ponds**	**Small Rivers/Streams**
Physical Response Methods				
Natural Recovery	B	C	C	C
Booming	A	A	A	A
Skimming	A	A	A	A
Barriers/Berms	-	-	-	A
Physical Herding	B	B	B	B
Manual Oil Removal/Cleaning	B	B	B	B
Mechanical Oil Removal	B	B	C	C
Sorbents	B	B	A	A
Vacuum	A	A	A	A

Debris Removal	-	B	B	B
Sediment Reworking	-	-	-	-
Vegetation Removal	B	B	B	B
In-Situ Burning	A	B	B	B
Flooding	-	-	-	-
Low-Pressure, Cold-Water Flushing	-	-	-	-
High-Pressure, Cold-Water Flushing	-	-	-	-
Low-Pressure, Hot-Water Flushing	-	-	-	-
High-Pressure, Hot-Water Flushing	-	-	-	-
Steam Cleaning	-	-	-	-
Sand Blasting	-	-	-	-
Chemical Response Methods				
Dispersants	-	-	-	-
Emulsion Treating Agents	B	B	I	I
Visco-Elastic Agents	-	-	-	-
Herding Agents	-	-	-	-
Solidifiers	-	-	-	-
Chemical Shoreline Pretreatment	-	-	-	-
Shoreline Cleaning Agents	-	-	-	-
Biological Response Methods				
Nutrient Enrichment	I	I	I	I
Natural Microbe Seeding	I	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact;
B = May cause some adverse habitat impact;
C = May cause significant adverse habitat impact;
D = May cause the most adverse habitat impact;
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time; or
"-" = Not applicable for this oil type.

Table 13. Heavy Oils: Summary of Relative Environmental Impact from Response Methods for Spills in Shoreline Habitats.

Shoreline Habitat								
Response Method	**Bedrock**	**Man-Made**	**Sand**	**Sand and Gravel**	**Vegetated Gravel**	**Shores**	**Mud**	**Wetlands**
Equivalent ESI No.*	**1A,2,8A**	**1B,6B,8B**	**4**	**3,5**	**6A**	**9A**	**9B**	**10A,B**
Physical Response Methods								

Natural Recovery	B	B	B	B	B	B	B	B
Booming	-	-	-	-	-	-	-	-
Skimming	-	-	-	-	-	-	-	-
Barriers/Berms	-	-	-	-	-	-	-	-
Physical Herding	-	-	-	-	-	-	-	-
Manual Oil Removal/Cleaning	A	A	A	A	A	B	C	C
Mechanical Oil Removal	-	-	A	B	C	C	D	D
Sorbents	B	B	B	B	B	B	B	A
Vacuum	B	B	A	B	B	B	B	B
Debris Removal	A	A	A	A	A	B	B	B
Sediment Reworking	-	-	B	B	B	D	D	D
Vegetation Removal	-	-	-	-	-	B	-	C
In-Situ Burning	B	B	B	B	B	B	C	B
Flooding	C	C	B	C	C	B	A	B
Low-Pressure, Cold-Water Flushing	C	C	B	B	B	B	C	B
High-Pressure, Cold-Water Flushing	B	B	D	C	B	D	D	D
Low-Pressure, Hot-Water Flushing	B	B	B	B	B	D	C	D
High-Pressure, Hot-Water Flushing	C	B	D	D	D	D	D	D
Steam Cleaning	D	C	-	D	D	-	-	-
Sand Blasting	D	C	-	-	-	-	-	-
Chemical Response Methods								
Dispersants	-	-	-	-	-	-	-	-
Emulsion Treating Agents	-	-	-	-	-	-	-	-
Visco-Elastic Agents	-	-	-	-	-	-	-	-
Herding Agents	-	-	-	-	-	-	-	-
Solidifiers	-	-	-	-	-	-	-	-
Chemical Shoreline Pretreatment	I	I	I	I	I	I	I	I
Shoreline Cleaning Agents	B	B	B	B	B	I	D	I
Biological Response Methods								
Nutrient Enrichment	D	D	C	C	C	B	I	I
Natural Microbe Seeding	I	I	I	I	I	I	I	I

***Key to ESI codes in Table 5 on page 14.**
The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:

A = May cause the least adverse habitat impact.;
B = May cause some adverse habitat impact;
C = May cause significant adverse habitat impact;
D = May cause the most adverse habitat impact;
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time; or
"-" = Not applicable for this oil type.

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3.1 Introduction

Oil spill protection, recovery, and cleanup methods are described in the following sections for four water environments and eight shoreline habitats. Each section is organized in the following format:

- Description of the environment or habitat;
- Matrices of response methods for four oil types; and
- Short summaries of the key issues considered for each response method.

The inland habitats are presented in order of their sensitivity, from least to most sensitive to oil spill impact, first for water environments, then for shoreline habitats. Accordingly, water environments begin with large rivers and end with small lakes and ponds. Shoreline habitats begin with bedrock and end with wetlands.

Response methods in each matrix are listed in order, generally beginning with those that cause the least adverse habitat impact, to those that can cause the most adverse habitat impact. Methods for which insufficient information is available for some habitats are listed last. Methods that are not applicable for all four oil types are excluded from the tables.

The use of water environments and shoreline habitats generally reflects the distinction between oil on a water body versus oil that is stranded at the land-water interface. Water-based activities consist mostly of containment, protection, and collection methods while onshore response includes protection, recovery, and cleanup. A large spill will likely affect a wide range of habitats and require use of many different methods. However, large spills can be divided into a series of small spills for developing site-specific response strategies. Often, more than one response method can be used with minimal habitat impacts. Spill conditions may dictate selecting a specific method, or combination of methods, over other possible methods.

We encourage you to refer to Section 4 for more information on each response method. Also, the references listed in Appendix A can provide valuable, detailed information on specific topics or applications.

3.2 Open Water

Habitat Description

Open-water environments exist in large water bodies, such as the Great Lakes, Lake Champlain, and Lake Mead. These large water bodies have ocean-like wave and current conditions; however, lake currents are generally weak (less than one knot). Local weather conditions commonly cause sudden changes in sea state. Suspended sediment loads are highly variable, both spatially and over time. River mouths are particularly problematic areas, with high suspended sediment and debris loads, shallow zones, and manmade structures, which create complex water circulation patterns.

Thermal stratification with an upper, warm layer over cool, denser water is a common feature of large lakes during the warmer months. In most temperate lakes, stratification ends in the autumn when surface cooling combines with water mixing from high winds. Ice formation is a common characteristic of interior and northern lakes in winter months. Although all inland waters are surrounded by land, response operations for open-water environments are water-based; that is, protection and recovery equipment must be deployed from vessels.

Sensitivity

Open waters are considered to have low to medium sensitivity to oil spill impact because physical removal rates are high, water-column concentrations of oil can be rapidly diluted, and most organisms are mobile enough to move out of the area affected by the spill. Enclosed and protected areas of large lakes are more sensitive than offshore and nearshore waters because of slower dilution rates. Oil spills can affect fish in the water column, with the early life stages at greatest risk. Also, many birds (waterfowl, raptors, gulls, terns, and diving birds) feed and rest on the water, and therefore are highly vulnerable. Human use of affected

areas may be restricted for a period of time, potentially limiting access for navigation, transportation, water intakes, or recreational activities during the spill.

Free-floating flora or mats can occur in sheltered bays of nutrient-rich lakes. Such mats may be particularly susceptible to oil because of their location in bays where oil may accumulate. Moreover, the plants are at the water surface (where the oil is) and without underground roots to regenerate after being oiled.

Table 14. Relative Environmental Impact from Response Methods for Open Water Environments.

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Booming - Deflection/Exclusion	A	A	A	A
Booming - Containment	-	A	A	A
Skimming/Vacuum	-	A	A	A
In-Situ Burning	-	A	A	A
Natural Recovery	A	A	B	B
Physical Herding	B	B	B	B
Sorbents	-	B	B	B
Vegetation Removal	-	B	B	B
Emulsion Treating Agents	-	B	B	B
Visco-Elastic Agents/Solidifiers	-	B	B	-
Dispersants	D	B	B	-
Herding Agents	D	B	B	-
Manual Oil Removal/Cleaning	-	-	-	B
Mechanical Oil Removal	-	-	-	B
Nutrient Enrichment	-	-	I	I
Natural Microbe Seeding	-	-	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Open Water Environments

Least Adverse Habitat Impact

Booming

- Most effective in low-wave conditions and slow currents
- Safety concerns limit the containment of gasoline spills; however, booms can be used to exclude or deflect the spill away from sensitive resources

Skimming/Vacuum

- Effectiveness limited by current velocities and widely spread, thin sheens
- Not applicable to gasoline spills because of safety concerns

In-Situ Burning

- Most appropriate in offshore, rather than nearshore, areas
- More difficult to ignite emulsified and heavy oils and sustain the burn
- Safety issues for workers, vessels, and aircraft must be addressed
- Not applicable to gasoline spills due to safety concerns and containment difficulties

Natural Recovery

- Low impact except for medium- to heavy-category oils, which are persistent and would eventually strand on shorelines

Some Adverse Habitat Impact

Physical Herding

- May be needed under calm conditions to move oil toward recovery devices
- Water spray onto gasoline likely to mix the product into the water column

Sorbents

- Not a stand-alone technique except for very small spills
- Inhibit the evaporation of gasoline spills

Vegetation Removal

- May be appropriate if oil is trapped in floating vegetation

Emulsion-Treating Agents

- Not applicable to oils that do not form emulsions, such as gasoline

Visco-Elastic Agents/Solidifiers

- Not appropriate to gasoline spills because of safety concerns during application and inhibition of evaporation
- The recovery of treated oil must be considered
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

Dispersants

- Inhibit the evaporation of gasoline spills
- Use requires comparing the impact of dispersed versus undispersed oil
- Not effective on heavy or weathered oils

Herding Agents

- Most effective under calm conditions
- Not applicable to heavy oils because oil must be fluid
- Inhibit the evaporation of gasoline spills

Manual Oil Removal/Cleaning and Mechanical Oil Removal

- Effective only when heavy oils have solidified into large masses
- Complete removal of heavy oil is rarely achieved

Insufficient Information

- ***Nutrient Enrichment and Natural Microbe Seeding***
- Not applicable to gasoline and diesel-like oils because they rapidly evaporate
- There is insufficient information on impact and effectiveness for other oil types, particularly for open-water applications in fresh water

3.3 Large Rivers

Habitat Description

Large rivers have varying salinities, meandering channels, and high flow rates (currents usually greater than one knot). These rivers are not necessarily navigable to large vessels. If they are, the environment can include associated locks, dams, pools, and other manmade structures. Examples of large rivers include the Mississippi River and its major tributaries, the Hudson River, the Delaware River, and the Columbia River. Water levels vary seasonally, with potential for reversal of water flow up tributaries and into backwater lakes during high water. Floodplains are common characteristics of large rivers. Floods generate high suspended sediment and debris loads. In northern regions, ice covers the surface in winter. River banks or bars are discussed in the sections on shore habitats (Sections 3.6 to 3.13), and backwater lakes are discussed in Section 3.4.

Sensitivity

Large rivers have medium sensitivity to oil spill impact because, even though they have high natural removal rates, they also have extensive biological and human use. Biological resources of concern include concentrations of migratory waterfowl and shorebirds, fish, and endangered mussel beds. Under flood conditions, river floodplains contain highly sensitive areas that are important habitats for many valuable species. Floating vegetation is present in areas of low flow. Recreational use of rivers is very high, and many are major transportation corridors. Drinking, industrial, and cooling water intakes are quite vulnerable to oil spills in this environment because of turbulent mixing, and they often shut down when slicks are present.

High currents, eddies, mid-river bars, ice formation, and flooding may complicate response measures in this habitat. Water flow across weirs and dams is of special concern because it is often turbulent and likely to emulsify oil slicks as they pass over these structures. Emulsified oil has a density close to water; it can readily suspend beneath the surface and remain in the water column as it moves through a series of locks and dams. Also, oil can adsorb onto sediment particles, which then settle out in quiet backwaters, potentially contaminating these habitats.

Original document included a field sketch of the habitat.

Table 15. Relative Environmental Impact from Response Methods for Large River Environments.

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Booming - Deflection/Exclusion	A	A	A	A
Booming - Containment	-	A	A	A
Skimming/Vacuum	-	A	A	A
Natural Recovery	A	A	B	C
Physical Herding	B	B	B	B
Sorbents	-	B	B	B
In-Situ Burning	-	B	B	B
Emulsion Treating Agents	-	B	B	B
Vegetation Removal	-	B	B	B
Debris Removal	-	B	B	B
Visco-Elastic Agents/Solidifiers	-	B	B	B
Manual Oil Removal/Cleaning	-	-	B	B
Mechanical Oil Removal	-	-	B	B
Dispersants	D	C	C	-
Herding Agents	D	D	D	-

Nutrient Enrichment	-	-	I	I
Natural Microbe Seeding	-	-	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Large River Environments

Least Adverse Habitat Impact

Booming

- Used primarily for diverting slicks towards collection points in low-current areas
- Safety concerns limit the containment of gasoline spills; however, booms can be used to exclude or deflect the spill away from sensitive resources

Skimming/Vacuum

- Not applicable to gasoline spills because of safety concerns

Some Adverse Habitat Impact

Natural Recovery

- For small gasoline and diesel-like spills, evaporation and natural dispersion would rapidly remove surface slicks
- For all other types and sizes of spills, oil recovery and/or protection of sensitive resources should be attempted

Physical Herding

- May be needed to flush oil trapped in debris, eddies, etc. toward recovery devices
- Water spray onto gasoline spills will likely enhance mixing of the product into the water column

Sorbents

- Not applicable to gasoline spills because of safety concerns and inhibition of evaporation
- May not be practical for large rivers because oil will spread and drift rapidly
- Overuse results in excess waste generation

In-Situ Burning

- May not be practical in rivers because oil will spread rapidly
- Containment and maintenance of minimum thickness for burning (1-3 millimeters) is difficult in fast currents

Emulsion-Treating Agents

- Not applicable for gasoline products, which do not emulsify

Vegetation Removal

- May be considered where oil is trapped in floating vegetation along shore and in eddies
- Removal of oiled vegetation may be required to prevent secondary oiling of wildlife or chronic sheening

Debris Removal

- River debris can trap persistent oils, causing chronic sheening and exposure of aquatic resources

Visco-Elastic Agents/Solidifiers

- Not applicable to gasoline spills because of safety concerns during application and inhibition of evaporation
- Recovery of treated oil may be difficult
- May not be practical in rivers because oil will spread and drift rapidly
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

Manual Oil Removal/Cleaning

- Concentrations of heavy oils that have hardened into solid or semi-solid masses can be manually picked up, from boat or shore
- Hand tools can be used to pick up small accumulations of oiled debris
- Operations conducted from boats minimize potential for habitat disruption by trampling onshore

Mechanical Oil Removal

- May be needed to recover large amounts of oil/oily debris trapped in booms or along shore
- Equipment can be operated from barges with less impact; shore-based operations are likely to cause localized disruption of shoreline habitat

Probable Adverse Habitat Impact

Dispersants

- Inhibit the evaporation of gasoline spills
- Not effective on heavy or weathered oils
- For large spills, limited dilution of dispersed oil in rivers likely to raise toxicity concerns
- Impacts on water intakes downstream would have to be evaluated

Most Adverse Habitat Impact

Herding Agents

- High currents make proper application difficult and carry product away
- Not applicable to heavy oils because oil must be fluid

Insufficient Information

Nutrient Enrichment and Natural Microbe Seeding

- Not applicable to gasoline and diesel-like oil spills because they rapidly evaporate
- There is insufficient information on impact and effectiveness for other oil types, particularly for applications in rivers

3.4 Small Lakes and Ponds

Habitat Description

Lakes and ponds are standing bodies of water of variable size and water depth. Waves and currents are generally very low, although the water surface can become choppy. Water levels can fluctuate widely over time, particularly on manmade lakes. Smaller ponds can completely freeze over in winter. The bottom sediments close to shore can be soft and muddy, and the surrounding land can include wet meadows and marshes. Floating vegetation can be common.

The rate of water exchange is highly variable within this group, ranging from days to years. These water bodies can include sections of a river with low flow rates (e.g., behind diversion dams) or that are somewhat isolated from regular flow (e.g., backwater lakes or oxbow lakes). Isolated water bodies, such as kettle lakes, are unique members of this category because they have no surface water outflow, and therefore have very low flushing rates. In shallow water, boat operations would be limited and most response operations would be conducted from shore.

Sensitivity

Small lakes and ponds have medium to high sensitivity to oil spill impact because of low physical removal rates, limited dilution and flushing of oil mixed into the water column, and high biological and human use. They provide valuable habitat for migrating and nesting birds and mammals, and support important fisheries. Small lakes can be the focus of local recreational activities. Associated wetlands have higher sensitivities and are discussed in Section 3.13.

Wind will control the distribution of slicks, holding the oil against a lee shore or spreading it along shore and into catchment areas. Wind shifts can completely change the location of slicks, contaminating previously clean areas. Thus, early protection of sensitive areas is important. The inlet and outlet are key areas for focusing protection efforts. Oil impacts on floating vegetation depend to a large degree on dose, with possible elimination of plants at high doses. Section 5 addresses sinking oils and response under ice conditions.

Original document included a field sketch of the habitat.

Table 16. Relative Environmental Impact from Response Methods for Small Lake and Pond Environments.

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Booming - Deflection/Exclusion	A	A	A	A
Booming - Containment	-	A	A	A
Skimming/Vacuum	-	A	A	A
Sorbents	-	A	A	A
Natural Recovery	A	B	C	C
In-Situ Burning	B	B	B	B
Herding Agents	B	B	B	-
Debris Removal	-	B	B	B
Vegetation Removal	-	B	B	B
Physical Herding	C	B	B	B
Visco-Elastic Agents/Solidifiers	-	B	B	-
Manual Oil Removal/Cleaning	-	C	C	B
Mechanical Oil Removal	-	C	C	C
Dispersants	D	D	D	-
Emulsion Treating Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Small Lake and Pond Environments

Least Adverse Habitat Impact

Booming

- Use containment booms to keep oil from spreading
- Safety concerns limit the containment of gasoline spills; however, booms can be used to
- exclude or deflect the spill away from sensitive resources

Skimming/Vacuum

- Not applicable to gasoline spills because of safety concerns
- Land-based operations need site-specific restrictions and monitoring to minimize physical destruction

Sorbents

- Overuse results in excess waste generation
- Inhibit the evaporation of gasoline spills

Some Adverse Habitat Impact

Natural Recovery

- Low impact for light oils but may have significant impact for medium crudes and heavier fuel oils because they persist and affect shoreline habitats

In-Situ Burning

- Less environmental impact in winter when snow and ice provide some protection, plants are dormant, and fewer animals are present
- Safety concerns limit containment of gasoline, but may be safely used with natural containment, such as gasoline trapped in ice

Herding Agents

- Most effective under calm conditions
- Should be coupled with recovery when used to protect sensitive habitats
- Not effective on heavy oils because oil must be fluid

Debris Removal

- Debris may be associated with nests or living areas (e.g., beaver lodges), so impacts on resident animal habitat may need consideration
- Operate from small boats to minimize substrate disruption

Vegetation Removal

- If oil is trapped in floating vegetation, may be only way to recover the oil in the absence of water currents
- May be appropriate to prevent secondary oiling of wildlife

Physical Herding

- Care should be taken not to drive oil into the water column or sediment

Visco-Elastic Agents/Solidifiers

- Visco-elastic agents, by improving overall oil recovery from the water surface, reduce secondary shoreline oiling
- Not applicable to gasoline spills because of safety concerns during application and inhibition of evaporation
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

Probable Adverse Habitat Impact

Manual Oil Removal/Cleaning

- Inherent inefficiency of manual removal of fluid oils would require large crews or repeated entries, resulting in disruption to substrate and wildlife
- Not applicable for gasoline spills because of safety concerns

Mechanical Oil Removal

- May be needed where oil has heavily contaminated bottom sediments
- May require very intrusive recovery techniques

Most Adverse Habitat Impacts

Dispersants

- Inhibit the evaporation of gasoline spills
- Shallow water depths and low dilution rates may result in high aquatic toxicity from oil/dispersant mixtures

Insufficient Information

Emulsion-Treating Agents

- Not applicable to oils that do not form emulsions, such as gasoline
- Insufficient toxicity data to evaluate environmental impact of shallow freshwater environment use

Nutrient Enrichment and Natural Microbe Seeding

- Not applicable to gasoline spills because they rapidly evaporate
- There is insufficient information on impact and effectiveness for other oil types
- There are special concerns about nutrient overloading in small, restricted water bodies

3.5 Small Rivers and Streams

Habitat Description

Small rivers and streams are characterized by shallow water (generally 1-2 meters) and narrow channels. Water flow can be highly variable, both throughout the seasons and with distance downstream. This grouping includes a wide range of waterbodies, from fast-flowing streams with low falls and numerous rapids over bedrock and gravel, to slow-moving bayous bordered by low muddy banks and fringed with vegetation. Sections of the channel may be choked with log jams and debris, and mid-channel bars and islands can divide water flow into multiple channels. Both boat and vehicular access can be very limited; often the only access will be at bridge crossings. Ice may further complicate response measures in this habitat.

Sensitivity

Small rivers and streams have medium to high sensitivity to oil spill impact. Oil spills may have more of an impact on small rivers and streams than on large rivers due to a variety of conditions, such as lower flow conditions, lower dilution rates, lower overall energy, and greater range of natural habitats. Fish spawn in streams and the tributaries of larger rivers; thus, the most sensitive, early life stages can be present. Fringing wetlands and adjacent floodplains are closely connected to small rivers and streams, and they are areas of high biological use and low natural removal rates.

Slicks usually contaminate both banks, and non-viscous oils are readily mixed into the entire water column in shallow streams, potentially exposing both aquatic and benthic organisms to oil. Initial weathering rates may be slower because spreading and evaporation are restricted in narrow channels and heavy vegetation cover. Fish kills are possible for spills ranging from gasoline to medium crude oils. Many different kinds of mammals, birds, reptiles, and amphibians use the stream bank habitats, and there can be localized high mortality rates of these animals. Spills can cause closure of water intakes for drinking water, irrigation, or industrial use along small rivers. A more aggressive response may be appropriate to prevent contamination of downstream habitat, particularly if water intakes, populated areas, or special habitat resources are present.

Original document included a field sketch of the habitat.

Table 17. Relative Environmental Impact from Response Methods for Small River and Stream Environments.

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Booming - Deflection/Exclusion	A	A	A	A
Skimming	A	A	A	A
Booming-Containment	-	A	A	A

Vacuum	-	A	A	A
Sorbents	-	A	A	A
Barriers/Berms	B	A	A	A
Physical Herding	B	B	B	B
Natural Recovery	A	B	C	C
Debris Removal	-	B	B	B
In-Situ Burning	C	B	B	B
Manual Oil Removal/Cleaning	-	C	C	B
Mechanical Oil Removal	-	C	C	C
Dispersants	D	D	D	-
Herding Agents	D	D	D	-
Emulsion Treating Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Small River and Stream Environments

Least Adverse Habitat Impact

Booming

- Used primarily to divert slicks towards collection points in low-current areas
- Safety concerns limit the containment of gasoline spills; however, booms can exclude or deflect the spill away from sensitive resources
- Expect low effectiveness with fast currents, shallow water, and steep banks

Skimming/Vacuum

- To protect public health and downstream resources where spreading is limited, recovery of large gasoline spills could be attempted with firefighting foam to suppress vapors and respiratory protection for workers

Sorbents

- Deploy in booms to recover sheens in low-current areas and along shore
- Trampling of stream bank and bed habitats during deployment and recovery of sorbents can disrupt streamside vegetation and drive oil into the sediment
- Overuse results in excess waste generation

Barriers/Berms

- Potential for physical disruption and sediment contamination in immediate area of the barrier/berm
- If all or most of the flow is diverted, may need to monitor water requirements to habitats downstream of the barrier to mitigate potential impacts
- Safety concerns limit actions at gasoline spills, although berms built ahead of the slick could be used to exclude oil from sensitive areas, such as side channels

Some Adverse Habitat Impact

Physical Herding

- May be only means to flush oil trapped in log jams, beaver dams, behind rocks, and in vegetation debris along banks to downstream collection areas
- Spraying of gasoline spills can mix the oil into the water column

Natural Recovery

- For small gasoline and diesel-like oil spills, evaporation and natural dispersion would rapidly remove surface slicks
- For all other types and sizes of spills, recovery of free or pooled oil and/or protection of sensitive resources should be attempted

Debris Removal

- Will release trapped oil and speed natural flushing rates

Visco-Elastic Agents/Solidifiers

- Visco-elastic agents may speed recovery of contained oil when time is critical
- Solidifiers may immobilize even gasoline spills, preventing their transport downstream and further impact
- Ineffective on heavy oils, which are too viscous to allow the product to mix into the oil

Vegetation Removal

- May be needed to remove oil trapped in floating and fringing vegetation
- Remove oiled vegetation to prevent chronic sheening in sensitive areas or secondary oiling of wildlife
- Monitor crews to minimize physical disturbance, which can be severe

In-Situ Burning

- May be difficult to protect stream-side vegetation
- Safety concerns limit containment of gasoline, but may be safely used if natural containment is present
- Less impact in winter when snow/ice provide some protection, plants are dormant, and fewer animals are present
- May not be practical in fast flowing streams where containment and maintenance of minimum slick thickness (1-3 millimeters) may be difficult

Probable Adverse Habitat Impact

Manual Oil Removal/Cleaning

- Viable for heavy oils that have solidified versus fluid oils that have spread
- Stream bank disruption likely from movement of work crews

Mechanical Oil Removal

- Only consider when large amounts of solidified oil have accumulated in the stream channel and need to be removed quickly

Most Adverse Habitat Impact

Dispersants

- Enhanced mixing of oil into the water column with restricted dilution will increase acute toxicity to aquatic organisms

Herding Agents

- Toxicity concerns when early life stages are present
- May not be practical due to fast currents and rough water surface
- Oil must be fluid, so not appropriate to heavy oils

Insufficient Information

Emulsion-Treating Agents

- Insufficient toxicity data to evaluate environmental impact of shallow freshwater environment use
- Not applicable to oils that do not form emulsions, such as gasoline

Nutrient Enrichment and Natural Microbe Seeding

Not applicable to gasoline spills because they rapidly evaporate

- There is insufficient information on impact and effectiveness, particularly for applications in small rivers and streams

3.6 Bedrock Habitats (ESI = 1A, 2, 8A)

Habitat Description

This shoreline type is characterized by an impermeable rocky substrate. The rock surface can be highly irregular, with numerous cracks and crevices. The slope of the shoreline varies from vertical rocky cliffs to shelving bedrock shores where flat or gently dipping rock layers have been cut by waves into wide platforms. Bedrock habitats are exposed to wide ranges in wave energy; headlands in the Great Lakes and other large lakes are the most exposed and bedrock shorelines in sheltered lakes are the least exposed. There can be a thin veneer of sand and gravel sediments on the rock platforms, although storm waves will strip these sediments off exposed shorelines. Boulder-sized debris can accumulate at the base of exposed rocky cliffs.

Sensitivity

Bedrock shoreline habitats have a range of sensitivities to oil spills, depending upon their degree of exposure to natural removal processes. They have few attached organisms and plants, and rocky shore productivity is typically low. However, they may provide shelter to fish and nesting sites for birds which can be present in large numbers in nearshore waters.

In exposed settings, oil may be partially held offshore by wave reflection off steep cliffs and platforms. Any oil that is deposited will be rapidly removed from exposed faces, although oil persistence on any specific shoreline segment is related to the incoming wave energy during, and shortly after, a spill. The most resistant oil would occur as a patchy band at or above the high water line, or deposited in any surface sediments.

In sheltered settings, oil will readily adhere to the rough rocky surface, forming a distinct band along the water line. Cracks and crevices will be sites of oil pooling and persistence. Oil will also penetrate and persist in any surface sediments. Medium to heavy oils can be very sticky and form thick black bands, while lighter oils are more readily removed by wave action, evaporation, and response efforts.

Original document included a field sketch of the habitat.

Table 18. Relative Environmental Impact from Response Methods for Bedrock Habitats (ESI = 1A, 2, 8A).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Natural Recovery	A	A	A	B
Debris Removal	-	A	A	A
Sorbents	B	A	A	B
Flooding	B	A	B	C
Low-Pressure, Cold-Water Flushing	B	A	A	C
High-Pressure, Cold-Water Flushing	B	B	B	B
Manual Oil Removal/Cleaning	-	B	B	A

Vacuum	-	B	B	B
In-Situ Burning	-	B	B	B
Shoreline Cleaning Agents	-	-	B	B
Solidifiers	-	B	B	-
Low-Pressure, Hot-Water Flushing	-	C	B	B
Nutrient Enrichment	-	C	C	D
High-Pressure, Hot-Water Flushing	-	D	D	C
Steam Cleaning	-	D	D	D
Sand Blasting	-	D	D	D
Natural Microbe Seeding	-	I	I	I
Chemical Shoreline Pretreatment	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Bedrock Habitats

Least Adverse Habitat Impact

Natural Recovery

- Sheltered bedrock may need cleanup because of slow natural removal rates
- Cleanup of larger spills may be needed because of the amount of oil present
- Heavy oils may persist on all but the most exposed shores

Debris Removal

Degree of oiling that warrants debris removal and disposal depends on human and sensitive resource use of the site

Sorbents

Overuse generates excess waste

Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents

Some Adverse Habitat Impact

Flooding and Low-Pressure, Cold-Water Flushing

- Most effective on fresh, fluid oils
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

High-Pressure, Cold-Water Flushing

- Primarily applicable to medium-crude oils while still fresh and liquid
- Can be effective in removing oil from crevices and pockets of sediment on bedrock

Manual Oil Removal/Cleaning

- Expect significant residues of diesel and medium oils with only manual removal because of their fluidity and difficulty of manual pickup
- Useful for heavy oils in patches or crevices

Vacuum

- Not applicable to gasoline spills because of safety concerns

In-Situ Burning

- Can effectively remove heavy oil accumulations
- Concerns about air pollution, thermal impact on biota, and physical nature of the residue

Shoreline Cleaning Agents

- May be only technique to remove sticky oils without hot-water, high-pressure washing
- Individual products vary in their toxicity and recoverability of the treated oil

Solidifiers

- Prevent the oil from being washed back into the water and are most appropriate for heavy accumulations of pooled oil on shelving bedrock
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

Low-Pressure, Hot Water Flushing

- Any organisms in the application area would be adversely affected by hot water
- Most effective on heavy crudes where heat would make oil more fluid

Probable Adverse Habitat Impact

Nutrient Enrichment

- Not applicable to gasoline spills because they rapidly evaporate
- Concerns about nutrient overloading in poorly flushed areas or where nutrient toxicity, especially ammonia, might be significant
- Potentially effective for lighter oils that leave thin residues; less effective for thick, wea thered oil residues

High-Pressure, Hot-Water Flushing

- Will likely kill any attached organisms; use is appropriate in limited areas only when oil removal is needed for aesthetic reasons

Most Adverse Habitat Impact

Steam Cleaning And Sand Blasting

- Highly intrusive techniques that will kill any organisms present
- Use only for aesthetic reasons in very limited areas

Insufficient Information

Natural Microbe Seeding

- There is insufficient information on impact and effectiveness
- Chemical Shoreline Pretreatment
- There is insufficient information on available products, their effectiveness, or impact

3.7 Manmade Structures (ESI = 1B, 6B, 8B)

Habitat Description

Manmade structures include vertical shore protection structures such as seawalls, piers, and bulkheads, as well as riprap revetments and groins, breakwaters, and jetties. Vertical structures can be constructed of concrete, wood, and corrugated metal. They usually extend below the water surface, although seawalls can have beaches or riprap in front of them. Riprap revetments are constructed of boulder-sized pieces of rock, rubble, or formed concrete pieces (e.g., tetrapods), placed parallel to the shoreline for shore protection. Riprap groins are oriented perpendicular to shore to trap sediment; jetties are designed to protect and maintain channels; and breakwaters are offshore structures constructed to protect an area from wave attack. Riprap structures have very large void spaces and are permeable, while seawalls and bulkheads have impermeable, solid substrates. These structures are very common along developed shores, particularly in harbors, marinas, and residential areas. The range in degree of exposure to waves and currents varies widely, from very low in dead-end canals, to very high on offshore breakwaters. Boat wakes can generate wave energy in otherwise sheltered areas.

Sensitivity

Manmade structures have a range of sensitivities to oil spills, depending on the degree of exposure to natural removal processes. Biological communities and use are sparse. Often, there are sources of pollutants or habitat degradation nearby, such as urban runoff, chronic small oil spills in marinas, poor water quality, and limited water circulation. More intrusive cleanup techniques are often conducted due to their lower biological use, higher public demand for oil removal for aesthetic reasons, and need to minimize human exposure to oil in populated areas. It is acknowledged that manmade structures can vary in permeability, cohesion, and mobility and, in turn, how they are affected by oiling. In this document, however, manmade structures have been grouped together so that the higher degree of cleanup often required can be adequately addressed.

Vertical structures are generally impermeable to oil penetration, but oil can heavily coat rough surfaces, forming a band at the water line. During storms, oil can splash over the top and contaminate terrestrial habitats. Riprap poses significant cleanup problems because of large void spaces between the riprap and heavy accumulations of debris. Large amounts of oil can become trapped in the riprap, where it is difficult to remove and a potential source of sheening.

Original document included a field sketch of the habitat.

Table 19. Relative Environmental Impact from Response Methods for Manmade Structures (ESI = 1B, 6B, 8B).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Manual Oil Removal/Cleaning	-	A	A	A
Debris Removal	-	A	A	A
High-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	B	A	A	B
Vacuum	-	B	A	A
Natural Recovery	A	A	B	B
Flooding	B	A	A	C
Low-Pressure, Cold-Water Flushing	B	A	A	C
Low-Pressure, Hot-Water Flushing	-	B	B	B
High-Pressure, Hot-Water Flushing	-	B	B	B
Shoreline Cleaning Agent	-	B	B	B
Solidifiers	B	B	B	-
In-Situ Burning	-	B	B	B
Nutrient Enrichment	-	C	C	D
Steam Cleaning	-	C	C	C

Sand Blasting	-	C	C	C
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Manmade Structures

Least Adverse Habitat Impact

Manual Oil Removal/Cleaning and Debris Removal

- Effective for removing debris and small, persistent pockets of oil

High-Pressure, Cold-Water Flushing

- Effective for removing sticky oils from solid surfaces and flushing pooled oil from riprap crevices, even for gasoline in populated areas
- May flush oiled sediments (if present) into nearshore bottom habitats
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Sorbents

- Use along riprap structures to recover residual sheening oil after other cleanup methods have been conducted, even for gasoline
- Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
- Overuse results in excess waste generation

Vacuum

- Early use of vacuum on pooled oil in crevices can increase the oil recovery rate and minimize oil losses during flushing
- Can only remove thick oil from accessible areas, so high residual oil likely

Natural Recovery

- Most effective for lighter oils and more exposed settings
- Heavier oils may necessitate removing persistent residues

Some Adverse Habitat Impact

Flooding

- Not applicable to seawalls; on riprap, only effective when the oil is fluid
- May be used on riprap in developed areas, even for gasoline spills, where pockets of the spilled product pose human health concerns
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Low-Pressure, Cold-Water Flushing

- Only effective when the oil is fluid
- Directed water spray can help remove trapped oil, even for gasoline
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Low-Pressure, Hot-Water Flushing and High-Pressure, Hot-Water Flushing

- Assumes that there are no biological communities in or immediately downslope from treatment area
- High water temperatures are often needed to liquefy heavy oils
- High water pressures are often needed to remove weathered oils from solid substrates and riprap

Shoreline Cleaning Agents

- Individual products vary in their toxicity and ability to recover the treated oil

Solidifiers

- Appropriate to recover and control chronic sheening, even for gasoline
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

In-Situ Burning

- Thick oil likely to occur as isolated pockets that are difficult to access and burn
- There will be concerns about air pollution and physical nature of the residue
- Public safety issues for burning in developed areas will be of special concern

Probable Adverse Habitat Impact

Nutrient Enrichment

- Not applicable to gasoline spills because they rapidly evaporate
- Concerns about nutrient overloading in poorly flushed areas or where nutrient toxicity, especially ammonia, might be significant
- Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues

Steam Cleaning and Sand Blasting

- Used when removing persistent oil is required for aesthetic reasons

Insufficient Information

Chemical Shoreline Pretreatment

- There is insufficient information on available products, their effectiveness, and impact
- Natural Microbe Seeding
- There is insufficient information on impact and effectiveness, particularly for applications on manmade structures

3.8 Sand Habitats (ESI = 4)

Habitat Description

Sand habitats have a substrate composed of sediments that are predominantly finer than 2 millimeters but greater than silt or clay-sized material (see Appendix B for grain sizes). The shoreline may consist of well-sorted sands of one principal size, or of poorly sorted mixtures of muddy sand, gravelly sand, or a combination of these two. When the sediments are fine-grained sand, beaches may be wide and flat; where the sediments are coarse-grained sand, they usually are steeper and narrower. Sandy shorelines may be naturally eroding, accreting, or stable, and groins or breakwaters may be placed to trap sand and maintain some beaches. Exposed sand beaches can undergo rapid erosional or depositional changes during storms. In developed areas, sand beaches can be artificially created by man and are commonly used for recreation. Sand bars and banks along rivers are also included in this habitat.

Sensitivity

Sand habitats have low to medium sensitivity to oil spills. They generally do not have sizable biological communities except where the habitat tends to be protected and consists of poorly sorted muddy sediments. Thus, ecological effects are likely to be of limited extent because of the low natural biological productivity. In developed areas, sand beaches are considered sensitive because of their high recreational use.

During small spills, oil will concentrate in a band along the swash line. Maximum penetration into fine-grained sand will be less than 15 centimeters; penetration in coarse sand can reach 25 centimeters or greater. Clean sand can bury oiled layers quickly, creating more difficult cleanup issues. On heavily used recreational beaches, extensive cleanup is usually required to remove as much of the oil as possible. When large amounts of sediment must be removed, it may be necessary to replace these sediments with clean material. Traffic on sand can push oil deeper.

Original document included a field sketch of the habitat.

Table 20. Relative Environmental Impact from Response Methods for Sand Habitats (ESI = 4).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Debris Removal	-	A	A	A
Natural Recovery	A	A	B	B
Flooding	B	A	A	B
Sorbents	-	A	A	b
Manual Oil Removal/Cleaning	D	B	A	A
Mechanical Oil Removal	D	B	B	A
Low-Pressure, Cold-Water Flushing	B	B	B	B
Vacuum	-	B	B	B
Sediment Reworking	D	B	B	B
Nutrient Enrichement	-	B	B	C
Shoreline Cleaning Agents	-	-	B	B
Solidifiers	-	B	B	-
In-situ Burning	-	-	B	B
Low-Pressure, Hot-Water Flushing	D	C	C	B
High-Pressure, Cold-Water Flushing	D	D	D	D
High-Pressure, Hot-Water, Flushing	D	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Sand Habitats

Least Adverse Habitat Impact

Debris Removal

- Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources

Natural Recovery

- Lower impact for small spills, lighter oil types, and remote areas

Flooding

- Only effective when the oil is fluid and on the sand surface, rather than penetrated or buried
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Sorbents

- Not applicable to gasoline spills because they rapidly evaporate
- Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
- Overuse results in excess waste generation

Some Adverse Habitat Impact

Manual Oil Removal/Cleaning

- Minimizes sediment removal and problems of erosion and waste disposal
- Effective when oil is mostly on the surface, not buried beneath clean sand
- Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated by manual cleanup are not balanced by benefits in removing oil

Mechanical Oil Removal

- Tends to remove large amounts of clean sand with the oiled sand
- Use on high-use beaches where rapid removal of oil is required and where long stretches of shoreline are heavily oiled
- Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated from mechanical cleanup are not balanced by benefits in removing oil

Low-Pressure, Cold-Water Flushing

- Only effective when the oil is fluid and adheres loosely to the sediments
- Optimize pressure to minimize the amount of sand washed downslope

Vacuum

- Early use of vacuum on pooled, liquid oil can prevent deeper penetration
- Will minimize amount of sorbent waste when used with flushing efforts
- Can vacuum heavy, non-sticky oil from sand substrates completely, but slowly

Sediment Reworking

- Appropriate for lightly oiled and stained sediments, to speed removal rates, and as a final step to polish recreational beaches
- Because gasoline tends to quickly evaporate, habitat disruption, worker safety concerns, and waste generated from sediment reworking are not balanced by benefits in removing oil

Nutrient Enrichment

- Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues
- May be concern about nutrient overloading in poorly flushed areas
- Not applicable to gasoline spills because they rapidly evaporate

Shoreline Cleaning Agents

- May be only technique to remove viscous oils without removing sediment
- Individual products vary in their toxicity and ability to recover the treated oil

Solidifiers

- Not applicable to gasoline spills because they rapidly evaporate
- Early use may prevent pooled oil from penetrating deeper
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

In-Situ Burning

- Can effectively remove pooled surface oil accumulations
- Concerns about air pollution, physical nature of the residue, and thermal impact on biota
- May have to dig trenches to accumulate oil in pools
- Lighter oils will penetrate the sand, leaving insufficient surface concentrations to burn

Probable Adverse Habitat Impact

Low-Pressure, Hot-Water Flushing

- May be needed to soften and lift sticky oil off the sand surface
- Any organisms present will be adversely affected by hot water

Most Adverse Habitat Impact

High-Pressure, Cold-Water Flushing And High-Pressure, Hot-Water Flushing

- High-pressure water jets will fluidize sand-sized sediments, erode the beach, and wash the oiled sediment into nearshore habitats

Insufficient Information

Chemical Shoreline Pretreatment

- More information needed on available products, their effectiveness, and impact

Natural Microbe Seeding

- There is insufficient information on impact and effectiveness in freshwater habitats

3.9 Mixed Sand and Gravel Habitats (ESI = 3, 5)

Habitat Description

Mixed sand and gravel habitats are characterized by a substrate that is composed predominantly of a mixture of sand- to cobble-sized sediments (see Appendix B for grain sizes). These habitats may vary from a well-sorted cobble layer overlying finer-grained (sand-sized) sediments to mixtures of sand, pebble, and cobble. Typically, well-sorted beaches are exposed to some wave or current action that separates and transports finer-grained sediments; however, the sediment distribution does not necessarily indicate the energy at a particular shoreline. On depositional beaches multiple berms can be formed at the different water levels generated during storms. In glaciated areas, the gravel component can include very large boulders. Natural replenishment rates are very slow for gravel, compared to sand. Mixed sand and gravel habitats occur as beaches along the Great Lakes and as point bars along rivers and streams.

