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Protection of Environment

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PARTS 190 TO 399

Revised as of July 1, 1985

SUBCHAPTER J—SUPERFUND PROGRAMS

PART 300—NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN

AUTHORITY: Sec. 105, Pub. L. 96-510, 94 Stat. 2764, 42 U.S.C. 9605; sec. 311(c)(2), Pub. L. 92-500, as amended, 86 Stat. 865, 33 U.S.C. 1321(c)(2); E.O. 12316, 46 FR 42237; E.O. 11735, 38 FR 21243.

SOURCE: 47 FR 31202, July 16, 1982, unless otherwise noted.

Subpart A—Introduction

§ 300.1 Purpose and objectives.

The purpose of the National Oil and Hazardous Substances Pollution Contingency Plan (Plan) is to effectuate the response powers and responsibilities created by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERLA) and the authorities established by section 311 of the Clean Water Act (CWA), as amended.

§ 300.2 Authority.

The Plan is required by section 105 of CERCLA, 42 U.S.C. 9605, and by section 311(c)(2) of the CWA, as

amended, 33 U.S.C. 1321(c)(2). In Executive Order 12316 (46 FR 42237) the President delegated to the Environmental Protection Agency the responsibility for the amendment of the NCP and all of the other functions vested in the President by section 105 of CERCLA. Amendments to the NCP shall be coordinated with members of the National Response Team prior to publication for notice and comment. Amendments shall also be coordinated with the Federal Emergency Management Agency and the Nuclear Regulatory Commission in order to avoid inconsistent or duplicative requirements in the emergency planning responsibilities of those agencies.

§ 300.3 Scope.

(a) The Plan applies to all Federal agencies and is in effect for:

(1) The navigable waters of the United States and adjoining shorelines, for the contiguous zone, and the high seas beyond the contiguous zone in connection with activities under the Outer Continental Shelf Lands Act or the Deep Water Port Act of 1974, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Fishery Conservation and Management Act of 1976). (See sections 311(b)(1) and 502(7) of the Clean Water Act.)

(2) Releases or substantial threats of releases of hazardous substances into the environment, and releases or substantial threats of releases of pollutants or contaminants which may present an imminent and substantial danger to public health or welfare.

(b) The Plan provides for efficient, coordinated and effective response to discharges of oil and releases of hazardous substances, pollutants and contaminants in accordance with the authorities of CERCLA and the CWA. It provides for:

(1) Division and specification of responsibilities among the Federal, State and local governments in response actions, and appropriate roles for private entities.

(2) The national response organization that may be brought to bear in response actions, including description of the organization, response personnel and resources that are available to respond.

(3) The establishment of requirements for Federal regional and Federal local contingency plans, and encouragement of pre-planning for response by other levels of government.

(4) Procedures for undertaking removal operations pursuant to section 311 of the Clean Water Act.

(5) Procedures for undertaking response operations pursuant to CERCLA.

(6) Designation of trustees for natural resources for purposes of CERCLA.

(7) National policies and procedures for the use of dispersants and other chemcials in removal and response actions.

(c) In implementing this Plan, consideration shall be given to the Joint Canada/U.S. Contingency Plan; the U.S./Mexico Joint Contingency Plan and international assistance plans and agreements, security regulations and responsibilities based on international agreements, Federal statutes and executive orders. Actions taken pursuant to this Plan shall conform to the provisions of international joint contingency Plans, where they are applicable. The Department of State should be consulted prior to taking any action which may affect its activities.

§ 300.4 Application.

The Plan is applicable to response taken pursuant to the authorities under CERCLA and section 311 of the CWA.

§ 300.5 Abbreviations.

(a) Department and Agency Title Abbreviations.

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
EPA—Environmental Protection Agency
FEMA—Federal Emergency Management Agency
HHS—Department of Health and Human Services

NIOSH—National Institute for Occupational Safety and Health
NOAA—National Oceanic and Atmospheric Administration
OSHA—Occupational Safety and Health Administration
USCG—U.S. Coast Guard
USDA—U.S. Department of Agriculture

(b) Operational Title Abbreviations.