Sensitivity

Mixed sand and gravel habitats have medium sensitivity to oil spills. Biological communities are very sparse because of sediment mobility, desiccation, and low organic matter. Most invertebrates living in this habitat are deep burrowers, such as some oligochaete worms and insect larvae. Characteristic insects are mayflies, stoneflies, caddisflies, and midges, although mayflies and stoneflies are scarce or absent where silt is present. The nearshore habitat is used by fish for spawning and protects fry and larvae. There are also limited numbers of birds and mammals.

Viscous oils reaching these habitats may not penetrate into the sediments because the pore spaces between sediments are filled with sand. Therefore, deep oil penetration and long-term persistence are lower than on gravel substrates. However, oil can still occur at depths below those of annual reworking, particularly if the oil is deposited high on the beach out of the reach of normal wave activity or is rapidly buried. Erosion can be a concern when large quantities of sediment are physically removed. In more sheltered areas, asphalt pavements can form if heavy surface oil deposits are not removed. Once formed, these pavements are very stable and can persist for years.

Original document included a field sketch of the habitat.

Table 21. Relative Environmental Impact from Response Methods for Mixed Sand and Gravel Habitats (ESI = 3, 5).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Debris Removal	-	A	A	A
Flooding	A	A	A	C
Natural Recovery	A	A	B	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	-	A	A	B
Vacuum	-	B	B	B
Manual Oil Removal/Cleaning	D	B	A	A
Sediment Reworking	D	B	B	B
Mechanical Oil Removal	D	C	B	B
Shoreline Cleaning Agents	-	-	B	B
Nutrient Enrichment	-	B	B	C
In-Situ Burning	-	-	B	B
Solidifiers	-	-	B	-
High-Pressure, Cold-Water Flushing	C	C	C	C
Low-Pressure, Hot-Water Flushing	D	C	C	B
High-Pressure, Hot-Water Flushing	D	D	D	D
Steam Cleaning	-	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Mixed Sand and Gravel Habitats

Least Adverse Habitat Impact

Debris Removal

- Degree of oiling that warrants debris removal and disposal depends on amount of use by humans and sensitive resources

Flooding

- Most effective when the oil is fluid and adheres loosely to the sediments
- Use on heavy oils is likely to leave large amounts of residual oil in the environment

Natural Recovery

- Least impact for small spills, lighter oil types, and remote areas

Low-Pressure, Cold-Water Flushing

- Most effective when the oil is fluid and adheres loosely to the sediments
- Excessive pressures can cause erosion
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Sorbents

- Overuse generates excess waste
- Useful for recovering sheens, even for gasoline spills
- Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents

Some Adverse Habitat Impact

Vacuum

- Early use of vacuum on pooled, liquid oil can prevent deeper penetration

Manual Oil Removal/Cleaning

- Gasoline tends to evaporate quickly; therefore manual cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits due to removing oil
- Minimizes sediment removal and problems of erosion and waste disposal
- Preferable when oil is mostly on the surface, not deeply penetrated or buried

Sediment Reworking

- Use to break up heavy surface oil or expose persistent subsurface oil deposits, particularly where sediment removal will cause erosion
- Use where there is sufficient exposure to waves to rework the sediments into their original profile and distribution
- Gasoline tends to evaporate quickly; therefore sediment reworking causes habitat disruption, worker safety concerns, and generates waste with no benefits due to removing oil

Mechanical Oil Removal

- Tends to remove large amounts of sediment with the oil
- Applicable for heavier oil types, which are difficult to remove otherwise
- Gasoline tends to evaporate quickly; therefore mechanical cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil

Shoreline Cleaning Agents

- May be only technique to remove viscous oils without removing sediment
- Individual products vary in their toxicity and ability to recover the treated oil

Nutrient Enrichment

- Not applicable to gasoline spills because they rapidly evaporate
- Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues
- Most applicable as a secondary technique after gross oil removal
- Concerns about nutrient overloading in poorly flushed areas

In-Situ Burning

- Can effectively remove pooled surface oil accumulations
- Concerns about air pollution, physical nature of the residue, and thermal impact on biota
- May have to dig trenches to accumulate oil in pools
- Lighter oils will not remain on the sediment surface

Solidifiers

- Early use may prevent pooled oil from penetrating deeper

- Not applicable to gasoline spills because they rapidly evaporate
- May be useful in recovering sheens when deployed as booms and pillows
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil
- Could use for lighter oils with correct product and situation

Probable Adverse Habitat Impact

High-Pressure, Cold-Water Flushing

- High-pressure water jets will flush oiled sediments into nearshore habitats
- Excessive pressures can cause erosion if large amounts of sand are present

Low-Pressure, Hot-Water Flushing

- Any organisms present will be affected by hot water
- Use on gasoline spills may transport the oil to more sensitive habitats

Most Adverse Habitat Impact

High-Pressure, Hot-Water Flushing

- Will flush oiled sand into nearshore zone and affect any organisms present

Steam Cleaning

- Highly intrusive technique; will kill any organisms present
- Potential for released oil to penetrate deeper into the sediments

Insufficient Information

Chemical Shoreline Pretreatment

- Need more information on available products, their effectiveness, and impact

Natural Microbe Seeding

- There is insufficient information on impact and effectiveness in freshwater habitats

3.10 Gravel Habitats (ESI = 6A)

Habitat Description

Gravel habitats are characterized by a substrate that is composed predominantly of gravel-sized sediments. By definition (see the grain-size chart in Appendix B), gravel includes sediments ranging in size from granules (greater than 2 millimeters) to boulders (greater than 256 millimeters). The sand fraction on the surface is usually less than ten percent, although the sand content can increase to 20 percent with depth. These sediments are highly permeable because there are few sand-sized sediments to fill the pore spaces between the individual gravel particles. Gravel substrates may also have low bearing capacity and, consequently, may not support vehicular traffic. Typically, well-sorted beaches are exposed to some wave or current action that reworks the sediments and removes the finer-grained sediments. However, the sediment distribution does not necessarily indicate the energy setting at a particular shoreline; sheltered beaches can still have a large gravel source. In glaciated areas, the gravel can include very large boulders. On depositional beaches, zones of pure pebbles or cobbles can form into multiple berms at the different water levels generated during storms. Gravel shorelines tend to be steeper than those composed of sand or mud. Natural replenishment rates are very slow for gravel compared to sand. Gravel habitats occur as beaches along the Great Lakes and as bars along rivers and streams.

Sensitivity

Gravel habitats have medium sensitivity to oil spills. Biological communities are very sparse because of sediment mobility, desiccation, and low organic matter. Characteristic insects are mayflies, stoneflies, caddisflies, and midges, all with larvae living among the sediments. Flatworms, leeches, and crustaceans may be found on the gravel undersides. The nearshore habitat is used by fish for spawning and provides protection for fry and larvae.

Gravel habitats are ranked higher in sensitivity than sand and gravel habitats because deep penetration of stranded oil into the permeable substrate is likely. Oil can penetrate to depths below those of annual reworking, resulting in long-term persistence of the oil. The slow replenishment rate makes removing oiled gravel highly undesirable. Also, formation of persistent asphalt

pavements is likely where there is high accumulation of persistent oils.

Original document included a field sketch of the habitat.

Table 22. Relative Environmental Impact from Response Methods for Gravel Habitats (ESI = 6A).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Debris Removal	-	A	A	A
Low-Pressure, Cold-Water Flushing	A	A	A	B
Flooding	A	A	A	C
Natural Recovery	A	A	B	B
Sorbents	-	A	A	B
Vacuum	-	B	B	B
High-Pressure, Cold-Water Flushing	C	B	B	B
Nutrient Enrichment	-	B	B	C
Manual Oil Removal/Cleaning	D	B	B	A
Sediment Reworking	D	B	B	B
Shoreline Cleaning Agents	-	-	B	B
In-Situ Burning		-	B	B
Solidifiers	-	-	B	-
Low-Pressure, Hot-Water Flushing	D	C	C	B
Mechanical Oil Removal	D	D	C	A
High-Pressure, Hot-Water Flushing	D	D	D	D
Steam Cleaning	-	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Least Adverse Habitat Impact

Debris Removal

- Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources

Low-Pressure, Cold-Water Flushing

- Only effective when the oil is fluid and loosely adheres to the sediments
- Usually used in conjunction with vacuum and sorbents

- Use on heavy oils is likely to leave large amounts of residual oil in the environment

Flooding

- Only effective when the oil is fluid and adheres loosely to the sediments
- Usually used with various flushing techniques
- Use on heavy oils is likely to leave large amounts of residual oil in the environment

Natural Recovery

- Least impact for small spills, lighter oil types, remote areas, and eroding areas

Sorbents

- Overuse generates excess waste
- Useful for recovering sheens, even for gasoline spills
- Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents

Some Adverse Habitat Impact

Vacuum

- Early use of vacuum on pooled, liquid oil can prevent deeper penetration

High-Pressure, Cold-Water Flushing

- High-pressure water jet is likely to flush finer sediments into nearshore submerged habitats
- Very viscous oils will require extremely high pressure to mobilize them

Nutrient Enrichment

- Not applicable to gasoline spills because they rapidly evaporate
- Concerns about nutrient overloading in poorly flushed areas or where nutrient toxicity, especially ammonia, might be significant
- Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues

Manual Oil Removal/Cleaning

- Gasoline tends to quickly evaporate; therefore manual cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil
- Minimizes sediment removal and problems of erosion and waste disposal
- Deep penetration of oil in porous gravel reduces effectiveness

Sediment Reworking

- Used where gravel removal is not feasible because of erosion concerns
- Sufficient exposure to waves is required to rework the sediments into their original profile and distribution
- Gasoline tends to evaporate quickly; therefore sediment reworking causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil

Shoreline Cleaning Agents

- May be only technique to remove viscous oils without removing sediment or using hot-water flushing
- Individual products vary in their toxicity and ability to recover the treated oil

In-Situ Burning

- Can effectively remove pooled surface oil accumulations
- May have to dig trenches to accumulate oil in pools
- Lighter oils will not remain on the sediment surface
- Concerns about air pollution, physical nature of the residue, and thermal impact on biota

Solidifiers

- Early use may prevent pooled oil from penetrating deeper
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil
- May be useful in recovering sheens when deployed as booms and pillows

Probable Adverse Habitat Impact

Low-Pressure, Hot-Water Flushing

- May be needed to flush viscous or deeply penetrated oil
- Any organisms present will be adversely affected by hot water

Mechanical Oil Removal

- Likely to remove large amounts of gravel with the oil
- Foot and vehicular traffic on gravel could mix oil deeper into the sediments

Most Adverse Habitat Impact

High-Pressure, Hot-Water Flushing

- High-pressure water jets are likely to flush oiled sediments into nearshore submerged habitats
- Any organisms present will be adversely affected by hot water and high pressure

Steam Cleaning

- Highly intrusive technique; will kill any organisms present
- Potential for released oil to penetrate deeper into the porous sediments

Insufficient Information

Chemical Shoreline Pretreatment

- Need more information on available products, their effectiveness, and impact

Natural Microbe Seeding

- There is insufficient information on impact and effectiveness in freshwater habitats

3.11 Vegetated Shoreline Habitats (ESI = 9A)

Habitat Description

Vegetated shoreline habitats consist of the non-wetland vegetated banks that are common features of river systems and lakes. Bank slopes may be gentle or steep, and the vegetation consists of grasses, bushes, or trees common to the adjacent terrestrial habitats. The substrate is not water-saturated and can range from clay to gravel. The banks may flood seasonally and are exposed to relatively high-energy removal processes, at least periodically. Along undeveloped shorelines, there can be leafy litter and woody debris trapped among the vegetation. In developed areas, yards and gardens may abut the lake or river.

Sensitivity

Vegetated shoreline habitats are considered to have medium to high sensitivity to oil spills. They are not particularly important habitats for sensitive animals and plants, although many animals use vegetated banks for drinking, washing food, crossing bodies of water, and feeding.

Bank plants oiled during a flood period could be susceptible, especially if the flood rapidly subsides, allowing oil to penetrate into bank sediments and to contact root systems. Small plants, particularly annuals, are likely to be most damaged. Stranded oil could remain in the habitat until another flood reaches the same level and provides a mechanism for natural flushing. On steep banks, the oil is likely to form a band, or multiple bands, at the waterline. On gentle banks, there is a greater potential for oil to accumulate in pools, penetrate the substrate, and coat large areas of vegetation, thus raising the issue of shoreline cleanup. In developed urban and suburban areas, human use and aesthetics would be the main reasons for cleanup.

Original document included a field sketch of the habitat.

Table 23. Relative Environmental Impact from Response Methods for Vegetated Shoreline Habitats (ESI = 9A).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Natural Recovery	A	A	B	B
Flooding	B	A	A	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	-	A	B	B
Manual Oil Removal/Cleaning	D	B	B	B
Debris Removal	-	B	B	B
Vacuum	-	B	B	B
Vegetation Removal	D	B	B	B
Nutrient Enrichment	-	B	B	B
In-Situ Burning	-	B	B	B
High-Pressure, Cold-Water Flushing	D	C	C	D
Mechanical Oil Removal	D	C	C	C
Low-Pressure, Hot-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Sediment Reworking	D	D	D	D
Solidifiers	-	D	D	-
Chemical Shoreline Pretreatment	-	I	I	I
Shoreline Cleaners	-	I	I	I
Natural Microbe Seeding	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Vegetated Shoreline Habitats

Least Adverse Habitat Impact

Natural Recovery

- Low impact for small or moderate-size spills and lighter oils
- More impact for large spills of medium- or high-viscosity oils

Flooding

- Operationally difficult and marginally effective for steep banks
- Appropriate for gentle banks where persistent oil has pooled, assuming that the released oil can be directed towards recovery devices or sorbents

- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Low-Pressure, Cold-Water Flushing

- Effective for washing oil stranded on the banks into the water for recovery
- Vegetation cover minimizes the potential for sediment erosion from flushing
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Some Adverse Habitat Impact

Sorbents

- Useful for recovering sheens, even for gasoline spills
- Physical removal rates of medium and heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
- Overuse generates excess waste

Manual Oil Removal/Cleaning

- Some mixing of oil into the substrate and trampling of vegetation is unavoidable with foot traffic in oiled areas
- Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated by manual cleanup are not balanced by benefits in removing oil

Debris Removal

- Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources
- Minimal concerns where substrate is firm or work is conducted from boats

Vacuum

- Potential damage where substrate will not support vehicular traffic
- Most effective where access is good and substrate can support vehicles
- Only useful when oil is pooled

Vegetation Removal

- Usually not necessary to reduce oil impact on vegetation
- May be required in areas used by sensitive animals

Nutrient Enrichment

- Applicable where nutrients are a limiting factor for oil degradation
- More effective after gross oil removal is completed
- Not applicable to gasoline spills because they rapidly evaporate

In-Situ Burning

- May be the least physically damaging means of oil removal from the banks
- Least impact for grassy areas versus banks covered with trees and shrubs

Probable Adverse Habitat Impact

High-Pressure, Cold-Water Flushing

- High-pressure water spray will disturb plants and erode sediments
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Mechanical Oil Removal

- Excessive physical disruption likely from use of equipment

Most Adverse Habitat Impact

Low-Pressure, Hot-Water Flushing

- Hot water could kill plants and potentially erode and degrade habitat

High-Pressure, Hot-Water Flushing

- Combination of high pressure and hot water poses high risk of sediment and vegetation loss

Sediment Reworking

- Will result in extensive habitat disruption

Solidifiers

- Not applicable to gasoline spills because they rapidly evaporate
- Application of loose particulates may impede removal of oil mixed with, and adhered to, vegetation, litter, and debris
- May be useful in recovering sheens when deployed as booms and pillows
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil or penetrate netting or fabric encasing the loose particulates

Insufficient Information

Chemical Shoreline Pretreatment

- There is insufficient information on impact and effectiveness in freshwater vegetation

Shoreline Cleaning Agents

- More information needed on available products, their effectiveness, and impact of use on vegetated bank habitats
- Individual products vary in their toxicity and ability to recover the treated oil

Natural Microbe Seeding

- There is insufficient information on impact and effectiveness in freshwater vegetated shorelines

3.12 Mud Habitats (ESI = 9B)

Habitat Description

Mud habitats are characterized by a substrate composed predominantly of silt and clay sediments, although they may be mixed with varying amounts of sand or gravel (see Appendix B for grain-size chart). The sediments are mostly water saturated and have low bearing strength. In general, mud shorelines have a low gradient, although some steep banks also may consist of mud. The mud habitats generally are low energy and sheltered from wave action and high currents. Adjacent nearshore areas are usually shallow with muddy sediments. These fine-grained habitats often are associated with wetlands; Section 3.13 discusses habitats where aquatic vegetation dominates. Bare or sparsely vegetated mud substrates are rare along Great Lake shorelines. However, they commonly occur along river floodplains and lake bottoms, where they can be exposed during seasonal low water levels.

Sensitivity

Mud habitats are highly sensitive to oil spills and subsequent response activities. Shoreline sediments are likely to be rich in organic matter and support an abundance of infauna. Muddy habitats are important feeding grounds for birds and rearing areas for fish.

Oil will not penetrate muddy sediments because of their low permeability and high water content, except through decaying root and stem holes or animal burrows. There can be high concentrations and pools of oil on the surface. Natural removal rates can be very slow, chronically exposing sensitive resources to the oil. The low bearing capacity of these shorelines means that response actions can easily leave long-lasting imprints, cause significant erosion, and mix the oil deeper into the sediments. When subsurface sediments are contaminated, oil will weather slowly and may persist for years. Response methods may be hampered by limited access, wide areas of shallow water, fringing vegetation, and soft substrate.

Original document included a field sketch of the habitat.

Table 24. Relative Environmental Impact from Response Methods for Mud Habitats (ESI = 9B).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils
Natural Recovery	A	A	A	B
Flooding	B	A	A	A
Sorbents	B	A	A	B
Debris Removal	-	B	B	B
Vacuum	-	C	B	B
In-Situ Burning	C	C	C	C
Low-Pressure, Cold-Water Flushing	D	C	C	C
Manual Oil Removal/Cleaning	D	D	C	C
Low-Pressure, Hot-Water Flushing	D	D	C	C
Solidifiers	D	D	C	-
Mechanical Oil Removal	D	D	D	D
High-Pressure, Cold-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Sediment Reworking	D	D	D	D
Shoreline Cleaning Agents	-	D	D	D
Natural Microbe Seeding	-	I	I	I
Nutrient Enrichment	-	I	I	I
Chemical Shoreline Pretreatment	I	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Mud Habitats

Least Adverse Habitat Impact

Natural Recovery

- Least impact for small spills and lighter oils, to prevent disruptions associated with cleanup efforts
- For large spills or heavy oils, expect long-term persistence in low-energy settings

Flooding

- Effective only for fresh, fluid oils
- Local topography may limit the ability to control where the water and released oil flow and effectiveness of recovery
- Use on gasoline spills may transport the oil to more sensitive habitats

Sorbents

- Useful as long as the oil is mobilized and recovered by the sorbent
- Overuse generates excess waste
- Careful placement and recovery is necessary to minimize substrate disruption

Some Adverse Habitat Impact

Debris Removal

- Degree of oiling that warrants debris removal and disposal depends on use by sensitive resources
- Extensive disruption of soft substrate likely

Vacuum

- Not applicable to gasoline spills because of safety concerns
- Use to remove oil pooled on the surface
- Avoid digging trenches to collect oil because they can introduce oil deeper into the sediment
- Disruption of soft substrates can be limited by placing boards on the surface and controlling access routes

Probable Adverse Habitat Impact

In-Situ Burning

- Heat may impact biological productivity of habitat, especially where there is no standing water to act as a heat sink on top of the mud

Low-Pressure, Cold-Water Flushing

- Mud is readily suspended if substrate is not firm
- Not effective for higher-viscosity oils that will not move with low pressure
- Local topography may limit the ability to control where the water and released oil flow and effectiveness of recovery
- Use on gasoline spills may transport the oil to more sensitive habitats

Manual Oil Removal/Cleaning

- Use where persistent oil occurs in moderate to heavy amounts, or where sensitive resources must be protected
- Response crews may trample soft substrates, mix oil deeper into the sediments, and contaminate clean areas

Low-Pressure, Hot-Water Flushing

- Physical and thermal impacts to habitat likely

Most Adverse Habitat Impact

Solidifiers

- High likelihood of disruption and mixing of oil deeper into the substrate during application and retrieval
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

Mechanical Oil Removal

- Soft substrate will not support vehicular traffic
- Will probably cause extensive physical habitat disruption

High-Pressure, Cold-Water Flushing and High-Pressure, Hot-Water Flushing

- High-pressure water will cause extensive sediment suspension and erosion
- Potential for burial of oiled sediments and transport of oil to adjacent areas

Sediment Reworking

- Will extensively disrupt physical habitat
- Increases oil penetration, burial, and persistence

Shoreline Cleaning Agents

- Current products are designed for use with high-pressure flushing; since used with flushing, water pressure needs to be considered
- Individual products vary in their toxicity and ability to recover the treated oil

Insufficient Information

Natural Microbe Seeding and Nutrient Enrichment

- Not applicable to gasoline spills because they rapidly evaporate
- There is insufficient information on impact and effectiveness in mud habitats

Chemical Shoreline Pretreatment

- There is insufficient information about direct toxicity of the products, disturbances resulting from application and retrieval, effectiveness, and net benefit

3.13 Wetland Habitats (ESI = 10A, 10B)

Habitat Description

Wetlands are characterized by water, unique soils that differ from adjacent upland areas, and vegetation adapted to wet conditions. Wetlands include a range of habitats such as marshes, bogs, bottomland hardwood forests, fens, playas, prairie potholes, and swamps. Substrate, vegetation, hydrology, seasonality, and biological use of inland wetlands are highly variable, making characterization difficult. The surfaces of wetlands usually have a low gradient and vegetated areas are typically at or under the water level. There can be distinct channels or drainages with flowing water, except at the exposed outer fringe; however, natural physical processes are minimal. Water levels may vary seasonally, and the wetland may be simply a zone of water-saturated soils during the dry season. Where mud habitats dominate the wetland, refer to Section 3.12 for a discussion of applicable response methods.

Sensitivity

Wetlands are highly sensitive to oil spills. The biological diversity in these habitats is significant and they provide critical habitat for many types of animals and plants. Oil spills affect both the habitat (vegetation and sediments) and the organisms that directly and indirectly rely on the habitat. Surprisingly little is known about oil impact on freshwater plants, although there are likely differences between robust perennials with substantial underground systems and cycles of winter die-back, and annuals that lack underground nutrient reserves. Detritus-based food webs are fundamentally important in wetlands; oil could possibly affect these by slowing decomposition rates of plant material.

Wetlands support populations of fish, amphibians, reptiles, birds, and mammals, with many species reliant upon wetlands for their reproduction and early life stages when they are most sensitive to oil. Many endangered animals and plants occur only in wetlands, and spills in such areas would be of particular conservation concern. Migratory waterbirds depend heavily on wetlands as summer breeding locations, migration stopovers, and winter habitats. The threat of direct oiling of animals using the wetland often drives efforts to remove the oil. If oil and/or cleanup efforts causes a loss of the more sensitive plants or modifies the ecosystem structure, then feeding and breeding of dependent wildlife may be affected.

Original document included a field sketch of the habitat.

Table 25. Relative Environmental Impact from Response Methods for Wetland Habitats (ESI = 10A and 10B).

Response Method	Gasoline Products	Diesel-Like Oils	Medium Oils	Heavy Oils

Natural Recovery	A	A	A	B
Sorbents	C	A	A	A
Flooding	B	A	A	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
In-Situ Burning	B	B	B	B
Vacuum	-	B	B	B
Debris Removal	-	B	B	B
Vegetation Removal	D	C	C	C
Manual Oil Removal/Cleaning	D	D	C	C
High-Pressure, Cold-Water Flushing	D	D	D	D
Low-Pressure, Hot-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Mechanical Oil Removal	D	D	D	D
Sediment Reworking	D	D	D	D
Solidifiers	D	D	D	-
Shoreline Cleaning Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I
Chemical Shoreline Pretreatment	-	I	I	I

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions:
A = May cause the least adverse habitat impact.
B = May cause some adverse habitat impact.
C = May cause significant adverse habitat impact.
D = May cause the most adverse habitat impact.
I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time.
"-" = Not applicable for this oil type.

Response Methods: Wetland Habitats

Least Adverse Habitat Impact

Natural Recovery

- Least impact for small to moderate spills and lighter oils; avoids damage often associated with cleanup activities
- Some cleanup may be warranted where large numbers of animals are likely to become oiled during wetland use

Sorbents

- Care is necessary during placement and recovery to minimize disturbance of substrate and vegetation
- Overuse generates excess waste

Flooding

- Erosion of substrate and vegetation may be a problem
- Can be used selectively to remove localized heavy oiling
- Can be difficult to direct water and oil flow towards recovery devices
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Low-Pressure, Cold-Water Flushing

- If water pressures are too high, the substrate and vegetation may be disturbed
- Use on heavy oils is likely to leave large amounts of residual oil in the environment
- Use on gasoline spills may transport the oil to more sensitive habitats

Some Adverse Habitat Impact

In-Situ Burning

- May be one of the least physically damaging means of heavy oil removal
- Presence of a water layer on marsh surface can protect roots
- Time of year (vegetation growth stage) is important consideration
- May be appropriate for gasoline spills trapped in ice

Vacuum

- Can be effective in removal of pooled oil from the marsh surface
- Trampling of vegetation and substrate can be limited by placing boards on the surface and limiting traffic

Debris Removal

- The removal of heavily oiled and mobile debris may reduce the tracking of oil off-site and contamination of wildlife

Probable Adverse Habitat Impact

Vegetation Removal

- Used to prevent oiling of sensitive animals using the wetland
- Most appropriate for oils that form a thick, sticky coating on the vegetation, such as medium and heavy oils
- May delay recovery of the vegetation due to both oil impact and physical destruction by cleanup crews
- Trampling of vegetation may be reduced by controlling access routes, using boards placed on surface, or conducting operations from boats

Manual Oil Removal/Cleaning

- Used where persistent oil occurs in heavy amounts and where sensitive resources using the wetlands are likely to be oiled

- Response crews may trample roots and mix oil deeper into the sediments

Most Adverse Habitat Impact

High-Pressure, Cold-Water Flushing

- High-pressure spray will disrupt sediments, root systems, and animals

Low-Pressure, Hot-Water Flushing and High-Pressure, Hot-Water Flushing

- Hot water will likely kill the vegetation

Mechanical Oil Removal

- Using vehicles in soft substrate will probably cause extensive physical disruption
- Can completely alter the marsh substrate, hydrology, and vegetation patterns for many years
- Use in heavily oiled wetlands when all other techniques have failed and there is an overriding reason for oil removal

Sediment Reworking

- No benefit from mixing oil deeper into fine-grained and organic soils

Solidifiers

- Not applicable to gasoline spills because they rapidly evaporate
- Use likely to increase adherence to vegetation and slow weathering/removal rates of residual oil
- Not effective on heavy oils, which are too viscous to allow the product to mix into the oil

Insufficient Information

Shoreline Cleaning Agents

- More information needed on available products, their effectiveness, and impact of use on vegetated bank habitats
- Individual products vary in their toxicity and recoverability of the treated oil

Nutrient Enrichment and Natural Microbe Seeding

- Not applicable to gasoline spills because they rapidly evaporate
- Concerns include eutrophication and acute toxicity, particularly from ammonia, because of shallow waters and low mixing rates
- There is insufficient information on impact and effectiveness in wetlands

Chemical Shoreline Pretreatment

- There is insufficient information about product toxicity, disturbances resulting from application and retrieval, effectiveness, and net benefit

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4.0 Spill Response Methods

This section describes methods previously categorized for use during response to oil spills in inland environments and habitats. The methods are used in the protection, recovery, and cleanup phases of a response. The main objective of protection is to keep oil out of a habitat or to reduce the amount that enters. Recovery consists of removing floating oil from the water surface. The cleanup phase consists of removing stranded oil from shoreline habitats via physical, chemical, and enhanced biological means. In most spill response situations, protection and oil recovery are the immediate goals. Combinations of protection, recovery, and cleanup methods are commonly used though these guidelines treat each method separately.

The following section includes a summary of the objective in using the method, a general description of the method, applicable habitat types, conditions under which the methods should be used, biological constraints commonly applied to the use of the method to protect sensitive resources, and the environmental effects expected from the proper use of the method. Some of the methods listed require special authorization for use during a spill; the appropriate agency must be contacted about the need for special approvals. We encourage you to refer to the references listed in Appendix A for further information.

Physical Response Methods

1 Natural Recovery	11 Sediment Reworking
2 Booming	12 Vegetation Removal
3 Skimming	13 In-Situ Burning
4 Barrier/Berm	14 Flooding
5 Physical Herding	15 Low-Pressure, Cold-Water Flushing
6 Manual Oil Removal/Cleaning	16 High-Pressure, Cold-Water Flushing
7 Mechanical Oil Removal	17 Low-Pressure, Hot-Water Flushing
8 Sorbents	18 High-Pressure, Hot-Water Flushing

9 Vacuum	19 Steam Cleaning
10 Debris Removal	20 Sand Blasting

Chemical Response Methods

21 Dispersants	25 Solidifiers
22 Emulsion Treating Agents	26 Chemical Shoreline Pretreatment
23 Visco-Elastic Agents	27 Shoreline Cleaning Agents
24 Herding Agents	

Biological Response Methods

28 Nutrient Enrichment

29 Natural Microbial Seeding

1. Natural Recovery

Objective
No attempt to remove any stranded oil in order to minimize impact to the environment, or because there is no proven effective method for cleanup.

Description
No action is taken, although monitoring of the incident continues.

Applicable Habitat Types
Can be used on all habitat types.

When to Use
On remote or inaccessible habitats, when natural removal rates are very fast (e.g., the evaporation of gasoline), when the degree of oiling is light, or when cleanup actions will do more harm than natural removal.

Biological Constraints
This method may be inappropriate for areas where high numbers of mobile animals (birds, terrestrial mammals) or endangered species use the body of water or shoreline.

Environmental Effects
Same as from the oil alone.

2. Booming

Objective
To control the movement of floating oil by containment, diversion, deflection, or exclusion.

Description
Placement of a device (boom) on the water that forms a barrier to floating oil. Containment is deploying a boom to hold the oil until it can be removed. Deflection is moving oil away from sensitive areas. Diversionis moving oil toward recovery sites that have slower flow, better access, etc. Exclusion is placing boom to prevent oil from reaching sensitive areas. The ultimate goal is to recover the oil.

Applicable Habitat Types
Can be used on all water environments. Booms begin to fail by entrainment when the effective current or towing speed exceeds 0.7 knots perpendicular to the boom.

When to Use
Nearly all types of response to spills on water involve deploying boom to assist in the recovery of floating oil. Booms must be properly deployed and maintained, including removing accumulated debris. Containment booming of gasoline spills is usually not attempted, because of both fire and inhalation hazards to responders. However, when public health is at risk, booming of gasoline can be attempted with use of foam and extreme safety procedures. Deflection or exclusion booming of sensitive areas to prevent exposure to oil, including gasoline, can be an important protection action.

Biological Constraints
Placement and maintenance of anchoring points should not cause excessive physical disruption. Boom must be maintained so that it does not trap oil improperly and cause more damage. Traffic to/from boom sites should not disturb wildlife.

Environmental Effects
Minimal if surface disturbance by cleanup work force traffic is controlled.

3. Skimming

Objective
To recover floating oil from the water surface.

Description
Mechanized equipment is placed at the oil/water interface. There are five different types of skimmers: weir, suction, centrifugal, submersion, and oleophilic. They may operate independently from shore, be mounted on vessels, or be completely self-propelled. All require collection and concentration of floating oil at the skimmer, usually using booms. Large amounts of water are often collected and must be handled. Adequate storage of recovered oil/water mixture must be available.

Applicable Habitat Types
Can be used on all water environments. Waves, currents, and debris reduce skimmer efficiencies.

When to Use
When sufficient amounts of floating oil can be contained. Skimming of gasoline spills is usually not feasible, because of both fire and inhalation hazards to responders. However, when public health is at risk, skimming of gasoline can be attempted using foam and extreme safety procedures.

Biological Constraints
Traffic to/from skimming sites should not disturb wildlife.

Environmental Effects
Minimal if surface disturbance by cleanup work force traffic is controlled.

4. Barriers/Berms

Objective
To prevent entry of oil into a sensitive area or to divert oil to a collection area.

Description
A physical barrier is placed across an area to prevent moving oil from passing. Barriers can consist of earthen berms, filter fences, air bubble barriers, or trenches. When it is necessary for water to pass, because of water volume or downstream needs, underflow dams (for low flow rates) or overflow dams are used.

Applicable Habitat Types
In streams and dry valleys, where the width and depth of the area to be closed off are relatively small. Also, at the mouths of small creeks along lake shorelines, to prevent oil from being blown upstream.

When to Use
When the flow of oil threatens sensitive habitats. If the barrier does not fail, it is the most effective strategy to exclude oil from an area.

Biological Constraints
Place barriers away from sensitive areas, such as spawning sites. Downstream water requirements should be monitored to prevent dewatering of sensitive areas.

Environmental Effects
May disrupt or contaminate sediments along banks or in channel. Dewatering or poor water quality downstream may affect aquatic organisms.

5. Physical Herding

Objective
To free oil trapped in debris or vegetation on water; to direct the movement of floating oil towards containment and recovery devices; or to push oil away from sensitive areas.

Description

Water or air streams and propeller wash generate a current to dislodge trapped oil and herd the released oil to containment and recovery area. May mix oil with water to form emulsified oil.

Applicable Habitat Types
In lakes and ponds where there are little or no currents, along rivers and streams where the channel or banks are accessible, and in and around manmade structures such as wharves and piers.

When to Use
In low-current or stagnant waterbodies, to herd oil in booms towards recovery devices. Along rivers and streams, when mobile oil has penetrated vegetated banks or accumulated in log jams or other debris, water spray and prop wash can mobilize the oil to flow downstream to collection points.

Biological Constraints
None.

Environmental Effects
May generate high levels of suspended sediments and mix them with the oil, resulting in deposition of contaminated sediments in benthic habitats.

6. Manual Oil Removal/Cleaning

Objective
To remove surface oil with hand tools and manual labor.

Description
Removal of surface oil by manual means (hands, rakes, shovels, buckets, rags, sorbent pads, etc.) and placing in containers. No mechanized equipment is used.

Applicable Habitat Types
Can be used on all habitat types.

When to Use
Light to moderate oiling conditions for stranded oil, or heavy oils on water that have formed semi-solid to solid masses that can be picked up manually.

Biological Constraints
Foot traffic over sensitive areas (wetlands, floating vegetation, etc.) needs to be restricted or prevented. There may be periods when access should be avoided, such as during bird nesting.

Environmental Effects
Minimal if surface disturbance by crew movement and waste generation is controlled.

7. Mechanical Oil Removal

Objective
Removal of oil from water surface, bottom sediments, and shorelines with heavy equipment. .

Description
Oil and oiled sediments are collected and removed using backhoes, dredges, graders, bulldozers, draglines, etc. On land, the oiled material is pushed into piles and transported offsite for treatment/disposal. On water, the equipment is operated from shore or barges to recover large amounts of heavy or solidified oil.

Applicable Habitat Types
On land, possible wherever there are surface sediments accessible to heavy equipment. On water, used in lakes, rivers, etc., where oil accumulates.

When to Use
When large amounts of oiled materials have to be collected and removed. Along shorelines, care should be taken to remove sediments only to the depth of oil penetration, which can be difficult with heavy equipment. Should be used carefully where excessive sediment removal may erode the beach. Will need special permission to use in areas with known cultural resources.

Biological Constraints
Heavy equipment may be restricted in sensitive habitats (e.g., wetlands, soft substrate) or areas containing endangered plants and animals.

Environmental Effects
The equipment is heavy, with many support personnel required. May be detrimental if excessive sediments are removed without replacement. All organisms in the sediments will be affected, although the need to remove the oil may make this response method the best overall alternative. Runoff from exposed oil and fine-grained oily sediments can affect adjacent bodies of water.

8. Sorbents

Objective
To remove floating oil by adsorption onto oleophilic material placed in water or at the waterline.

Description
Sorbent material is placed on the water surface, allowing it to absorb oil as it is released by natural processes. Forms include sausage boom, rolls, sweeps, pads, and snares. Efficacy depends on the capacity of the particular sorbent, energy available for lifting oil off the substrate, and stickiness of the oil. Recovery of all sorbent material is mandatory.

Applicable Habitat Types
Can be used on any habitat or environment type.

When to Use
When the stranded oil is mobile and transport of oil is expected on or off the site. The oil must be viscous and thick enough to be released by the substrate and absorbed by the sorbent. Often used as a secondary treatment method after gross oil removal and in sensitive areas where access is restricted.

Biological Constraints
Access for deploying and retrieving sorbents should not affect soft or sensitive habitats or wildlife. Sorbent use should be monitored to prevent overuse and generating large volumes of waste.

Environmental Effects
Physical disturbance of habitat during deployment and retrieval. When the sorbents are no longer effective, oil may remain in critical habitats during sensitive periods.

9. Vacuum

Objective
To remove free oil pooled on the substrate or from the water in sheltered areas.

Description
A vacuum unit with a suction head recovers free oil. The equipment can range from small, portable units that fill individual 55-gallon drums to large supersuckers that are truck-mounted and can lift large rocks. Can be used with booms and flushing systems to move the oil toward the suction head. Removal rates from substrates can be extremely slow.

Applicable Habitat Types
Any accessible habitat type. May be mounted on barges for water-based operations, on trucks backed to the recovery area, or hand-carried to remote sites.

When to Use
When free, liquid oil is stranded on the substrate (usually in depressions), trapped in vegetation and is readily accessible, or concentrated on the water surface. Often used instead of skimmers for floating oil recovery. Usually requires shoreline access points. Not used in recovery of gasoline spills because of safety hazard.

Biological Constraints
Special restrictions should be identified for areas where foot traffic and equipment operation should be limited, such as soft substrates. Operations in wetlands need to be very closely monitored, with a site-specific list of restrictions.

Environmental Effects
Minimal if foot and vehicular traffic is controlled and minimal substrate is removed.

10. Debris Removal

Objective
To remove contaminated debris from the shoreline or water surface.

Description
Manual or mechanical removal of debris from the shore or water surface. Can include cutting up and removal of oiled logs.

Applicable Habitat Types
Can be used on any habitat or environment type where safe access is allowed.

When to Use
When driftwood and debris are heavily contaminated and provide a potential source of chronic oil release, an aesthetic problem, a source of contamination for other organisms in the area, or skimmer clogging problems.

Biological Constraints
Disturbance to adjacent areas should be minimized. Foot traffic over sensitive areas (wetlands, spawning grounds) needs to be restricted. May be periods when access should be restricted (spawning periods, large numbers of migratory waterbirds).

Environmental Effects
Physical disruption of substrate, especially when equipment must be deployed to recover a large quantity of debris.

11. Sediment Reworking

Objective
To rework oiled sediments to break up the oil deposits, increase its surface area, and mix deep subsurface oil layers, which will expose the oil to natural removal processes and enhance the rate of oil degradation.

Description
The oiled sediments are roto-tilled, disked, or otherwise mechanically mixed using heavy equipment. Along lake shores, oiled sediments may also be pushed lower on the shore to enhance natural cleanup from reworking by wave activity. The process may be aided with high-volume flushing of gravel.

Applicable Habitat Types
On any sedimentary substrate that can support heavy equipment.

When to Use
On sand to gravel beaches with subsurface oil, where sediment removal is not feasible (due to erosion concerns or disposal problems). Also where surface oil deposits have started to form pavements or crusts. Appropriate for sites where the oil is stranded above the normal water level.

Biological Constraints
Avoid use on shores near water intakes, fish-spawning areas, or near bird-nesting or concentration areas because of the potential for release of oil and oiled sediments into adjacent bodies of water.

Environmental Effects
Due to the mixing of oil into sediments, this method could further expose organisms that live below the original layer of oil. Repeated mixing over time could delay re-establishing organisms. Runoff from treated sites could contaminate downslope areas.

12. Vegetation Removal

Objective
To cut and remove oiled vegetation to prevent oiling of wildlife or chronic oil releases.

Description
Manual cutting of oiled rooted vegetation using weed eaters. Cut vegetation is raked up. Floating vegetation is removed either manually or mechanically.

Applicable Habitat Types
Wetlands composed of emergent, herbaceous vegetation and floating aquatic vegetation.

When to Use
When the risk of oiled vegetation contaminating wildlife is greater than the value of the vegetation that is to be cut, and there is no less destructive method that removes or reduces the risk to acceptable levels.

Biological Constraints
Operations must be strictly monitored to minimize the degree of root destruction and mixing of oil deeper into the sediments. Access in bird-nesting areas should be restricted during nesting seasons.

Environmental Effects
Vegetation removal will destroy habitat for many animals. Cut areas will have reduced plant growth. Along exposed sections of shoreline, the vegetation may not regrow, eroding and destroying the habitat. Trampled areas will recover much more slowly.

13. In-Situ Burning

Objective
To remove oil from the water surface or habitat by burning.

Description
Oil floating on the water surface is collected into slicks at least 2-3 millimeters thick and ignited. The oil can be contained in fire resistant booms, or by natural barriers such as ice or the shore. On land, oil in the habitat is burned, usually when it is on a combustible substrate such as vegetation, logs, and other debris. Oil can be burned off non-flammable substrates using a burn promoter. On sedimentary substrates, it may be necessary to dig trenches for oil to accumulate in pools thick enough to burn efficiently. Heavy and emulsified oils are harder to ignite and sustain an efficient burn, but are still burnable.

Applicable Habitat Types
On any habitat type except dry muddy substrates where heat may impact the biological productivity of the habitat.

When to Use
On floating slicks, early in the spill event when the oil can kept thick enough (2-3 millimeters). On land, where there is heavy oil in sites not amenable or accessible to physical removal and it is important to immobilize the stranded oil quickly. In wetlands and mud habitats, a water layer minimizes impacts to sediments and roots. Many potential applications for spills in ice.

Biological Constraints
Large volumes of smoke are generated, and its effect on nesting birds and populated areas should be evaluated.

Environmental Effects
Temperature and air quality effects are likely to be localized and short-lived. Toxicological impact from burn residues have not been evaluated. There are few studies on the relative effects of burning oiled wetlands compared to other techniques or natural recovery, but the limited data indicate little impact of burning relative to natural recovery when the soils are saturated.

14. Flooding

Objective
To wash oil stranded on the land surface to the water's edge for collection.

Description
A perforated header pipe or hose is placed above the oiled shore or bank. Ambient water is pumped through the header pipe at low pressures and flows downslope to the water. On porous sediments, water flows through the substrate, pushing loose oil ahead of it (or floats oil to the water's surface) then transports the oil down the slope for pickup. Flow is maintained to remove the majority of free oil. Oil is trapped by booms and is recovered by skimmers or other suitable equipment.

Applicable Habitat Types
All habitat types.

When to Use
In heavily oiled areas when the oil is still fluid and loosely adheres to the substrate, and where oil has penetrated into gravel sediments. This method is frequently used with other washing techniques (low- or high-pressure, cold water).

Biological Constraints
Not appropriate where nearshore sediments contain rich biological communities.

Environmental Effects
Habitat may be physically disturbed by foot traffic during operations and smothered by sediments washed down the slope. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

15. Low-Pressure, Cold-Water Flushing

Objective
To remove liquid oil that has adhered to the substrate or manmade structures, pooled on the surface, or become trapped in vegetation.

Description
Ambient water is sprayed at low pressures (<50 psi), usually from hand-held hoses, to lift oil from the substrate and direct it to the water's edge for pickup. Can be used with a flooding system to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types
On heavily oiled substrates, riprap, and seawalls where the oil is still liquid. In wetlands and along vegetated banks where free

oil is trapped in vegetation.

When to Use
Where free, liquid oil is stranded onshore or floating in very shallow areas.

Biological Constraints
Not appropriate where nearshore sediments contain rich biological communities. May need to restrict use so that the oil/water effluent does not drain across sensitive habitats. Use from boats will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects
If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

16. High-Pressure, Cold-Water Flushing

Objective
To remove oil that has adhered to hard substrates or manmade structures.

Description
Similar to low-pressure flushing except that water pressure is 100-1,000 psi. High-pressure spray will more effectively remove sticky or viscous oils. If water volumes are low, sorbents are placed directly below the treatment area to recover oil.

Applicable Habitat Types
Bedrock, manmade structures, and gravel habitats.

When to Use
When low-pressure flushing is not effective at removing adhered oil, which must be removed to prevent continued oil release or for aesthetic reasons. When a directed water jet can remove oil from hard-to-reach sites.

Biological Constraints
May need to restrict flushing so that the oil/water effluent does not drain across sensitive habitats. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects
May drive oil deeper into the substrate if water jet is improperly applied. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

17. Low-Pressure, Hot-Water Flushing

Objective
To remove non-liquid oil that has adhered to the substrate or manmade structures, or pooled on the surface.

Description
Hot water (90F up to 170F) is sprayed with hoses at low pressures (<50 psi) to liquefy and lift oil from the substrate and direct it to the water's edge for pickup. Used with flooding to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types
On heavily oiled bedrock, sand to gravel substrates, and manmade structures.

When to Use
Where heavy, but relatively fresh oil is stranded onshore. The strategy is to heat the oil to above its pour point, so it will flow. Less effective on sticky oils.

Biological Constraints
Avoid wetlands or nearshore sediments with rich biological communities. Use should be restricted so that the hot oil/water effluent does not contact sensitive habitats. Boat use will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects
Hot water can kill all organisms in direct contact. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable during the response.

18. High-Pressure, Hot-Water Flushing

Objective
To mobilize weathered and viscous oil adhered to surfaces.

Description
Hot water (90F up to 170F) is sprayed with hand wands at pressures greater than 100 psi. Used without water flooding, this procedure requires immediate use of vacuum or sorbents to recover the oil/water runoff. When used with a flooding system, the oil is flushed to the water surface for collection by skimmers or sorbents.

Applicable Habitat Types
Gravel habitats, bedrock, and manmade structures.

When to Use
When oil has weathered to the point that even warm water at low pressure no longer effectively removes oil, to prevent continued release of oil. To remove viscous oil from manmade structures for aesthetic reasons.

Biological Constraints
Use should be restricted so that the oil/water effluent does not drain across sensitive habitats (damage can result from exposure to oil, oiled sediments, and hot water). Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects
All attached organisms and plants in the direct spray zone will be removed or killed, even when used properly. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

19. Steam Cleaning

Objective
To remove heavy residual oil from solid substrates.

Description
Steam or very hot water (170F to 212F) is sprayed with hand wands at high pressure. Water volumes are very low compared to flushing methods.

Applicable Habitat Types
Manmade structures such as seawalls and riprap.

When to Use
When heavy oil residue remaining on a shoreline needs to be cleaned for aesthetic reasons, and when hot-water wash is not effective.

Biological Constraints
Not to be used in areas of soft substrate, vegetation, or high biological abundance directly on or below the structure.

Environmental Effects
Complete destruction of all organisms in the spray zone. Difficult to recover all released oil.

20. Sand Blasting

Objective
To remove heavy residual oil from solid substrates.

Description
Use of sandblasting equipment to remove oil from the substrate. May include recovery of used (oiled) sand in some cases.

Applicable Habitat Types
Manmade structures such as seawalls and riprap.

When to Use
When heavy oil residue is remaining on the shoreline, which needs to be cleaned for aesthetic reasons, and even steam cleaning is not effective.

Biological Constraints
Not to be used in areas of soft substrate, vegetation, or high biological abundance directly below or adjacent to the structures.

Environmental Effects
Complete destruction of all organisms in the blast zone. Possible smothering of downstream organisms with sand. When the

used sand is not recovered, introduces oiled sediments into the adjacent habitat.

21. Dispersants

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

Description
Specially formulated products containing surface-active agents are sprayed at concentrations of about 5 percent by volume 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 turbulence is needed to mix the dispersant into the oil and to mix the treated oil into the water.

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

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

Biological Constraints
Use in shallow water could affect benthic resources. The potential impact of dispersed oil on water intakes should be thoroughly considered prior to use.

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

22. 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 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 to separate excess water 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, where emulsified oil can reduce skimmer efficiency.

Biological Constraints
There is insufficient information to evaluate at this time.

Environmental Effects
Because this is a new application approach, there are very few data available to evaluate environmental effects. Effective dosages are one to two orders of magnitude lower than dispersants. Environmental concerns regarding application to slicks are: how treatment might adversely 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.

23. Visco-Elastic Agents

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

Description
Chemical agent is applied as a liquid spray or a slurry onto the oil in the proper dosage. Some mixing is required and is usually provided by the water spray during application. Treated oil is rendered visco-elastic, but still fluid, gelatinous, or semi-solid; there is no chemical change in the oil. The primary purpose is to increase the efficiency in skimmer removal rates while minimizing amount of water. 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 near 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 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 affected by the treated oil cannot be kept away from the treated oil.

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

24. Herding Agents

Objective
To collect or herd oil into a smaller area and thicker slick in order to increase recovery. Also can be used to herd oil away from sensitive areas or used inside containment booms when it is necessary to move the boom.

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 stillwater environments.

When to Use
Potential use for collection and protection. For collection, used 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 possible, though available products vary greatly in their aquatic toxicity.

25. Solidifiers

Objective
To change the physical state of spilled oil from a liquid to a solid to reduce impact of oil to shorelines.

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 manmade structures.

When to Use
When immobilization of the oil is desired, to prevent refloating from a shoreline, penetration into the substrate, or further spreading. However, the oil may not fully solidify unless the product is well mixed 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 impact because

of slow weathering rates. Physical disturbance is likely during application and recovery.

26. Chemical Shoreline Pretreatment

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

Description
Various types of film-forming agents or wetting 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 so timing is critical. It should be noted that there are no products now being sold as shoreline pretreatment agents.

Applicable Habitat Types
Bedrock, sand and gravel habitats, and manmade structures.

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

Biological Constraints
Unknown at this time but there are likely to be constraints based on product toxicity and persistence.

Environmental Effects
Unknown at this time since there are no commercially available products. There are concerns about toxicity and smothering since these products could be applied directly on clean substrates.

27. 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 or lift weathered or heavy oils to enhance flushing methods. The intent is 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 cannot be removed using warm to hot water. This approach may be most applicable where flushing effectiveness decreases as the oil weathers.

Biological Constraints
The released oil should be recovered rather than dispersed into the water column. Use may be restricted where suspended sediment concentrations are high, near 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.

28. Nutrient Enrichment

Objective
To speed the rates of natural microbial degradation of oil by adding 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 oleophilic formulations, which adhere to the oil itself and are sprayed directly on the oiled areas.

Applicable Habitat Types
Could be used on any habitat type where safe access is allowed and nutrients are deficient.

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 limit 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 timeframes than by 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 is available on effects in fresh water.

29. Natural Microbe Seeding

Objective
To speed the rates of microbial degradation of oil by adding live microbes with enhanced oil-degrading abilities.

Description
Formulations containing hydrocarbon-degrading microbes (usually with fertilizers) are added to the oiled area. The argument is made that indigenous microorganisms will be killed by the oil or will be slow to degrade the oil, so new microbial species need to be added to speed the process of biodegradation. Little information is currently available to show whether natural microbe seeding increases biodegradation more than nutrient enrichment alone.

Applicable Habitat Types
Could be used on any habitat type where safe access is allowed and additional microbes are needed.

When to Use
On moderate 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 existing microorganisms are not present or effective. 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 evaporate faster than they would degrade.

Biological Constraints
If product contains fertilizers, not suitable in shallow water or restricted bodies of water 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 is available on effects in fresh water.

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5.0 Special Considerations

This section summarizes the following selected topics of special concern in freshwater habitats:

- Public health concerns;
- Conditions under which oil might sink;
- Oil behavior in ice conditions;
- Oil behavior and cleanup in permafrost; and
- Firefighting foam.

5.1 Public Health Concerns

The human-health concerns associated with oil spills entail risks to the public from exposure to the oil and to responders during cleanup activities. In freshwater areas, the risks of exposure of the public are of special concern, because of the potential for contamination of public drinking water supplies and the proximity of populated areas to spill sites. Human-health risks from spilled oil occur along three potential pathways: ingestion, dermal contact, and inhalation. Ingestion pathways include drinking contaminated water and eating tainted food (e.g., fish, birds, and mammals).

Water intakes in relatively shallow lakes and rivers may be highly susceptible to contamination during oil spills. Response procedures may thus include temporarily closing the intakes, protectively booming the intake area, bringing on-line additional treatment equipment at the water-treatment plant, and/or monitoring water quality for the contaminants of concern. The low-molecular weight, aromatic compounds (benzene, ethylbenzene, toluene, and xylene) are usually of greatest concern, because of their much higher water solubility, compared to the other compounds in oil. These four compounds usually represent 70-95 percent of the water-soluble fraction (typically about 25-40 ppm) in crude oils. Water-treatment plants that have granular activated carbon filtration systems can remove low levels of oil contamination, especially the aromatic compounds, which can cause taste and odor problems at very low concentrations.

The potential for direct contact of oil on skin is greatest during cleanup, and measures should be taken to keep the public away from all spill response operations. Inhalation of volatile compounds from spills of crude oil and light, refined products poses a risk to the public in adjacent areas. However, these risks are greatest with long-term exposure.

Fire risks are mostly associated with volatile, refined products such as gasoline. Response operations at these spills must be conducted with caution. Often, the best response to spills of volatile products is to allow the product to evaporate, while diverting the slicks away from populated areas and sensitive habitats.

5.2 Conditions Under Which Oil Might Sink in Fresh Water

Most oil spills result in floating oil slicks. There are very specific conditions that can cause an oil spill to sink rather than float in freshwater settings.

1. The oil has a specific gravity greater than 1.00 at the ambient temperature.

Specific gravity is the ratio of the density of a material to fresh water. Although nearly all crude oils and most refined products have a specific gravity less than 1.00 and will therefore float, some of the residual refined products (e.g., very heavy fuel oils, asphalt) are so heavy that their specific gravity is greater than 1.00. Spills of these oils can sink immediately and flow along with the bottom currents or as droplets in the water column. However, very small changes in wa ter density can refloat sinking oil. There have been several spills in the freshwater sections of a river where the oil originally sank and moved along the bottom. However, at the fresh/salt mixing zone, where the water density increased with salinity, some of the oil rose to the surface. In other spills, oil has been reported to sink with very cold temperatures at night, only to refloat after the water absorbs heat from the sun.

2. The oil has a specific gravity just under 1.00 but forms a very stable emulsion.

Water-in-oil emulsions can contain up to 80 percent water, which increases the specific gravity accordingly. Also, during the emulsification process, some sediment can be incorporated into the emulsion, either from the suspended sediments in the water mixed into the oil, or those adhered to the floating slick. Only a very small amount of sediment is needed to sink oil. Usually residual refined products (e.g., No. 6 fuel oil, Bunker C) have a specific gravity of 0.99 or greater.

3. The oil comes ashore, picks up sediment, and then is eroded from the shore.

Medium and heavy oils can adsorb to sediment when they strand, making the mixture heavier than water. However, the oil/sediment mixture must be eroded from the shoreline, usually by waves, which tend to break up the oil slicks. The oiled sediment can be deposited in the nearshore zone, but as small tarballs or widely scattered contaminated sediment, rather than a layer of sunken oil. In some instances, the tarballs can stick to each other, forming a tar mat just offshore.

4. The oil is a blend of light and heavy refined products, and the light fraction is lost by evaporation.

Many intermediate fuel oils are actually mixtures of No. 2 and No. 6 oils. If the spill conditions were such that the light oil component completely evaporated, and the heavy oil was particularly heavy, the weathered oil might sink.

5.3 Oil Behavior in Ice Conditions

Several important differences in the behavior of spilled oil in ice conditions greatly reduce the effectiveness of response methods. For spills in water colder than the oil's pour point, the oil will quickly become viscous or tar-like. Even lighter, refined products can lose the ability to disperse and become non-coalescing, semi-solid, smooth, spherical particles that are difficult to recover. Weathering and loss by evaporation are slowed by low temperature, thickness of the slick, restriction of spreading, entrapment below the ice, and encapsulation in ice.

When spilled on ice, oil may pool in depressions and cavities, or be transported across the ice by wind. In ice with a porous crystal structure, oil can penetrate the ice; diesel-like oils can penetrate freely and deeply, while heavy oils remain more on the surface. Oil on the ice surface can also be entrapped by growing ice. If a light cover of snow covers the oil on the ice, the increased absorption of solar radiation by the oil under the snow can result in daily melting and nightly re-freezing that can form an ice/oil/ice layer.

Oil spills trapped beneath the ice will collect in the rough underside areas of the ice sheet. Entrapped oil will spread until it reaches an equilibrium thickness. The oil can become encapsulated within the growing ice sheet, where it will remain until spring thaw or when leads in the ice sheet form. During breakup, decaying ice increases in porosity and decreases in strength. Oil spilled under or sandwiched between this ice will rise through the ice and collect on the ice surface.

For oil spilled under the ice, there are new infrared and imaging techniques available to assist in location of thick oil pockets. Holes can be drilled in the ice at these collection points, and the oil removed by vacuum. When the oil is encapsulated in the ice, there are two options: remove the contaminated ice or delay recovering the oil until the spring thaw. The largest logistical issue with contaminated ice is separating the oil from large quantities of ice during the winter. In-situ burning and certain types of skimmers have been shown to be effective for removing oil in broken ice.

5.4 Permafrost

In the polar regions of the world, where the average annual temperature is below 0C, the soil freezes permanently and is known as "permafrost." Permafrost can range in thickness from a few centimeters for recently frozen soil, to hundreds of meters thick for old permafrost. In truly Arctic regions, all soils are in the form of permafrost; at its edges, the permafrost may be discontinuous and depend upon the soil type. In the United States, permafrost exists only in Alaska and at high altitudes in northern mountains. For oil spills, the major areas of concern are the Alaskan North Slope and the Trans-Alaskan pipeline route.

Ice is one of the most important components of permafrost. The continued existence of the frozen soil depends strongly on the insulating properties of the surface soil. During the summer months, the surface soil thaws, forming an active layer. The water in this layer remains in place, since the frozen subsurface is not permeable. Disturbing this surface-active layer (3-6 centimeters up to one meter in depth) can increase thawing of the subsurface and will result in surface slumping. It can take years for this disturbance to be healed.

The active layer of the permafrost supports a wide variety of specialized Arctic fauna and flora. Disturbing plants in this layer could affect this habitat for decades. While the data are limited, there is evidence that tundra plants are very sensitive to oil effects. This vegetation, particularly moss and lichen, forms the principal food sources for many of the animals in permafrost regions.

The sensitivity and issues of oil spill response in permafrost areas are similar to those for wetlands. It is best to allow the spill to recover naturally unless large areas have been affected. Appropriate response methods for summer spills would include installing berms to prevent continued spread of the oil, vacuuming pooled oil, applying sorbents to recover pooled oil in areas of limited access, and manually removing heavily oiled soils. Nutrient addition may be considered following gross oil removal. During summer, foot traffic in the permafrost should be highly controlled; structures such as board walkways should be used when possible to minimize physical disturbance. Vehicle traffic should be prohibited. It may be necessary to build a gravel road to the spill site to provide adequate insulation to prevent thawing of the permafrost. In winter, vehicular transport over snow-covered permafrost can be conducted without concern of physical disruption, and conventional land-based response techniques can be used, including in-situ burning.

5.5 Firefighting Foam

When responding to spills involving petroleum and refined fuels such as gasoline, firefighters often apply foam to suppress vapors and reduce the potential of fire. If the spilled material is already burning, foams are used to extinguish petroleum-liquid fires because they separate the burning liquid from the air, effectively smothering the fire. There are three basic types of foam commonly used:

1. *Film-Forming Fluoroprotein (FFFP)* type foams are manufactured from hydrolyzed, naturally occurring proteins with fluorocarbon surfactants added as stabilizers and to improve fire extinguishing characteristics.

2. *Aqueous Film-Forming Foams (AFFF)* are made from fluorocarbon surfactants with additional stabilizers. The advantage of AFFF over FFFP is its ability to form a thin aqueous film that travels ahead of the foam bubbles to extinguish the fire quickly.

3. *Alcohol-Resistant Foams* are specifically formulated for application on alcohols and polar flammable liquids.

Each of these foams is created by mechanical action that fills the foam bubbles with air. A fourth type of foam, Multipurpose Foam Compounds, is being developed since many gasolines are required to contain alcohol or polar additives (such as methyl t-butyl ether) to decrease automobile emissions. These additives are water-soluble and reduce the effectiveness of conventional foams used on gasoline fires.

There are two environmental concerns with using firefighting foams. First, the acute aquatic toxicity of these products has not been fully evaluated. Toxicity should be evaluated in terms of the likely dose expected from normal application rates and possible synergistic effects when combined with petroleum oils. Second, these products may alter the physical properties of the treated oil. Most firefighting foams contain surfactants that may increase the rate of dispersion of the oil if improperly applied or mixed due to currents, storms, or boat traffic.

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Appendix A.

Oil Spill Response Technology Bibliography

The following bibliography is not intended to be comprehensive, but instead provides a list of key references from which many other publications may be found dealing with spill response techniques, strategies, equipment, and effects.

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Appendix B

Grain-Size Scale

Graphic was included in original document only.

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APPENDIX VII: CHEMICAL USE CHECKLIST

A. COMPILE DATA

1. Spill Data
Circumstances:
Time/date of incident:
Location:
Type of oil product:
Volume of product released:
Total potential of release:
Type of release (instantaneous, continuous, etc.):

2. Characteristics of Spilled Oils
Specific gravity:
Viscosity:

3. Weather and Water Conditions/Forecasts
Air temperature:
Wind
Speed:
Direction:
Water
Conditions:
Temperature:
Depth:

4. Oil Trajectory Information
48-hour surface oil trajectory forecast
Surface area of slick:
Expected conditions of landfall:
48-hour dispersed or chemically treated oil trajectory forecast
Oil movement in water column:
Surface oil movement and expected landfall:
Concentration of the dispersant/oil mixture in the water column:

5. Chemical Characteristics and Application Equipment
CHEMICAL CHARACTERISTICS

	Product 1	Product 2	Product 3
Chemical Name Trade Name Manufacturer When Available Location Characteristics: - toxicity - effectiveness - reactions - applicability - flash point Amount Available Type of Containers Application Methods Benefits to Problem (e.g. reduce vapor, increase viscosity)			

TRANSPORTATION AND EQUIPMENT

	Company 1	Company 2	Company 3
Name Location Equipment Available Transportation of Equipment			

6. Comparison of the Effectiveness of Conventional Clean Methods vs. Use of Chemicals

- Containment at the source
- Burning
- Shoreline protection strategies
- Shoreline cleanup strategies
- Time necessary to execute response

7. Habitats and Resources at Risk

- Shoreline habitat type and area of impact
- Resources
  - endangered/threatened species
  - critical habitat for the above species
  - waterfowl use
  - shellfish
  - finfish
  - commercial use
  - public use areas
  - other resources of significance

8. Other Users of the Water: Nearby and Downstream

- Water supply, potable
- Water supply, industrial

B. RECOMMENDATIONS

1. Options

- Do not use chemicals
- Use chemicals on a trial basis
- Disperse or chemically treat in limited defined areas
- Disperse or chemically treat to maximum extent possible with accepted methods and available equipment

2. Other Recommendations/Rationale:

C. EVALUATION OF DECISION

1. Will application remove a significant amount of the slick from the surface water?

2. Can the extent or location of shoreline impacts be altered in a positive manner?

3. Can the damage to endangered/threatened species, mammals, and waterfowl be lessened?

4. Will the damage to habitats and resources resulting from the chemical use be less than those resulting without the use?

5. If recreational, economic, and aesthetic considerations are a higher priority than natural resource considerations, what is the most effective means of their protection?

D. MONITORING OF CHEMICAL USE

1. Records
Chemical brand:
Equipment and methods used in application:
Dilution of chemical prior to application, if any:
Rate of application:
Times and area of application:
Wind and wave conditions during application:

2. Effectiveness - visual and photographic documentation

- Oil before and after chemical application
- Resurfacing of dispersed or chemically treated oil
- Sampling of the water beneath the oil slick and the oil/chemical combination to determine the level of petroleum hydrocarbons in the water

3. Environmental Impacts - visual and photographic surveys

- Extent of shoreline impact by chemically treated and untreated oil
- Mortality or abnormal behavior of fish, birds, or mammals
- Comparison of shoreline areas impacted by oil and oil/chemical mixtures
- Analysis of oil concentrations in sediments under chemically treated oil
- Investigation of water column organisms for signs of adverse impact due to chemically treated oil
- Collection and analysis of birds affected by chemicals or oil/chemical mixture

4. Public Health
Sampling water supplies for petroleum and chemical constituents:

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APPENDIX VIII: IN SITY BURNING OF OIL AS A RESPONSE TOOL IN REGION 5

Guidance for Approving Proposals to Burn Oil

Prepared for Region 5 Regional Response Team by Countermeasures Workgroup, Region 5 Regional Response Team, January 1996

Part I

INTRODUCTION

In order to minimize the environmental impacts and facilitate effective cleanup of an oil spill, responders have a limited number of techniques available to them. These include:

· mechanical methods,

· the use of certain chemical countermeasures, and

· in situ burning.

Under certain specific conditions, in situ burning may offer a logistically simple, rapid, inexpensive, and relatively safe means for reducing the shoreline impacts of an oil spill. Moreover, because a large portion of the oil is converted to gaseous combustion products, the need for collection, storage, transport, and disposal of recovered material can be substantially reduced.

In situ burning may be able to remove large amounts of spilled oil before spreading and drifting of the spill fouls shorelines and threatens wildlife. In certain circumstances, such as oil spilled in ice conditions, burning may be the only viable response technique. For these and other reasons, in situ burning is gaining attention and favor as a potential oil spill response technique.

In situ burning must be evaluated in conjunction with other containment and cleanup alternatives. Specific spill conditions will often dictate the response techniques used and selection always involves tradeoffs. For example, a potentially ecologically damaging but efficient cleanup technique could be used to meet site-specific response goals. Also, techniques may be used early in response simply because they can be implemented immediately, rather than waiting until ones with lower impact can be mobilized. In situ burning, which might have a significant short-term impact, may actually produce the lowest long-term impact because it removes the oil quickly.

This policy document contains the background information and guidance necessary to aid the Federal and State OSC, the appropriate RRT members, and Area Committees in their consideration of whether to allow the use of in situ burning as an oil spill countermeasure.

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1. RRT 5 POLICY FOR USING IN SITU BURNING AS AN OIL SPILL RESPONSE TOOL

RRT5 strongly recommends that in situ oil burning be considered as a means to avert potential oil spill impacts to the region's beaches, wetland environments, and Great Lakes and inland resources. In situ burning should augment, not replace, other oil spill response techniques such as mechanical removal or chemical countermeasures. Where and when appropriate, in situ burning can be used as a first-strike option for defensive purposes (e.g., open water burning and burning in ice conditions), and as a cleanup technique (e.g., burning of wetlands to remove spilled oil).

Since the use of in situ burning is being encouraged, education of the public and the response community is also necessary to reduce misconceptions and anxieties. This should be accomplished by outreach to public forums and in the area planning/committee process.

The RRT has adopted this policy applicable to spill responses under the direct oversight of a Federal On-Scene Coordinator (FOSC). This policy authorizes the FOSC to use in situ burning as a response countermeasure to an oil discharge when he or she believes it is appropriate after key members of the RRT have been consulted and concur. In some circumstances this policy is overridden by State laws and in the case of the use of burning agents during in situ burning by the NCP (40 CFR 300.910). To the extent that this policy applies, the following summarizes the appropriate situations where concurrence and consultation should take place:

(a) The requirements of this policy apply only to responses under the direct oversight of an FOSC, but its general application is strongly encouraged.

(b) The appropriate State's approval is always required. In Region 5, the use of in situ burning as a response tool will always be within State waters and inland areas and consequently be subject to State law and policy. When burning agents are used this is a requirement of the law (the NCP).

(c) The U.S. Environmental Protection Agency (U.S. EPA) must concur with the Federal OSC's recommendation to authorize the use of in situ burning. When burning agents are used this is a requirement of the law (the NCP).

(d) The U.S. Department of Interior (DOI) must also concur with the decision to burn during a spill response overseen by a Federal OSC. The responsibility of concurrence is given to DOI because of its authorities, and potential assistance to the Federal OSC, regarding the Endangered Species Act and potential representation of Federally recognized Native American communities. Furthermore, DOI has significant responsibilities as a Federal natural resource trustee.

(e) As a natural resource trustee, the Department of Commerce (DOC/National Oceanic and Atmospheric Administration (NOAA) should be consulted when considering an in situ burn. Notification should be from the RRT Co-Chairs via the DOC RRT member.

(f) Native American community official(s) must be consulted on any decision to use in situ burning when a burn would reasonably be expected to impact those designated areas of Native American interests.

(g) Finally, this approval must also be in concert with Canadian Federal Government officials, adjoining States and/or provinces, and local officials with approving jurisdictions, where deemed appropriate or necessary. Additionally, the NOAA Scientific Support Coordinator (SSC) should be contacted to assist in the decision-making process.

The use of in situ burning for response will follow the Region 5 approved guidelines and procedures established to allow the State and Federal On-Scene Coordinator the safe and effective use of this response tool. This includes, but is not limited to, the RRT 5 Cleanup Guidelines.

Special Note on Notification: *Once notified by the RRT Co-Chairs, DOI must develop its position on the burn in a limited timeframe consistent with the incident-specific conditions and response limitations. Typically this would be on the order of hours. Significant efforts will be made to contact DOI; however, if no contact can be made within a reasonable timeframe, a decision to burn will be made without DOI concurrence. The Co-Chairs will establish this incident-specific time frame and provide DOI with the spill information and Federal OSC justification for conducting the burn.*

1.1. Authority

Section 300.115 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) states that the RRT is responsible for regional planning and coordinating preparedness and response actions. The NCP further states, "...[The RRT] provides the appropriate regional mechanism for development and coordination of preparedness activities before a response action is taken and for coordination and advice to the OSC/RPM during such response actions.…"

Section 4201 of the Oil Pollution Act (OPA; P.L. 101-380) amended the Clean Water Act, which gives the general removal authority to "...ensure effective and immediate removal of a discharge, and mitigation ...of oil..." This same section requires the contents of the NCP to contain "...procedures ad techniques to be employed in identifying, containing, dispersing, and removing oil.…"

Finally Section 7001 of OPA supports the concept of developing innovative technologies that are effective "...in preventing or mitigating oil discharges and which protect the environment.…"

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2. IN SITU BURNING AS A RESPONSE TOOL—AN OVERVIEW

2.1. Definition

In situ burning, for the purposes of this guidance, is defined as the use of an ignition source to initiate the combustion of spilled oil that will burn due to its intrinsic properties and does not include the adding of a burning agent to sustain the burn.

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 is virtually uncontrolled with 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.

2.2. Potential Effectiveness

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, including:

· 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 other methods. In comparison, mechanical removal (such as skimming) typically has an efficiency of 10 to 20 percent.

In situ burning is most 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 combustion a slightly less viable alternative for those materials than for crude oils.

***An additional source of information about applicable habitats in which to conduct in situ burning is the joint NOAA/American Petroleum Institute document,* Options for Minimizing Environmental Impacts of**

Freshwater Spill Response*.*

2.3. 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 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.

2.4. Byproducts of In Situ Burning

Byproducts of in situ burning exist because no combustion 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, byproducts can be categorized into three groups: unburned oil, airborne components, and combustion residues. Each of these is discussed in greater detail in Part II of this guidance document.

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3. SAFETY AND HUMAN HEALTH CONSIDERATIONS OF IN SITU BURNING

3.1. 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:

(a) 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 ar 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.

(b) 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.

(c) 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.

(d) 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 personal protective equipment that may be used to minimize inhalation of and skin contact with combustion byproducts. Exposure limits such as OSHA's Permissible Exposure Limits (PELs) are applicable to this group of typically healthy adults.

Other hazards can include the exposure of personnel to extreme heat conditions, smoke, and fumes. Work also may be done under time constraints or for 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.

3.2. 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 those expected for similar types of combustion such as forest fires. Many human health experts believe 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 the 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 byproducts 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 its 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 gases resultant from the burned material. Because wind direction meanders under most circumstances, no population should be within a 45-degree arc to either side of the wind direction. Local wind and weather events (air stability class, lake breezes, and frontal passages, for example) must be considered when determining downwind directions.

3.3. Public Notification

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

Additional information about effectiveness can be found in **Part II - Technical and Background Information.**

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4. ECOLOGICAL CONSIDERATIONS OF IN SITU BURNING

4.1. Open Water In Situ Burning

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. ***Additional information about worker and general public health and safety can be found in*** **Part II - Technical and Background Information.**

4.2. 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 that the ambient-temperature water is continually being supplied below the oil layer as the boom is towed.

4.3. Surface Microlayer

4.3.1. 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.

4.3.2. 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.

4.4. In Situ Burning 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 recycling, and

· 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:

(a) the high Btu of the oil may increase the temperature and heat penetration of the burn, and

(b) 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. 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:

(a) 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.

(b) Cons

· Burning can cause substantial initial plant damage because the aboveground 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. ***Part II of this document contains summary of published case studies where the burning of marshes was used as a response tool .***

4.5. 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 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 byproducts 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.

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5. OPERATIONAL CONSIDERATIONS FOR CONDUCTING IN SITU BURNING

5.1. 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.

5.2. 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.

5.2.1. IN SITU BURNING IN ICE/WINTER CONDITIONS

Containment is almost always required to maintain the minimum 2- to 3-cm 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 that it is possible to ignite and burn fresh, weathered, and emulsified oil at temperatures as low as -35 degrees Celsius. 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 to 99 percent have been shown during field studies and actual spills. Oil/snow mixtures of up to 75 percent can be ignited with a diesel or gasoline-soaked rag (from *Detection of Oil in Ice and Burning Oil Spills in Winter Conditions*, PROSCARAC, Inc., March 1992).

5.2.2. IN SITU BURNING IN WETLANDS AND MARSHES

Based on very limited data on effectiveness and effects of burning on oiled marshes, the following guidelines are suggested:

(a) 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.

(b) Impacts to below-ground vegetation are likely to be lower if there is a water layer between the oil and the substrate.

(c) A standing water layer of just a few inches may get hot enough to kill the roots anyway; however, little information is available regarding this effect.

(d) Burning of oiled woody wetland vegetation (compared to grasses and sedges) should not be considered.

(e) 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.

(f) 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.

(g) Light fuels oils and crudes burn more efficiently and generate less residues, which should reduce the potential for long-term impacts.

(h) Burning of oil trapped in ice appears to have the least environmental impact because the burn area is contained, the plants are dormant, and the above-ground vegetation is dead.

(i) There is some concern that burning of muddy substrate could alter their physical properties (i.e., make them hard), thus degrading their biological productivity.

(j) 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.

5.3. 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 device 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.

5.4. 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.

5.5. 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. ***Further information on the efficacy of fire-resistant booms can be found in*** **Part II - Technical and Background Information.**

5.6. 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.

5.7. Effects of Emulsification

The effect of water content on oil ignition is believed 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.

5.8. 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.

Although sinking of burn residues has seldom been observed in test burns, a slight increase 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 underwent 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 circumstance specific to this situation should not be used as the basis for generalization in all burning scenarios.

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6. SUMMARY OF POTENTIAL TRADEOFFS RELEVANT TO BURNING

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.

6.1. Advantages

(a) 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;

(b) 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;

(c) 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;

(d) 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.

6.2. Disadvantages

(a) Large quantities of highly visible black smoke are generated that may adversely affect human and other exposed populations downwind;

(b) There may be the potential for mortalities and other adverse biological impacts from localized temperature elevations at the water surface. Although these could 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 present reasons for not considering burning as a cleanup technique;

(c) The longer-term effects of burn residues on exposed biological populations have not been investigated. It is not known whether these materials represent a significant source of toxicity;

(d) In situ burning must be carefully controlled in order to maintain worker safety and to prevent unintended environmental impacts;

(e) 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.

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7. MONITORING

The primary operational purpose in monitoring the burning of spilled oil is to determine whether 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 must occur during a response involving the use of in situ burning and must be accompanied by a detailed monitoring plan. More information regarding specific monitoring procedures and standards can be found in the Technical Appendices.

Operational monitoring should include such parameters as:

· type and amount of oil spilled;

· weather and sea conditions;

· trajectory of the slick and smoke plume;

· estimated volume of oil to be burned;

· estimated volume of oil burned and remaining;

· the effectiveness of residual material collection;

· adverse effects to natural resources (e.g., number of dead organisms).

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, are 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;

· compounds (PAHs, particulates) to be monitored

· species and numbers of biota (e.g., waterfowl, aquatic organisms, vegetation) in the area.

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PART II— Technical and Background Information

1. BURN EFFICIENCY

The efficiency of an in situ burn is usually expressed as the percent reduction in original oil weight following combustion. Researchers have found that oil thickness, degree of weathering, and degree of emulsification are among the most important factors affecting the efficiency with which oil will burn. The interaction among these parameters will determine the amount oil that is actually removed from the surface of the water during a burn.

Although the efficiency of in situ burning is highly dependent on a number of physical factors, test burns and applications in actual spill situations suggest that it can effectively remove ;large quantities of crude oil from the water. For example, Benner *et al.* (1990) found that 54 to 83 percent of an Alberta Sweet crude oil sample was burned in laboratory tests of in situ burning (the range in efficiencies correlated with oil layer thicknesses from 2 to 10 mm). Brown and Goodman (1986) measured burn efficiencies for Norman Wells crude in simulated ice floe conditions ranging from 67 to 90 percent (the higher efficiencies resulted when thicker layers of oil were burned).

In 1989, a test burn in the first days of the *Exxon Valdez* spill in Prince William Sound, Alaska, burned approximately 15,000 to 30,000 gallons of Prudhoe Bay crude oil, at an estimated efficiency of 98 percent or better (Allen 1990; Evans *et al.* 1990).

These removal efficiencies refer to the amount of oil burned once it is contained within a boom. It does not include the inefficiencies associated with collecting and containing the oil itself. Fingas *et al.* (1989) found that chemical dispersants could, in some cases, be very effective in removing crude oils from the water surface. They also determined that some oil-dispersant combinations had no effect. Solsberg *et al.* (1976) evaluated the effectiveness of seven skimmer-type oil recovery devices, and found a wide range of efficiencies in picking up spilled oil and in the amount of oil recovered relative to the amount of water recovered. With its consistently high efficiency in oil removal, in situ burning compares favorably with the best performances of these more familiar response techniques.

In situ burning has been tested most often with crude oil spills. Its feasibility with other kinds of products (e.g., marine diesel fuel and Bunker C fuel) has also been demonstrated (Twardus 1980), although inherent characteristics of the non-crude oils make them less amenable to the technique. That is, in situ burning is more effective in removing crude oil than other types of oil because of difficulties in establishing and maintaining necessary slick thicknesses (in the case of lighter, lower-viscosity oils) and difficulties with ignition (for heavier, less volatile oils).

A 1991 U.S. EPA summary noted the variant in burn efficiency with slick thickness: with a slick of 10 mm thickness, approximately 80 to 90 percent of the oil is burned; with a slick of 100 mm thickness, approximately 98 to 99 percent is burned (U.S. EPA 1991).

Alyeska (1992) commented that the effects of emulsification on burn efficiency are similar to, but more pronounced than, those for weathering. Similarly, Buist (1989) determined that oil burning efficiency also declined with increasing emulsification as shown below. Similar results were obtained by Bech *et al.* (1992). These observations again imply that two separate ignitions may be necessary for efficient product removal when the oil has emulsified. The first ignition would vaporize water form the slick, while the second ignition (after collection of the oil to thicken it) would burn off the oil. During spills, burn efficiency will also depend on wind speed, currents and ability to deploy and maneuver equipment.

Summary Table (Buist 1989)

Type of Emulsion Burn Efficiency (percent)

Unemulsified Hibernia Crude 85 - 90 25% water-in-oil 70 - 80 50% water-in-oil Hibernia B-27 70 - 75 75% water-in-oil Hibernia B-27 5 - 35 ≥ 50% water-in-oil Hibernia C-96 0

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2. AIRBORNE COMPONENTS OF IN SITU COMBUSTION

Most of the oil in an in situ burn will be converted to carbon dioxide and water. Particulates, mostly soot, comprise 10 to 15 percent of the smoke plume. Small amounts of toxic gases are emitted as well. These include sulfur dioxide, nitrogen dioxide, and carbon monoxide. In addition, small amounts of polynuclear aromatic hydrocarbons (PAHs) are emitted from the fire, mostly as residues attached to the particulates. These combustion byproducts are discussed below.

2.1. Sulfur dioxide

(SO_2)

Sulfur dioxide is a gas formed when sulfur in the oil oxidizes during the combustion process. This gas is toxic and irritates the

eyes and respiratory tract by forming sulfuric acid on these moist surfaces (Amdur 1986).

The concentration of SO_2 in the smoke plume depends on the sulfur content of the oil. Average SO_2 level measured in experimental burns have been below 2 ppm in the plume 100 to 200 meters downwind of the burn (Fingas *et al.* 1993). Several miles downwind, sulfur dioxide from in situ burning is expected to be much below the level of concern for the general population.

Table 1. Major in situ burning pollutants and their exposure standards

Pollutant OSHA PEL* NAAQS SO_2 2 ppm 0.14 ppm/24 hr NO_2 1 ppm 0.05 ppm PAH 0.2 (volatile) _

CO 35 ppm 9 ppm PM-10 5 mg/m^3 0.15 mg/m^3

*Time-weighted average concentration over 8 hours

2.2. Nitrogen dioxide

(NO_2)

Nitrogen dioxide is another gaseous byproduct of oil combustion. Like SO_2, it is reactive, toxic, and a strong irritant to the eyes and respiratory tract. NO_2 is less soluble that SO_2 and therefore may reach the deep portions of the lungs (the critical gas exchange area of the lungs) so that even low concentrations may cause pulmonary edema, which may be delayed (Amdur 1986).

Sampling results to date indicate that the concentration of nitrogen dioxide in the plume several miles downwind of the burn does not exceed several parts per billion. Therefore, it is not expected to pose a threat to the general public several miles downwind of the burn.