ERT—Environmental Response Team
FCO—Federal Coordinating Officer
NRC—National Response Center
NRT—National Response Team
NSF—National Strike Force
OSC—On-Scene Coordinator
PAAT—Public Affairs Assist Team
PIAT—Public Information Assist Team
RRC—Regional Response Center
RRT—Regional Response Team
SSC—Scientific Support Coordinator

§ 300.6 Definitions.

Terms not defined in this section have the meaning given by CERCLA or the CWA.

Claim, as defined by section 101(4) of CERCLA, means a demand in writing for a sum certain.

Claimant, as defined by section 101(5) of CERCLA, means any person who presents a claim for compensation under CERCLA.

Coastal zone, as defined for the purpose of this Plan, means all U.S. waters subject to the tide, U.S. waters of the Great Lakes, specified ports and harbors on the inland rivers, waters of the contiguous zone, other waters of the high seas subject to this Plan, 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 EPA/USCG agreements and identified in Federal regional contingency plans.

Contiguous zone means the zone of the high seas, established by the United States under Article 24 of the Convention on the Territorial Sea and Contiguous Zone, which is contiguous to the territorial sea and which extends nine miles seaward from the outer limit of the territorial sea.

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. For purposes of this Plan, discharge shall also mean 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) or as drinking water by one or more individuals.

Environment, as defined by section 101(8) of CERCLA, means (a) the navigable waters of the United States, the waters of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the U.S. under the Fishery Conservation and Management Act of 1976, and (b) any other surface water, ground water, drinking water supply, land surface and subsurface strata, or ambient air within the United States or under the jurisdiction of the United States.

Facility, as defined by section 101(9) of CERCLA, means (a) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (b) any site or area where a hazardous substance has been deposited, stored, disposed of or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel.

Federally permitted release, as defined by section 101(10) of CERCLA, means (a) discharges in compliance with a permit under section 402 of the Federal Water Pollution Control Act; (b) discharges resulting from circumstances identified and reviewed and made part of the public record with respect to a permit issued or modified under section 402 of the Federal Water Pollution Control Act and subject to a condition of such permit; (c) continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the Federal Water Pollution Control Act, which are caused by events occurring within the scope of relevant operating or treatment systems; (d) discharges in compliance with a legally enforceable permit under section 404 of the Federal Water Pollution Control Act; (e) releases in compliance with a legally enforceable final permit issued pursuant to section 3005 (a) through (d) of the Solid Waste Disposal Act from a hazardous waste treatment, storage, or disposal facility when such permit specifically identifies the hazardous substances and makes such substances subject to a standard of practice, control procedure or bioassay limitation or condition, or other control on the hazardous substances in such releases; (f) any release in compliance with a legally enforceable permit issued under section 102 or section 103 of the Marine Protection, Research and Sanctuaries Act of 1972; (g) any injection of fluids authorized under Federal underground injection control programs or State programs submitted for Federal approval (and not disapproved by the Administrator of EPA) pursuant to part C of the Safe Drinking Water Act; (h) any emission into the air subject to a permit or control regulation under section 111, section 112, title 1 part C, title 1 part D, or State implementation plans submitted in accordance with Section 110 of the Clean Air Act (and not disapproved by the Administrator of EPA), including any schedule or waiver granted, promulgated, or approved under these sections; (i) any injection of fluids or other materials authorized under applicable State law (1) for the purpose of stimulating or treating wells for the production of crude oil, natural gas, or water, (2) for the purpose of secondary, tertiary, or other enhanced recovery of crude oil or natural gas, or (3) which are brought to the surface in conjunction with the production of crude oil or natural gas and which are reinjected; (j) the introduction of any pollutant into a publicly-owned treatment works when such pollutant is specified in and in compliance with applicable pretreatment standards of section 307 (b) or (c) of the CWA and enforceable requirements in a pretreatment program submitted by a State or municipality for Federal approval under section 402 of such Act, and (k) any release of source, special nuclear, or by-product material, as those terms are defined in the Atomic Energy Act of 1954, in compliance with a legally enforceable license, permit, regulation, or order issue pursuant to the Atomic Energy Act of 1954.

Fund or Trust Fund means the Hazardous Substance Response Trust Fund established by section 221 of CERCLA.

Ground water, as defined by section 101(12) of CERCLA, means water in a saturated zone or stratum beneath the surface of land or water.