2.3. Polynuclear aromatic hydrocarbons (PAHs)

PAHs are a group of hydrocarbons characterized by multiple benzene rings attached together. These compounds have very low vapor pressures and are not very flammable (compared to other compounds found in crude oils). PAHs are found in the unburned oil as well as the smoke plume. Some PAHs are known or suspected to be carcinogens. Target organs may include the skin (from chronic skin contact with oils) or the lungs from inhalation of aerosol. Based on data from NOBE and previous burns, most PAHs are burned in the fire, and their concentration in the oil residue is higher than in the smoke plume. Considering the low level of PAHs detected in these past burns, it is felt that they present only a small exposure hazard.

2.4. Carbon monoxide (CO)

Carbon monoxide is a common byproduct of incomplete combustion. The toxicity of CO is acute and stems from its high affinity to the hemoglobin molecule in red blood cells. CO will chemically displace oxygen from the blood and cause oxygen deprivation in the cells of the body. In experimental burns the average level of CO in the smoke plume over the duration of the burns (15 to 30 minutes) was found to be 1 to 5 ppm 150 meters downwind of the burns.

2.5. Particulates

Particulates in the smoke plume are considered by most health professionals to be the main combustion product to investigate and monitor. Therefore, particulates will be discussed in more detail.

Particulates are small pieces of solid materials (dusts, soot, fumes) or liquid material (mists, fogs, sprays) that remain suspended in the air long enough to be inhaled. During in situ burning, elemental carbon (soot) and hydrocarbons are emitted. Since these particles absorb light to a high degree, the smoke plume is usually black.

Particulate concentration is measured in several ways. A relatively accurate method involves sampling with an air pump that draws air through a filter. Depending on pore size, the filter may collect more than 99.9 percent of the particulates in the air. Real-time instruments that can measure particulate concentration at the time of measurement are also available; some are quite sensitive and accurate. They must be calibrated to the particulates of concern, and may be affected by other aerosols such as water vapor.

Since 10 micrometers (:m) in diameter is the size below which particulates may reach the deep portion of the lungs and become a burden on the respiratory system, most scientists tend to divide the particulate mass into "total" particulates, which include any size measurable, and "PM-10," which is the fraction of particulates smaller than 10 :m in diameter.

Particulate size also plays a crucial role in determining how long they will be suspended in the air. Larger particulates (tens of :m in diameter) would precipitate rather quickly close to the burning site. Smaller particulates (ranging from a fraction of a :m to several :m in diameter) would stay suspended in the air for a long time and be carried over long distances by the prevailing winds. Particulates small enough to be inhaled (PM-10) are also the ones to remain suspended. A practical implication is that if those particulates do not descend to ground level (where people are) they will not threaten the population downwind. For most people, exposure to inert respirable particulates may become a problem at high concentrations (several milligrams of particulates per cubic meter of air). However, sensitive individuals may develop respiratory problems at levels much lower than that. Several recent studies (Schwartz 1992; Pope *et al.* 1992; Dockery *et al.* 1992) suggest that there is a correlation between particulate concentration in the air and daily mortality. these studies used measurements of air pollution and matched them to mortality and morbidity data in several cities in the U.S.: Philadelphia, Detroit, Provo, and Birmingham, Alabama. Higher levels of PM-10 were associated with increase in daily morbidity and mortality, especially among older people and people with allergies, respiratory problems, and cardiovascular diseases. An increase of 100 :g/m^3 of the measured daily particulate level was associated with 6 percent increase in mortality (Schwartz 1992). The biological mechanism has not been determined, but the possibility of such a correlation should dictate that in situ burning be conducted only when it does not pose a hazard to human health, and exposure to particulates should not exceed the applicable Federal or State standard.

Sampling conducted so far indicates that the populations downwind and even response personnel will be exposed to very low levels of gases and particulates. In the recent experimental in situ burn off the coast of Newfoundland, many particulates were tagged with sampling badges to assess their exposure to volatile organic compounds (VOCs). Initial analysis of those badges indicates that exposures in most cases were below the level of detection (LOD=0.001 mg per sample). The few detected VOC "hits" could be traced to fuel and solvents on the vessels rather that VOCs from the spilled or burning oil (Bowes 1994). Similarly, the level of respirable particulates (PM-10) was monitored by a University of Washington research aircraft. While concentration of PM-10 at or above 150 micrograms per cubic meters (:g/m^3) of air extended to a distance of approximately 6 miles in the plume itself, PM-10 concentration beneath the plume, 150 to 200 feet above the surface, did not exceed background levels of 30 to 40 :g/m^3 (Ferek personal communication). These data agreed well with previous measurements done in test burns in Mobile Bay, Alabama.

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APPENDIX IX: FISH AND WILDLIFE ANNEX TO THE U.S. EPA REGION 5 REGIONAL/AREA CONTINGENCY PLAN

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November 1996

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Part I provides guidance for spill response planning and Part II provides guidance for spill response activities.

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INTRODUCTION

Part I of this Annex provides guidance for spill response planning and Part II provides guidance for spill response activities.

Objectives of the Fish and Wildlife and Sensitive Environments Plan

Agencies with fish and wildlife responsibilities need to be informed of the course of events during a spill and first responders need to be aware of environmentally sensitive areas in the vicinity of the spill. The purpose of this Fish and Wildlife Annex is to provide information that will allow spill responders to quickly recognize threats to fish, wildlife, and their habitats, (i.e. sensitive environments) and to minimize the effects of both the spill and response activities on these natural resources.

Overview of Fish and Wildlife Response Issues

The On-Scene-Coordinator (OSC) should promptly notify natural resource trustees of spills. The OSC should also coordinate response activities with the appropriate natural resource trustees, including the selection of a removal action. When the OSC becomes aware that a release may affect any endangered or threatened species, or their habitats, the OSC shall consult with the appropriate natural resource trustee. For Federally listed endangered or threatened species the appropriate trustee is the Department of the Interior (DOI), acting through the U.S. Fish and Wildlife Service (USFWS). The appropriate USFWS contact for each State is included in this Annex.

The designated State official normally assumes responsibility for notifying the State trustee of natural resources affected/potentially affected by the incident. However, the OSC should not hesitate to contact the State wildlife agency independently for technical assistance. Appropriate State fish and wildlife agency contacts are listed in this Annex.

For inland waters, the fish and wildlife resources for which the Federal government is primarily responsible include migratory birds and Federally listed endangered and threatened species. Migratory birds include most species of wild birds except certain introduced species and nonmigratory game birds. Federal agencies also are responsible for wildlife on Federally owned land. The States have primary responsibility for all other species of wildlife and fish, as well as some shared responsibility for migratory birds and Federally listed endangered and threatened species. Federally listed endangered and threatened species are listed by county in this Annex.

Lands (Federal, State, and locally owned) that should be presumed to contain high quality fish and wildlife habitat include parks, designated wildlife areas and refuges, and forests. Most surface waters and wetlands should also be presumed to be high quality fish and wildlife habitat. Spills which impact large areas of surface water will likely threaten protected species of wildlife. Lands designated as critical habitat under provisions of the Endangered Species Act of 1973 (ESA) are specific land parcels and are identified in this Annex.

The seasonal timing of a spill may affect the degree of damage to fish and wildlife resources. For example, spills to some surface waters will pose a greater threat to waterfowl during the spring and fall migration periods. In the spring, oiled waterfowl (and other wildlife) may also return to their nests and contaminate eggs or chicks, thus multiplying the impact. A very minute amount of oil on an egg can be enough to kill the developing embryo. Waterfowl and other wildlife that become oiled can transport oil residues to distant locations and impact wildlife concentration areas several miles away.

An oil spill affecting wildlife can involve agencies such as the USFWS and State wildlife agencies, private wildlife rehabilitators such as Tri-State Bird Rescue or International Bird Rescue Research Center (IBRRC), and volunteers. Wildlife rehabilitation activities may last well beyond completion of the cleanup. For those States which have developed a trained and organized network of volunteer wildlife rehabilitators, information on how to mobilize the network is presented in this Annex. A general list of appropriate wildlife agency contacts, and other wildlife contacts, is also included.

The Occupational Safety and Health Administration (OSHA) requires that those responding to spills be properly trained and that the hazards of the spilled material be known. This can result in wildlife not being rehabilitated if the spilled materials are unknown or if they present an unacceptable health risk to rehabilitators. There will also be delays in wildlife rehabilitation if volunteers have not been trained. USFWS resources available for spill response are generally very limited. The assistance of State wildlife agencies and professional and volunteer wildlife rehabilitators will be critical to the success of any wildlife cleaning and rehabilitation operation.

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PART I. PLANNING GUIDANCE FOR SPILL RESPONSE

1.0 REGULATORY AND STATUTORY AUTHORITIES AND OBLIGATIONS

1.1 Federal Statutory Regulations

Authority and guidance for wildlife response following oil spills is contained in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP 1968) which recognized the need to utilize Federal agency expertise during responses to oil spills and releases of hazardous substances.

1.1.1 Department of the Interior, U.S. Fish & Wildlife Service

The Department of the Interior (DOI) has trustee responsibility for migratory birds under the Migratory Bird Treaty Act (16-USC 703-722) and for threatened and endangered species under the Endangered Species Act (16 USC 1531-1544). The DOI and Department of Commerce share trustee responsibility for anadromous fish under the Anadromous Fish Conservation Act (16 USC 7571-757f).

As a manager of trust natural resources delegated under DOI, the U.S. Fish and Wildlife Service (USFWS) has the responsibility to conserve, enhance, and protect fish and wildlife and their habitat. The USFWS role during prespill planning, "removal" activities, and "preassessment" activities has been enhanced and formalized by the new responsibilities identified in the Oil Pollution Act of 1990 (OPA) and the mandated amendments to the Federal Water Pollution Control Act (FWPCA) ("Clean Water Act") which revised the NCP.

Specifically, USFWS personnel are responsible for protecting trust natural resources from the threat of injury or injury caused by a discharge of oil. Additionally, they are responsible for assisting in the identification of sensitive environments in advance of discharges, assisting the OSC during the response phase, assessing injuries, determining damages, and overseeing wildlife rehabilitation during actual discharges. (For more specific roles and responsibilities of the USFWS during a spill, please refer to Part II, Section 1.2.1.).

The following list briefly summarizes the primary authorities which direct the USFWS in carrying out its responsibilities related to oil spill response and contingency planning:

1.1.1.1 Migratory Bird Treaty Act

Prohibits the taking or possession of any migratory birds, except as permitted by certain regulations which are enforced by the USFWS. Prosecutions under this law apply to oil spill situations which result in migratory bird mortality. Rehabilitation of oiled migratory birds is also subject to permitting regulations under this Act.

1.1.1.2 Endangered Species Act

Provides for the conservation of threatened and endangered species of fish, wildlife, and plants. The USFWS has lead authority for the Secretary of the Interior within the geographic area covered by this Area Plan to prohibit unauthorized taking or possession of Federally listed endangered species (Also see Part I, Section 4).

1.1.1.3 Bald Eagle Protection Act

Provides for the protection of the bald eagle and the golden eagle by prohibiting the taking, possession and commerce of such birds. The USFWS has lead authority for the Secretary of the Interior within the geographic area covered by this Area Plan to prohibit unauthorized taking or possession of bald or golden eagles.

1.1.1.4 National Wildlife Refuge System Administration Act

Provides directives for the administration and management of all areas (lands and waters) in the National Wildlife Refuge System. The USFWS is responsible for ensuring that all uses of these areas are compatible with the major purposes for which such areas were established.

1.1.1.5 Anadromous Fish Conservation Act

Authorizes the Secretary of the Interior to enter into cooperative agreements with the States and other non-Federal interests for conservation, development, and enhancement of anadromous fish, including those in the Great Lakes.

Also authorizes the USFWS to conduct studies and make recommendations to U.S. EPA concerning measures for eliminating or reducing polluting substances detrimental to fish and wildlife in interstate or navigable waters, or their tributaries.

1.1.1.6 Fish and Wildlife Coordination Act

Requires consultation with the USFWS and State fish and wildlife Agencies in instances in which diversions or other modifications to water bodies are proposed, authorized, permitted, or licensed by a Federal agency under a Federal permit or license. It recognizes the vital contribution of fish and wildlife resources to the Nation and requires coordination and equal consideration of fish and wildlife conservation with other water resources development objectives.

1.1.1.7 Oil Pollution Act of 1990

Requires the USFWS to assist in the development of Area Contingency Plans, including fish and wildlife response plans; assist in preparation of damage assessment regulations; and, if necessary, conduct natural resource damage assessments.

1.1.1.8 Comprehensive Environmental Response Compensation and Liability Act (Superfund)

Requires the USFWS to protect and restore trust resources injured by uncontrolled releases of hazardous materials. Authorizes the USFWS to conduct assessments to establish injury and the dollar equivalent of that injury for collection of damages from parties responsible for releasing hazardous materials.

1.1.2 Department of the Interior, National Park Service

[To be provided]

1.1.3 Department of the Interior, Bureau of Indian Affairs

[To be provided]

1.1.4 Department of Commerce, National Oceanic and Atmospheric Administration

[To be provided]

1.1.5 Department of Agriculture, Forest Service

[To be provided]

1.2 State Regulations

[To be provided]

2.0 NOTIFICATION OF NATURAL RESOURCE TRUSTEES

(NCP sec. 300.300(b)(c)(d), NCP sec. 300.210(c)(4)(ii)(G))

When an oil spill occurs, any person in charge of a vessel or facility, or any other person, shall immediately notify the National Response Center (NRC) of the discharge at 1-800-424-8802. (Alternatively, if direct notification to the NRC is not possible, notification may be made to the U.S. Coast Guard or the U.S. EPA predesignated OSC, or the nearest Coast Guard Unit.) The State or Federal OSC, when notified by the NRC, should then notify the Office of Environmental Compliance (OEPC) and the State natural resource agencies. In addition, contacts may be made with the local USFWS Ecological Services Field Office. Primary contacts for the USFWS and State Natural Resource Agencies are listed in Part II, Section 3. Only one contact per agency is necessary; the persons initially contacted will notify other personnel within their respective agencies, such as law enforcement staff and refuge managers. The USFWS will provide responders with information concerning the presence of trust natural resources, as well as technical assistance concerning the effects of oil on these resources. The USFWS may help coordinate wildlife recovery and rehabilitation efforts in conjunction with the State fish and wildlife agencies.

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3.0 MECHANISMS FOR TIMELY IDENTIFICATION OF PROTECTION PRIORITIES

(NCP 300.210(c)(4)(ii)(B))

3.1 During a Spill

A threat to fish, wildlife, or important habitat may be reported by any Federal, State, Local agency, or individual with pertinent information. During a spill, the timely identification of protection priorities for fish, wildlife, and their habitats shall be accomplished through coordination between the representatives of the USFWS, the State agency with responsibility for fish and wildlife resources, and the OSC or his representative. This coordination shall be initiated by the party that first becomes aware of a threat to high priority natural resources.

Some natural resources that, at any given time or location, may warrant a high level of protection include the following categories of lands and species:

a. **Federally listed endangered and threatened species, designated critical habitat, and other habitats known to be utilized by these species;**
b. **migratory birds including waterfowl, raptors, songbirds, and most other bird species and their habitats;**
c. **State listed endangered and threatened species and their habitats;**
d. **designated areas of high quality fish and wildlife habitat such as Federal and State wildlife refuges and wildlife management areas, State and Federal fish hatcheries, natural area preserves, parks, and forests;**
e. **surface waters in general including rivers and streams, ponds and lakes, and wetlands;**
f. **other species of fish and wildlife (game and non-game) and their associated habitats.**

Information about the location of these environmentally sensitive areas will be developed by the Area Committee as part of the spill planning process. Knowledge of these areas may need to be refined or augmented during an actual spill. Sources of information about environmentally sensitive areas may include commercially available Local maps and State atlases, National Wetland Inventory maps, U.S. Geological Survey quadrangle maps, maps developed by the Area Committee, maps and information developed as part of facilities plans, maps and information developed by various government agencies, and computer GIS information. Detailed computerized GIS maps of sensitive areas that could be accessible from the field using laptop computers would be beneficial to response personnel.

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3.2 Prior to Application of Chemical or Other Countermeasures

(NCP 300.210 (c)(4)(ii)(C) and (D))

The OSC must consult with the Department of the Interior (DOI) before use of chemical countermeasures that could be destructive to fish, wildlife, or their habitats (chemical dispersants, emulsifiers, cleaning agents, agents to accelerate burning, etc.). The OSC must obtain concurrence from DOI before an in-situ burn countermeasure may be implemented. Containment and removal should be the first priority countermeasures and should be considered "pre-approved."

Prior to response activities in wetlands and other sensitive environments, especially operations involving heavy machinery, the OSC should coordinate with the USFWS and State fish and wildlife agency. Identification of areas sensitive to physical modification or perturbation will have been identified to the extent possible by the Area Committee. In general, these will include the same areas identified as sensitive environments. The location of disposal and staging areas may require refinement during a spill, and this planning should be coordinated with the USFWS and State fish and wildlife agency.

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4.0 THREATENED AND ENDANGERED SPECIES

4.1 Federally Threatened and Endangered Species Within U.S. EPA Region 5

Threatened and endangered (T&E) species inhabit, or live near, almost every body of water in the Region. Some USFWS Field Offices provide an annually-updated list of Federal T&E species, by county. These lists are provided under the appropriate State in Part II Section 3.

Federal and State listed T&E species and their designated critical habitat(s) (Federal) are given high priority for fish and wildlife protection in U.S. EPA Region 5 contingency planning (See Part II, Section 2). The Federally protected species that reside within U.S. EPA Region 5, and their habitat descriptions, are listed in Table 1.

TABLE 1. FEDERALLY LISTED SPECIES WITHIN U.S. EPA REGION 5

SPECIES	STATUS	HABITAT	RANGE
MAMMALS			
Gray bat (Myotis grisescens)	Endangered	Caves	Illinois, Indiana, Missouri
Gray wolf (Canis lupus)	Threatened in Minnesota; Endangered in Wisconsin and Michigan	Northern forested areas [Critical habitat = Beltrami, Cook, Itasca, Koochiching, Lake, Lake of the Woods, Roseau, St. Louis Counties in Minnesota and Isle Royale in Michigan]	Michigan, Minnesota, Wisconsin
Indiana bat (Myotis sodalis)	Endangered	Summer habitat includes small to medium river and stream corridors with well developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula. [Critical habitat has been designated for hibernacula: Blackball Mine in LaSalle County, Illinois; Big Wyandotte Cave in Crawford County and Ray=s Cave in Greene County, Indiana]	Illinois, Indiana, Michigan, Ohio
BIRDS			
Bald eagle (Haliaeetus leucocephalus)	Threatened	Mature forest near water	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
Least tern (Sterna antillarum)	Interior population Endangered	Bare alluvial islands and dredged spoil islands	Illinois, Indiana
Kirtland's warbler (Dendroica kirtlandii)	Endangered	Breeding in jack pine	Michigan, Wisconsin (singing males only
Peregrine falcon (Falco peregrinus)	Endangered	Historically nested on cliffs; now nesting on man-made structures (buildings, smokestacks and bridges) in urban settings	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

Piping Plover (Charadrius melodus)	Threatened and Endangered; Great Lakes Population is Endangered; Great Plains population is Threatened	Beaches along shorelines of the Great Lakes; now limited to Lake Michigan shoreline in Michigan Lake of the Woods, Minnesota; Bare alluvial and dredged spoil islands; sand and gravel areas around fly ash ponds	Michigan, Minnesota
FISHES			
Pallid sturgeon (Scaphirhynchus albus)	Endangered	Mississippi River downstream of its confluence with the Missouri River; Ohio River below Dam #53; Missouri River	Illinois
Scioto madtom (Noturus trautmani)	Endangered, may be extinct (Ohio Division of Wildlife will not admit extinction until after the year 2000)	Stream riffles of moderate flow over sandy gravel bottom	Ohio
REPTILES			
Copperbelly watersnake (Nerodia erythrogaster neglecta)	Proposed as Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods	Illinois, Indiana, Michigan, Ohio
Lake Erie water snake (Nerodia sipedon insularum)	Proposed as threatened	Shorelines of islands in western Lake Erie	Ohio
MUSSELS			
Clubshell (Pleurobema clava)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers	Indiana, Michigan, Ohio
Fanshell (Cyprogenia stegaria [= irrorata])	Endangered	Found in areas of packed sand and gravel at locations in a good current	Illinois, Indiana, Ohio
Fat pocketbook (Potamilus capax)	Endangered	Large rivers in slow-flowing water	Illinois, Indiana
Higgins' eye pearly mussel (Lampsilis higginsi)	Endangered	Mississippi River and some of its larger northern tributaries (i.e., St. Croix and Wisconsin Rivers) in gravel or sand	Illinois, Minnesota, Wisconsin
Northern riffleshell (Epioblasma torulosa rangiana)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie	Indiana, Michigan, Ohio
Orange-footed pearly mussel (=pimple back) (Plethobasus cooperianus)	Endangered	Gravel bars with strong currents in large rivers	Illinois, Indiana
Pink mucket pearly mussel (Lampsilis abrupta [= orbiculata])	Endangered	The lower Mississippi and Ohio Rivers and their larger tributaries	Illinois, Indiana, Ohio
Purple cat's paw pearly mussel (Epioblasma [=Dysnomia] obliquata obliquata [=sulcata sulcata])	Endangered	Gravel riffles of medium to large rivers	Ohio
Ring pink mussel (=golf stick pearly) (Obovaria	Endangered	Large rivers in sand or gravel	Indiana

retusa)			
Rough pigtoe (Pleurobema plenum)	Endangered	Medium to large rivers in sand or gravel	Indiana
White cat's paw pearly mussel (Epioblasma obliquata perobliqua)	Endangered	Firm sand or gravel riffles in small streams and medium to large rivers	Ohio
White warty-back pearly mussel (Plethobasus cicatricosus)	Endangered	Large rivers in gravel	Indiana
Winged mapleleaf (Quadrula fragosa)	Endangered	Medium to large rivers in mud, sand, or gravel; only known extant population in the St. Croix River	Minnesota, Wisconsin
SNAILS			
Iowa pleistocene snail (Discus macclintocki)	Endangered	North-facing algific talus slopes	Illinois
INSECTS			
American burying beetle (=giant carrion) (Nicrophorus americanus)	Endangered		Indiana, Michigan, Ohio
Hines emerald dragonfly (Somatochlora hineana)	Endangered	Spring fed wetlands, wet meadows and marshes; calcareous streams & associated wetlands overlying dolomite bedrock.	Illinois, Wisconsin
Hungerford's crawling water beetle (Brychius hungerfordi spangler)	Endangered	Cool riffles of clean, slightly alkaline streams; known to occur in only 3 isolated locations.	Michigan
Karner blue butterfly (Lycaeides melissa samuelis)	Endangered	Pine barrens and oak savannas on sandy soils and containing wild lupines (Lupinus perennis), the only known food plant of larvae.	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
Mitchell's satyr butterfly (Noenympha mitchellii mitchellii)	Endangered	Fens; wetlands characterized by calcareous soils which are fed by carbonate-rich water from seeps and springs.	Indiana, Michigan, Ohio
PLANTS			
American hart's-tongue fern (Phyllitis scolopendrium var. americanum)	Threatened	Cool limestone sinkholes in mature hardwood forest.	Michigan
Decurrent false aster (Boltonia decurrens)	Threatened	Disturbed alluvial soils (Mississippi and Illinois River alluvial floodplain).	Illinois
Dwarf lake iris (Iris lacustris)	Threatened	Partially shaded sandy-gravelly soils on lakeshores.	Michigan, Wisconsin
Eastern prairie fringed orchid (Platanthera leucophaea)	Threatened	Mesic to wet prairies and meadows.	Illinois, Michigan, Ohio, Wisconsin
Fassett's locoweed (Oxytropis campestris	Threatened	Open sandy lakeshores.	Wisconsin

var. chartacea)			
Houghton's goldenrod (Solidago houghtonii)	Threatened	Sandy flats along Great Lakes shores.	Michigan
Lakside daisy (Hymenoxys herbacea) (=H. acaulis var. glabra)	Threatened	Dry rocky prairies; limestone rock surfaces including outcrops and quarries.	Illinois, Ohio
Leafy prairie clover (Dalea foliosa)	Endangered	Prairie remnants on thin soil over lime-stone (Des Plaine River floodplain).	Illinois
Leedy's roseroot (Sedum integrifolium var. leedyi)	Threatened	Cool, wet groundwater-fed limestone cliffs.	Driftless area of southeastern Minnesota
Mead's milkweed (Asclepias meadii)	Threatened	Prairies.	Illinois
Michigan monkey-flower (Mimulus glabratus var. michiganensis)	Endangered	Soils saturated with cold flowing spring water; found along seepages, streams and lakeshores.	Michigan
Minnesota trout lily (Erythronium propullans)	Endangered	North facing slopes & floodplains in deciduous forests.	Minnesota
Northern monkshood (Aconitum noveboracense)	Threatened	Cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps.	Ohio, Wisconsin
Pitcher's thistle (Cirsium pitcheri)	Threatened	Stabilized dunes and blowout areas.	Illinois, Indiana, Michigan, Wisconsin
Prairie bush-clover (Lespedeza leptostachya)	Threatened	Dry to mesic prairies with gravelly soils.	Illinois, Minnesota, Wisconsin
Running buffalo clover (Trifolium stoloniferum)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day.	Indiana, Ohio
Small whorled pogonia (Isotria medeoloides)	Threatened	Dry woodland; upland sites in mixed forests (second or third growth stage).	Illinois, Michigan, Ohio
Virginia spiraea (Spiraea virginiana)	Threatened	Stream banks and floodplains.	Ohio
Western prairie fringed orchid (Platanthera praeclara)	Threatened	Wet prairies & sedge meadows.	Minnesota

4.2 Endangered Species Act of 1973

The ESA requires Federal agencies whose actions may affect a listed species or their critical habitat to consult with the USFWS regarding the proposed action. OPA and CERCLA require the U.S. EPA to develop contingency plans for inland areas for accidental discharges of oil and other hazardous materials. Implementing these mandates incurs responsibility under the ESA because (1) development and approval of potential response activities is a Federal action subject to the consultation requirements of section 7(a)(2) of the ESA; and (2) if it is determined that actual spill control methods to be used during OPA/CERCLA-mandated activities may adversely affect Federally listed species, then appropriate actions to minimize such effects must be incorporated into Area Plans.

4.2.1 Section 2 - Purpose

Fish, wildlife, and plant species have aesthetic, ecological, educational, historical, recreational, and scientific value to the U.S.; some species have become extinct or are threatened with extinction. Section 2 of the ESA describes the purposes of the Act as:

1. **providing a means to conserve the ecosystems upon which endangered and threatened species depend;**
2. **providing a program for the conservation of such species;**
3. **taking steps to achieve purposes of existing treaties and conventions affecting wildlife, fish, and plants.**

4.2.2 Section 3 - Definitions

Section 3 of the ESA provides definitions for the purposes of the Act. Following are definitions that may be pertinent to this Fish and Wildlife Annex:

Action describes all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the U.S.

Biological Opinion is a document stating the opinion of the USFWS, as to whether or not a Federal action is likely to jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of its critical habitat.

Critical Habitat is habitat that has been determined to be critical to the conservation of the species. It has legal standing and is protected under the ESA just as the species is. This must be published in the Federal Register and is subject to public review.

Endangered Species means any species which is in danger of extinction throughout all or a significant portion of its range.

Essential Habitat is habitat needed by a species to survive or recover, however, it is not officially designated as "critical habitat". Essential habitat is not a synonym for critical habitat.

Fish or wildlife means any member of the animal kingdom, including without limitation any mammal, fish, bird, amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate, and includes any body part, product, egg, or offspring thereof, or the dead body or parts thereof.

Plant is described as any member of the plant kingdom, including seeds, roots, and other parts.

Proposed species is any species of fish, wildlife, or plant that is proposed in the Federal Register to be listed under Section 4 of the ESA.

Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct".

> **Harass is further defined as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.**
>
> **Harm is further defined as an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.**

Threatened Species is any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

4.2.3 Section 7 - Interagency Cooperation

Section 7(a)(1) requires Federal agencies to use their authorities to further the conservation of listed species. Section 7(a)(2) prohibits Federal agencies from undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or modify critical habitat.

See attachment 2 for the USFWS Biological Opinion on the U.S. EPA Region 5 Area/Regional contingency plan for emergency response activities.

4.2.4 Section 9 - Prohibited Acts

This section of the ESA prohibits take (see definitions, Part 1 Section 2.2.2) of listed threatened or endangered species or alteration of critical habitat. An incidental take statement provided for in Section 7 constitutes an exemption from the Section 9 prohibition against take. It applies to the Federal action agency as well as to the permit applicant.

4.2.5 Section 10 - Exceptions

Section 10 of the ESA provides for exceptions to the Section 9 prohibitions. The USFWS can issue permits to take listed species for scientific purposes, or to enhance the propagation or survival of listed species. The USFWS can also issue permits to take listed species or modify habitat that is incidental to otherwise legal activities, such as that provided through the Section 7 process.

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5.0 POTENTIAL ENVIRONMENTAL EFFECTS FROM RESPONSE ACTIVITIES

(NCP sec. 300.210(c)(4)(ii)(C)

Removal actions or countermeasures may have adverse effects on fish and wildlife, their habitats, as well as other sensitive environments. In most situations it will be important that the advantages and disadvantages of various removal or countermeasure techniques be carefully evaluated to ensure the achievement of a net environmental benefit.

The following is a brief description of adverse effects of various actions associated with oil spill cleanup:

Countermeasure/Response	Potential Adverse Effects
1) No removal	a) excess oil would remain in habitat indefinitely; b) residual oil may be naturally weathered, but may be toxic to

	biota and would cause habitat degradation
2) Protective/sorbent, boom deployment	a) excess oil would remain in habitat indefinitely; b) residual oil may be naturally weathered, but may be toxic to biota and would cause habitat degradation
3) Protective/sorbent, boom deployment, + mechanical pumping/skimming	a) potential physical disturbance of habitat/biota; b) resuspension/dispersion of oiled sediments
4) In-situ burning	a) smoke plume air quality concerns; b) riparian habitat may be permanently or temporarily damaged
5) Mechanical pumping/skimming	a) potential physical disturbance of habitat/biota; b) resuspension/dispersion of oiled sediments

Based on the above, the following generally applicable prioritized countermeasure and removal actions may be recommended:

Countermeasure	**Potential Adverse Effect(s) Minimized**
1) booms	a) physical disturbance of sensitive areas/habitats b) disturbance, illegal taking of fish and wildlife c) limited wildlife contact with cleaning/ bioremediation agents
2) mechanical pumping	a) physical disturbance of sensitive areas/habitats b) limited wildlife contact with cleaning/ bioremediation agents
3) mechanical	a) limited wildlife contact with skimming agents cleaning/ bioremediation
4) in-situ burning	a) physical disturbance of sensitive areas/habitats b) limited wildlife contact with cleaning/bioremediation agents

Movement/transport of oiled debris to the following habitats may pose a substantial threat to fish and wildlife and sensitive environments:

1. **riverine backwaters**
2. **wetlands**
3. **fish/shellfish spawning/nursery areas**
4. **waterfowl/migratory bird foraging/breeding areas**

To completely reduce risk to sensitive resources, oiled debris should not be placed in such habitats.

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6.0 COUNTERMEASURE EVALUATION AND METHODS TO MINIMIZE THE IMPACTS OF RESPONSE ACTIVITIES

(NCP 300.210 (c)(4)(ii)(B-D)

Section 300.210 (c)(4)(ii)(B-D) of the NCP mandates that the Fish and Wildlife Annex provide a mechanism for expeditious evaluation and appropriate consultations on the effects to fish and wildlife, their habitat, and other sensitive environments from the application of various countermeasures.

Among other considerations, decisions regarding appropriate countermeasures should take into account the relative impact of various response methods on fish and wildlife and sensitive areas. Informed decisions can be made on the deployment of appropriate countermeasures through consulting with the appropriate natural resource agency for sensitive area information and by utilizing the spill response and sensitive area guidance in contingency plans. When deciding on an appropriate response method, the most important considerations are the efficient removal of the oil threat and the effective protection of essential habitats.

Federal law prohibits the use of a chemical to control oil on water, unless specifically authorized by a Federal OSC (FOSC). The FOSC may authorize use of any chemical product if its use is necessary to prevent or substantially reduce a hazard to human life. In situations where a human hazard is not present, the OSC must receive the concurrence of the RRT co-chair and the RRT representative(s) of the affected State(s) before authorizing the use of a chemical product to control oil on water. The OSC and/or responsible party must also consult the appropriate Federal and State natural resource trustees and land management agencies in regard to the following concerns:

a. **physical disturbance of wildlife, their habitat, and other sensitive areas;**
b. **illegal or inadvertent taking of live fish and wildlife or disturbance of carcasses by response personnel;**
c. **the use of cleaning or bioremediation agents in fish and wildlife habitat and environmentally sensitive areas;**
d. **the movement of oiled debris into fish and wildlife habitat and other sensitive environments.**

Many of the issues dealing with appropriate response methods will be addressed in detail in Sub-Area Planning. Response sections of Sub-Area Plans may include:

" Identification of specific areas of concern throughout the subarea, pre-planning for the materials most commonly spilled, and the locations where spills are most likely to occur;"

" Response methods for habitats and sensitive areas using the API/NOAA guidance, *Options for Minimizing the Environmental Impacts of Freshwater Spill Response*;"

" Pre-approval of appropriate removal actions, including the use of chemicals and dispersants, in accordance with 40 CFR 300.900-920, Subpart J - Use of Dispersants and Other Chemicals; and"

" Locations of access points, staging areas, and boom anchor points."

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7.0 MONITORING PLANS TO EVALUATE THE EFFECTIVENESS OF REMOVAL ACTIONS OR COUNTERMEASURES

(NCP 300.210 (c)(4)(ii)(E))

Formal quantitative monitoring by the USFWS will be done as required on a case-by-case basis. The USFWS may rely in large measure on the information developed by State agencies because formal quantitative monitoring on the part of the USFWS may not always be feasible on a routine basis.

Specific monitoring plans to evaluate the effectiveness of different countermeasures or removal actions on wildlife may be developed in the sub-area plans. The effectiveness of the removal action or countermeasure, with regard to wildlife, will be judged on the basis of the welfare of fish and wildlife remaining in the affected area after cleanup. When no new animals are becoming fouled with oil or otherwise being injured by the spill or countermeasures, the cleanup will have been successfully completed.

The assessment of aquatic biota will, in some instances, be left to the State environmental agency or State fish and wildlife agency. Evaluation of spill effects on fish and wildlife, during and after cleanup, will be the responsibility of both the USFWS and the State fish and wildlife agency.

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8.0 PLANNING FOR THE ACQUISITION AND UTILIZATION OF NECESSARY FISH AND WILDLIFE RESPONSE CAPABILITIES

(NCP sec. 300.210(c)(4)(ii)(F)

8.1 Overview

The USFWS and State natural resource agency have the responsibility to oversee spill response activities being conducted relative to their effects on fish and wildlife resources. These oversight responsibilities are coordinated with the OSC. In some instances, the Federal and State agencies will participate in activities such as hazing, capture, relocation, and release of wildlife. Those natural resource agencies, however, typically do not conduct treatment of injured trust resources. The USFWS and State natural resource agency(ies) may recommend that the responsible party(ies) or OSC (in the case of an unknown or uncooperative responsible party) contract with an experienced Qualified Wildlife Rehabilitator (QWR). In all cases where a QWR is utilized, the USFWS and State natural resource agencies will maintain an oversight role. Oversight responsiblities include, but are not limited to, the notification of a QWR, the supervision of deterrence, collection, handling, proper veterinary care, provisions for adequate rehabilitation facilities, assurance that proper cleaning procedures are being followed, wildlife release, review of appropriate permits, review of record keeping practices, and identifying appropriate disposition of carcasses to labs and evidence storage.

A successful rehabilitation effort depends on proper planning, management and equipment, experienced response personnel and trained volunteers. Effective rescue and rehabilitation of contaminated animals requires expert knowledge and experience in the areas of volunteer and staff training, human health hazard recognition, liability issues, disposal of wastewater, and media relations. Wildlife rehabilitation also requires specialized medical expertise and stockpiles of specially designed equipment.

Therefore, consultation and coordination with Federal, Tribal, and State natural resource agencies during both pre-spill planning and spill response is essential to adequately identify, understand and address natural resource concerns.

8.2 Permit Requirements (NCP sec. 300.210(c)(4)(ii)(G)

Federal and State permits are required to collect, transport, possess, rehabilitate, euthanize, release, or band migratory birds and threatened and endangered species.

Federal Permits

If rescue and rehabilitation efforts are deemed to be necessary and worthwhile, the following Federal permits may apply:

Migratory Bird:

> ***Banding or Marking:*** **50 CFR 21.22. A permit is required before any migratory bird is captured for the purpose of banding or marking. Official bands are issued by the U.S. Geological Survey (USGS) Biological Resources Division (BRD) Bird Banding Laboratory (BBL) for this purpose. Any rehabilitation group that participates in the wildlife response and bands birds is required to possess this permit.**
>
> ***Special Purpose:*** **50 CFR 21.27. May be issued for special purpose activities related to migratory birds, their parts, nests, or eggs. Permits may be issued for activities that can be shown to sufficiently benefit the migratory birds, important research, human concern for individual birds, or other compelling justification. During oil spills and discharges, it is expected that the initial cleaning, emergency care, and triage of animals will be done by contracted experts under a Special Purpose Permit. Unless authorized by the USFWS, no one rehabilitator or rehabilitation group will be designated as Ain charge@ o rehabilitation efforts, but will work with the cleanup team under Regional guidelines. Off site rehabilitation of any migratory bird will be done only by Federally licensed Rehabilitators. In addition, this permit does not authorize the use of recovering sick or injured migratory birds to be used for display or educational purposes.**

Eagle Permits:

50 CFR 22. These permits are authorize the taking, possession, or transportation of bald eagles or golden eagles, or their parts, nests, or eggs for scientific or exhibition purposes. They may be required for the possession of such birds during rehabilitation. The USFWS must be notified within 48 hours of acquisition. Directions will be given at that time as to disposition and/or location of continued treatment.

Endangered Species:

50 CFR 17.22. Permits are for scientific purposes, enhancement of propagation or survival, or for incidental take. The 30 day comment period for this type of permit may be waived by the USFWS Director during emergency conditions, where the life and health of a specimen is threatened and there is no alternative available. This permit is required by rehabilitators participating in wildlife responses that include endangered species.

Authorities for Permits:

The specific Federal laws and regulations that require such permits are as follows:

> **(a). Migratory Bird Treaty Act of 1918, as amended (16 U.S.C.703 et seq.). This law stipulates that no person shall take, possess, import, export, transport, sell, purchase or barter, any migratory bird, or the parts, nests, or eggs of such bird except as permitted by Federal regulations in 50 CFR. A valid permit, issued by the provisions of 50 CFR Part 21 and 50 CFR Part 13 is required for the collection, salvage, and possession of any migratory bird. Enforcement authority and penalties for violations are provided.**
>
> **(b). Bald Eagle Protection Act of 1940, as amended (16 U.S.C. 668 et seq.). This law stipulates that no person shall take, possess, or transport any bald eagle or any golden eagle, or the parts, nests, or eggs of such birds except as permitted under the terms of a valid permit issued by the USFWS pursuant to 50 CFR 22 and 50 CFR 13. Enforcement authority and penalties for violations are provided.**
>
> **(c). Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). This law makes it unlawful for any person to commit, attempt to commit, solicit another to commit, or cause to be committed, the import or export, taking, possessing, sale or offering for sale any endangered species except as permitted under the terms of a valid permit issued by the USFWS pursuant to 50 CFR 17. Enforcement authority and penalties for violations are provided.**

All inquiries regarding Federal Migratory Bird permits and criteria for qualified wildlife rehabilitators are to be directed to the following:

> **Migratory Bird Permit Office**
> **U.S. Fish and Wildlife Service**
> **P.O. Box 45**
> **Bishop Henry Whipple Federal Building**
> **1 Federal Drive**
> **Fort Snelling, MN 55111-0045 (612) 725-3776**

In a spill situation, response and rehabilitation permit needs for endangered species will be determined by the USFWS on an emergency case-by-case basis administered under 50 CFR 17.21, 22, 31, and 32.

State Permits:

The State laws and regulations that require such permits are as follows:

> **[to be provided]**

State permits may be obtained through the applicable State agency office listed below:

ILLINOIS	Illinois Department of Natural Resources 217/782-6384
INDIANA	Indiana Department of Natural Resources

317/232-8160

MICHIGAN Michigan Department of Natural Resources
517/373-9329

MINNESOTA Minnesota Department of Natural Resources
612/296-3344

OHIO Ohio Department of Natural Resources
614/264-6046

WISCONSIN Wisconsin Department of Natural Resources
608/266-2193

8.3 Selection of a Qualified Wildlife Rehabilitator (QWR)

An effective wildlife rehabilitation effort for oil contaminated wildlife requires direction by people with demonstrated field experience in oil spill response. Specific information on obtaining a Federal rehabilitation permit can be obtained through the U.S. Fish and Wildlife Service Region 3 Migratory Bird Office (see above for address and phone number).

8.3.1. Recognized Professional Rehabilitators

Two organizations, Tri-State Bird Rescue and Research, Inc. and International Bird Rescue, have become recognized experts in oiled bird rehabilitation:

Tri-State Bird Rescue and Research, Inc.
110 Possum Hollow Road
Newark, Delaware 19711
Telephone: 302-737-7241
Fax: 302-737-9562
24-hour 800-710-0695 or 0696

International Bird Rescue Research Center
699 Potter Street
Berkeley, California 94710
Telephone: 510-841-9086
Fax: 510-841-9089

Both organizations have extensive experience in bird rescue and rehabilitation and have worked with both government and industry. Other local bird rehabilitation organizations may also have comparable capabilities. Veterinarians, researchers, and biologists from the National Biological Service, USFWS, other Federal agencies, State wildlife agencies, and universities may also be able to provide assistance and expertise during wildlife rehabilitation efforts.

8.3.2 Volunteers

While most wildlife rehabilitators and veterinarians cannot make the commitment of time needed to develop the resources to respond to major oil spills, many rehabilitators, veterinarians, and staff and volunteers from environmental organizations may be able to make significant contributions to spill-related wildlife rehabilitation efforts. The QWR should be able to identify each person's or organization's strengths and incorporate them into the rehabilitation effort. The USFWS in U.S. EPA's Region 5 has sponsored a series of apprenticeship workshops for wildlife rehabilitators, veterinarians, and biologists. The workshop participants are in the initial stages of being trained to offer professional assistance (as volunteers or part-time staff) to a QWR during major oil spills.

In major wildlife rehabilitation efforts, there may be two or three shifts per day, with a shift utilizing over 50 volunteer workers. Volunteers must be appropriately trained, precisely scheduled for suitable tasks, and must be supervised at all times.

8.4 Health and Safety Concerns in Wildlife Rescue and Rehabilitation (NCP sec. 300.210(c)(4)(ii)(H))

Health and safety concerns in wildlife rescue and rehabilitation should be considered in all plans. Please refer to Part I, Section 9 for a more comprehensive narrative.

8.5 Identification of Facilities and Equipment Necessary for Deterring, Capturing, Cleaning, Rehabilitating, and Releasing Oiled Wildlife (NCP sec. 300.210(c)(4)(ii)(F))

[This information was written for the USFWS Twin Cities Field Office in July, 1995, by Tri-State Bird Rescue and Research, Inc.]

8.5.1 Facility Requirements

Facility needs usually focus on the majority of species affected by a petroleum discharge, which are generally birds. Facility requirements can vary significantly, depending on: overall size of response, species and age of wildlife contaminated, the type of contaminant, the season/weather, the location of the spill, and the rehabilitation effort. The facility needed will vary according to the needs of the specific spill situation, and should be determined by a QWR experienced in oil spill response work.

Because facility requirements can vary significantly, a permanent facility is not always advisable, and may actually be an impediment in providing the appropriate facility design for the situation. A suitable facility must have a large open space on the ground floor that can easily be configured and reconfigured to accommodate the changing needs of this unique form of wildlife rehabilitation. All rehabilitation efforts should be accommodated under one roof. Experience has taught that multiple buildings or a tent situation are inefficient and unsuitable. A warehouse, armory, motor pool or convention hall that is accessible to a trained labor force, is within reasonable distance

from hotel accommodations, and has adequate parking and exterior grounds could meet this requirement. If a facility is situated in a secure site, i.e., military installation or refinery, accommodations for a fluctuating volunteer work force need to be addressed. The facility may be located up to 3-4 hours from the spill site, provided that on-scene stabilization is administered prior to transport. An oil spill stabilization site can be located at the time of a spill.

It is recommended that a list be assembled of potential real estate within the identified high risk areas, and that the sites be physically reviewed by a representative of a wildlife response group with major spill response experience. Once acceptable facilities have been identified, all costs, availability, and contract information should be reviewed on a yearly basis.

The following list represents minimum facility needs for rehabilitating 100-150 oiled wildlife.

(1) Space Requirements

Front Desk/Admissions	300 sq. ft.
Operations Office	300 sq. ft.
Kitchen/Food Storage	300 sq. ft.
Husbandry Area (large central room)	2800 sq. ft.
Supplies/Storage	500 sq. ft.
Wildlife Cleaning Area 1	750 sq. ft.
Medical Treatment/Exam	300 sq. ft.
Pathology/Lab/Cold Storage	150 sq. ft.
Isolation Ward	300 sq. ft.
Volunteer/Worker Rest Area	300 sq. ft.
Bathrooms, Deacon, Changing	200 sq. ft.
Outside Pool Areas @ one 10' x 15' x 2' pool for 15 birds, and access and maintenance space	3300 sq. ft.
Nonhazardous and regulated (medical and oily) trash	
Indoor	100 sq. ft.
Outside	400 sq. ft.
Outside area for oily wastewater	300 sq. ft.
Loading Dock/Parking for 50 (opposite side of building from outside cages)	5000 sq. ft.
Total interior sq. ft.	6300 sq. ft.
Total exterior sq. ft.	9000 sq. ft.
Total sq. ft.	15,200 sq. ft.

Note: If an existing wildlife rehabilitation center were to be used, it would require the above space in addition to the space allocated for any existing caseload. Animals impacted by an oil spill must be cared for separately from the in-house population.

(2) Hot/Cold Water Capacity

When selecting a wildlife response facility, it is important that the water supply not be contaminated by the oil spill. For preplanning purposes, potential facility locations should be selected in areas of low oil spill probability. All oily waste water must be collected and disposed of in accordance with Federal and municipal regulations, however, the large quantities of rinse, pool, and general use water is permissible for discharge to most municipal systems. It is therefore inadvisable to select a location that relies on a septic system to handle waste because this large volume of water can exceed the design capacity of most septic systems. Ideally there should be external access to cold water supplies for filling pools.

Due to the nature of wildlife rehabilitation, large amounts of water are used in many locations throughout the facility. It is therefore advisable that the facility has floors that can tolerate being wet, with drains at least in the areas dedicated to cleaning activities.

Cold Water Volume (pools and general use)	23,360 gal./day
Hot Water Volume (animal cleaning only)	450 gph @ 104 degrees F. (6750 gal/day @ 15 hrs.)
Water Pressure (animal cleaning only)	50-60 psi.
Water Hardness (animal cleaning only)	2.5-3.5 grains/gallon

A suitable facility in terms of size, availability, and location should not be discounted due to hot water and hardness capacities. Provided that there is an adequate cold water supply, mobile hot water and treatment systems can be retrofitted into existing equipment without much difficulty.

(3) Electrical/Lighting

The electrical needs of a wildlife response facility are very similar to those of a conventional manufacturing/industrial operation in so far as there is a need for general and task lighting, with an adequate number of separately circuited outlets throughout the space capable of providing 20 amp protection. Because of potential risk of electrical shock in wet areas, the addition of GFI circuit breakers in those areas is desirable.

In addition to lighting and the HVAC system, electric power will be used for freezers, refrigerators, heat lamps, pet dryers, office and medical equipment, pool pumps and filters, power tools, etc.

200 amp 120/240 volt 3-wire single phase service with minimum of ten (10) 20 amp circuits in addition to the lighting and HVAC needs, with the ability to expand.

(4) HVAC Systems

The three main concerns regarding air quality are:

1. **Eliminating the thermal stress to debilitated animals by providing a stable, draft free inside air temperature between 70-80 degrees F.;**
2. **Minimizing human exposure to petroleum volatiles; and**
3. **Minimizing animal exposure to pathogenic organisms (bacterial and fungal).**

Air within a wildlife response facility should be exchanged 6 times per hour within office areas, 10 times per hour within large open spaces involving animal care, and 20 times per hour within critical care and/or surgical areas.

Typical HVAC systems used in industrial space are often forced air or closed recirculating systems which by themselves will not meet the above requirements. These systems will need to be augmented with portable filtration (HEPA) and air exchange units. The design of these systems should be determined by the wildlife response group once the facility has been selected, and the particulars of the animal caseload is known.

Air quality in systems that employ return air filtration can be enhanced through the replacement of the existing filters with an electrostatic type. This will not, however, preclude the need for HEPA type filtration and regular air exchanges as outlined above.

(5) Communications

A minimum of three (3) telephone lines (public, private, fax/modem) are necessary with the ability to add more if needed.

8.5.2 Equipment, Training and Personnel Needed For Field Retrieval

(1) Equipment

- **Boats**
- **Safety protection/floatation gear**
- **Personal protective clothing**
- **Different types of netting**
- **Transport containers (boxes, ventilated)**
- **Transport vehicles (to and from spill site)**
- **Adequate communication (cellular phones, etc.)**
- **If stabilization is necessary at spill site (prior to transportation to rehabilitation facility), need rehabilitators to have necessary training and equipment available for stabilization**

(2) Training

- **OSHA training**
- **Coast Guard boat training**
- **QWR wildlife rescue and rehabilitation training**
- **QWR wildlife handling training**

(3) Personnel

- **Natural resources trust agencies personnel**
- **QWR trained field retrieval personnel**
- **QWR trained rehabilitation personnel**
- **Enforcement personnel**
- **Boat handlers**
- **Rehabilitators trained by QWR (both aspects of rehabilitation and handling)**
- **Personnel to handle 1-800 # calls for potential oiled wildlife sightings**

If wildlife retrieval must begin prior to the QWR arrival, there is a need to specify where the wildlife would be taken for rehabilitation and who would be handling them. Please refer to Part I, Section 9 for further narrative.

8.6 Drills and Exercises (NCP sec. 300.212)

The State natural resource agency, the USFWS, and the QWR should be incorporated into appropriate drills and/or exercises involving oil spill response situations which may potentially impact wildlife. By including these groups as part of the exercise, the OSC will fully understand and appreciate the vital role that wildlife rehabilitation plays in the overall success of the response strategy.

Since the majority of this work occurs during the first 24-36 hours of a spill incident, early involvement of the QWR in drills and exercises is imperative. The QWR should provide a daily end-of-day report to the incident commander, outlining all communication and response efforts made by the QWR. This information should be incorporated into the daily drill documents. The QWR participating in the drills/exercises should be included in the final critique of the drill/exercise to help ensure a complete and accurate assessment is made regarding the ability of all participants to respond to wildlife at risk.

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9.0 SAFETY AND TRAINING (NCP sec. 300.210(c)(4)(ii)(H))

9.1 Requirements for OSHA and U.S. EPA training

The annex should identify and secure the means of providing, if needed, the minimum required Occupational Safety and Health Administration (OSHA) or U.S. EPA training for volunteers, including those who assist with injured wildlife. Training should precede actual work in hazardous environments.

Two OSHA regulations address most of the occupational health and safety issues encountered during wildlife rescue and rehabilitation:

1. **The OSHA standard for Hazardous Waste Operations and Emergency Response (HAZWOPER) (29 CFR 1910.120) applies to organizations or individuals involved directly in retrieval or clean-up efforts. In addition, each State may have its own worker safety requirements. Coordination with the appropriate State agency should be conducted to ensure those requirements are also met.**
2. **The Hazard Communication Standard (29 CFR 1910.1200), also known as "Right-to-Know Law" or "HazCom", requires that all chemicals in the work place be fully evaluated for possible physical or health hazards and that all information relating to these hazards be made available to all workers. HazCom applies to rehabilitation organizations because petroleum is considered to be a hazard to human health.**

Appropriate available training offered by U.S. EPA (through their Environmental Response Training Program in Cincinnati, Ohio) includes the following:

a. **Hazardous Materials Incident Response Operations (165.5) 40hrs. (This course meets OSHA's requirement (29 CFR 1910.120) for a minimum of 40 hours of classroom safety training for hazardous waste site workers.)**
b. **Emergency Response to Hazardous Materials Incidents (165.15) 40hrs. (This course meets and exceeds OSHA's requirement (29 CFR 1910.120 paragraph q) for a minimum of 24 hours of training for a hazardous materials technician.)**

Rehabilitation organizations are legally required to educate and protect all employees, including volunteers, in accordance with OSHA standards. Individuals working with oiled animals must receive information concerning all potential hazards associated with the handling of these animals. The following requirements should be applied to wildlife rescue and rehabilitation personnel, including volunteers:

Wildlife rescue and rehabilitation management personnel - This is the core team of rehabilitators who will direct operations. These people must have 24-hours of classroom training in hazardous waste operations and emergency response.

Rehabilitation facility volunteers - These volunteers work under the direction of the management team. Persons in this category must receive four hours of training at the HAZWOPER Awareness level, or have sufficient equivalent training or proven experience in specific competencies, before they can begin work. Additional training would be necessary before volunteers would be allowed on scene.

Retrieval volunteers - These volunteers work under the direction of the search and rescue management team and are allowed on-scene, but not in the hot zone. Volunteers working in this category must receive between four and eight hours of HAZWOPER training (Awareness level) and site safety training before they can begin work.

9.2 Wildlife Response Training

A contracted private source may be responsible for training volunteers on site. Additionally, USFWS may be interested in providing periodic training in preparation for spills.

Training Topics:

1. **general overview of the external and internal effects of oil on wildlife;**
2. **current treatment protocols;**
3. **facility needs; and**
4. **human health and safety.**

Training Goals:

1. **clarify the duties and the responsibilities of the spiller, cleanup contractor, State and Federal agencies, volunteers and the general public;**
2. **improve the treatment and the release rates for affected wildlife;**
3. **enhance speed and quality of a response involving wildlife following an oil spill event;**
4. **reduce wildlife response costs by making efforts more cost-effective; and**
5. **help to insure the safety of all those working in a wildlife response.**

9.3 Wildlife Risks

Specific human health and safety concerns in handling wildlife will vary with the species of animals involved, but the following safeguards apply universally:

1. **Wearing gloves while cleaning animal cages and food bowls, washing hands with a disinfectant soap, wearing gloves and surgical mask while performing necropsies (post-mortem examinations), and providing for adequate room ventilation will help reduce the risk of contracting wildlife transmitted diseases.**
2. **Protective eyewear should be worn when working with birds having long, pointed beaks, and towels (for entire body control) or gloves should be used to restrain feet of all birds.**
3. **All individuals who will be handling oiled wildlife must be trained in proper capture and restraint techniques. The head (beak or teeth) and feet (talons or claws) of most animals can cause serious injuries if the handler has received improper or incomplete training.**
4. **Animals should be held at or below waist-height, away from human faces. At least two people should be present for any prolonged handling (examinations, washing, etc.). Aggressive mammals should be controlled with nets or snare poles, and should be sedated for any prolonged handling.**
5. **Any worker handling wildlife should have a current tetanus shot, and only individuals who have received prophylactic rabies vaccinations should handle wild mammals.**

Diseases which can be transmitted from animals to humans pose a potential risk to oil/hazmat spill responders during the rescue, rehabilitation and release of wildlife. Although this list may not be inclusive, the following diseases are of particular concern:

Birds

***Aspergillosis*--a fungal disease causing respiratory problems in humans.**

***Chlamydiosis*--a bacterial disease causing flu-like symptoms in people. Potentially fatal.**

***Salmonellosis*--a bacterial disease causing diarrhea in humans.**

***Avian Tuberculosis*--a bacterial disease causing skin lesions and occasionally respiratory problems in humans.**

***Histoplasmosis*--a fungal disease causing pneumonia in humans.**

Mammals:

***Rabies*--a viral disease causing central nervous system (CNS) disorder in humans. Fatal if untreated.**

***Giardia*--a protozoal disease causing diarrhea.**

***Baylisascaris*--a parasite causing CNS disorder & death in humans.**

***Campylobacteriosis*--a bacteria causing diarrhea in humans.**

***Cryptosporidiosos*--a protozoal disease causing diarrhea in humans.**

***Toxoplasmosis*--a protozoal disease which may cause CNS disorder in humans.**

If responders are likely to come into contact with captured wildlife during a spill event, the site safety officer (or a contracted veterinarian) should be consulted to determine appropriate prevention measures. Volunteers should contact medical professionals if they become ill during or after potential exposure to wildlife diseases. Medical professionals may also wish to consult the National Biological Survey, National Wildlife health Center in Madison, Wisconsin (608-271-4640; fax 608-264-5431), for wildlife disease diagnostic assistance.

9.4 Safety Equipment

Appropriate equipment is important for safe spill response activities. Necessary equipment will vary according to the particular situation, and may depend on such circumstances as the size of the spill and types of resources affected. For individuals not involved directly in on-site (hot zone) retrieval or cleanup efforts (exposed only to Level D hazards), personal protective equipment may include the following:

1. **coveralls**
2. **gloves**
3. **boots/shoes, leather or chemical resistant, steel shank and toe**
4. **safety glasses or chemical splash goggles**
5. **hard hat with face shield**
6. **escape mask**

Where sampling includes aquatic sites, personal protective equipment should include:

1. **knee, hip, or chest waders in good condition**
2. **long rubber gloves**

Life jackets are required for work in boats or over water. Safety equipment may also include specially designed respiratory equipment and/or ear protection.

9.5 Product Risks

Petroleum products in, on, and around wildlife may present a hazard to human health and safety. Various components in certain petroleum products can damage skin, conjunctivae of eyes, lungs, or the gastrointestinal tract (if inadvertently ingested). Chronic and/or prolonged exposure may cause damage to the central nervous system and some cancers, such as skin cancer and leukemia. Fetal defects have been documented in laboratory animals. Individual risk factors such as pregnancy or history of liver disease should be taken into consideration in allowing volunteers and staff to work in contaminated areas. Personal hygiene must be stressed during the decontamination process. Protective measures should always be taken to avoid and/or minimize oil exposure throughout spill response activities.

9.6 Watercraft Safety

Airboats or boats propelled by outboard motors are effective for hazing waterbirds and for searching for sick or injured wildlife. Small, noisy, shallow-draft aluminum boats are particularly effective for hazing, and can be used as platforms for shell crackers during the day and for propane exploders or bright lights at night. Although relatively ineffective for herding diving birds, boats may be used for herding young or molting waterfowl that are incapable of flight.

Response personnel will ensure that all watercraft operations are conducted in accordance with local laws and regulations of the U.S. Coast Guard and OSHA, as well as any applicable internal agency regulations.

Response leader responsibilities should include the following:

1. **Ensure that all workers who operate or work in watercraft have received first aid instruction in artificial respiration.**
2. **Ensure that personnel who operate watercraft have completed a recognized boating or water safety course.**

Each watercraft will be required to have personal protective equipment (personal flotation devices), firefighting equipment, and other safety equipment (distress signaling devices, bailing devices, and emergency position indicating radiobeacons, running lights, radio, fog horns, navigational aids, anchor and anchor line), and undergo periodic inspections as required by USCG and OSHA regulations.

9.7 Aircraft Safety

Aircraft, especially helicopters, are effective in hazing migratory birds from large areas because of the combination of loud noise and rapid approach from above. Helicopters may also be used to herd flightless birds (young and molting birds). Aircraft can also be utilized for reconnaissance and transportation of personnel, equipment, and accessing injured wildlife.

Aircraft are considered to be especially useful during the early stages of cleanup and hazing operations. They are more effective if used in combination with other devices such as shell crackers and propane exploders. Because of their maneuverability and noise, helicopters are more effective than fixed-wing aircraft.

Established aviation safety programs and aircraft accident prevention programs within each organization will be complied with at sites at which such response measures are anticipated.

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10.0 COMPATIBILITY OF NON-FEDERAL RESPONSE PLANS (NCP Sec. 300.210(c)(4)(ii)(I)

Section 300.210(c)(4)(ii)(I) of the NCP mandates that the Fish and Wildlife Annex to the ACP define the requirements for evaluating compatibility between this Annex and non-Federal response plans on issues affecting fish and wildlife, their habitat, and sensitive environments.

Facility owners or operators must determine the maximum distance at which a worst case oil spill from their facility could cause injury to fish and wildlife and sensitive environments and develop a plan for mitigating that discharge's potential adverse effects. Facility plans must be consistent with the requirements of the NCP, RCP, and this ACP Annex. Pipeline plans in the Region will be reviewed and approved by DOT.

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11.0 NATURAL RESOURCE DAMAGE ASSESSMENT (NRDA)

At the same time response efforts to contain and remove oil and undertake wildlife rescue and rehabilitation are occurring, natural resource trustees may pursue NRDA activities. These activities constitute a preliminary assessment, or preassessment, of natural resource injuries. While preassessment activities are generally different from removal/response activities and in most instances are conducted simultaneously. The removal/response activities are controlled by the OSC, while the components of the damage assessment process are directed by the trustees. There is a procedural linkage of the funding mechanisms (both are funded by the Oil Spill Liability Trust Fund) and it becomes necessary for natural resource managers to distinguish between the removal and preassessment activities.

NRDA regulations, authorized by OPA and other Federal laws, presumes trustees will seek economic damages from responsible parties for injuries to natural resources from oil discharges. Trustees include Federal landowners, Federal natural resource managers, States, Indian tribes, and foreign governments. Damages collected must be used to restore, replace, or acquire natural resources equivalent to injured natural resources and to reimburse assessment costs.

11.1 Authority

NRDA is authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), the Clean Water Act (CWA), and the OPA. To facilitate compliance with OPA, the Department of Commerce (DOC) promulgated 15 CFR Part 990 - Natural Resource Damage Assessment Regulations. The final rule for these regulations was published in the Federal Register on January 5, 1996 with February 5, 1996 as the effective date of the final rule.

11.2 Natural Resource Trustees - NRDA Roles and Responsibilities

Section 1006(b) of OPA provides for the designation of Federal, State, Indian Tribe, and foreign natural resource trustees to determine if injury to, destruction of, loss of, or loss of use of natural resources and services has resulted from an incident, to assess damages for those injuries, to present a claim for damages (including the reasonable costs of assessing these damages), to recover damages, and to develop and implement a plan for the restoration, replacement, or acquisition of the equivalent of the injured natural resources and services under their trusteeship. The DOI is the Federal trustee for migratory birds, certain anadromous fish, endangered species, and DOI-managed lands such as National Parks and Recreation Areas and Wildlife Refuges. The DOI Office of Environmental Policy and Compliance (OEPC) is the initial contact for notification and for overall coordination of trustee activities. The USFWS, a bureau of DOI and the program manager for migratory birds, endangered species, anadromous fish, and lands in the National Wildlife Refuge System, will likely be among those involved for DOI in spill incidents because of their responsibility for these resources. In instances where other Federal agency lands or resources are involved, those agencies (e.g. Department of Defense, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration [NOAA]) may serve as co-trustees with DOI. At the time of a spill, the trustees will agree upon one agency to act as Federal lead administrative trustee and will convene a trustee group in cooperation with State, Indian, and foreign trustees, as appropriate, to ensure the best possible coordination of natural resource trustee activities such as data gathering, damage assessment, and negotiations with the responsible parties.

11.3 Process

The NRDA process in the final rule includes 3 phases as outlined below:

1. **preassessment**
2. **restoration planning**
3. **restoration implementation.**

11.3.1 Preassessment Phase

When notified of an incident involving oil, trustees must first determine threshold criteria that provide their authority to begin an NRDA, such as applicability of OPA and risks to natural resources under their trusteeship. Based on early available information, trustees make a preliminary determination whether natural resources or services under their authorities have been, or are likely to be, injured. Through coordination with response agencies, trustees next determine whether response actions will eliminate the threat of ongoing and future injuries. If injuries have occurred and/or are expected to continue, and feasible restoration alternatives exist to address such injuries, trustees may proceed with the assessment.

Preassessment phase activities will likely be conducted simultaneously with removal/response activities. The intent of the preassessment phase activities is generally to acquire data and materials that are likely to be lost if not collected during or immediately after a spill has occurred. Such field sampling and data collection is generally limited to:

1. **Samples necessary to preserve perishable materials likely to have been affected or to contain evidence of the oil. These samples will generally consist of biological material that is either dead or which has been visibly affected by the oil.**
2. **Samples of other materials which exhibit ephemeral conditions, such as surface water, sediments, soil, or the oil itself, which are necessary for identification of released product and measurement of concentrations. If not collected immediately, such information could otherwise be lost due to product dilution, movement, decomposition, or leaching.**
3. **Counts of dead or visibly injured organisms which, if delayed, may not be possible due to factors such as decomposition, scavenging, sinking, or movement from**

the spill site by currents.

Other types of activities that may be involved in assessment initiation include release detection and notification, trustee identification and notification, site characterization, and identification of pathways, exposed areas, and potentially affected resources. In very specific circumstances, a natural resource trustee may also undertake emergency restoration efforts to prevent or reduce the immediate migration of oil onto or into a trust resource. Emergency restoration is only undertaken if the responsible party or U.S. EPA cannot or does not conduct response actions within the time frame that natural resource trustees deem necessary to protect trust resources.

Because certain NRDA activities (e.g. collection of water and sediment samples) may be identical to those conducted by others as part of the response, all sampling and field work conducted by the natural resource trustees should be coordinated with the lead response agency so as to minimize duplication of sampling and data collection efforts. Work performed for response purposes is reimbursable by the OSLTF under response costs. Activities performed that are not response-related may be reimbursable by the OSLTF under assessment initiation costs.

11.3.2 Restoration Planning Phase

The purpose of the Restoration Planning Phase is to evaluate potential injuries to natural resources and services, and to use that information to determine the need for and scale of restoration activities. The Restoration Planning Phase provides the link between injury and restoration. The Restoration Planning Phase has two basic components; injury assessment and restoration selection.

11.3.2.1 Injury Assessment

The purpose of injury assessment is to determine the nature and extent of injuries to natural resources and services, thus providing a technical basis for evaluating the need for, type of, and scale of restoration actions. Under the final rule, injury is defined as an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Trustees must determine that there is: 1) exposure, a pathway, and an adverse change to a natural resource or service as a result of an actual discharge; or 2) an injury to a natural resource service as a result of response actions or a substantial threat of a discharge. Trustees must also quantify the degree and spatial and temporal extent of injuries. Injuries are quantified by comparing the condition of the injured natural resources or services to baseline, where necessary.

11.3.2.2 Restoration Selection

Once injury assessment is complete, trustees must develop a plan for restoring the injured natural resources and services. Acceptable restoration actions include any of the actions authorized under OPA (restoration, rehabilitation, replacement, or acquisition of the equivalent), or some combination of those actions.

11.3.3 Restoration Implementation Phase

The Final Restoration Plan is presented to responsible parties to either implement or to fund the trustees' costs of implementing the plan, thus providing the opportunity for settlement of damages claims without litigation. Should responsible parties decline to settle a claim, OPA authorizes the trustees to bring a civil action for damages in Federal court or seek an appropriation from the OSLTF for such damages.

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PART II. EMERGENCY SPILL RESPONSE GUIDANCE

1.0 ROLES AND RESPONSIBILITIES OF NATURAL RESOURCE TRUSTEES (NCP sec. 300.210(c)(4)(I) and 300.615)

1.1 Overview

When a spill occurs, impacts to the ecosystem are usually unavoidable. However, such impacts can be minimized through proper planning and coordination with State and Federal natural resource trustees and managers both before and during a spill. Consultation and coordination with natural resource managers during the pre-spill planning phase aids in identifying and understanding potential natural resource concerns and issues as a result of spills in general. Consultation and coordination during a spill is also essential to ensure that site-specific resource concerns are addressed.

1.2 Spill Response

The DOI has statutory responsibilities for protecting migratory birds and Federally-listed threatened and endangered species. In addition, DOI shares trustee responsibilities with the Department of Commerce for anadromous fish. These DOI responsibilities at the field level have been delegated to the USFWS. During a spill event, the USFWS will normally serve as the lead agency for trustee response, coordinating with other trustees and providing oversight for a qualified wildlife rehabilitator (QWR).

If wildlife other than migratory birds, Federally-listed threatened or endangered species, or anadromous fish are found injured, the responsible trustee agency would typically be the State wildlife agency.

During a spill response, natural resource trustees and managers can provide the OSC with technical assistance and expertise on potential effects of oil on fish and wildlife and their habitats (for Notification numbers, see Part II, Section 3). They are frequently familiar with the habitat in the path of the spill and can provide recommendations concerning the best locations for equipment staging, access points, or boom anchors. They can recommend specific habitats where protective actions should be taken and provide advice on specific response measures. They can assist in the development of a monitoring plan and subsequent collection of data. Finally, the USFWS and State natural resource agencies will direct or provide oversight for the protection, rescue, and rehabilitation of wildlife.

When a spill occurs, natural resource trustees or managers will provide advice on the measures necessary to minimize or prevent the exposure of wildlife to oil, as well as the priority and timing of such measures. Protective measures may include one or more of the following:

- preventing the oil from reaching areas where migratory birds and other wildlife are located by either containing or recovering the oil, or
- deterring birds or other wildlife from entering areas affected by oil by using wildlife hazing devices or other methods.

If exposure of birds and other wildlife to oil cannot be prevented, an immediate decision must be made regarding whether to rescue and rehabilitate oiled birds and other wildlife. The decision must be made in consultation with the applicable Federal (USFWS) and State natural resource management agencies, since State and Federal permits are required by law (please refer to Part I, Section 8). Rehabilitation services for contaminated wildlife can be contracted for by the Responsible Party, the OSC, or Federal and State designated trustees. However, full authority regarding protection, rescue and rehabilitation of wildlife and fish remains with the trustees.

Following a spill, natural resource trustees may have the additional responsibility of assessing injury to the environment as a result of the spill. Natural Resource Damage Assessment (NRDA) is the process (refer to Part I, Section 11) by which trustees collect, compile, and evaluate data, information and statistics to determine the extent of injury to natural resources. This information is used to assess damages (the dollar amount necessary to restore injured trust resources and compensate for lost use as a result of injury) and to seek recovery of those damages from the responsible party. The initiation of a NRDA is typically begun while response activities are still being carried out.

1.2.1 Specific Responsibilities of Federal Natural Resource Trustees During a Spill Response

1.2.1.1 U.S. Department of the Interior, U.S. Fish and Wildlife Service

The USFWS is the lead agency for the DOI in the management of migratory birds (co-trustee with State natural resource agencies), Federally-listed endangered and threatened species, and USFWS lands (such as National Wildlife Refuges, Waterfowl Production Areas, and fish hatcheries) within this ACP planning area. During a spill response, USFWS personnel (biologists, law enforcement officers, refuge and fisheries managers) have the following responsibilities:

- **a. ensure notification of all necessary USFWS personnel, and establish a response protocol delineating roles of each USFWS office. Coordination protocol with the State natural resource agency and other trustees will also be established.**
- **b. provide the OSC with specific fish and wildlife habitat information for USFWS lands. USFWS will also provide recommendations for preventing or minimizing spill impacts to USFWS lands, as well as consult on the best locations for response staging areas and access points.**

  8 provide the OSC with critical habitat information for Federally-listed threatened and endangered species. USFWS will also provide recommendations for preventing or minimizing spill impacts to these species, as well as advise on the best locations for response staging areas and access points in the vicinity of endangered species critical habitat.

- **c. provide the OSC with fish and wildlife habitat information for locations other than Federal lands within the area potentially affected by the spill (in coordination with the State natural resource agencies and other trustees).**
- **d. provide the OSC with technical assistance and expertise on potential effects of oil on fish and wildlife and their habitats or on other sensitive environments that can be found in the potentially impacted area.**
- **e. provide the OSC with assistance in coordination of wildlife rescue and rehabilitation efforts (in conjunction with the State natural resource agency and other trustees). NOTE: It is critical that properly licensed and qualified rehabilitators be contacted as soon as it is determined that such services are necessary. The USFWS and State natural resource agencies have joint responsibility for overseeing any activity involving the handling of wildlife. Because such activities may impinge upon the Natural Resource Damage Assessment (NRDA) responsibilities of the trustees, any decision to rescue and rehabilitate oiled and injured wildlife during a spill response must be made in coordination with the USFWS and State natural resource agency.**
- **f. initiate a Natural Resource Damage Assessment (NRDA) (in conjunction with other natural resource trustee agencies), if applicable. Such activity usually involves acquiring data both during and after a spill event to document: (1) evidence of the oil in water, sediments, soil, and organisms; (2) effects on fish, wildlife, and/or their habitat; (3) exposure pathways, and; (4) the potential need to undertake emergency restoration efforts to prevent or reduce the immediate migration of oil onto or into a trust resource. Because activities associated with NRDA initiation may be identical to those conducted as part of the response, all sampling and field work conducted by the natural resource trustees should be coordinated with the lead response agency.**

1.2.1.2 Department of the Interior, National Park Service

[To be provided]

1.2.1.3 Department of the Interior, Bureau of Indian Affairs

[To be provided]

1.2.1.4 Department of Commerce, NOAA

This section provides NOAA=s element of the Fish and Wildlife and Sensitive Environments Annex to the U.S. EPA Region 5 RCP\ACP.>

The NCP requires a Fish and Wildlife and Sensitive Environments Annex to the NCP, RCP=s, and ACP=s. The Annex is intended to provide for coordinated, immediate, and effective protection, rescue, and rehabilitation of, and minimization of risk of injury to, fish and wildlife resources and habitat.

Following is a summary of how NOAA contributes to these goals and objectives:

1. **NOAA and the American Petroleum Institute (API) developed the manual Options for Minimizing Environmental Impacts of Freshwater Spill Response (also known as the Freshwater Manual). It provides a framework for identification of appropriate countermeasures in the Great Lakes region. It contains information to assist contingency planners and field responders with selecting appropriate protection, response, and cleanup techniques, both before and after an oil spill. The guide provides information on 29 response methods and classifies their relative environmental impact on 12 freshwater environments and habitats in combination with 4 oil types. Spill topics of special concern in freshwater settings are also discussed including: public health, conditions under which oil might sink in freshwater, and oil behavior in ice conditions. The manual is available though the NOAA HAZMAT Scientific Support Coordinator (SSC) assigned to U.S. Coast Guard District 9 in Cleveland, Ohio.**
2. **NOAA developed Environmental Sensitivity Index (ESI) Maps for the Great Lakes. The ESI maps include information for three main components: shoreline habitats; sensitive biological resources; and human-use resources. Shoreline habitats are ranked from 1 to 10 (10 being most sensitive) based on their relative sensitivity to oil spills, potential biological injury, and ease of cleanup. Four major categories of biological resources were considered during the production of the ESI maps; birds, fish, plants, and mammals. The human-use features include: airports, boat ramps, Coast Guard units, marinas, national parks, State parks, water intakes, and wildlife areas. A complete set of ESI maps for the Great Lakes is maintained by the NOAA HAZMAT SSC, USCG District 9 Marine Safety Division, USCG District 9 Civil Engineering Unit, and U.S. EPA Region 5 Emergency Response Branch. USCG District 9 Marine Safety Offices have ESI Maps for their area of responsibility.**
3. **NOAA maintains an extensive library and database of resources at risk in the Great Lakes and remainder of the U.S. This information is available through the NOAA SSC for contingency planning and during incident response.**
4. **NOAA and U.S. EPA Region 4 developed a strategy for meeting OPA 90 mandates for sensitive area mapping in oil spill contingency plans. The strategy compliments the ESI system noted above. The Reach Sensitivity Index (RSI) provides a sensitivity index classification system for small rivers and streams. This RSI also compliments the ongoing U.S. EPA Region 5 mapping of the Mississippi River. Reference NOAA/HAZMAT Report 96-11, A strategy for Mapping Sensitive Resource of Rivers and Streams in U.S. EPA Region 4, July 1996.**
5. **In the spirit of the intent of the Fish and Wildlife and Sensitive Environments Annex, the NOAA SSC has assisted USCG MSO's with the development of ACP appendices including: "Sensitive Areas", "Response and Protection Priorities and Strategies", and "Countermeasures and Removal Techniques".**

1.2.2 Specific Responsibilities of State Natural Resource Trustees During a Spill Response

The State natural resource agencies are trustees (or co-trustees depending on the State) for the natural resources of the State and co-trustees with the USFWS concerning the management of migratory birds and some Federally threatened and endangered species. The State natural resource trustee has management authority over all State lands, parks, timber, waters, minerals, and wildlife. This includes the protection, preservation, and propagation of fish and wildlife resources of the State. In response to a

spill event, State natural resource agency personnel (biologists, conservation officers, managers) have the following responsibilities:

a. **notify other appropriate State natural resource agency personnel and establish a response protocol describing the role of responders;**
b. **coordinate efforts with other participating natural resource trustees, such as the USFWS.**
c. **provide the OSC with specific fish and wildlife habitat information within the area concerning all lakes, streams, wetlands, and rivers. The State agency will also consult with the responders as to the best locations for staging and recovery areas as well as access points.**
d. **provide the OSC 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.**
e. **provide the OSC with technical assistance and expertise on potential effects of oil and hazardous substances on fish and wildlife and their habitats.**
f. **provide the OSC with assistance for coordination of wildlife rescue and rehabilitation efforts in cooperation with the USFWS.**
g. **assess damages to natural resources during (as circumstances allow) and after a spill. Data acquired would be used to determine the extent of injury to natural resources, to develop restoration or replacement strategies, and to develop and submit a claim for damages to the responsible party(ies).**

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2.0 IDENTIFICATION AND PRIORITIZATION OF NATURAL RESOURCES REQUIRING PROTECTION (NCP sec. 300.210(c)(4)(ii)(A)&(B))

Sensitive environments and species are identified in order to provide for coordinated, immediate, and effective protection of fish, wildlife, and their habitats that may be affected by a discharge of oil or hazardous material. Identification of sensitive natural resources allows priority to be placed on protection of these resources prior to a discharge (through pre-spill planning of appropriate countermeasures and pre-staging of response equipment), as well as during a spill event (by focusing attention and response resources on the most critical areas).

2.1 Identification

Because natural systems are dynamic, the best available information on the identification and distribution of sensitive resources will be obtained through the Federal and State natural resource biologists/managers. The experience of these professionals, as well as their ability to provide the most up-to-date information, cannot effectively be utilized without the event-specific conditions of a discharge, such as the location, season, weather, type and amount of material involved. Because of the importance of coordinating with natural resource biologists and managers at the time of a spill, a list of Federal and State agency personnel most familiar with the resources has been assembled (see Part II, Section 3.). Once alerted, these personnel will provide event-specific technical assistance to the Federal or State OSC.

Clearly, there is a need for prior identification of sensitive natural resources to guide those responding to discharges during initial phases of response (i.e., before the consensus opinions of natural resource managers can be obtained). Therefore, a list of high priority natural resources is provided below (see Section 2.3: Categories for Resource Protection Prioritization).

2.2 Prioritization

Because of the diversity and extent of sensitive natural resources in the ACP region, it is important to reach a consensus, to the extent possible, on the highest resource priorities in order to provide for time-sensitive, coordinated, and effective protection, rescue, and restoration.

Although prioritization is difficult, several criteria that may be used in making this determination have been identified:

- **relative abundance or scarcity of a particular resource;**
- **relative diversity and abundance of resources at a particular site;**
- **fecundity of biological resources;**
- **vulnerability to spills;**
- **sensitivity to the product discharged;**
- **amenability to restoration or remediation;**
- **protection by Federal and State laws;**
- **economic importance.**

2.3 Categories for Resource Protection Prioritization

In general, natural resources are most at risk from oil spills when:

1. **large numbers of individuals are concentrated in a relatively small area, such as bays where rafts of waterfowl concentrate during migration and overwintering;**
2. **areas important to specific life stages or migration patterns, such as foraging and overwintering sites, are impacted by oil;**
3. **the species are threatened or endangered;**
4. **early life stages of birds and anadromous fish are present in somewhat restricted areas;**
5. **specific areas are known to be vital sources for propagation, such as shellfish beds;**
6. **a significant percentage of the population is likely to be exposed to oil; and**
7. **wildlife come ashore for resting, molting, or birthing.**

The above factors lead to categories of natural resources that should be considered of high priority for protection and remediation:

a. Priority 1

- **Federally listed or proposed Endangered and Threatened Species and their Designated Critical Habitat (DOI/FWS/NPS)**

b. Priority 2

- **Migratory birds (waterfowl, wading birds, shorebirds, raptors, diving birds, songbirds) and their habitats (DOI/FWS)**
  Migratory Bird Nesting Sites (DOI/FWS)
  Colonial Waterbird Nesting Sites (DOI/FWS)
  Migratory Concentration Areas for Migratory Birds (DOI/FWS)
  Seasonal Concentration Areas for Migratory Birds (DOI/FWS)
- **Anadromous Fish Spawning Areas (DOI/FWS/NOAA)**

- **National and State Protected Areas:**
  National Wildlife Refuges and Waterfowl Production Areas (DOI/FWS)
  National Wilderness Areas (DOI/FWS/NPS; USDA/FS)
  National Parks (DOI/NPS)
  National Preserves (DOI/NPS)
  National Forests (USDA/FS)
  National Fish Hatcheries (DOI/FWS; NOAA/NMFS)
  Clean Lakes Program Critical Areas (U.S. EPA)
  Tribal Lands (appropriate Tribal Contact)
  State Parks
  State Refuges
  State Wildlife Management Areas
  State Forests
- **State-listed or proposed Endangered and Threatened Species**
- **High quality priority freshwater wetlands (other than included above) identified by Local, State, regional, or Federal levels of Government (U.S. EPA; COE; DOI/FWS/NPS; USDA/FS)**
- **Federal and State Species of Concern (DOI/FWS/NPS)**
- **Outstanding National Resource Waters/Outstanding Resource Value Waters (if not listed above):**
  National Wild and Scenic Rivers (DOI/NPS; USDA\FS)
  Critical areas under the Clean Lakes Program (U.S. EPA/States)
  Sites within Joint Venture Project Areas under the North American Waterfowl Management Plan (DOI/FWS)
  Sites under the RAMSAR Treaty on Wetlands of International Importance (DOI/FWS)
  State Scientific and Natural Areas
  Calcareous Fens
  State Wild and Scenic Rivers
  Trout streams

c. Priority 3 - Sensitive Recreation Areas

- **Heritage Program Sites**
- **Cultural Sites (Archeological, Historical, Monuments)**
- **Recreational Areas (Boating, Fishing, Swimming)**

PLEASE NOTE: Fish and wildlife agency concerns are intensified with the above species and specified areas at specific times of the year (e.g., breeding and migration season). Should an oil spill occur within these designated areas, the USFWS and State(s) natural resource agencies should be contacted immediately to assist in determining the routing direction of the spill as well as other aspects of the cleanup effort.