Hazardous substance, as defined by section 101(14) of CERCLA, means (a) any substance designated pursuant to section 311(b)(2)(A) of the CWA; (b) any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA; (c) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress); (d) any toxic pollutant listed under section 307(a) of the CWA; (e) any hazardous air pollutant listed under section 112 of the Clean Air Act; and (f) any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act. The terms do not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (a) through (f) of this paragraph, and the term does not include natural gas, natural gas liquids, liquified natural gas or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

Inland zone means the environment inland of the coastal zone excluding the Great Lakes and specified ports and harbors of inland rivers. The term inland zone delineates the area of Federal responsibility for response action. Precise boundaries are determined by EPA/USCG agreement and identified in Federal regional contingency plans.

Lead agency means the Federal agency (or State agency operating pursuant to a contract or cooperative agreement executed pursuant to section 104(d)(1) of CERCLA) that pro-

vides the on-scene coordinator or the responsible official.

Natural Resources, as defined by section 101(16) of CERCLA, means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of fishery conservation zones established by the Fishery Conservation and Management Act of 1976), any State or local government or any foreign government.

Offshore facility, as defined by section 101(17) of CERCLA and section 311(a)(11) of the CWA, means any facility of any kind located in, on, or under any of the navigable waters of the U.S. and any facility of any kind which is subject to the jurisdiction of the U.S. and is located in, on, or under any other waters, other than a vessel or a public vessel.

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 pollution fund means the fund established by section 311(k) of the CWA.

Onshore facility, (a) as defined by section 101(18) of CERCLA means any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under any land or non-navigable waters within the United States; and (b) as defined by section 311(a)(10) of CWA means any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under any land within the United States other than submerged land.

On-Scene Coordinator means the Federal official predesignated by the EPA or the USCG (or a State official acting pursuant to a contract or cooperative agreement executed pursuant to section 104(d)(1) of CERCLA) to coordinate and direct Federal responses under this Plan; provided, however, that with respect to releases from DOD facilities or vessels, the OSC shall be designated by DOD.

Person, as defined by section 101(21) of CERCLA, means an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, U.S. Government, State, municipality, commission, political subdivision of a State, or any interstate body.

Plan means the National Oil and Hazardous Substances Pollution Contingency Plan published under section 311(c) of the CWA and revised pursuant to section 105 of CERCLA.

Pollutant or contaminant, as defined by section 104(a)(2) of CERCLA, shall include, but not be limited to, any element, substance, compound, or mixture, including disease causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingesting through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformation, in such organisms or their offspring. The term does not include petroleum, including crude oil and any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under section 101(14)(A) through (F) of CERCLA, nor does it include natural gas, liquified natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and synthetic gas).

Release, as defined by section 101(22) of CERCLA, means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, but excludes (a) any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons; (b) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine; (c) release of source, by-product or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954, if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under section 170 of such act, or, for the purposes of section 104 of CERCLA or any other response action, any release of source, by-product, or special nuclear material from any processing site designated under section 102(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978; and (d) the normal application of fertilizer. For the purposes of this Plan, release also means substantial threat of release.

Remove or removal, as defined by section 311(a)(8) of CWA refers to removal of oil or hazardous substances from the water and shorelines or the taking of such other actions as may be necessary to minimize or mitigate damage to the public health or welfare. As defined by section 101(23) of CERCLA, remove or removal means the clean-up or removal of released hazardous substances from the environment; such actions as may be necessary taken in the event of the threat of release of hazardous substances into the environment; such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances; the disposal of removed material; or the taking or such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or the environment, which may otherwise result from such release or threat of release. The term includes, in addition, without being limited to, security fencing or other measures to limit access, provision of alternative water supplies, temporary evacuation and housing of threatened individuals not otherwise provided for, action taken under section 104(b) of CERCLA, and any emergency assistance which may be provided under the Disaster Relief Act of 1974.