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3.0 STATE-BY-STATE NOTIFICATION NUMBERS AND INFORMATION RESOURCES OF FISH AND WILDLIFE RESOURCE MANAGERS

When an oil spill impacts wildlife, or has the significant potential for impact, in addition to contacting the NRC (1-800-424-8802), the State or Federal OSC should immediately contact the State natural resource agency and the appropriate USFWS Field Office in each State. Primary contact points for the agencies are listed under the appropriate State heading. Only one contact per agency is necessary because the person initially contacted will notify other personnel in their agency, such as Law Enforcement staff and Refuge managers. The OSC may also contact any other natural resource agency for help with fish and wildlife issues.

The USFWS is responsible for the management and protection of migratory birds, Federally listed threatened and endangered species (and their critical habitat), and for USFWS lands, including National Wildlife Refuges, Waterfowl Production Areas, and National Fish Hatcheries. The USFWS will provide responders with information concerning these resources, as well as technical assistance concerning the effects of oil on these resources. The USFWS will help coordinate wildlife recovery and rehabilitation efforts in conjunction with the State natural resource trustee.

On-scene-coordinators must also contact Native American community officials if they need technical information/assistance in the protection of fish and wildlife resources on tribal lands. (Please refer to the directory of tribal authorities presented in the ACP/RCP.)

3.1 Information for Spills that Occur in Illinois

3.1.1 Appropriate Staff Contacts for the Designated Officials for Fish and Wildlife Resource Management Agencies

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service Regional Office - Region 3 - Minneapolis, MN

Regional Pollution Response Coordinator
Bishop Henry Whipple Federal Building
Fort Snelling, MN 55111-4056
Office hours: (612)725-3536
24-hours: (612) 725-3536 (press "7" for after hours numbers)
Fax: (612) 725-3526

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service Illinois (Mississippi River -left and right banks)

U. S. Fish and Wildlife Service
Ecological Services
Rock Island Illinois Field Office
4469 48th Avenue Court
Rock Island, Illinois 61201

Richard C. Nelson (Primary - 24 hours)
Phone: 309-793-5800 (office)
Phone: 319-359-7815 (home)
Fax: 309-793-5804

cc:mail nelson,richard
Internet: richard_c_nelson@mail.fws.gov.

Jody Millar (Primary - Duty Hrs.)
Phone: 309-793-5800 (office)
Fax: 309-793-5804
cc:mail millar,jody
Internet: jody_g_millar@mail.fws.gov.

Illinois (Greater Chicago Metropolitan Area)

U. S. Fish and Wildlife Service
Ecological Services
Barrington Illinois Field Office
1000 Hart Road, Suite 180
Barrington, Illinois 60010

Benjamin Tuggle (Primary - 24 hours)
Phone: 847-381-2253 (office)
Phone: 815-455-9767 (home)
Fax: 847-381-2285
cc:mail tuggle,benjamin
Internet: benjamin_tuggle@mail.fws.gov.

Edward Kareki (Primary - Duty Hrs.)
Phone: 847-381-2253
Fax: 847-381-2285

STATE OF ILLINOIS
Illinois Environmental Protection Agency

Primary
James O'Brien, Manager
Office of Chemical Safety (29)
Illinois EPA
2200 Churchill Road
P.O. Box 19276 Springfield, IL 62794-9276
24 hr 217-782-7860 (IEMA)
Phone:217-782-3637
FAX: 217-782-1431
NOAA Mail: None
TWX/TELEX: None

Alternate
Dennis Ahlberg, Manager
Emergency Response Unit
Illinois EPA
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276
Phone:217-782-3637
24 hr. 217-782-7860 (IEMA)
FAX: 217-782-1431
NOAA Mail: None
TWX/TELEX: None

3.1.2 Table 2. Illinois County Occurrences of Federally Listed Species

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN ILLINOIS (revised July 12, 1995)

COUNTY	SPECIES
Adams	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Indiana bat (Myotis sodalis) E
Alexander	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Lest tern (Sterna antillarum) E Gray bat (Myotis grisescens) E Indiana bat (Myotis sodalis) E
Bond	Bald eagle (Haliaeetus leucocephalus) T; breeding Indiana bat (Myotis sodalis) E
Brown	Bald eagle (Haliaeetus leucocephalus) T; wintering
Bureau	Bald eagle (Haliaeetus leucocephalus) T; wintering Decurrent false aster (Boltonia decurrens) T
Calhoun	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering
Carroll	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering

Cass	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost]
Christian	Bald eagle (Haliaeetus leucocephalus) T; wintering
Clinton	Bald eagle (Haliaeetus leucocephalus) T; wintering
Cook	Peregrine falcon (Falco peregrinus) E Prairie bush-clover (Lespedeza leptostachya) T Eastern prairie fringed orchid (Platanthera leucophaea) Hines emerald dragonfly (Somatochlora hineana) PE
DeWitt	Bald eagle (Haliaeetus leucocephalus) T; wintering
DuPage	Hines emerald dragonfly (Somatochlora hineana) PE Prairie bush-clover (Lespedeza leptostachya) T Eastern prairie fringed orchid (Platanthera leucophaea) T
Edwards	Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
Fayette	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering
Ford	Indiana bat (Myotis sodalis) E Mead=s milkweed (Asclepias meadii) T
Franklin	Bald eagle (Haliaeetus leucocephalus) T; wintering
Fulton	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Decurrent false aster (Boltonia decurrens) T
Gallatin	Fat pocketbook pearly mussel (Potamilus capax) E; Wabash River Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
Greene	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering
Grundy	Bald eagle (Haliaeetus leucocephalus) T; wintering Eastern prairie fringed orchid (Platanthera leucophaea) T
Hancock	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Fat pocketbook pearly mussel (Potamilus capax) E; [transplanted in Mississippi River]
Hardin	Gray bat (Myotis grisescens) E Indiana bat (Myotis sodalis) E Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
Henderson	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Indiana bat (Myotis sodalis) E Higgins= eye pearly mussel (Lampsilis higginsi) E; Mississippi River
Henry	Eastern prairie fringed orchid (Platanthera leucophaea) T
Iriquois	Eastern prairie fringed orchid (Platanthera leucophaea) T
Jackson	Bald eagle (Haliaeetus leucocephalus) T; wintering Least tern (Sterna antillarum) E; Mississippi River Indiana bat (Myotis sodalis) E
Jasper	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering
Jefferson	Bald eagle (Haliaeetus leucocephalus) T; wintering
Jersey	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Indiana bat (Myotis sodalis) E Decurrent false aster (Boltonia decurrens) T
Jo Daviess	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Iowa pleistocene snail (Discus macclintocki) E

	Higgins= eye pearly mussel (Lampsilis higginsi) E; Mississippi River
Johnson	Bald eagle (Haliaeetus leucocephalus) T; wintering Gray bat (Myotis grisescens) E Indiana bat (Myotis sodalis) E Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
Kane	Eastern prairie fringed orchid (Platanthera leucophaea) T
Lake	Karner blue butterfly (Lycaeides melissa samuelis) E Eastern prairie fringed orchid (Platanthera leucophaea) T Dune thistle (Cirsium pitcheri) T [introduced]
LaSalle	Bald eagle (Haliaeetus leucocephalus) T; wintering Indiana bat (Myotis sodalis) E; Critical Habitat = Blackball Mine
Lawrence	Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
Lee	Prairie bush-clover (Lespedeza leptostachya) T
Macoupin	Indiana bat (Myotis sodalis) E
Madison	Bald eagle (Haliaeetus leucocephalus) T; wintering Decurrent false aster (Boltonia decurrens) T
Marshall	Bald eagle (Haliaeetus leucocephalus) T; wintering Decurrent false aster (Boltonia decurrens) T
Mason	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Decurrent false aster (Boltonia decurrens) T
Massac	Pink mucket pearly mussel (Lampsilis orbiculata) (=P. abrupta) E; Ohio River Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
McDonough	Indiana bat (Myotis sodalis) E
McHenry	Bald eagle (Haliaeetus leucocephalus) T; wintering Prairie bush-clover (Lespedeza leptostachya) T Eastern prairie fringed orchid (Platanthera leucophaea) T
Menard	Bald eagle (Haliaeetus leucocephalus) T; wintering
Mercer	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Higgins= eye pearly mussel (Lampsilis higginsi) E; Mississippi River
Monroe	Bald eagle (Haliaeetus leucocephalus) T; wintering Indiana bat (Myotis sodalis) E
Morgan	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Decurrent false aster (Boltonia decurrens) T
Moultrie	Bald eagle (Haliaeetus leucocephalus) T; wintering
Ogle	Bald eagle (Haliaeetus leucocephalus) T; wintering Prairie bush-clover (Lespedeza leptostachya) T
Peoria	Bald eagle (Haliaeetus leucocephalus) T; wintering Decurrent false aster (Boltonia decurrens) T
Pike	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Gray bat (Myotis grisescens) E Indiana bat (Myotis sodalis) E Fat pocketbook pearly mussel (Potamilus capax) E; [transplanted in Mississippi River] Higgins= eye pearly mussel (Lampsilis higginsi) E; Mississippi River Decurrent false aster (Boltonia decurrens) T
Pope	Bald eagle (Haliaeetus leucocephalus) T; breeding Gray bat (Myotis grisescens) E Indiana bat (Myotis sodalis) E Copperbelly watersnake (Nerodia erythrogaster neglecta) PT

Pulaski	Bald eagle (Haliaeetus leucocephalus) T; wintering Gray bat (Myotis grisescens) E Indiana bat (Myotis sodalis) E Copperbelly watersnake (Nerodia erythrogaster neglecta) PT Orange-footed pearly mussel (Plethobasis cooperianus) (=P striatus) E; Ohio River
Putnam	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Decurrent false aster (Boltonia decurrens) T
Randolph	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Pallid sturgeon (Scaphirynchus albus) E; Mississippi River Small whorled pogonia (Isotria medeoloides) T
Richland	Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
Rock Island	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Higgins= eye pearly mussel (Lampsilis higginsi) E; Essential Habitat = Sylvan Slough
Saline	Indiana bat (Myotis sodalis) E Copperbelly watersnake (Nerodia erythrogaster neglecta) PT Mead=s milkweed (Asclepias meadii) T
Sangamon	Bald eagle (Haliaeetus leucocephalus) T; wintering
Schuyler	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost] Indiana bat (Myotis sodalis) E Decurrent false aster (Boltonia decurrens) T
Scott	Bald eagle (Haliaeetus leucocephalus) T; wintering Indiana bat (Myotis sodalis) E Decurrent false aster (Boltonia decurrens) T
Shelby	Bald eagle (Haliaeetus leucocephalus) T; wintering
St. Clair	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Decurrent false aster (Boltonia decurrens) T; Mississippi River floodplain
Tazewell	Bald eagle (Haliaeetus leucocephalus) T; wintering Lakeside daisy (Hymenoxys herbacea) T [introduced] Decurrent false aster (Boltonia decurrens) T
Union	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Indiana bat (Myotis sodalis) E
Wabash	Bald eagle (Haliaeetus leucocephalus) T; wintering Copperbelly watersnake (Nerodia erythrogaster neglecta) PT
White	Bald eagle (Haliaeetus leucocephalus) T; wintering Copperbelly watersnake (Nerodia erythrogaster neglecta) PT Fanshell mussel (Cyprogenia stegaria)(=C. irrorata) E; Wabash River Fat pocketbook pearly mussel (Potamilus capax) E; Wabash River
Whiteside	Bald eagle (Haliaeetus leucocephalus) T; wintering [night roost]
Will	Bald eagle (Haliaeetus leucocephalus) T; wintering Hines emerald dragonfly (Somatochlora hineana) PE Lakeside daisy (Hymenoxis herbacea) T [introduced] Leafy prairie clover (Dalea foliosa) E; Des Plaines River floodplain Mead=s milkweed (Asclepias meadii) T
Winnebago	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Prairie bush-clover (Lespedeza leptostachya) T [introduced]
Williamson	Bald eagle (Haliaeetus leucocephalus) T; breeding and

	wintering
Woodford	Bald eagle (Haliaeetus leucocephalus) T; wintering Decurrent false aster (Boltonia decurrens) T; Illinois River floodplain

3.1.3 Table 3. Federally Listed Species that Occur in Illinois and their Habitat

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN ILLINOIS (revised July 12, 1995)

SPECIES	STATUS	HABITAT	CURRENT DISTRIBUTION
BIRDS			
Peregrine falcon (Falco peregrinus)	E	Breeding	Cook
Bald eagle (Haliaeetus leucocephalus)	T	Breeding	Adams, Alexander, Bond, Calhoun, Carroll, Fayette, Green, Jo Daviess, Mason, Pike, Pope, Randolph, St. Clair, Union, Winnebago, Williamson
Bald eagle (Haliaeetus leucocephalus)	T	Wintering	Adams, Alexander, Brown, Bureau, Calhoun, Carroll, *Cass, Christian, Clinton, De Witt, Fayette, Franklin, *Fulton, Greene, Grundy, Hancock, *Henderson, Jackson, Jasper, Jefferson, *Jersey, Jo Daviess, Johnson, LaSalle, Madison, Marshall, Mason, McHenry, Menard, *Mercer, Monroe, *Morgan, Moultrie, Ogle, Peoria, Pike, Pulaski, *Putnam, Randolph, *Rock Island, Sangamon, *Schuyler, Scott, Shelby, St. Clair, Tazewell, Union, Wabash, White, *Whiteside, Will, Winnebago, Williamson, Woodford *** Counties with night roosts**
Least Tern (Sterna antillarum)	E	Bare aluvial and dredged spoil islands	Alexander, Jackson (Mississippi River)
Piping Plover (Charadrius melodus)	E	Lakeshore beaches (Great Lakes drainage)	EXTIRPATED
FISH			
Pallid sturgeon (Scaphirynchus albus)	E	Rivers	Randolph (Mississippi River)
MAMMALS			
Gray bat (Myotis grisescens)	E	Caves	Alexander, Hardin, Johnson, Pike, Pope, Pulaski
Indiana bat (Myotis sodalis)	E	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests	Adams, *Alexander, Bond, Ford, Hardin, Henderson, *Jackson, Jersey, Johnson, *LaSalle, Macoupin, McDonough, *Monroe, Pike, *Pope, Pulaski, Saline, Schuyler, Scott, *Union Critical Habitat: Blackball Mine, Lasalle County *** Counties with hibernacula**
REPTILES			
Copperbelly watersnake (Nerodia erythrogaster neglecta)	PT	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain	Edwards, Gallatin, Hardin, Johnson, Lawrence, Massac, Pope, Richland, Saline, Wabash, White

		woods	
INVERTEBRATES			
Iowa pleistocene snail (Discus macclintocki)	E	North-facing algific talus slopes	Jo Daviess
Karner blue butterfly (Lycaeides melissa samuelis)	E	Pine barrens and oak savannas on sandy soils and containing wild lupines (Lupinus perennis), the only known food plant of larvae.	Lake
Hines emerald dragonfly (Somatochlora hineana)	PE	Spring fed wetlands, wet meadows and marshes	Cook, Will, Dupage (Des Plaines River drainage)
MUSSELS			
Fanshell mussel (Cyprogenia stegaria) (=C. irrorata)	E	Rivers	White (Wabash River)
Fat pocketbook pearly mussel (Potamilus capax)	E	Rivers	*Hancock, *Pike (Mississippi River); White, Gallatin (Wabash River) *** Transplanted populations**
Higgins' eye pearly mussel (Lampsilis higginsi)	E	Rivers Essential Habitat: Rock Island (Sylvan Slough)	Jo Daviess, Rock Island, Mercer, Henderson (Mississippi River); Rock River below Steel Dam at Milan
Pink mucket pearly mussel (Lampsilis orbiculata) (=P. abrupta)	E	Rivers	Massac (Ohio River)
Tubercled-blossom pearly mussel (Epioblasma torulosa)	E	Rivers	EXTIRPATED
Orange-footed pearly mussel (Plethobasis cooperianus) (=P. striatus)	E	Rivers	Pulaski (Ohio River)
White warty-back pearly mussel (Plethobasis cicatricosus)	E	Rivers	EXTIRPATED
Clubshell (Pleurobema clava)	E	Rivers	EXTIRPATED
Rough pigtoe (Pleurobema plenum)	E	Rivers	EXTIRPATED
Ring pink (Obovaria retusa)	E	Rivers	EXTIRPATED

PLANTS			
Small whorled pogonia (Isotria medeoloides)	T	Dry woodland	Randolph
Prairie bush-clover (Lespedeza leptostachya)	T	Dry to mesic prairies with gravelly soils	Cook, DuPage, Lee, Ogle, McHenry, *Winnebago [search for this species whenever prairie remnants are found] ***=introduced**
Running buffalo (Trifolium stoloniferum)	E	Disturbed bottomland meadows	NONE
Lakside daisy (Hymenoxis herbacea)	T	Dry rocky prairies	*Tazewell, *Will *** = introduced**
Mead's milkweed (Asclepias meadii)	T	Virgin prairies	*Ford, Saline, *Will [search for this species whenever prairie remnants are found] *** = introduced**
Decurrent false aster (Boltonia decurrens)	T	Disturbed alluvial soils	St. Clair (Mississippi River floodplain); Bureau, Fulton, Jersey, Madison, Marshall, Mason, Morgan, Peoria, Pike, Putnam, Schuyler, Scott, Tazewell, Woodford (Illinois River floodplain)
Eastern prairie fringed orchid (Platanthera leucophaea)	T	Mesic to wet prairies	Cook, DuPage, Grundy, Henry, Iriquois, Kane, Lake, McHenry [search for this species whenever prairie remnants are found]
Price's potato bean (Apios priceana)	T	Wet floodplain forests, shrubby swamps	EXTIRPATED (Union)
Leafy prairie clover (Dalea foliosa)	E	Prairie remnants on thin soil over lime-stone	Will (Des Plaines River floodplain)
Dune thistle (Cirsium pitcheri)	T	Lakeshore dunes	Lake [introduced]

3.2 Information for Spills that Occur in Indiana

3.2.1 Appropriate Staff Contacts for the Designated Officials for Fish and Wildlife Resource Management Agencies

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service Regional Office - Region 3 - Minneapolis, MN

Regional Pollution Response Coordinator
Bishop Henry Whipple Federal Building
Fort Snelling, MN 55111-4056
Office hours: (612)725-3536
24-hours: (612) 725-3536 (press "7" for after hours numbers)
Fax: (612) 725-3526

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service Indiana

U.S. Fish and Wildlife Service
Ecological Services
Bloomington Indiana Field Office
620 South Walker Street
Bloomington, Indiana 47403-2121

Daniel Sparks (Primary - 24 hrs.)
Phone: 812-334-4261 (office)
Phone: 812-336-4341 (home)
Fax: 812-334-4273
cc:mail sparks,daniel

Internet: Daniel_Sparks@mail.fws.gov

Cindy Chaffee (Primary - 24 hrs.)
Phone: 812-334-4261 (office)
Phone: 812-384-9671 (home)
Fax: 812-334-4273
cc:mail chaffee,cindy
Internet: Cindy_Chaffee@mail.fws.gov

Dave Hudak (Secondary - duty hrs.)
Phone: 812-334-4261 (office)
Fax: 812-334-4273
cc:mail hudak,dave
Internet: Dave_Hudak@mail.fws.gov

STATE OF INDIANA
Indiana Department of Natural Resources

Dave Herbst, Deputy Director
Indiana Department of Natural Resources 402 West Washington St.
Room W256
Indianapolis, Indiana 46203
Phone:317-232-4020
24 hr (not available)
FAX: 317-232-8150
NOAA Mail: 0000
TWX/TELEX: 0000

John Rose, Assistant Commissioner
Indiana Department of Environmental Management
Office of Environmental Response
100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
Phone:317-232-8603
24 hr 317-233-7745
FAX: 317-233-6358
NOAA Mail: 0000
TWX/TELEX: 0000

3.2.2 Table 4. Indiana County Occurrences of Federally Listed Species

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN INDIANA (revised June 1995)

COUNTY	SPECIES
Allen	Eastern fanshell pearly mussel (Cyprogenia stegaria) E Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E
Bartholomew	Eastern fanshell pearly mussel (Cyprogenia stegaria) E
Blackford	Indiana bat (Myotis sodalis) E
Boone	Indiana bat (Myotis sodalis) E
Brown	Bald eagle (Haliaeetus leucocephalus) E
Carroll	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E Rough pigtoe (Pleurobema plenum) E Fat pocketbook (Potamilus capax) E
Cass	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E
Clark	Indiana bat (Myotis sodalis) E Gray bat (Myotis grisescens) E Fat pocketbook (Potamilus capax) E Running buffalo clover (Trifolium stoloniferum) E
Clay	Indiana bat (Myotis sodalis) E Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Clinton	Indiana bat (Myotis sodalis) E
Crawford	Indiana bat (Myotis sodalis) E Gray bat (Myotis grisescens) E
De Kalb	Northern riffleshell (Epioblasma torulosa rangiana) E; White cat=s paw pearly mussel (Epioblasma obliquata perobliqua);

	E Clubshell (Pleurobema clava) E
Dearborn	Running buffalo clover (Trifolium stoloniferum) E
Delaware	Clubshell (Pleurobema clava) E Northern riffleshell (Epioblasma torulosa rangiana) E; Indiana bat (Myotis sodalis) E Running buffalo clover (Trifolium stoloniferum) E
Dubois	Eastern fanshell pearly mussel (Cyprogenia stegaria) E Bald eagle (Haliaeetus leucocephalus) T Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Elkhart	Prairie white-fringed orchid (Platanthera leucophaea) T
Fountain	Eastern fanshell pearly mussel (Cyprogenia stegaria) E Indiana bat (Myotis sodalis) E Clubshell (Pleurobema clava) E
Fulton	Northern riffleshell (Epioblasma torulosa rangiana) E Indiana bat (Myotis sodalis) E Rough pigtoe (Pleurobema plenum) E Clubshell (Pleurobema clava) E
Gibson	Eastern fanshell pearly mussel (Cyprogenia stegaria) E Indiana bat (Myotis sodalis) E Fat pocketbook (Potamilus capax) E Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened Clubshell (Pleurobema clava) E Least Tern; interior population (Sterna antillarum) E
Greene	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T
Hamilton	Clubshell (Pleurobema clava) E Prairie white-fringed orchid (Plantanthera leucophaea) T
Hancock	Clubshell (Pleurobema clava) E Indiana bat (Myotis sodalis) E
Harrison	Clubshell (Pleurobema clava) E Indiana bat (Myotis sodalis) E Gray bat (Myotis grisescens) E
Hendricks	Indiana bat (Myotis sodalis) E
Henry	Indiana bat (Myotis sodalis) E
Howard	Indiana bat (Myotis sodalis) E
Huntington	Clubshell (Pleurobema clava) E Indiana bat (Myotis sodalis) E
Jackson	Eastern fanshell pearly mussel (Cyprogenia stegaria) E Clubshell (Pleurobema clava) E Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Jasper	Indiana bat (Myotis sodalis) E
Jay	Indiana bat (Myotis sodalis) E
Jefferson	Running buffalo clover (Trifolium stoloniferum) E
Jennings	Gray bat (Myotis grisescens) E
Johnson	Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E
Knox	Eastern fanshell pearly mussel (Cyprogenia stegaria) E ; Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E Indiana bat (Myotis sodalis) E Rough pigtoe (Pleurobema plenum) E Fat pocketbook (Potamilus capax) E Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened

Kosciusko	Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E Indiana bat (Myotis sodalis) E Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
La Porte	Indiana bat (Myotis sodalis) E Prairie white-fringed orchid (Plantanthera leucophaea) T Mitchell=s satyr butterfly (Neonympha mitchellii) E
Lagrange	Indiana bat (Myotis sodalis) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened; Prairie white-fringed orchid (Plantanthera leucophaea) T; Mitchell=s satyr butterfly (Neonympha mitchellii) E; Karner blue butterfly (Lycaeides melissa samuelis) E
Lake	Prairie white-fringed orchid (Plantanthera leucophaea) T; Karner blue butterfly (Lycaeides melissa samuelis) E; Mead=s milkweed (Asclepias meadii) T; Dune Thistle (Cirsium pitcheri) T
Lawrence	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E; Gray bat (Myotis grisescens) E
Madison	Clubshell (Pleurobema clava) E
Marion	Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E; Running buffalo clover (Trifolium stoloniferum) E
Marshall	Clubshell (Pleurobema clava) E
Martin	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E; Bald eagle (Haliaeetus leucocephalus) T; Rough pigtoe (Pleurobema plenum) E
Miami	Clubshell (Pleurobema clava) E
Monroe	Indiana bat (Myotis sodalis) E; Bald eagle (Haliaeetus leucocephalus) T
Montgomery	Indiana bat (Myotis sodalis) E
Morgan	Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E; Bald eagle (Haliaeetus leucocephalus) T
Noble	Prairie white-fringed orchid (Plantanthera leucophaea) T
Ohio	Running buffalo clover (Trifolium stoloniferum) E
Orange	Indiana bat (Myotis sodalis) E; Bald eagle (Haliaeetus leucocephalus) T
Owen	Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E; Bald eagle (Haliaeetus leucocephalus) T; Fat pocketbook (Potamilus capax) E
Parke	Indiana bat (Myotis sodalis) E; Bald eagle (Haliaeetus leucocephalus) T
Pike	Clubshell (Pleurobema clava) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Porter	Karner blue butterfly (Lycaeides melissa samuelis) E; Pitcher's thistle (Cirsium pitcheri) T
Posey	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E; Rough pigtoe (Pleurobema

	plenum) E; Fat pocketbook (Potamilus capax) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened; Pink mucket (Lampsilis abrupta) E
Pulaski	Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E
Putnam	Indiana bat (Myotis sodalis) E
Randolph	Indiana bat (Myotis sodalis) E
Rush	Indiana bat (Myotis sodalis) E
Shelby	Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E
Spencer	Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
St. Joseph	Indiana bat (Myotis sodalis) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened; Prairie white-fringed orchid (Platanthera leucophaea) T
Starke	Indiana bat (Myotis sodalis) E; Prairie white-fringed orchid (Platanthera leucophaea) T
Steuben	Clubshell (Pleurobema clava) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened; Prairie white-fringed orchid (Platanthera leucophaea) T; Mitchell's satyr butterfly (Neonympha mitchellii) E
Sullivan	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E; Rough pigtoe (Pleurobema plenum) E
Tippecanoe	Eastern fanshell pearly mussel (Cyprogenia stegaria) E ; Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E; Rough pigtoe (Pleurobema plenum) E; Ring pink (Obovaria retusa) E
Vanderburgh	Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Vermillion	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E
Vigo	Eastern fanshell pearly mussel (Cyprogenia stegaria) E ; Northern riffleshell (Epioblasma torulosa rangiana) E; Clubshell (Pleurobema clava) E; Rough pigtoe (Pleurobema plenum) E
Wabash	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; Clubshell (Pleurobema clava) E; Indiana bat (Myotis sodalis) E
Warren	Eastern fanshell pearly mussel (Cyprogenia stegaria) E; White cat=s paw pearly mussel (Epioblasma obliquata perobliqua) E; Clubshell (Pleurobema clava) E; Rough pigtoe (Pleurobema plenum) E
Warrick	Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Washington	Indiana bat (Myotis sodalis) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
Wayne	Indiana bat (Myotis sodalis) E

Wells	Indiana bat (Myotis sodalis) E; Copperbelly water snake (Nerodia erythrogaster neglecta) Proposed Threatened
White	Clubshell (Pleurobema clava) E; Prairie white-fringed orchid (Platanthera leucophaea) T

3.2.3 Table 5. Federally Listed Species that Occur in Indiana and their Habitat

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN INDIANA (revised June 1995)

SPECIES	STATUS	HABITAT	CURRENT DISTRIBUTION
MAMMALS			
Indiana bat (Myotis sodalis)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests	Recent: Clark, Crawford (critical habitat), Delaware, Greene (critical habitat), Hancock, Harrison, Henry, Jasper, Jay, Knox, La Porte, Lawrence, Marion, Martin, Monroe, Montgomery, Orange, Owen, Randolph, Rush, Starke, Wabash, Washington, Wayne, Wells New additions: Tippecanoe, Clinton, Hendricks, Parke, Vermillion, Fountain, Huntington, Fulton, Putnam, Ripley, Jefferson, St Joseph, Stueben Historic: Parke, Kosciusko, LaGrange, Clay, Pulaski Probable Occurrence: Statewide
Gray bat (Myotis grisescens)	Endangered	Caves	Recent: Clark (nursery), Crawford, Harrison, Jennings Historic: Lawrence
BIRDS			
Bald eagle (Haliaeetus leucocephalus)	Threatened	Recent: Wintering	Allen, Bartholomew, Brown, Carroll, Clark, Crawford, Daviess, DuBois, Elkhart, Franklin, Foulton, Fountain, Gibson, Grant, Greene, Harrison, Henry, Huntington, Jackson, Jasper, Jefferson, Jennings, Johnson, Knox, Kosciusko, LaGrange, LaPorte, Lawrence, Marion, Marshall, Martin, Monroe, Montgomery, Morgan, Newton, Orange, Owen, Parke, Perry, Pike, Posey, Pulaski, Putnam, Ripley, Scott, Spencer, Starke, Steuben, Sullivan, Tippecanoe, Union, Vanderburgh, Vermillion, Vigo, Wabash, Warren, White
Bald eagle (Haliaeetus leucocephalus)	Threatened	Recent: Nesting & Wintering	Brown, DuBois, Greene, Martin, Monroe, Morgan, Orange, Owen, Parke
Peregrine falcon (Falco peregrinus)	Endangered	Breeding	Lake
Peregrine falcon (Falco peregrinus)	Endangered	Hacking Site	Allen and Marion
Least Tern (Sterna antillarum)	Endangered	Breeding	Gibson
REPTILES			
Copperbelly water snake (Nerodia erythrogaster neglecta)	Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods	DuBois, Gibson, Jackson, Jennings, Pike, Posey, St Joseph, Scott, Spencer, Steuben, Warrick, Washington
MUSSELS			

Clubshell (Pleurobema clava)	Endangered	Rivers	Dekalb, Fulton, Kosciusko
Cracking pearly mussel (Hemistena lata)	Endangered	Rivers	EXTIRPATED
Fanshell (Cyprogenia stegaria)	Endangered	Rivers	Martin, Sullivan, Tippecanoe, Wabash, White
Fat pocketbook (Potamilus capax)	Endangered	Rivers	Gibson and Posey
Northern riffleshell (Epioblasma torulosa rangiana)	Endangered	Rivers	Pulaski
Orange-footed pearly mussel (Plethobasus cooperianus)	Endangered	Rivers	EXTIRPATED
Pink mucket pearly mussel (Lampsilis orbiculata) (=P. abrupta)	E	Rivers	Posey
Ring pink (Obovaria retusa)	E	Rivers	EXTIRPATED
Rough pigtoe (Pleurobema plenum)	Endangered	Rivers	Martin
Tubercled-blossom pearly mussel (Epioblasma torulosa)	E	Rivers	EXTIRPATED
White cat's paw pearly mussel (Epioblasma obliquata perobliqua)	Rivers	Rivers	EXTIRPATED
White warty-back pearly mussel (Plethobasis cicatricosus)	E	Rivers	EXTIRPATED
INSECTS			
Mitchell's satyr (Neonympha mitchellii)	Endangered	fens	LaGrange, LaPorte
Karner blue butterfly (Lycaeides melissa samuelis)	Endangered	Pine barrens and oak savannas on sandy soils and containing wild lupines (Lupinus perennis), the only known food plant of	Lake, Porter

		larvae.	
PLANTS			
Pitcher's thistle (Cirsium pitcheri)	Threatened	Lakeshores; stabilized dunes and blowout areas	Lake, Porter
Running buffalo clover (Trifolium stoloniferum)	Endangered	Disturbed bottomland meadows	Ohio

3.3 Information for Spills that Occur in Michigan

3.3.1 Appropriate Staff Contacts for the Designated Officials for Fish and Wildlife Resource Management Agencies

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Regional Office - Region 3 - Minneapolis, MN

Regional Pollution Response Coordinator
Bishop Henry Whipple Federal Building
Fort Snelling, MN 55111-4056
Office hours: (612)725-3536
24-hours: (612) 725-3536 (press "7" for after hours numbers)
Fax: (612) 725-3526

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Michigan

U.S. Fish and Wildlife Service
Ecological Services
East Lansing Field Office
2651 Coolidge Road
East Lansing, Michigan 48823

Charles M. Wooley (Primary - 24 hrs.)
Phone: 517-351-8470
Fax: 517-351-1443
cc:mail wooley,charles
Internet: charles_wooley@mail.fws.gov.

Lisa L. Williams (Primary - duty hrs.)
Phone: 517-351-8324
Fax: 517-351-1443
cc:mail williams,lisa
Internet: lisa_williams@mail.fws.gov.

Dave Best (Secondary - duty hrs.)
Phone: 517-351-6263
Fax: 517-351-1443

STATE OF MICHIGAN

Michigan Department of Natural Resources
(no contacts as of yet)

Michigan Department of Environmental Quality
(no contacts as of yet)

3.3.2 Table 6. Federally Listed Species that Occur in Michigan and their Habitat

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN MICHIGAN (revised December 12, 1994)

SPECIES	STATUS	HABITAT	CURRENT DISTRIBUTION
MAMMALS			
Gray wolf (Canis lupus)	Endangered		Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft
Indiana bat (Myotis sodalis)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat =	Barry, Branch, Calhoun, Eaton, Ingham, Hillsdale, Livingston, St. Joseph, Washtenaw

		small stream corridors with well developed riparian woods; upland forests	
EASTERN COUGAR (Felis concolor cougar)	Endangered		
BIRDS			
Bald eagle (Haliaeetus leucocephalus)	Threatened		Alcona, Alger, Allegan, Alpena, Arenac, Baraga, Bay, Benzie, Cheboygan, Chippewa, Clare, Clinton, Crawford, Delta, Dickinson, Emmet, Gogebic, Grand Traverse, Houghton, Iosco, Iron, Kalkaska, Keweenaw, Leelanau, Luce, Mackinac, Manistee, Marquette, Mason, Mecosta, Menominee, Missaukee, Monroe, Montmorency, Muskegon, Newaygo, Ogenaw, Ontonagon, Oscoda, Otsego, Presque Isle, Roscommon, Saginaw, Schoolcraft, St. Clair
Kirtland's warbler (Dendroica kirtlandii)	Endangered		Alcona, Crawford, Iosco, Kalkaska, Marquette, Montmorency, Ogemaw, Oscoda, Otsego, Roscommon
Peregrine falcon (Falco peregrinus)	Endangered		Marquette
Piping plover (Charadrius melodus)			Alger, Berrien, Charlevoix, Cheboygan, Chippewa, Emmet, Huron, Leelanau, Luce, Mackinac, Muskegon, Schoolcraft
REPTILES			
Northern copperbelly water snake (Nerodia erythrogaster neglecta)	Proposed Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods	Branch, Cass, Hillsdale
MUSSELS			
Clubshell (Pleurobema clava)	Endangered	Rivers	Hillsdale
Northern riffleshell (Epioblasma torulosa rangiana)	Endangered	Rivers	Monroe, Sanilac, Wayne
INSECTS			
Mitchell's satyr (Neonympha mitchellii)	Endangered		Barry, Berrien, Branch, Cass, Jackson, Kalamazoo, Lenawee. St. Joseph, Van Buren, Washtenaw
Karner blue butterfly (Lycaeides melissa samuelis)	Endangered	Pine barrens and oak savannas on sandy soils and containing wild lupines (Lupinus perennis), the only known food plant of larvae.	Allegan, Ionia, Lake, Monroe, Montcalm, Muskegon, Newaygo, Oceana

American burying beetle (Nicrophorus americanus)	Endangered		Alger, Arenac, Berrien, Kalamazoo, Menominee, Oakland, Washtenaw
Hungerford's crawling water beetle	Endangered		Emmet, Montmorency
PLANTS			
Pitcher's thistle (Cirsium pitcheri)	Threatened		Alger, Allegan, Alpena, Antrim, Arenac, Benzie, Berrien, Charlevoix, Cheboygan, Chippewa, Delta, Emmet, Grand Traverse, Iosco, Leelanau, Mackinac, Manistee, ason, Muskegon, Oceana, Ottawa Presque Isle, Schoolcraft, Van Buren
Michigan monkey-flower (Mimulus glabratus var. michiganesis)	Endangered		Benzie, Charlevoix, Cheboygan, Emmet, Leelanau, Mackinac
Dwarf lake iris (Iris lacustris)	Threatened		Alpena, Charlevoix, Cheboygan, Chippewa, Delta, Emmet, Mackinac, Menominee, Presque Isle, Schoolcraft
Hart's tongue fern (Phyllitis scolopendrium var. americana)	Threatened		Chippewa, Mackinac
Houghton's goldenrod (Solidago houghtonii)	Threatened		Charlevoix, Cheboygan, Chippewa, Crawford, Delta, Emmet, Mackinac, Preque Isle, Schoolcraft
Small whorled pogonia (Isotria medeoloides)	Threatened		Berrien
Eastern prairie fringed orchid (Platanthera leucophaea)	Threatened		Bay, Huron, Livingston, Monroe, Saginaw, St. Clair, St. Joseph, Tuscola, Washtenaw, Wayne

3.4 Information for Spills that Occur in Minnesota

3.4.1 Appropriate Staff Contacts for the Designated Officials for Fish and Wildlife Resource Management Agencies

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Regional Office - Region 3 - Minneapolis, MN

Regional Pollution Response Coordinator
Bishop Henry Whipple Federal Building
Fort Snelling, MN 55111-4056
Office hours: (612)725-3536
24-hours: (612) 725-3536 (press "7" for after hours numbers)
Fax: (612) 725-3526

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Minnesota

U.S. Fish and Wildlife Service
Ecological Services
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

Dave Warburton (Primary - 24 hrs.)
Phone: 612-725-3548 (office)
Phone: 612-437-6105 (home)

Fax: 612-437-6105
cc:mail warburton, dave
Internet: warburton_dave@mail.fws.gov.

STATE OF MINNESOTA
Minnesota Department of Natural Resources

Minnesota Department of Natural Resources
Ecological Services
500 Lafayette Road
St. Paul, MN 55155

State Duty Officer (Primary - 24 hrs.)
Phone: 612-296-2835 (office)
Phone: 612-649-5451 (24-hours)
Fax: 612-296-1811

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

State Duty Officer (Primary - 24 hrs.)
Phone: 612-296-6300 (office)
Phone: 612-649-5451 (24-hours)
Fax: 612-297-8676

3.4.2 Table 7. Minnesota County Occurrences of Federally Listed Species

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN MINNESOTA (revised August 11, 1994)

Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.

COUNTY	SPECIES
Aitken	Gray wolf, Canis lupus, Threatened (T). A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Anoka	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Becker	Gray wolf (NE portion of the county), Canis lupus , T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Beltrami	Gray wolf, Canis lupus, T, a primary range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Benton	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Big Stone	None.
Blue Earth	Bald eagle, Haliaeetus leucocephalus, T. Wintering. Peregrine falcon, Falco peregrinus, E. Breeding.
Brown	Bald eagle, Haliaeetus leucocephalus, T. Wintering & breeding. Prairie bush clover, Lespedeza leptostachya, T. Gravelly soil, dry to mesic prairie.
Carlton	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Carver	Bald eagle, Haliaeetus leucocephalus, T. Wintering.
Cass	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Chippewa	Bald eagle, Haliaeetus leucocephalus, T. Breeding & wintering.
Chisago	Bald eagle, Haliaeetus leucocephalus, T. Breeding. Higgins' eye pearly mussel, Lampsilis higginsi, Endangered (E). St. Croix R. Winged mapleleaf mussel, Quadrula fragosa, E. St. Croix R.
Clay	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairies & sedge meadow.
Clearwater	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Cook	Gray wolf, Canis lupus, T. A primary range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Cottonwood	Prairie bush clover, Lespedeza leptostachya, T. Gravelly soil, dry to mesic prairie.

Crow Wing	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Dakota	Bald eagle, Haliaeetus leucocephalus, T. Breeding. Peregrine falcon, Falco peregrinus, E. Breeding.
Dodge	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie & sedge meadow.
Douglas	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Faribault	None.
Fillmore	Leedy's roseroot, Sedum integrifolium var. leedyi, T. Wet limestone cliffs.
Freeborn	None.
Goodhue	Bald eagle, Haliaeetus leucocephalus, T. Breeding & wintering. Minnesota trout lily, Erythronium propullans, E. N. facing slopes & floodplains in deciduous woods. Prairie bush clover, Lespedeza leptostachya, T. Gravelly soil, dry to mesic prairie.
Grant	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Hennepin	Bald eagle, Haliaeetus leucocephalus, T. Breeding. Peregrine falcon, Falco peregrinus, E. Breeding.
Houston	Bald eagle, Haliaeetus leucocephalus, T. Breeding & wintering. Higgins' eye pearly mussel, Lampsilis higginsi, E. Mississippi R.
Hubbard	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Isanti	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Itasca	Gray wolf, Canis lupus, T. A primary range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Jackson	Prairie bush clover, Lespedeza leptostachya, T. Gravelly soil, dry to mesic prairie.
Kanabec	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Kandiyohi	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Kittson	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding. Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Koochiching	Gray wolf, Canis lupus, T. A primary range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Lac Qui Parle	Bald eagle, Haliaeetus leucocephalus, T. Wintering.
Lake	Gray wolf, Canis lupus, T. A primary range county Bald eagle, Haliaeetus leucocephalus, T. Breeding. Peregrine falcon, Falco peregrinus, E. Breeding.
Lake of the Woods	Gray wolf, Canis lupus, T. A primary range county Bald eagle, Haliaeetus leucocephalus, T. Breeding. Piping plover, Charadrius melodus, T. Breeding on Pine and Curry Islands in Lake of the Woods.
LeSueur	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.
Lincoln	None.
Lyon	None.
Mahnomen	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Marshall	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Martin	None.
McLeod	None.