Remedy or remedial action, as defined by section 101(24) of CERCLA, means those actions consistent with permanent remedy taken instead of, or in addition to, removal action in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment. The term includes, but is not limited to, such actions at the location of the release as storage, confinement, perimeter protection using dikes, trenches, or ditches, clay cover, neutralization, clean-up of released hazardous substances or contaminated materials recycling or reuse, diversion, destruction, segregation or reactive wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and runoff, onsite treatment or incineration, provision of alternative water supplies, and any monitoring reasonably required to assure that such actions protect the public health and welfare and the environment. The term includes the costs of permanent relocation of residents and businesses and community facilities where the President determines that, alone or in combination with other measures, such relocation is more cost-effective than and environmentally preferable to the transportation, storage, treatment, destruction, or secure disposition offsite of hazardous substances or may otherwise be necessary to protect the public health or welfare. The term does not include offsite transport of hazardous substances, or the storage, treatment, destruction, or secure disposition offsite of such hazardous substances or contaminated materials unless the President determines that such actions (a) are more cost-effective than other remedial actions; (b) will create new capacity to manage in compliance with subtitle C of the Solid Waste Disposal Act, hazardous substances in addition to those located at the affected facility; or (c) are necessary to protect public health or welfare or the environment from a present or potential risk which may be created by further exposure to the continued presence of such substances or materials.

Respond or response, as defined by section 101(25) of CERCLA, means remove, removal, remedy, or remedial action.

Responsible official refers to the Federal offical (or State official acting pursuant to a contract or cooperative agreement executed pursuant to section 104(d)(1) of CERCLA), assigned

by the lead agency, responsible for coordinating planned removals, remedial actions and related activities under Subpart F of this plan. Where reference is made to the responsibilities and authorities of an OSC, those responsibilities and authorities also apply to a responsible official.

Size classes of discharges refers to the following size classes of oil discharges which are provided as guidance to the OSC and serve as the criteria for the actions delineated in Subpart E. They are not meant to imply associated degrees of hazard to public health or welfare, nor are they a measure of environmental damage. Any oil discharge that poses a substantial threat to the public health or welfare or results in critical public concern shall be classified as a major discharge regardless of the following quantitative measures:

(a) *Minor discharge* means a discharge to the inland waters of less than 1,000 gallons of oil or a discharge to the coastal waters of less than 10,000 gallons of oil.

(b) *Medium discharge* means a discharge of 1,000 to 10,000 gallons of oil to the inland waters or a discharge of 10,000 to 100,000 gallons of oil to the coastal waters.

(c) *Major discharge* means a discharge of more than 10,000 gallons of oil to the inland waters or more than 100,000 gallons of oil to the coastal waters.

Trustee means any Federal natural resources management agency designated in Subpart G of this plan, and any State agency which may prosecute claims for damages under section 107(f) of CERCLA.

United States, as defined by section 311(2)(5) of CWA, refers to the States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands. As defined by section 101(27) of CERCLA, United States and State include the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, The Commonwealth of the Northern Marianas and any other territory or possession over which the U.S. has jurisdiction.

Volunteer means any individual accepted to perform services by a Federal agency which has authority to accept volunteer services (example: see 16 U.S.C. 742f(c)). A volunteer is subject to the provisions of the authorizing statute, and § 300.25 of this Plan.

Subpart B—Responsibility

§ 300.21 Duties of President delegated to Federal agencies.

(a) In Executive Order 11735 and Executive Order 12316 the President delegated certain functions and responsibilities vested in him by the CWA and CERCLA, respectively. Responsibilities so delegated shall be responsibilities of Federal agencies under this Plan unless:

(1) Responsibility is redelegated pursuant to section 8(f) of Executive Order 12316, or

(2) Executive Order 11735 or Executive Order 12316 is amended or revoked.

§ 300.22 Coordination among and by Federal agencies.

(a) Federal agencies should coordinate their planning and response activities through the mechanisms described in Subpart C of this Plan and other means as may be appropriate.

(b) Federal agencies should coordinate planning and response action with affected State and local government and private entities.

(c) Federal agencies with facilities or other resources which may be useful in a Federal response situation should make those facilities or resources available consistent with agency capabilities and authorities.

(d) When the Administrator of EPA or the Secretary of the Department in which the Coast Guard is operating determines:

(1) That there is an imminent and substantial threat to the public health or welfare because of a discharge of oil from any offshore of onshore facility; or

(2) That there may be an imminent and substantial endangerment to the public health or welfare of the environment because of a release or threatened release of a hazardous substance, from a facility; he/she may request the Attorney General to secure the relief necessary to abate the threat. The action described here is in addition to any actions taken by a State or local government for the same purpose.