Meeker	None.
Mille Lacs	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Morrison	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Mower	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Murray	None.
Nicollet	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.
Nobles	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Norman	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Olmsted	Peregrine falcon, Falco peregrinus, E. Breeding. Leedy's roseroot, Sedum integrifolium var. leedyi, T.; Wet limestone cliffs.
Otter Tail	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Pennington	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding. Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Pine	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Pipestone	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Polk	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding. Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Pope	None.
Ramsey	Bald eagle, Haliaeetus leucocephalus, T. Breeding. Peregrine falcon, Falco peregrinus, E. Breeding.
Red Lake	Gray wolf, Canis lupus, T. A peripheral range county.
Redwood	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering. Prairie bush clover, Lespedeza leptostachya, T.; gravelly soil, dry to mesic prairie.
Renville	Bald eagle, Haliaeetus leucocephalus, T. Wintering. Prairie bush clover, Lespedeza leptostachya, T.; gravelly soil, dry to mesic prairie.
Rice	Minnesota trout lily, Erythronium propullans, E. North-facing slopes and floodplains in deciduous woods. Prairie bush clover, Lespedeza leptostachya, T.; gravelly soil, dry to mesic prairie.
Rock	Western prairie fringed orchid, Platanthera praeclara, T. Wet prairie, sedge meadow.
Roseau	Gray wolf, Canis lupus, T. A primary range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
St. Louis	Gray wolf, Canis lupus, T. A primary range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding. Peregrine falcon, Falco peregrinus, E. Breeding.
Scott	Bald eagle, Haliaeetus leucocephalus, T. Wintering.
Sherburne	
Sibley	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.
Stearns	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Steele	Minnesota trout lily, Erythronium propullans, E. North-facing slopes and floodplains in deciduous woods.
Stevens	None.
Swift	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.
Todd	Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Traverse	None.

Wabasha	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.
Wadena	Gray wolf, Canis lupus, T. A peripheral range county. Bald eagle, Haliaeetus leucocephalus, T. Breeding.
Waseca	None.
Washington	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering. Peregrine falcon, Falco peregrinus, E. Breeding. Higgins= eye pearly mussel, Lampsilis higginsi, E. St. Croix River.
Watonwan	None.
Wilkin	None.
Winona	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering. Higgins' eye pearly mussel, Lampsilis higginsi, E. St. Croix River. Karner blue butterfly, Lycaeides melissa samuelis, E. Whitewater State Wildlife Management Area.
Wright	None.
Yellow Medicine	Bald eagle, Haliaeetus leucocephalus, T. Breeding and wintering.

3.4.3 Table 8. Federally Listed Species that Occur in Minnesota and their Habitat

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN MINNESOTA (revised August 11, 1994)

Species	Status	Habitat	Distribution
MAMMALS			
Gray wolf (T)(Canis lupus) MN DNR Threatened; R3 lead	Threatened	Northern forested areas	Primary Range (CRITICAL HABITAT) - Beltrami, Cook,Itasca, Koochiching, Lake, Lake of the Woods, Roseau, St. Louis Cos. Peripheral Range - Aitkin, NE Becker, Carlton, Cass, Clearwater, n. Crow Wing, Hubbard, e. Kittson, Mahnomen, e. Marshall, e. Pennington, Pine, e. Polk, e. Red Lake, e. Wadena Cos.
BIRDS			
Peregrine falcon (Falco peregrinus); R5 lead	Endangered MN DNR Endangered		Blue Earth, 1994; Dakota, 1993; Hennepin, 1993; Lake, 1993; Olmsted, 1993; Ramsey, 1993; St. Louis, 1993; Washington, 1993
Bald eagle (Haliaeetus leucocephalus); R3 lead	Threatened; MN DNR Threatened Breeding		Aitkin, Anoka, Becker, Beltrami, Benton, Blue Earth, Brown, Carlton, Cass, Chippewa, Chisago Dakota, Douglas, Goodhue, Grant, Hennepin, Houston, Hubbard, Isanti, Itasca, Kanabec, Kandiyohi, Kittson, Koochiching, Lake, Mahnomen, Marshall, Mille Lacs, Morrison, Nicollet, Otter Tail, Pennington, Pine, Polk, Ramsey, Redwood, Roseau, St. Louis, Sherburne, Sibley, Stearns, Swift, Todd, Wabasha, Wadena, Washington, Winona, & Yellow Medicine Cos. Aitkin, 1994; Anoka, 1994; Becker, 1994; Beltrami, 1994; Benton, 1994; Brown, 1994; Carlton, 1989; Cass, 1994; Chippewa, 1993; Chisago, 1994; Clearwater, 1994; Cook, 1993; Crow Wing, 1994; Dakota, 1994; Douglas, 1988; Goodhue, 1994; Grant, 1993; Hennepin, 1994; Houston, 1994; Hubbard, 1994; Isanti, 1990; Itasca, 1993; Kanabec, 1994; Kandiyohi, 1994; Kittson, 1992; Koochiching, 1993; Lake, 1993; Lake of the Woods, 1994; LeSueur, 1994; Mahnomen, 1994; Marshall, 1992; Mille Lacs, 1993; Morrison, 1994; Nicollet, 1994; Otter Tail, 1994; Pennington, 1994; Pine, 1994; Polk, 1993; Ramsey, 1994; Redwood, 1994; Roseau, 1994; St. Louis, 1994; Sherburne, 1994; Sibley,

			1994; Stearns, 1994; Swift, 1994; Todd, 1994; Wabasha, 1992; Wadena, 1992; Washington, 1993; Winona, 1992; Yellow Medicine, 1994;
Bald eagle		wintering	Blue Earth, Brown, Carver, Chippewa, Dakota, Goodhue, Houston, Lac qui Parle, LeSueur, Nicollet, Redwood, Renville, Scott, Sherburne, Sibley, Swift, Wabasha, Washington, Winona, &Yellow Medicine Cos.
Piping plover (Charadrius melodus) R6 lead * Endangered in the Great Lakes drainage, threatened in rest of range, including Lake of the Woods.	Endangered & Threatened MN DNR Endangered	Sandy beaches islands Lake of the Woods Co. bare alluvial (Pine & Currie Is.)& dredge spoil	Potential nesting: Traverse Co. (Lk. Traverse)St. Louis Co. (Duluth Hbr.)Marshall Co. (Agassiz NWR & Thief Lk. WMA)Lk. of the Woods, 1993; Marshall, 1980, St. Louis, 1979; Traverse, 1946.
MUSSELS			
Higgins' eye pearly mussel (Lampsilis higginsi); R3 lead	Endangered; MN DNR Endangered	Rivers	Mississippi R. downstream from Twin Cities (Houston & Winona Cos. St. Croix R. (Chisago &Washington Cos.) Potential: All MN Miss. R.Cos. Carver, 1989; Houston, 1977.
Winged mapleleaf Quadrula fragosa; R3 lead	Endangered; MN DNR Unlisted	Rivers	St. Croix R. (Chisago Co.)Chisago, 1993.
INSECTS			
Karner blue butterfly Lycaeides melissa samuelis; R3 lead	Endangered; MN unlisted	Savannas with wild lupine (Lupinus perennis)	Winona Co. (Whitewater WMA) Anoka, 1984; Winona, 1994.
PLANTS			
Leedy's roseroot (Sedum integrifolium var. leedyi)	Threatened; MN DNR Endangered	Cool, wet groundwater-fed limestone cliffs	Fillmore & Olmstead Cos. (also in Yeates & Schuyler Cos., NY)
Minnesota Trout Lily (Erythronium propullans); R3 lead	Endangered MN DNR Endangered	N. facing slopes & floodplains in deciduous forests.	Goodhue, Rice, & Steele Cos. A MN endemic. Goodhue, 1993; Rice, 1992; Steele, 1992.
Prairie bush clover (Lespedeza leptostachya); R3 lead	Threatened MN DNR Endangered	gravelly soil Dry to mesic prairies.	Brown, Cottonwood, Goodhue, Jackson, Redwood, Renville, & Rice Cos. Also in IA, IL, & WI. Brown, 1992, Goodhue, 1991; Houston, 1993; Jackson, 1991; Redwood, 1990; Renville, 1977; Rice, 1990.
Western prairie fringed orchid, Platanthera praeclara; R? lead	Threatened; MN DNR Endangered	Wet prairies & sedge meadows.	Clay, Dodge, Kandiyohi, Kittson, Mower, Nobles, Norman, Pennington, Pipestone, Polk, & Rock Cos. Also in IA, KS, MO, ND, NE, & OK. Clay, 1993; Dodge, 1982; Freeborn, 1939; Kittson, 1993; Mower, 1980; Norman, 1993; Pennington, 1992; Pipestone, 1984; Polk, 1993; Rock , 1985.

3.5 Information for Spills that Occur in Ohio

3.5.1 Appropriate Staff Contacts for the Designated Officials for Fish and Wildlife Resource Management Agencies

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Regional Office - Region 3 - Minneapolis, MN

Regional Pollution Response Coordinator
Bishop Henry Whipple Federal Building
Fort Snelling, MN 55111-4056
Office hours: (612)725-3536
24-hours: (612) 725-3536 (press "7" for after hours numbers)
Fax: (612) 725-3526

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Ohio

U.S. Fish and Wildlife Service
Ecological Services
Reynoldsburg Ohio Field Office
6950-H Americana Parkway
Reynoldsburg, Ohio 43068

Bill Kurey (Primary - 24 hrs.)
Kent Kroonemeyer (Secondary - duty hrs.)
Phone: 614-469-6923
Fax: 614-469-6919
cc:mail Kroonemeyer,Kent
Internet: Kent_Kroonemeyer@mail.fws.gov.

STATE OF OHIO
Ohio Department of Natural Resources, Ohio Division of Wildlife

Central Ohio
Steve Jacks, Manager
District One
1500 Dublin Rd.
Columbus, Ohio 43215
Phone: 614-644-3925
Fax: 614-644-3931

Northwest Ohio
Dean Scott, Manager
District Two
952 Lima Ave., Box A
Findlay, Ohio 45840
Phone: 419-424-5000
Fax: 419-422-4875

Northeast Ohio
(manager vacant)
District Three
912 Portage Lakes Dr.
Akron, Ohio 44319
Phone: 216-644-2293
FAX: 216-644-8403

Southeast Ohio
John Marshall, Manager
District Four
360 E. State St.
Athens, Ohio 45701
Phone: 614-594-2211
FAX: 614-592-1626

Southeast Ohio
Dave Graham, Manager
District Five
1076 Old Springfield Pike
Xenia, Ohio 45385-1238
Phone: 513-372-9261
Fax: 513-376-3011

3.5.2 Table 9. Ohio County Occurrences of Federally Listed Species

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN OHIO (revised March 10, 1995)

COUNTY	SPECIES
Adams	Indiana bat (Myotis sodalis) E Clubshell (Pleurobema clava) E
Allen	Indiana bat (Myotis sodalis) E
Ashland	Indiana bat (Myotis sodalis) E
Ashtabula	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting Clubshell (Pleurobema clava) E
Auglaize	Indiana bat (Myotis sodalis) E

Brown	Indiana bat (Myotis sodalis) E Running buffalo clover (Trifolium stoloniferum) E
Butler	Indiana bat (Myotis sodalis) E Running buffalo clover (Trifolium stoloniferum) E
Champaign	Indiana bat (Myotis sodalis) E
Clark	Indiana bat (Myotis sodalis) E Eastern prairie fringed orchid (Platanthera leucophaea) T
Clermont	Indiana bat (Myotis sodalis) E Running buffalo clover (Trifolium stoloniferum) E
Clinton	Indiana bat (Myotis sodalis) E
Columbiana	Indiana bat (Myotis sodalis) E
Coshocton	Purple cat's paw pearlymussel (Epioblasma obliquata) E Fanshell (Cyprogenia stegaria (=C. irrorata)) E Clubshell (Pleurobema clava) E
Crawford	Indiana bat (Myotis sodalis) E
Cuyahoga	Indiana bat (Myotis sodalis) E Peregrine falcon (Falco peregrinus) E; nesting Piping plover (Charadrius melodus) E; EXTIRPATED
Darke	Indiana bat (Myotis sodalis) E
Defiance	Indiana bat (Myotis sodalis) E Clubshell (Pleurobema clava) E Northern copperbelly water snake (Nerodia erythrogaster neglecta) Proposed as Threatened
Delaware	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting Clubshell (Pleurobema clava) E
Erie	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting and wintering Lakeside daisy (Hymenoxys herbacea) (Formerly H. acaulis var. glabra) Lake Erie water snake (Nerodia sipedon insularum) Proposed as Threatened
Fairfield	Indiana bat (Myotis sodalis) E Clubshell (Pleurobema clava) E
Fayette	Indiana bat (Myotis sodalis) E
Franklin	Indiana bat (Myotis sodalis) E Peregrine falcon (Falco peregrinus) E; nesting Scioto madtom (Noturus trautmani) E Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E
Fulton	Indiana bat (Myotis sodalis) E
Gallia	Pink mucket pearlymussel (Lampsilis abrupta (=L. orbiculata)) E
Geauga	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting
Greene	Indiana bat (Myotis sodalis) E Clubshell (Pleurobema clava) E
Hamilton	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; wintering Peregrine falcon (Falco peregrinus) E; nesting Running buffalo clover (Trifolium stoloniferum) E
Hancock	Indiana bat (Myotis sodalis) E Clubshell (Pleurobema clava) E
Hardin	Indiana bat (Myotis sodalis) E Northern copperbelly water snake (Nerodia erythrogaster neglecta) Proposed as Threatened
Henry	Indiana bat (Myotis sodalis) E
Highland	Indiana bat (Myotis sodalis) E
Hocking	Indiana bat (Myotis sodalis) E American burying beetle (Nicrophorus americanus) E; EXTIRPATED
Holmes	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T Eastern prairie fringed orchid (Platanthera leucophaea) T
Huron	Indiana bat (Myotis sodalis) E
Knox	Indiana bat (Myotis sodalis) E
Lake	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T
Lawrence	Pink mucket pearlymussel (Lampsilis abrupta (=L. orbiculata)) E

Licking	Indiana bat (Myotis sodalis) E
Logan	Indiana bat (Myotis sodalis) E Hine=s emerald dragonfly (Somatochlora hineana) E; EXTIRPATED
Lorain	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T
Lucas	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting and wintering Peregrine falcon (Falco peregrinus) E; nesting Hine=s emerald dragonfly (Somatochlora hineana) E; EXTIRPATED Karner blue butterfly (Lycaeides melissa samuelis) E Eastern prairie fringed orchid (Platanthera leucophaea) T
Madison	Indiana bat (Myotis sodalis) E Scioto madtom (Noturus trautmani) E Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E
Mahoning	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T
Marion	Indiana bat (Myotis sodalis) E
Medina	Indiana bat (Myotis sodalis) E
Meigs	Pink mucket pearlymussel (Lampsilis abrupta (=L. orbiculata)) E
Mercer	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T
Miami	Indiana bat (Myotis sodalis) E
Montgomery	Indiana bat (Myotis sodalis) E Peregrine falcon (Falco peregrinus) E; nesting Running buffalo clover (Trifolium stoloniferum) E
Morgan	Fanshell (Cyprogenia stegaria (=C. irrorata)) E Pink mucket pearlymussel (Lampsilis abrupta (=L. orbiculata)) E
Morrow	Indiana bat (Myotis sodalis) E
Ottawa	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting and wintering Lakeside daisy (Hymenoxys herbacea) (Formerly H. acaulis var. glabra) Eastern prairie fringed orchid (Platanthera leucophaea) T Lake Erie water snake (Nerodia sipedon insularum) Proposed as Threatened Paulding
Paulding	Indiana bat (Myotis sodalis) E
Perry	Indiana bat (Myotis sodalis) E
Pickaway	Indiana bat (Myotis sodalis) E Scioto madtom (Noturus trautmani) E Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E
Pike	Indiana bat (Myotis sodalis) E
Portage	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting Mitchell=s satyr (Neonympha mitchellii) E; EXTIRPATED Northern monkshood (Aconitum noveborancense) T
Preble	Indiana bat (Myotis sodalis) E
Putnam	Indiana bat (Myotis sodalis) E
Richland	Indiana bat (Myotis sodalis) E
Ross	Indiana bat (Myotis sodalis) E
Sandusky	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting and wintering Eastern prairie fringed orchid (Platanthera leucophaea) T
Scioto	Indiana bat (Myotis sodalis) E Virginia spiraea (Spirea virginiana) T Small whorled pogonia (Isotria medeoloides) T
Seneca	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting
Shelby	Indiana bat (Myotis sodalis) E
Stark	Indiana bat (Myotis sodalis) E
Summit	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T Peregrine falcon (Falco peregrinus) E; nesting Northern monkshood (Aconitum noveborancense) T

Trumbull	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting Clubshell (Pleurobema clava) E
Tuscarawas	Clubshell (Pleurobema clava) E
Union	Indiana bat (Myotis sodalis) E Scioto madtom (Noturus trautmani) E Clubshell (Pleurobema clava) E
Van Wert	Indiana bat (Myotis sodalis) E
Warren	Indiana bat (Myotis sodalis) E Running buffalo clover (Trifolium stoloniferum) E
Washington	Fanshell (Cyprogenia stegaria (=C. irrorata)) E Pink mucket pearlymussel (Lampsilis abrupta (=L. orbiculata)) E
Wayne	Indiana bat (Myotis sodalis) E Eastern prairie fringed orchid (Platanthera leucophaea) T
Williams	Indiana bat (Myotis sodalis) E Northern riffleshell (Epioblasma torulosa rangiana) E Clubshell (Pleurobema clava) E White cat=s paw pearlymussel (Epioblasma obliquata perobliqua) E Hine's emerald dragonfly (Somatochlora hineana) E; EXTIRPATED Northern copperbelly water snake (Nerodia erythrogaster neglecta) Proposed as Threatened
Wood	Indiana bat (Myotis sodalis) E
Wyandot	Indiana bat (Myotis sodalis) E Bald eagle (Haliaeetus leucocephalus) T; nesting

3.5.3 Table 10. Federally Listed Species that Occur in Ohio and their Habitat

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN OHIO (revised March 10, 1995)

SPECIES	STATUS	HABITAT	CURRENT DISTRIBUTION
MAMMALS			
Indiana bat (Myotis sodalis)	Endangered	Summer habitat includes small to medium river and stream corridors with well developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula.	Adams, Allen, Ashland, Ashtabula, Auglaize, Brown, Butler, Champaign, Clark, Clermont, Clinton, Columbiana, Crawford, Cuyahoga, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Geauga, Greene, Hamilton, Hancock, Hardin, Henry, Highland, Hocking, Holmes, Huron, Knox, Lake, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Mercer, Miami, Montgomery, Morrow, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Union, Van Wert, Warren, Wayne, Williams, Wood, Wyandot.
BIRDS			
Bald eagle (Haliaeetus leucocephalus)	Threatened	Mature forest near water	Breeding: Ashtabula, Delaware, Geauga, Portage, Seneca, Summit, Wyandot, Trumbull Wintering: Hamilton Breeding and Wintering: Erie, Holmes, Lake, Lorain, Lucas Mahoning, Mercer, Ottawa, Sandusky.
Peregrine falcon (Falco peregrinus)	Endangered	Historically nested on cliffs; now nesting on man-made structures (buildings, smokestacks and bridges) in urban settings.	Breeding: Cuyahoga, Franklin, Hamilton, Lucas, Montgomery Hack Site: Summit.
Piping plover (Charadrius melodus)	Endangered	Beaches along shorelines of the Great Lakes	EXTIRPATED

REPTILES			
Copperbelly water snake (Nerodia erythrogaster neglecta)	Proposed Threatened	Proposed as Threatened Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods.	Defiance, Hardin, Williams
Lake Erie water snake (Nerodia sipedon insularum)	Proposed Threatened	Shorelines of islands in western Lake Erie	Ottawa, Erie
FISH			
Scioto madtom (Noturus trautmani)	Endangered	Stream riffles of moderate flow over sandy gravel bottom; may be extinct (Ohio Division of Wildlife will not admit extinction until after the year 2000)	Possibly EXTINCT
MUSSELS			
Clubshell (Pleurobema clava)	Endangered	Rivers	Adams, Ashtabula, Coshocton, Defiance, Delaware, Fairfield, Franklin, Greene, Hancock, Madison, Pickaway, Trumbull, Tuscarawas, Union, Williams
Fanshell (Cyprogenia stegaria) (=C. irrorata)	Endangered	Rivers	Coshocton, Morgan, Washington
Northern riffleshell (Epioblasma torulosa rangiana)	Endangered	Rivers	Franklin, Madison, Pickaway, Williams
Pink mucket pearly mussel (Lampsilis abrupta) (=L. orbiculata)	Endangered	Rivers	Gallia, Morgan, Washington, Lawrence, Meigs
Purple cat's paw pearlymussel (Epioblasma obliquata)	Endangered	Rivers	Coshocton
White cat's paw pearlymussel (Epioblasma obliquata perobliqua)	Endangered	Rivers	Williams
INSECTS			
Mitchell's satyr (Neonympha mitchellii)	Endangered	Fens; wetlands characterized by calcareous soils which are fed by carbonate-rich water from seeps and springs	Portage
American Burying Beetle	Endangered	EXTIRPATED	

(Nicrophorus americanus)			
Hines emerald dragonfly (Somatochlora hineana)	Endangered	Spring fed wetlands, wet meadows and marshes; calcareous streams & associated wetlands overlying dolomite bedrock	EXTIRPATED
Karner blue butterfly (Lycaeides melissa samuelis)	Endangered	Pine barrens and oak savannas on sandy soils and containing wild lupines (Lupinus perennis), the only known food plant of larvae.	Lucas
PLANTS			
Eastern prairie (Platanthera leucophaea)	Threatened	Mesic to wet prairies and meadows	Clark, Holmes, Lucas, Ottawa, Sandusky, Wayne
Lakeside daisy (Hymenoxys herbacea) (Formerly H. acaulis var. glabra)	Threatened	Dry rocky prairies; limestone rock surfaces including outcrops and quarries	Erie, Ottawa
Northern monkshood (Aconitum noveboracense)	Threatened	Cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps	Portage, Summit
Small whorled pogonia (Isotria medeoloides)	Threatened	Dry woodland; upland sites in mixed forests (second or third growth stage)	Scioto
Virginia spiraea (Spirea virginiana)	Threatened	Stream banks and floodplains	Scioto
Running buffalo clover (Trifolium stoloniferum)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day	Brown, Butler, Clermont, Hamilton, Montgomery, Warren

3.6 Information for Spills that Occur in Wisconsin

3.6.1 Appropriate Staff Contacts for the Designated Officials for Fish and Wildlife Resource Management Agencies

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Regional Office - Region 3 - Minneapolis, MN

Regional Pollution Response Coordinator
Bishop Henry Whipple Federal Building
Fort Snelling, MN 55111-4056
Office hours: (612)725-3536
24-hours: (612) 725-3536 (press "7" for after hours numbers)
Fax: (612) 725-3526

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service, Wisconsin

U.S. Fish and Wildlife Service
Ecological Services
Green Bay Field Office
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Ken Stromberg (Primary - 24 hrs.)
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Ken Stromberg (Primary - duty hrs.)
Phone: 414-465-7440
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P. Dave Allen, II (Secondary - duty hrs.)
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STATE OF WISCONSIN
Wisconsin Department of Natural Resources

[To be provided]

3.6.2 Table 11. Wisconsin County Occurrences of Federally Listed Species

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN WISCONSIN (revised April 4, 1995)

COUNTY	SPECIES
Adams	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Ashland	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Piping plover (Charadrius melodus) E
Barron	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Bayfield	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Fassett's locoweed (Oxytropis campestris var. chartaceae) T
Brown	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Dwarf lake iris (Iris lacustris) T
Buffalo	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E
Burnett	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Calumet	Bald eagle (Haliaeetus leucocephalus) T; wintering
Chippewa	Bald eagle (Haliaeetus leucocephalus) T; breeding
Clark	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Columbia	Bald eagle (Haliaeetus leucocephalus) T; wintering Peregrine falcon (Falco peregrinus) E; potential breeding
Crawford	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E
Dane	Bald eagle (Haliaeetus leucocephalus) T; wintering Peregrine falcon (Falco peregrinus) E; potential breeding Prairie bush clover (Lespedeza leptostachya) T Eastern prairie fringed orchid (Platanthera leucophaea) T
Door	Bald eagle (Haliaeetus leucocephalus) T; breeding Peregrine falcon (Falco peregrinus) E; potential breeding Hine's emerald dragonfly (Somatochlora hineana) E Dwarf lake iris (Iris lacustris) T Pitcher's thistle (Cirsium pitcheri) T
Douglas	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Piping plover (Charadrius melodus) E Kirtland's warbler (Dendroica kirtlandii) E; singing males only
Dunn	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E

Eau Claire	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Karner blue butterfly (Lycaeides melissa samuelis) E
Florence	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Forest	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Grant	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E Prairie bush clover (Lespedeza leptostachya) T
Green	Eastern prairie fringed orchid (Platanthera leucophaea) T
Green Lake	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Iowa	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E
Iron	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Jackson	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Kirtland's warbler (Dendroica kirtlandii) E; singing males only Karner blue butterfly (Lycaeides melissa samuelis) E
Jefferson	Eastern prairie fringed orchid (Platanthera leucophaea) T
Juneau	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Kenosha	Peregrine falcon (Falco peregrinus) E; potential breeding Karner blue butterfly (Lycaeides melissa samuelis) E Eastern prairie fringed orchid (Platanthera leucophaea) T
LaCrosse	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; breeding Higgins' eye pearly mussel (Lampsilis higginsi) E
Langlade	Bald eagle (Haliaeetus leucocephalus) T; breeding
Lincoln	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Manitowoc	Pitcher's thistle (Cirsium pitcheri) T
Marathon	Bald eagle (Haliaeetus leucocephalus) T; breeding
Marinette	Bald eagle (Haliaeetus leucocephalus) T; breeding
Marquette	Karner blue butterfly (Lycaeides melissa samuelis) E
Menominee	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Milwaukee	Peregrine falcon (Falco peregrinus) E; breeding
Monroe	Karner blue butterfly (Lycaeides melissa samuelis) E Northern monkshood (Aconitum noveborancense) T
Oconto	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E
Oneida	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Outagamie	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Karner blue butterfly (Lycaeides melissa samuelis) E
Ozaukee	Eastern prairie fringed orchid (Platanthera leucophaea) T
Pepin	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding
Pierce	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E Prairie bush clover (Lespedeza leptostachya) T

Polk	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Karner blue butterfly (Lycaeides melissa samuelis) E Higgins' eye pearly mussel (Lampsilis higginsi) E Winged mapleleaf mussel (Quadrula fragosa) E
Portage	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E Fassett's locoweed (Oxytropis campestris var. chartaceae) T
Price	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Racine	Peregrine falcon (Falco peregrinus) E; potential breeding Eastern prairie fringed orchid (Platanthera leucophaea) T
Richland	Bald eagle (Haliaeetus leucocephalus) T; breeding Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E Northern monkshood (Aconitum noveborancense) T
Rock	Prairie bush clover (Lespedeza leptostachya) T Eastern prairie fringed orchid (Platanthera leucophaea) T
Rusk	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding St. Croix Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Karner blue butterfly (Lycaeides melissa samuelis) E Higgins' eye pearly mussel (Lampsilis higginsi) E
Sauk	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Karner blue butterfly (Lycaeides melissa samuelis) E Prairie bush clover (Lespedeza leptostachya) T Northern monkshood (Aconitum noveborancense) T
Sawyer	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Shawano	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Karner blue butterfly (Lycaeides melissa samuelis) E
Sheboygan	Peregrine falcon (Falco peregrinus) E; potential breeding Eastern prairie fringed orchid (Platanthera leucophaea) T Pitcher's thistle (Cirsium pitcheri) T
Taylor	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Trempealeau	Bald eagle (Haliaeetus leucocephalus) T; wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E
Vernon	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Peregrine falcon (Falco peregrinus) E; potential breeding Higgins' eye pearly mussel (Lampsilis higginsi) E Northern monkshood (Aconitum noveborancense) T
Vilas	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding
Walworth	Eastern prairie fringed orchid (Platanthera leucophaea) T
Washburn	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Kirtland's warbler (Dendroica kirtlandii) E; singing males only
Waukesha	Eastern prairie fringed orchid (Platanthera leucophaea) T
Waupaca	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Karner blue butterfly (Lycaeides melissa samuelis) E
Waushara	Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E Fassett's locoweed (Oxytropis campestris var. chartaceae) T
Winnebago	Bald eagle (Haliaeetus leucocephalus) T; breeding and wintering Eastern prairie fringed orchid (Platanthera leucophaea) T
Wood	Gray wolf (Canis lupus) E Bald eagle (Haliaeetus leucocephalus) T; breeding Karner blue butterfly (Lycaeides melissa samuelis) E

3.6.3 Table 12. Federally Listed Species that Occur in Wisconsin and their Habitat

DISTRIBUTION OF FEDERALLY THREATENED (T), ENDANGERED (E), AND PROPOSED (P) SPECIES IN WISCONSIN (revised April 4, 1995)

SPECIES	STATUS	HABITAT	CURRENT DISTRIBUTION
MAMMALS			
Gray wolf (Canis lupus)	E	Northern forested areas	Ashland, Bayfield, Burnett, Douglas, Florence, Forest, Iron, Jackson, Juneau, Lincoln, Oneida, Polk, Price, Rusk, Sawyer, Taylor, Vilas, Washburn, Wood
BIRDS			
Bald eagle (Haliaeetus leucocephalus)	T	Mature forest near water	Adams, Ashland, Barron, Bayfield, Brown, Buffalo, Burnett, Calumet, Chippewa, Clark, Columbia, Crawford, Dane, Door, Douglas, Dunn, Eau Claire, Florence, Forest, Grant, Green Lake, Iowa, Iron, Jackson, Juneau, LaCrosse, Langlade, Lincoln, Marathon, Marinette, Menominee, Oconto, Oneida, Outagamie, Pepin, Pierce, Polk, Portage, Price, Richland, Rusk, St. Croix, Sauk, Sawyer, Shawano, Taylor, Trempealeau, Vernon, Vilas, Washburn, Waupaca, Waushara, Winnebago, Wood
Peregrine falcon (Falco peregrinus)	E	Breeding; historically nested on cliffs, now nesting on man-made structures (buildings, smokestacks and bridges) in urban settings	Dane, LaCrosse, Milwaukee
Peregrine falcon (Falco peregrinus)	E	Potential Breeding; historically nested on cliffs, now nesting on man-made structures (buildings, smokestacks and bridges) in urban settings	Adams, Buffalo, Columbia, Crawford, Door, Grant, Iowa, Juneau, Kenosha, Pepin, Pierce, Polk, Racine, Richland, St. Croix, Sauk, Sheboygan, Trempealeau, Vernon
Piping plover (Charadrius melodus)	E	beaches along shorelines of the Great Lakes; bare alluvial and dredge spoil islands	Ashland, Douglas
Kirtland's warbler (Dendroica kirtlandii)	E	singing males only; potential breeding in jack pine	Douglas, Jackson
MUSSELS			
Higgins' eye pearly mussel (Lampsilis higginsi)	E	Mississippi River and some of its larger northern tributaries (i.e., St. Croix and Wisconsin Rivers) in gravel or sand	Buffalo, Crawford, Grant, Iowa, LaCrosse, Pierce, Polk, Richland, St. Croix, Trempealeau, Vernon
Winged mapleleaf mussel (Quadrula fragosa)	E	Medium to large rivers in mud, sand, or gravel; only known extant population in the St. Croix River	Polk
INSECTS			

Karner blue butterfly (Lycaeides melissa samuelis)	E	Pine barrens and oak savannas on sandy soils and containing wild lupines (Lupinus perennis), the only known food plant of larvae.	Adams, Barron, Burnett, Clark, Dunn, Eau Claire, Green Lake, Jackson, Juneau, Kenosha, Marquette, Menominee, Monroe, Oconto, Outagamie, Polk, Portage, St. Crois, Sauk, Shawano, Waupaca, Washara, Wood
Hine's emerald dragonfly (Somatochlora hineana)	E	Spring fed wetlands, wet meadows and marshes; calcareous streams & associated wetlands overlying dolomite bedrock	Door
PLANTS			
Dwarf lake iris (Iris lacustris)	T	Partially shaded sandy-gravelly soils on lakeshores	Brown, Door
Eastern prairie fringed orchid (Platanthera leucophaea)	T	Mesic to wet prairies and meadows	Dane, Green, Jefferson, Kenosha, Ozaukee, Racine, Rock, Sheboygan, Walworth, Waukesha, Winnebago
Fassett's locoweed (Oxytropis campestris var. chartaceae)	T	Open sandy lakeshores	Bayfield, Portage, Waushara
Northern monkshood (Aconitum noveborancense)	T	Cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps	Grant, Monroe, Richland, Sauk, Vernon
Pitcher's thistle (Cirsium pitcheri)	T	Stabilized dunes and blowout areas	Door, Manitowoc, Sheboygan
Prairie bush-clover (Lespedeza leptostachya)	T	Dry to mesic prairies with gravelly soils	Dane, Grant, Pierce, Rock, Sauk

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REFERENCES/ACKNOWLEDGMENTS

1. Department of Commerce, National Oceanic and Atmospheric Administration, 15 CFR Part 990, Natural Resource Damage Assessment Final Rule. Federal Register Notice, Vol. 61. No. 4, Friday, January 5, 1996.
2. Environmental Protection Agency, 40 CFR Parts 9 and 300, National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule. Federal Register Notice Vol. 59, No. 178, Thursday, September 15, 1994.
3. North Carolina Coastal Areas Wildlife Contingency Plan.
4. U.S. Department of the Interior, Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11 & 17.12. October 31, 1995.
5. U.S. Fish and Wildlife Service Administrative Manual 24 AM 2.
6. U.S. Fish and Wildlife Service Administrative Manual 24 AM 16 - Exhibit A.
7. U.S. Fish and Wildlife Service Administrative Manual 24 AM 16 - Exhibit D.
8. U.S. Fish and Wildlife Service Administrative Manual 24 AM 16 - Exhibit F.
9. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Environmental Response Training Program (Schedule of Courses).
10. U.S. Environmental Protection Agency Region VIII Contingency Plan-Fish and Wildlife Sensitive Environments Annex.

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ATTACHMENT 1. SAFETY CHECKLIST SAFETY CHECKLIST

PART I. BEFORE FIELD ACTIVITY

1. Employee:_____Date:_____

2. Site Location:_____

3. Activity Description: Environmental Sampling_____
Reconnaissance_____
Other (describe)_____

4. Type of Response/Site:
Spill_____Industrial_____Nonindustrial_____
Rural_____Suburban_____Urban_____
Private Lands_____Refuge_____Hatchery_____
Other Service Lands_____

5. Site topography: Mountains_____River_____Valley_____
Level_____Sloping_____

6. Site Accessibility:
Foot only:_____
Road: Good_____Fair_____Poor_____
Air: Good_____Fair_____Poor_____

7. Suspected
chemical(s):_____
_____

8. Source of
chemical(s):_____
_____

9. First Aid available: Yes_____No_____

10. If SCBA, identify team members (buddies):_____
_____

PART II. AFTER RESPONSE

1. List possible chemical exposure: Same as above_____
Other chemicals:_____
Identified or suspected:_____

2. Describe any contact or exposure with chemical:_____
_____

3. Equipment Decontamination:_____

4. Approximate time at site: hr/day_____for_____days_____

5. Personal Protective Equipment used:
Gloves_____
Hip Waders_____
Chest waders_____
Other_____

6. Date Part I Prepared:_____Reviewed by:_____
Date:_____
Date Part II Prepared:_____Reviewed by:_____
Date:_____

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ATTACHMENT 2. BIOLOGICAL OPINION

Biological Opinion to be provided upon completion.

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APPENDIX X: STATE HISTORIC PRESERVATION OFFICERS IN REGION 5

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1. INTRODUCTION

Each State, Territory, and the District of Columbia, has a State Historic Preservation Officer (SHPO). The SHPO can provide many important services to local governments and historic preservation commissions. The National Historic Preservation Act establishes certain SHPO responsibilities. These include the following:

(a) Ensuring comprehensive Statewide historic preservation planning;

(b) Conducting a Statewide survey to identify historic properties;

(c) Nominating properties to the National Register of Historic Places;

(d) Assisting local governments in developing historic preservation programs and in becoming certified to participate in the national program;

(e) Advising and assisting in Federal, State, and local historic preservation projects;

(f) Participating in review of Federal, State, and local undertakings that may affect historic properties; and

(g) Providing public information, education, training, and technical assistance in historic preservation.

Under National Park Service (NPS) regulations, SHPOs may also participate in NPS certification of properties and projects for historic preservation tax incentives.

In addition, SHPOs carry out duties under State laws, and seek to advance the interests of historic preservation generally in their States. For example, many SHPOs:

(a) Conduct preservation conferences and workshops;

(b) Distribute State grants and loans for preservation;

(c) Maintain and interpret State-owned historic properties;

(d) Conduct programs to acquire and administer historic preservation easements;

(e) Administer State legislation to protect historic properties from non-Federal construction and land-use projects;

(f) Administer State legislation relating to archeological resources, shipwrecks, and other special kinds of historic properties;

(g) Publish newsletters, scholarly publications, and popular books and brochures;

(h) Administer State history museums and conservation laboratories;

(i) Develop and support State and local preservation statutes;

(j) Help State and local authorities use preservation in primary and secondary curricula, and in public education generally; and

(k) Provide technical assistance to owners of historic properties.

The SHPO is designated by the Governor of each State. In some States, he or she serves directly in the Governor's cabinet or executive office. In other States, the SHPO may be an official in an archives and history office, a planning department, a conservation department, a parks and recreation department, a State historical society, or a State museum.

Under NPS regulations, each SHPO must be assisted by a staff of appropriate preservation officials, in most cases including historians, architectural historians, historical architects, and archaeologists. Many SHPOs are also assisted by academic institutions, historical and archeological societies, and other preservation-oriented groups through contracts or cooperative agreements.

Most SHPOs receive their primary funding from their State legislatures. In addition, NPS provides SHPOs with grants-in-aid from the Historic Preservation Fund (HPF), a special fund created by the National Historic Preservation Act. HPF grants must be matched with non-Federal funds or in-kind contributions.

2. SHPOs IN REGION 5

2.1. Illinois

William L. Wheeler, SHPO
Associate Director
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701-1512
217-785-1153
FAX: 217-524-7525

Theodore Hild, Deputy SHPO
Chief of Staff
Preservation Services Division
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701-1512
217-785-1153
FAX: 217-524-7525

2.2. Indiana

Patrick Ralston, SHPO
Director, Dep't. of Natural Resources
402 West Washington St., Room W256
Indianapolis, IN 46204
317-232-4020
FAX: 317-232-8036

Daniel Fogerty, Deputy SHPO
Division of Historic Preservation
402 West Washington St., Room 274
Indianapolis, IN 46202
317-232-1646
FAX: 317-232-8036

2.3. Michigan

Dr. Kathryn Eckert, SHPO
Department of State
717 W. Allegan Street
Lansing, MI 49818
517-373-6362
FAX: 517-373-0511

2.4. Minnesota

Dr. Nina Archabel, SHPO
Director, Minnesota Historical Soc.
345 Kellogg Boulevard West
St. Paul, MN 55102-1906
612-296-2747
FAX: 612-296-1004

2.5. Ohio

Dr. W. Ray Luce, SHPO
The Ohio Historical Society
Historic Preservation Division
1982 Velma Avenue
Columbus, OH 43211
614-297-2470
FAX: 614-297-2411

2.6. Wisconsin

Jeff Dean, SHPO
Director, Historic Preservation Div.
State Historical Society of Wisconsin
816 State Street
Madison, WI 53706
608-264-6500
FAX: 608-264-6404

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APPENDIX XI: Environmentally and Economically Sensitive Area Indices

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The following files will allow the environmentally and economically sensitive area data to be worked with in, or printed from, a current word processing program such as Microsoft Word or Corel Word Perfect. As with the file above, they are self-extracting and compressed. When prompted to save the file to your computer, please take note of the directory in which you save the file. When the download is complete, open *file manager* or *explorer*, go to the directory in which the file has been saved. To uncompress the file, double click it using your mouse. The name of the compressed and extracted file is noted in parenthesis.

Please note the number of pages in each report before printing!!

You may wish to only print out necessary files; printing the entire environmentally sensitive area report will use over 2,500 pages. Similarly, printing the entire marinas and boat launches report will use over 1,000 pages.

Environmentally Sensitive Areas

Data report for all of U.S. EPA Region 5 -- 1.55MB -- *(ess.exe will extract to ess.doc)*

WARNING! There are over 5000 records in this report and if printed, will be over 2500 pages.