(e) In accordance with section 311(d) of CWA, whenever a marine disaster in or upon the navigable waters of the United States has created a substantial threat of a pollution hazard to the public health or welfare, because of a discharge or an imminent discharge from a vessel of large quantities of oil or hazardous substances designated pursuant to section 311(b)(2)(A) of CWA, the United States may:

(1) Coordinate and direct all public and private efforts to abate the threat;

(2) Summarily remove and, if necessary, destroy the vessel by whatever means are available without regard to any provisions of law governing the employment of personnel or the expenditure of appropriated funds. The authority for these actions has been delegated under Executive Order 11735 to the Administrator of EPA and the Secretary of the Department in which the Coast Guard is operating, respectively, for the waters for which each designates the OSC under this Plan.

(f) Response actions to remove discharges originating from the Outer Continental Shelf Lands Act operations shall be in accordance with this Plan.

(g) Where appropriate, discharges of radioactive materials shall be handled pursuant to the appropriate federal radiological plans.

§ 300.23 Other assistance by Federal agencies.

(a) Each of the Federal agencies listed in paragraph (b) of this section has duties established by statute, executive order, or Presidential directive which may be relevant to Federal response action following or in prevention of a discharge of oil or a release of a hazardous substance, pollutant or contaminant. These duties may also be relevant to the rehabilitation, restoration, and replacement of damaged or lost natural resources. Federal regional contingency plans should call upon agencies to carry out these duties in a coordinated manner.

(b) The following Federal agencies may be called upon by an OSC during the planning or implementation of a response to provide assistance in their respective areas of expertise, consistent with their capabilities and legal authorities:

(1) Department of Agriculture.
(2) Department of Commerce.
(3) Department of Defense.
(4) Department of Energy.
(5) Federal Emergency Management Agency.
(6) Department of Health and Human Services.
(7) Department of the Interior.
(8) Department of Justice.
(9) Department of Labor.
(10) Department of State.
(11) Department of Transportation.
(12) Environmental Protection Agency.

(c) In addition to their general responsibilities under paragraph (a) of this section Federal agencies should:

(1) Make necessary information available to the NRT, RRTs, and OSCs.

(2) Inform the NRT and RRTs (consistent with national security considerations) of changes in the availability of resources that would affect the operations of the Plan.

(3) Provide representative as necessary to the NRT and RRTs and assist RRTs and OSCs in formulating Federal regional and Federal local contingency plans.

(d) All Federal agencies are responsible for reporting releases of hazardous substances and discharges of oil from facilities or vessels which are under their jurisdiction or control in accordance with section 103 of CERCLA, and Subparts E and F of this Plan.

(e) Executive Order 12316 delegates to the USCG and EPA all authorities under sections 104 (a) and (b) and 101(24) of CERCLA subject to the following:

(1) HHS is delegated all authorities under section 104(b) of CERCLA relating to a determination that illness, disease or complaints thereof may be attributable to exposure to a hazardous

substance, pollutant or contaminant. (In addition, section 104(i) of CERCLA calls upon HHS to: establish appropriate disease/exposure registries; conduct appropriate health surveys and studies; develop and provide appropriate testing for exposed individuals; develop, maintain and provide information on health effects of toxic substances; and maintain a list of areas restricted or closed because of toxic substance contamination.)

(2) FEMA is delegated the authorities vested in the President by section 104(a) of CERCLA to the extent they require permanent relocation of residents, businesses, and community facilities or temporary evacuation and housing of threatened individuals not otherwise provided for. (FEMA is also delegated authority under section 101(24) of CERCLA to the extent they require a determination by the President that "permanent relocaton of residents and businesses and community facilities" is included within the terms "remedy" and "remedial action" as defined in section 101(24) of CERCLA.)

(3) DOD is delegated all authority of section 104 (a) and (b) of CERCLA with respect to releases from DOD facilities or vessels, including vessels owned or bareboat chartered and operated.

(f) If the situation is beyond the capability of State and local governments and the statutory authority of Federal agencies, the President, acting upon a request by the Governor, may declare a major disaster or emergency and appoint a Federal Coordinating Officer to assume responsibility for direction and control of the Federal response.

§ 300.24 State and local participation.