Data report by state

- **Iowa -- 0.19MB -- *(ess_ia.exe will extract to ess_ia.doc)***

- Illinois -- 0.14MB -- *(ess_il.exe will extract to ess_il.doc)*
- Indiana -- 0.08MMB -- *(ess_in.exe will extract to ess_in.doc)*
- Michigan -- 0.28MB -- *(ess_mi.exe will extract to ess_mi.doc)*
- Minnesota -- 0.57MB -- *(ess_mn.exe will extract to ess_mn.doc)*
- Missouri -- 0.09MB -- *(ess_mo.exe will extract to ess_mo.doc)*
- New York -- 0.05MB -- *(ess_ny.exe will extract to ess_ny.doc)*
- Ohio -- 0.06MB -- *(ess_oh.exe will extract to ess_oh.doc)*
- Pennsylvania -- 0.02MB -- *(ess_pa.exe will extract to ess_pa.doc)*
- South Dakota -- 0.03MB -- *(ess_sd.exe will extract to ess_sd.doc)*
- Wisconsin -- 0.25MB -- *(ess_wi.exe will extract to ess_wi.doc)*

Economically Sensitive Areas

- Surface Water Intakes -- 0.94MB -- *(intk.exe will extract to intk.doc)*
- Marinas and Boat Launches -- 1.13MB -- *(mar.exe will extract to mar.doc)*
- Locks and Dams -- 0.03MB -- *(lock.exe will extract to lock.doc)*

First Nation/Tribal Concerns

- Tribal Lands -- 46KB -- *(tri.exe will extract to tri.doc)*

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APPENDIX XII: CONTINGENCY PLANNING

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1. INTRODUCTION

The responsibility for preventing spills and planning response to a spill generally lies with the party storing, transporting, or using the material. Often the conditions of storage, transport, and use are regulated by local, Tribal, State, or Federal programs. Some of the programs require permits or specify in detail the preventive measures and planning which are required of users, transporters, and storers. Some of these governmental programs include inspections to verify adequacy of preventive measures. Only in the most serious circumstances are any of the governmental agencies authorized to intervene to prevent a spill from occurring.

Coordination among the various levels of organization—private industry, local, Tribal, State, area, and Federal—occurs through the development of their independent contingency planning efforts and through their interaction during a response. In the event of a release, there is a hierarchical response and technical assistance structure. The roles and responsibilities of each response organization are laid out in the various contingency plans.

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2. STATUTORY AUTHORITY

2.1. Emergency Planning

Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), also known as the Emegency Planning and Community Right-to-Know Act (EPCRA), created a system of State and local planning agencies for chemical emergencies and provided a way for communities to gain information about potential chemical hazards. The Act's mandates cover three main topics:

· emergency planning,

· emergency notification requirements, and

· requirements for reporting hazardous chemical inventories.

Regulations to implement the statute are found at 40 CFR Part 355. In Region 5, five States (Illinois, Indiana, Minnesota, Ohio, and Wisconsin) have their own legislation patterned after the Federal law.

Title III establishes two planning authorities for chemical emergencies: State Emergency Response Commissions (SERCs), and Local Ememgerncy Response Committees (LEPCs). SERCs establish LEPCs, and supervise and coordinate the LEPCs' activities. LEPCs develop contingency plans that include:

· identification of facilities covered by the law,

· designation of community and facility emergency coordinators,

· methods and procedures,

· information on emergency response equipment and facilities available in the community, and

· training and exercise programs.

These plans are reviewed by the SERCs.

Indian Tribes are designated as the implementing authority of Title III on all lands within Indian country. A Tribe may form its emergency planning organization as a Tribal Emergency Response Committee (TERC), as an LEPC, or by joining an off-reservation LEPC.

Emergency planning requirements cover facilities that have an extremely hazardous substance (listed at 40 CFR 355 Appendices A and B) present on-site above a threshold quantity. Owners/operators of facilities subject to the law must identify themselves to the SERC and LEPC and develop a facility emergency plan. There are 458 local planning districts in Region 5.

The RRT will review, upon request of an LEPC, the local Title III plan. RRT5 will review plans that have been accepted by the SERC. The RRT will review no more than two plans per State per year because of the time involved for such reviews. RRT5 will use NRT-1A to review the plans.

2.2. Oil Pollution Act of 1990 (OPA)

To be written.

2.3. FEMA

To be written.

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3. PRIVATE INDUSTRY

Section 311(j)(5) of the Clean Water Act (CWA), as amended by OPA, requires that owners and operators of facilities prepare and submit a Facility Response Plan (FRP) — a plan for responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge, of oil or a hazardous substance. This requirement applies to any facility that because of its location, could reasonably be expected to cause "substantial harm" to the environment by discharging into or on navigable waters, adjoining shorelines, or the exclusive economic zone.

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4. LOCAL LEVEL

In the event of an emergency/disaster, police and fire services are ordinarily the first to respond. They initially assess the incident and determine its scope and magnitude. Additional agencies may become involved, depending on the nature of the incident. The local emergency management coordinator monitors and evaluates the incident.

If the emergency/disaster escalates to the point where coordination between several local agencies is necessary, the emergency management coordinator may recommend that the chief executive declare a local state of emergency, thereby activating the appropriate response and recovery aspect of local government.

Local response procedures are followed as stated in the local emergency response plans. If the emergency escalates beyond the capability of local government, the chief executive may request assistance from State government in accordance with State statutes.

Each LEPC is to prepare an emergency response plan in accordance with Section 303 of EPCRA. These plans are to be reviewed once a year, or more frequently as circumstances change in the community or as any subject facility may require. The Area Contingency Plan (ACP) should be coordinated with these LEPC plans through the applicable sub-area plans. Due to the size of U.S. EPA Region 5's area, coordination with LEPC plans will take place in the development of the sub-area plans. Sub-area planning is currently ongoing in the Detroit, Michigan and Minneapolis/St. Paul, Minnesota areas.

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5. STATE LEVEL

To be written.

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6. REGIONAL LEVEL

The RRT is responsible for the planning and coordination of contingency plans at the Regional level. Regional hazardous materials planning is performed through the joint efforts of various Federal Agencies with major environmental, transportation, emergency management, worker safety, and public health responsibilities. These agencies are responsible for coordinating Federal emergency preparedness and planning on a nationwide basis. The Federal Regional Contingency Plan provides for coordination of timely and effective response by the various agencies and other organizations to oil discharge and hazardous substance releases in order to protect public health, welfare, and the environment.

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7. AREA LEVEL RESPONSE

The Area Committee is not a response organization and exists to augment the planning structure of the NRT and RRT.

The Area Contingency Plan (ACP) provides a coordinated and effective Federal, State, and local response to oil spills. The Plan shall, when implemented in conjunction with the provisions of the NCP, be adequate to remove a worst-case discharge, and to mitigate or prevent substantial threat of such a discharge. The ACP will address specific areas within the Region that have a high potential for a release of oil or that are of particular environmental or economic sensitivity to such a discharge. The ACP will ensure that a coordinated response structure is in place to mitigate the effects of a significant release in such areas. This process will involve extensive coordination with LEPC plans and Facility Response Plans (FRPs) to identify the areas of concern and develop an adequate response strategy involving Federal, State, local, Tribal, and private entities.

During a response, the FRP will initially be activated, followed by the LEPC, State, Regional, and National Contingency Plans as necessary, depending upon the magnitude of the spill. Coordination of the ACP with all other plans prior to and during the response is the responsibility of the Area OSC. The OSC shall meet with the other responding parties to coordinate and integrate this Plan with all other relevant plans including, but not limited to, Federal, State, local, Tribal, and private plans.

Section 311(j)(4)(B) of CWA, as amended by OPA, requires that the Area Committee under the direction of the Federal OSC for the Area be responsible for:

(a) Preparing an Area Contingency Plan for the Area, which includes all of U.S. EPA Region 5;

(b) Working with Federal, State, and local officials to enhance the contingency planning of those officials and to assure preplanning of joint response efforts, including appropriate procedures for:

· mechanical recovery,

· chemical spill control,

· shoreline cleanup,

· protection of sensitive environmental areas, and

· protection, rescue, and rehabilitation of fisheries and wildlife; and (c) Working with Federal, State, and local officials to expedite decisions for the use of dispersants and other mitigating substances and devices.

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8. NATIONAL LEVEL RESPONSE

8.1. NCP

To be written.

8.2. Federal Response Plan

To be written.

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9. INTERNATIONAL LEVEL

A Joint Contingency Plan has been developed with Canada for releases of oil and

hazardous substances. The International Joint Commission (IJC) monitors the quality of the boundary waters of the Great Lakes system (see Section 2.9.). DOS provides assistance in coordinating responses to releases that cross the U.S.-Canadian boundary.

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10. TRAINING

RRT5 strongly supports Regional training activities. The RRT management group is a panel that reviews SARA Title III Section 305(a) training grants.

In order to extend training to the widest possible audience, the RRT maintains a video lending library of training materials concerning response and safety at the FEMA Region 5 office in Chicago, Illinois. When funds are available to the RRT, courses are offered that target special needs identified by the members of the RRT. From time to time the RRT may sponsor courses to train its own members, and encourages that exercises be conducted as a training tool.

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11. EXERCISES

The National Preparedness for Response Exercise Program (PREP) was developed to establish a workable exercise program that meets the intent of OPA. PREP incorporates the exercise requirements of USCG, U.S. EPA, the Research and Special Program Administration (RSPA) of the Office of Pipeline Safety (OPS), and the Mineral Management Service (MMS).

PREP guidelines are not regulations. However, the four Federal Agencies have agreed that participation in PREP will satisfy all exercise requirements imposed by CWA. Although participation in PREP is voluntary, those choosing not to participate in PREP will be required to comply with the exercise requirements in the regulations imposed by each of the four regulatory agencies.

PREP is structured around a system of internal and external exercises. The internal exercises are conducted wholly within a plan holder's organization, testing the various components of a response plan to ensure the plan is adequate for the organization to respond to an oil or hazardous substance spill. Currently, the response plans and exercises only address oil response, but will eventually address hazardous substance response.

11.1. Internal Exercises

Internal exercises for industry include: 1) Qualified Individual Notification Drills; 2) Emergency Procedures Drills for vessels and barges; 3) Spill Management Team Tabletop Exercises; and 4) Unannounced Exercises. The internal exercises will be self-certified and self-evaluated by the plan holder organization. Each planholder will be on a triennial cycle for exercises, which began January 1, 1994. Within this triennial cycle, each planholder must exercise the various components of the entire response plan. The PREP document contains a list of 15 core components. These are not all-inclusive; a plan may have more or fewer components, but these are generally what should be in the plan. The completion of the required internal exercises over the 3-year period will satisfy the regulatory requirements for exercising the entire plan once every 3 years.

11.2. External Exercises

The external exercises, or Area Exercises, test the interaction of the planholder with the entire response community in a specific Area. For the purpose of PREP, an Area is defined as that specific geographic area for which a separate and distinct ACP has been developed. The Area Exercises will exercise the government-industry interface for pollution response. The PREP goal is to conduct 20 Area Exercises per year throughout the country, with the Federal Government leading 6 exercises and industry leading the 14 other exercises. The Area Exercises will be realistic exercises, including equipment deployment. The exercises will be developed by a design team consisting of local, State, and Federal Government, and industry representatives. The Area Exercises will be scheduled by the National Scheduling Coordinating Committee (NSCC), which will receive input from the Area Committees and the RRT Co-Chairs. These various levels of input are designed to ensure all local, State, and Area concerns are taken into consideration when scheduling the exercises.

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APPEND XIII: STATE EMERGENCY INFORMATION

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1. ILLINOIS

The Emergency Response Unit (ERU) works within the State response system, in which the Illinois Emergency Management Agency (IEMA) serves as the central receiving and dispatching point for response to any emergency or disaster requiring State notification or involvement. IEPA responsibility involves response to:

(a) Oil and chemical spills on water or land;

(b) Releases of harmful quantities of toxic substances into the atmosphere;

(c) Emergencies involving public water supplies;

(d) Emergencies involving wastewater treatment systems;

(e) Emergencies involving solid waste disposal sites;

(f) Fish kills caused by pollutants;

(g) Emergency disposal or treatment of hazardous materials;

(h) Abandoned hazardous waste incidents posing immediate hazards;

(i) Transportation incidents involving hazardous materials which pose an immediate threat of a release.

ERU operates from IEPA's headquarters in Springfield, Illinois, during normal working hours, supplemented by an oncall duty officer to cover periods after normal working hours and during weekends and holidays. Incident coordination, management, and response personnel operate from the Springfield office, which is centrally located. In addition, ERU has full-time response personnel in IEPA's Maywood (Chicago-area) office and in its Collinsville (St. Louis East-area) office. After hours and during weekends and holidays, ERU maintains emergency response specialists on call from its Maywood, Springfield, and Collinsville offices to assist the Duty Officer and to provide onscene response. In addition, personnel from IEPA's regional or district field offices representing one of IEPA's pollution control divisions (Air, Land, Water, or Public Water Supplies) are often called upon to conduct the necessary field response consistent with their capabilities.

ERU assistance consists of:

(a) Providing technical information regarding identification, chemical and physical properties, toxicity data, and potential dangers associated with a hazardous material.

(b) Monitoring or sampling air, water, soil, waste and containers.

(c) Serving in an advisory capacity concerning:

· containment of the material;

· restoration of the environment, including setting emergency cleanup objectives;

· evacuation recommendations; and · disposal or treatment of hazardous material or debris resulting from the emergency.

(d) Providing oversight and ensuring completeness of cleanup actions taken by responsible parties.

(e) Acting as OSC during State-financed emergency cleanups.

(f) Providing notice to users of affected water and land. Such notices may be communicated through other State and local agencies involved.

(g) Providing professional and technical assistance, personnel, and equipment to directly assist public safety officials within the scope of IEPA's responsibilities and resources.

(h) Documenting violations of the Illinois Environmental Protection Act for potential legal action.

(i) Expediting the issuance of waste treatment, storage or disposal permits by and through IEPA's Land Pollution Control Division, usually in less than 24 hours; as well as authorizing emergency exemptions for the transportation, storage, and disposal of special wastes.

IEPA utilizes commercial response contractors when it uses State funds to mitigate and remediate incidents. The ability to use State funds is limited to situations involving CERCLA Hazardous Substances and does not include petroleum products (oil) unless the release is from a UST. IEPA currently has contracts annually with commercial response contractors for emergency response and mitigation (two contractors), emergency incident waste disposal (one contractor), emergency lab pack response (one contractor), and leaking UST response (four remediation and two oversight contractors). (Note: Contract data is for 1990_1991 and may vary.)

1.1. Notification Procedures

A release is usually defined as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment" in the various laws and regulations which require immediate or expeditious reporting of releases. In general, it includes on-site loss of containment, as well as releases that go beyond facility boundaries. Following is a list of the sources of those reporting requirements and a brief description of what is to be reported, how soon, and to whom.

(a) CERCLA (42 U.S.C 9601, et seq.), Section 103(a) - any release equal to or greater than a reportable quantity of a "hazardous substance" (the CERCLA list, and also published in Table 302.4 of 40 CFR 302, dated July 1, 1987) from a vessel or an onshore or offshore facility, immediately to the National Response Center (NRC) at 1-800-424-8802).

(b) 40 CFR 110.9 (Oil Pollution) - any "discharge" (essentially defined as the "release") of oil from a vessel or an onshore or offshore facility into navigable waters of the United States, immediately to the NRC.

(c) SARA, Title III, Section 304 - any release equal to or greater than a reportable quantity of a "hazardous substance" or an "extremely hazardous substance" (Appendix A of CFR 355 dated April 22, 1987) from a facility, or related to transportation, immediately to

1) the State Emergency Response Commission, the Illinois Emergency Management Agency (IEMA) in Illinois, at 800-782-7860 or 217-782-7860; and 2) the community emergency coordinator of the Local Emergency Planning Committee (the designated person in each county and the City of Chicago who coordinates emergency response operations). Phone numbers may be obtained by calling IEMA at 217-524-6887 or 217-782-4694.

(d) 35 Ill. Adm. Code 723.130(c) (Illinois Hazardous Waste Regulations) - any "discharge" of a "hazardous waste" (the CERCLA list) by an air, rail, highway, or water transporter (no time frame given), to the NRC and IEMA.

(e) 29 Ill. Adm. Code part 430 (Emergency and Written Notification of an Incident or Accident Involving a Reportable Hazardous Substance) - Any release equal to or greater than a reportable quantity of a "hazardous substance," or an "extremely hazardous substance," immediately to IEMA and the community emergency coordinator of the local emergency planning committee and any incident or accident involving a "hazardous material" (any substance or material so designated pursuant to the Hazardous Materials Transportation Act, 49 U.S.C.A. 1801 et seq.) which results in: 1) death, hospitalization, or evacuation of a member or members of the general public, 2) overturn of a motor vehicle on a public highway, 3) fire, breakage, release, or suspected contamination involving an etiologic (disease-causing) agent, or 4) any release of oil which meets the reporting requirements in 40 CFR 110, immediately to IEMA.

The preceding list of reporting requirements is necessarily simplified. You are encouraged to refer to the documents cited for more detail. These documents are available upon request by writing or calling: Illinois EPA, Office of Chemical Safety, #29, 2200 Churchill Road, P.O. Box 19276, Springfield, Illinois 62794-9276; telephone (217) 785-0830.

1.2. Immediate Notification

The information to be reported is as follows:

(a) The chemical name or identity of any substance involved in the release;

(b) An indication of whether or not the substance is on the list of extremely hazardous substances;

(c) An estimate of the quantity in pounds of any substance that was released into the environment;

(d) The time and duration of the release;

(e) The specific location of the release;

(f) The medium or media (air, water, land) into which the release occurred;

(g) Proper precautions to take as a result of the release, including evacuation (unless such information is readily available to the community emergency coordinator pursuant to the emergency plan);

(h) Any known or anticipated acute or chronic health risks or public safety risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals; and

(i) Name of the reporter and phone number where the reporter may be contacted, as well as the name and telephone numbers of a person or persons to be contacted for further information.

1.3. Written Followup Notification

As soon as practicable after the occurrence of the release, incident, or accident, the following shall be provided:

(a) An update of the information provided in the immediate notification; and

(b) Actions to be taken to respond to and contain any release.

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2. INDIANA

The Indiana Department of Environmental Management (IDEM) is the lead agency for receiving and responding to spills and environmentally related emergencies. ERS responders are prepared to respond to reports 24 hours per day. Spill reports are made through the 24-hour spill line: (317) 233-7745 or (888) 233-7745 (toll-free in-state). Between 7:00 a.m. and 5:00 p.m., Monday through Friday, spill reports are received by ERS staff directly on the 24-hour number. During other times and days, including after hours, weekends and holidays, the 24-hour number is staffed by employees of the Indiana State Department of Health (ISDH). During those times, the initial spill report information is taken by the ISDH staff. The staff immediately notifies the ERS responder on-call with the information. The responder then returns the call to the person who made the spill report and obtains relevant information and, if necessary, initiates a response. Notification of a Title III releases through the 24-hour number fulfills the requirement for notifying the Indiana State Emergency Response Commission (SERC).

When making a spill report pursuant to the Indiana Spills Reporting, Containment, and Response Rule (327 IAC 2-6.1), Emergency Planning and Notification (IC 13-7-37), CERCLA as amended by SARA Title III (42 USC 9601 et seq. and 40 CFR 302.4), the responsible party shall immediately notify IDEM at the 24-hour number and provide the following information:

· name, address, and telephone number of the person making the spill report.

· name, address, and telephone number of a contact person, if different than above.

· location of the spill.

· time of the spill.

· identification of the substance spilled.

· approximate quantity of the substance that has been or may further be spilled.

· duration of the spill.

· source of the spill.

· name and location of the waters damaged, if any.

· identity of any spill response organization responding to the spill.

· measures that have been or will be undertaken to perform a spill response.

· any other information that may be significant to the response action.

Under the Spill Rule, the responsible party is also required to:

(a) Contain the spill to prevent it from entering waters of the State;

(b) Perform a spill response to recover and contain or neutralize the spilled material

(c) Notify downstream water users and affected property owners, and

(d) Submit written reports as required.

In addition to providing a Responder/OSC, ERS staff, with the occasional assistance of the four IDEM program offices (Air, Water, Solid and Hazardous Waste, and Environmental Response), can be expected to provide the following:

(a) 24hour onsite investigation by staff who are trained in hazardous material spill containment and cleanup, stream monitoring, and hazardous waste disposal.

(b) Ensuring containment and cleanup by the spiller.

(c) Monitoring and determining the movements of pollutants in waters of the State.

(d) Information and advice on the chemical characteristics and known effects of spilled material.

(e) Notifying and advising downstream water users, particularly public surface water suppliers, including time of travel and duration.

(f) Field analytical capability for a limited range of chemicals and full laboratory capability for analysis of contaminants.

(g) Advising the spiller of availability of suitable disposal sites within the State for disposal of contaminated material, if available.

(h) Providing communications capabilities for agencies at the scene to meet and coordinate actions.

(i) Establishing, where possible, the cause and party responsible for a fish kill for purposes of recovering replacement costs for fish for the Department of Natural Resources.

(j) If the responsible party cannot be identified or is unwilling to conduct a cleanup and substantial danger to the public health and/or environment exists, IDEM can obtain funds to hire contractors to conduct a cleanup.

2.1. Emergency Burning Of Oil Spills

The following IDEM staff, in the order of contact, have permission to process emergency burning of oil spills:

· David Rice

· Herman Carney

· Woodard Smith

If these individuals are not present, the request should be forwarded to T. Method, Assistant Commissioner.

As in the past, input from the IDEM office that might be involved should be received and the appropriate form should be completed by the source, and returned to Mr. Rice. He should also receive a report from the individual who processes the request. Mr. Rice will supply the necessary form upon request.

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3. MICHIGAN

In the event of an oil or other hazardous material incident, local government designates an incident commander, usually the highest ranking fire official at the scene. This person directs activities relating to the immediate incident response through a command post. If the incident escalates to a point where coordination of several local agencies is required, the local emergency management coordinator may recommend that the chief executive of the local jurisdiction declare a local state of emergency, thereby activating appropriate response capacities local government. The local emergency management coordinator then coordinates the overall local response.

In accordance with Act 207, P.A. 1941, as amended, the State Police representative, in conjunction with the local fire department, assesses the situation and jointly determines the emergency measures to be taken. The Department of State Police representative is the focal point for recordkeeping, communications, and coordination of all other State agencies. This person may work out of the local command post if minimal response is necessary.

DNR has established the Pollution Emergency Alerting System (PEAS) as a 24-hour answering service to facilitate reporting of releases to the department.

Response at the scene consists of division personnel providing technical advice as listed below. Department personnel are not expected to perform hands-on first responder activities to control the incident. DNR has an environmental response team, which can be activated by Regional or Deputy Directors or a team member. The team's primary purpose is to bring together all necessary expertise in appropriate divisions with technical expertise and it is headed by the departmental emergency management coordinator. DNR has a representative on the Federal RRT. This person represents State interests on the team and functions as a liaison between the Federal and State governments.

3.1. Michigan Department Of Natural Resources

DNR has authority to employ spill containment contractors under the Water Cleaning Emergency Fund. Local government may work directly with DNR in responding to the incident. DNR determines the emergency measures to be taken.

The following tasks are applicable to all types of oil or other hazardous material releases:

3.1.1. ENVIRONMENTAL RESPONSE DIVISION

The Environmental Response Division is designated as the lead division for discharges/releases which occur on land. The division will be responsible for the following tasks:

(a) Report to the scene to provide technical support and advice on the appropriate action to minimize the impact on the environment.

(b) Attempt to identify the party responsible for the release. Once identified, the actions of this party will be monitored to ensure that the party contains and cleans up the spill adequately and in a timely manner.

(c) If a responsible party is not identified or if the identified responsible party fails to take the appropriate actions in a timely manner, DNR may initiate actions to contain and clean up the spill. This is done under the authority of the Water Cleaning Emergency Fund or the Hazardous Waste Service Fund. Private contractors are generally

hired to perform this service under the supervision of the Division. When these limited funding sources have been expended, the division shall notify the appropriate Federal Agency of the restricted response capability and defer containment and cleanup to the Federal Government.

(d) Collect samples of soil, water and other appropriate media for analysis to determine extent and concentration of contamination. The division shall be responsible for preservation, delivery, and chain of custody for the samples, according to divisional standard operating procedures. A copy of the results shall be provided to the departmental emergency management coordinator in a timely manner.

(e) Coordinate with the Federal OSC (U.S. EPA for Federally designated inland zone; USCG for Federally designated coastal zone), if involved, and with the Federal RRT, if activated. The chief of the Site Management Unit is the Michigan representative on the RRT, and may request the assistance of the RRT if it is deemed necessary. This person functions as a liaison between the Federal team and the Emergency Management Division of the Department of State Police.

(f) Provide for the reporting of releases through the Pollution Emergency Alerting System (PEAS) 24-hour hotline. Spill reports will be forwarded to the appropriate DNR district and division. Any notification of a hazardous materials-related emergency received by the PEAS hotline will be relayed immediately to the Department of State Police, Special Operations Section.

3.1.2. SURFACE WATER QUALITY DIVISION

The Surface Water Quality Division is the lead division for discharges/releases that occur on inland waters or enter the Great Lakes or connecting waterways. The Division will be responsible for the following tasks:

(a) Report to the scene to provide technical advice on the type of chemical involved (through sampling).

(b) Provide advice on appropriate measures to protect rivers, streams, and other bodies of water.

(c) Attempt to identify the party responsible for the release. Once identified, the actions of this party will be monitored to ensure that the party contains and cleans up the spill adequately and in a timely manner.

(d) Collect samples of surface water and other appropriate media for analysis to determine the extent and concentration of contamination. The divisions shall be responsible for the preservation, delivery, and chain of custody for the samples according to divisional standard operating procedures. A copy of the results shall be provided to the departmental emergency management coordinator in a timely manner.

(e) If a responsible party is not identified or the identified responsible party fails to take the appropriate actions in a timely manner, DNR may initiate actions to contain and clean up the spill. This is done under the authority of the Water Cleaning Emergency Fund or the Hazardous Waste Service Fund. Private contractors are generally hired to perform this service under the supervision of the Division. When these limited funding sources have been expended, the division shall notify the appropriate Federal Agency of the restricted response capability and defer containment and cleanup to the Federal Government.

3.1.3. AIR QUALITY DIVISION

The Division will be responsible for the following tasks:

(a) Provide advice on appropriate protective actions through the departmental emergency management coordinator.

(b) Oversee the emergency releasing and/or burning of material. Grant temporary permits or waivers as appropriate.

3.1.4. WILDLIFE DIVISION

The Division will be responsible for the following tasks:

(a) Provide advice on wildlife which may require protection from the effects of the incident through the departmental emergency management coordinator.

(b) Take action to protect wildlife, such as hazing, relocating, etc.

(c) Coordinate wildlife rehabilitation. Agreements are signed with various private wildlife rehabilitators within the State.

3.1.5. FISHERIES DIVISION

The Division will be responsible for the following tasks:

(a) The departmental emergency management coordinator provides advice on unique aquatic life that may require protection from effects of the incident.

(b) Obtain fish samples for laboratory analysis.

3.1.6. PARKS DIVISION

The Division will be responsible for the following tasks:

(a) When a State park is involved, take action to clear persons from the affected area and control access to the area.

(b) Direct parks personnel to assist in spill containment as coordinated by the departmental emergency management coordinator.

3.1.7. LAW ENFORCEMENT DIVISION

The Division will be responsible for the following tasks:

(a) The departmental emergency management coordinator is assigned to this division. This person coordinates all departmental activity when the situation is of a life-threatening nature and response is coordinated through the emergency management system, or when DNR Emergency Response Team is activated.

(b) Assist in clearing persons and boats from the affected area and control access to the area.

(c) Use watercraft to assist in boom deployment and material recovery.

(d) Maintain radio communications.

3.1.8. WASTE MANAGEMENT DIVISION

The Division will be responsible for the following tasks:

(a) Advise on suitable disposal sites for collected material.

(b) Take action to ensure timely and proper disposal of material.

3.2. Bureau of Public Health

3.2.1. BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH

(a) Monitor public and private water supplies.

(b) Monitor public exposure to air contaminants. The Division of Occupational Health is responsible for monitoring public exposure to air contaminants and for recommending countermeasures and protective actions. The division is responsible for ensuring that all employees whose duties expose them to an actual or potential health hazard during the emergency response are afforded adequate protection as required by applicable occupational health standards, including 29 CFR 1910.120, the "Hazardous Waste Operations and Emergency Response" standard.

Teams of district industrial hygienists are dispatched, as appropriate and feasible, to monitor actual and potential exposure of citizens to airborne contaminants resulting from an emergency hazardous materials release. This may include real-time spot monitoring with direct reading devices, collection of spot samples for laboratory analysis, and assisting the Interagency Center on Health and Environmental Quality with dispersion estimates of ground-level airborne contaminant concentrations. Appropriate countermeasures and protective action guidelines are recommended to help citizens guard against the health hazards of airborne contaminants resulting from the release. (c) Coordinate food service inspection in shelters.

3.2.2. BUREAU OF HEALTH FACILITIES

(a) Ensure that health care facility emergency procedures are adequate. The Division of Health Facilities Licensing and Certification has the responsibility for ensuring that health care facility emergency procedures are adequate.

(b) Ensure that adequate patient treatment is available and being provided during an incident.

(c) Coordinate the use of the MEDCOM system.

3.2.3. DEPARTMENTAL EMERGENCY MANAGEMENT COORDINATOR

(a) Coordinate victim identification services.

(b) Provide liaison to Federal emergency public health/medical programs and services. During this type of incident, the departmental emergency management coordinator coordinates with the Council on Environmental Quality in seeking the advice and assistance of Federal agencies such as ATSDR. The departmental coordinator also may need to coordinate with the HHS representative to the RRT.

3.2.4. COUNCIL ON ENVIRONMENTAL QUALITY (TOXICOLOGICAL RESOURCE CENTER)

(a) Report to the scene for initial public health evaluation.

(b) Identify chemicals.

(c) Perform air, water, or ground dispersion modeling and provide information though the departmental emergency management coordinator.

(d) Provide information concerning the characteristics of chemicals and recommended population protective actions through the departmental emergency management coordinator.

(e) Provide information concerning the toxic health effects of the spill.

(f) Provide information to the public concerning health effects.

3.2.5. BUREAU OF LABORATORY AND EPIDEMIOLOGICAL SERVICES

(a) Perform laboratory analyses on the material to identify the type of chemical.

3.3. Department Of State Police

The local fire department that responds to an oil or other hazardous material incident is required to notify the Department of State Police, Fire Marshal Division. This reporting requirement is satisfied by notification of the nearest Department of State Police post, which relays the information to the Special Operations Section at State Police headquarters. The Department of State Police is responsible for notifying other State agencies.

The Department of State Police has primary responsibility for responding to an incident through the Michigan Fire Prevention Act (Act 207, P.A. 1947, as amended). Official Order 50 clarifies the department's procedures in implementing this act. It states the following:

(a) If the incident occurs at a fixed site or involves rail transportation, the Fire Marshal Division has site coordination responsibilities.

(b) If the incident involves road transportation, the Motor Carrier division has site coordination responsibilities.

(c) If the incident is confined to a site area emergency, personnel from one of the two divisions are the focal point for recordkeeping, communications, and coordination with other State agencies. The Fire Marshal or Motor Carrier Division coordinates incident command in conjunction with local government. In the absence of either of these two divisions, the Emergency Management Division assumes first responder duties. In accordance with Act 207, Department of State Police personnel, in conjunction with the local fire department, determine the emergency measures to be taken.

In addition, Act 390, P.A. 1976, as amended, authorizes the department to coordinate all mitigation, preparedness, response, and recovery activities. This system is explained in the Michigan Emergency Management Plan. The emergency management system is used if the incident is of an immediate life-threatening nature requiring population protective actions or if the incident requires the coordination of State agencies.

In the event of a substantial release causing a community emergency that requires the assistance of several State agencies or population protective action, the Emergency Management Division coordinates the overall response. The division acts as liaison between State and local government. The Motor Carrier or Fire Marshal Division continues to coordinate the immediate site response. Department of State Police personnel are not expected to perform hands-on first responder activities to control the incident.

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4. MINNESOTA

Minnesota law requires discharges to be reported to the State Duty Officer, who is on duty in the Capitol building 24 hours per day. The various laws requiring reports include discharges to the air, land, and water; cover oil, hazardous substances, pesticides, and fertilizers, and other materials that could cause pollution; and have no "reportable quantities" except for petroleum at 5 gallons. The Duty Officer numbers are (612) 649-5451 and (800) 422-0798.

Minnesota Statute Chapter 115E requires companies handling oil and hazardous substances to act to prevent releases and to be prepared for releases they may have. Chapter 115E requirements are similar to those of OPA, but cover protection of the public's safety and the environment, and cover pollution of the land, air, and waters of the State. A facility operator is to notify the Emergency Response Commission when their plan is completed, and must supply a copy upon request. MPCA ERT staff actively inspect the prevention and preparedness capabilities of major facilities, and will assist facility owners if requested. They conduct enforcement if the preparedness of a facility is found to be inadequate, especially if it contributed to a release or poor response.

State agencies, including MPCA, Natural resources, Transportation, Public Safety, and Health, operate under ICS principles. In incidents threatening the public's safety, local commanders receive State support. In a major incident requiring Federal assistance, MPCA will generally be the liaison between State and Federal responders. DEM conducts incident command training for State, local, and private responders. DEM and the State Fire Marshal contract with a number of local jurisdictions to provide hazardous materials assessment and response teams to the various regions of the State. These teams are dispatched by DEM after the Duty Officer has received a request from a local incident commander stating that local capabilities are inadequate for the needed response.

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5. OHIO

The Emergency Response Section of OEPA acts as the staff to the State Emergency Response Commission. This Community RighttoKnow Unit collects chemical inventories from facilities regulated by Title III. Grants are currently being provided to County LEPCs to develop and exercise emergency response plans. The facility identification forms collected by Ohio under Chapter 3750 of the Ohio Revised Code include the name and phone number of the facility emergency contact, and OEPA program permit numbers.

A toll-free number to receive spill reports and citizen complaints is answered 24 hours a day, seven days a week. Spill information is entered into a database for management.

Spills are responded to on a priority basis. Priority I spills are those requiring immediate response because of their volume (over 5,000 gallons of oil) or their toxicity. Priority II spills are responded to within 24 hours, and are smaller in volume (500 to 5,000 gallons) or of a toxicity that does not present an immediate threat to the public. Priority III spills make up the majority of spills.

When needed, OEPA may contract with Ohio Department of Transportation, Ohio Department of Natural Resources, Highway Safety, or the National Guard for air support in flying personnel to the scene of an emergency and samples to the laboratories.

When the spiller cannot be located or is uncooperative, OEPA is called in for containment and cleanup. The Immediate Removal Special Account is used for spills where a response is needed to provide containment of an actively spilling substance. OEPA also has two contractors under a $500,000 level-of-effort contract. This contract is used primarily for addressing small collections of abandoned drums of hazardous materials.

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6. WISCONSIN

To be written.

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7. STATE ACCESS TO THE OIL SPILL LIABILITY TRUST FUND

In accordance with regulations promulgated under Section 1012(d)(1) of OPA, the President, upon the request of a Governor of a State or the individual designated by the Governor, may obligate the OSLTF through the NPFC for payment in an amount not to exceed $250,000 for removal costs consistent with the NCP required for the immediate removal of a discharge, or the mitigation or prevention of a substantial threat of a discharge, of oil.

The following persons are designated by their Governors to obligate OSLTF funds:

Illinois James P. O'Brien, Manager, Office of Chemical Safety

Illinois Environmental Protection Agency

Indiana Greta Hawvermale, Commissioner

Indiana Department of Environmental Management

John Rose, Assistant Commissioner

Indiana Department of Environmental Management

Michigan Paul Blakeslee, Chief of Field Operations

Michigan Department of Natural Resources

Minnesota Steve Lee, Supervisor

Minnesota Pollution Control Agency

Ohio Timothy Hickin, Manager, Emergency Response Section

Ohio Environmental Protection Agency

Wisconsin Steven Bass, Division of Energy and Intergovernmental Affairs

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APPENDIX XIV: alternative response tool evaluation system (artes)

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APPENDIX XV: Acronyms

ACP Area Contingency Plan

AOR Area of Response

APHIS Animal Plant and Health Inspection Service

API American Petroleum Institute

ASCS Agricultural Stabilization and Conservation Service

AST Atlantic Strike Team

ATSDR Agency for Toxic Substances and Disease Registry

BIA Bureau of Indian Affairs

BLM Bureau of Land Management

BOA Basic Ordering Agreement

CANUSLAK Canadian-U.S. Lakes

CANUTEC Canadian Transportation Emergency Center

CDC Centers for Disease Control

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act of 1980,

42 U.S.C. Section 9601 *et seq.*, also known as Superfund

CHEMTREC Chemical Transportation Emergency Center

COTP Captain of the Port (USCG)

CRREL Cold Region Research Engineering Laboratory

CWA Clean Water Act, as amended by OPA, 33 U.S.C. Section 1251 *et seq.*

DEM Department of Emergency Management

DNR Department of Natural Resources

DOA Department of Agriculture

DOC Department of Commerce

DOD Department of Defense

DOE Department of Energy

DOI Department of the Interior

DOJ Department of Justice

DOL Department of Labor

DOS Department of State

DOT Department of Transportation

DRG District Response Group (USCG)

DWRO Director of Western Rivers Operations

EMD Emergency Management Division

EPCRA Emergency Planning and Community Right-to-Know Act of 1986 (Title III of SARA)

EPIC Environmental Photographic Interpretation Center

ERB Emergency Response Branch

ERCS Emergency Response Cleanup Services

ERD Emergency Response Division

ERS Emergency Response Section

ERT Environmental Response Team

ERU Emergency Response Unit

ESF Emergency Support Function

ESI Environmental Sensitivity Index

FCO Federal Coordinating Officer

FEMA Federal Emergency Management Agency

FNS Food and Nutrition Service

FPN Federal Project Number

FRERP Federal Radiological Emergency Response Plan

FRMAP Federal Radiological Monitoring and Assessment Plan

FRP Facility Response Plan

FRP/ESF Federal Response Plan/Emergency Support Function

FS Feasibility Study

FSIS Food Safety and Inspection Service

FWPCA Federal Water Pollution Control Act

GLACIER Great Lakes Area Computerized Inventory for Emergency Response

GLC Great Lakes Commission

GLERL Great Lakes Environmental Research Laboratory

GLIFWC Great Lakes Indian Fish and Wildlife Commission

GSA General Services Administration

HAZMAT hazardous material(s)

HHS Department of Health and Human Services

HMIX Hazardous Materials Information Exchange

IAG Interagency Agreement

IAPC Inland Area Planning Committee

IC Incident Commander

ICP Incident Command Plan

ICS Incident Command System

IDEM Indiana Department of Environmental Management

IDPH Indiana Department of Public Health

IEMA Illinois Emergency Management Agency

IEPA Illinois Environmental Protection Agency

IJC International Joint Commission

INDOT Indiana Department of Transportation

ISDH Indiana State Department of Health

ISP Indiana State Police

LAT Lead Administrative Trustee

LEPC Local Emergency Planning Committee

MASS Modeling and Simulation Studies

MDA Michigan Department of Agriculture

MDEQ Michigan Department of Environmental Quality

MDPH Michigan Department of Public Health

MERC Michigan Emergency Response Commission

MLC Marine Logistics Command

MMS Mines and Minerals Service

MOU Memorandum of Understanding

MPCA Minnesota Pollution Control Agency

MSDS Material Safety Data Sheet

MSO Marine Safety Office

MSP Michigan State Police

NCP National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300

NFA National Fire Academy

NIH National Institutes of Health

NIIMS National Interagency Incident Management System

NIOSH National Institute for Occupational Safety and Health

NMFS National Marine Fisheries Service

NPFC National Pollution Fund Center

NOAA National Oceanic and Atmospheric Administration

NPS National Park Service

NRC National Response Center or Nuclear Regulatory Commission

NRDA Natural Resources Damage Assessment

NRT National Response Team

NSF National Strike Force

NSFCC National Strike Force Coordination Center

NWS National Weather Service

OEPA Ohio Environmental Protection Agency

OEPC Office of Environmental Policy and Compliance

OISC Office of the Indiana State Chemist

OPA Oil Pollution Act of 1990, 33 U.S.C. Section 2701

OPS Office of Pipeline Safety

ORIA Office of Radiation and Indoor Air

ORSANCO Ohio River Valley Water Sanitation Commission

OSC OnScene Coordinator

OSFM Office of the State Fire Marshall

OSHA Occupational Safety and Health Administration

OSHWM Office of Solid and Hazardous Waste Management

OSLTF Oil Spill Liability Trust Fund

OSRO Oil Spill Removal Organization

OSSM On-Scene Spill Model

OSWER Office of Solid Waste and Emergency Response

PHS Public Health Service

PIAT Public Information Assistance Team

POLREP Pollution Report Message

PREP National Preparedness for Response Exercises Program

PRFA Pollution Removal Funding Authorization

PRP Potentially Responsible Party

PUCO Public Utilities Commission of Ohio

RCP Regional Contingency Plan

RCRA Resource Conservation and Recovery Act

REMM Riverine Emergency Management Model

RERT Radiological Emergency Response Team

RP Responsible Party

RPM Remedial Project Manager

RQ Reportable Quantity

RRC Regional Response Center

RROC Regional RCRA Off-Site Coordinator

RRT Regional Response Team

RRT5 Region 5 Regional Response Team

RSPA Research and Special Programs Administration

SARA Superfund Amendments and Reauthorization Act of 1986

SEHO Safety and Health Officer

SEMA State Emergency Management Agency

SEOC State Emergency Operations Center

SERC State Emergency Response Commission

SHPO State Historic Preservation Officer

SLSDC St. Lawrence Seaway Development Corporation

SONS Spill of National Significance

SSC Scientific Support Coordinator

START Superfund Technical Assessment Team

SUPSALV Supervisor of Salvage

TERC Tribal Emergency Response Commission

TSCA Toxic Substances Control Act

UCS Unified Command System

UMR Upper Mississippi River

UMRBA Upper Mississippi River Basin Association

USACE United States Army Corps of Engineers

USCG United States Coast Guard

USDA United States Department of Agriculture

U.S. EPA United States Environmental Protection Agency

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

WDNR Wisconsin Department of Natural Resources

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