(a) Each State governor is requested to assign an office or agency to represent the State on the appropriate RRT. Local governments are invited to participate in activities on the appropriate RRT as may be provided by State law or arranged by the State's representative. The State's representative may participate fully in all facets of activities of the appropriate RRT and is encouraged to designate the element of the State government that will direct State supervised response operations.

(b) State and local government agencies are encouraged to include contingency planning for response, consistent with this Plan and Regional Contingency Plans, in all emergency and disaster planning.

(c) States are encouraged to use State authorities to compel potentially responsible parties to undertake response actions, or to themselves undertake response actions which are not eligible for Federal funding.

(d) States may enter into contracts or cooperative agreements pursuant to section 104(c)(3) and (d) of CERCLA or section 311(c)(2)(H) of the CWA, as appropriate, to undertake actions authorized under Subparts E and F of this Plan. Requirements for entering into these agreements are included in §§ 300.58 and 300.62 of this Plan.

§ 300.25 Non-government participation.

(a) Industry groups, academic organizations, and others are encouraged to commit resources for response operations. Specific commitments should be listed in Federal regional and Federal local contingency plans.

(b) It is particularly important to use the valuable technical and scientific information generated by the non-government local community along with those from Federal and State government to assist the OSC in devising clean-up strategies where effective standard techniques are unavailable, and to ensure that pertinent research will be undertaken to meet national needs.

(c) Federal local contingency plans should establish procedures to allow for well-organized, worthwhile, and safe use of volunteers. Local plans should provide for the direction of volunteers by the OSC, or by other Federal, State or local officials knowledgeable in contingency operations and capable of providing leadership. Local plans also should identify specific areas in which volunteers can be used, such as beach surveillance, logistical support, and bird and wildlife treatment. Unless specifically requested by the OSC, volunteers generally should not be used for physical removal or remedial activities. If, in the judgement of the OSC or an appropriate participating agency, dangerous conditions exist, volunteers shall be restricted from on-scene operations.

(d) If any person other than the Federal government or a State or person operating under contract or cooperative agreement with the United States, takes response action and intends to seek reimbursement from the Fund, such actions to be in conformity with this Plan for purposes of section 111(a)(2) of CERCLA may only be undertaken if such person notifies the Administrator of EPA or his/her designee prior to taking such action and receives prior approval to take such action.

Subpart C—Organization

§ 300.31 Organizational concepts.

Three fundamental kinds of activity are performed pursuant to the Plan: planning and coordination, operations at the scene of a discharge and/or release, and communications. The organizational elements created to perform these activities are discussed below in the context of their roles in these activities.

§ 300.32 Planning and coordination.

(a) National planning and coordination is accomplished through the National Response Team (NRT).

(1) The NRT consists of representatives from the agencies named in § 300.23. Each agency shall designate a member to the team and sufficient alternates to ensure representation, as agency resources permit. Other agencies may request membership on the NRT by forwarding such requests to the chairman of the NRT.

(2) Except for periods of activation because of a response action, the representative of EPA shall be the chairman and the representative of USCG shall be the vice chairman of the NRT. The vice chairman shall maintain records of NRT activities along with national, regional, and local plans for response actions. When the NRT is activated for response action, the chairman shall be the representative of the Federal lead agency.

(3) While the NRT desires to achieve a consensus on all matters brought before it, certain matters may prove unresolvable by this means. In such cases, each cabinet, department or agency serving as a participating agency on the NRT may be accorded one vote in NRT proceedings.

(4) The NRT may establish such bylaws and committees as it deems appropriate to further the purposes for which it is established.

(5) When the NRT is not activated for a response action, it shall serve as a standing committee to evaluate methods of responding to discharges or releases, to recommend needed changes in the response organization and to recommend revisions to this Plan.

(6) The NRT may consider and make recommendations to appropriate agencies on the training, equipping and protection of response teams and necessary research, development, demonstration, and evaluation to improve response capabilities.

(7) Direct planning and preparedness responsibilities of the NRT include:

(i) Maintaining national readiness to respond to a major discharge of oil or release of a hazardous substance or pollutant or contaminant which is beyond regional capabilities;

(ii) Monitoring incoming reports from all RRTs and activating when necessary;

(iii) Reviewing regional responses to oil discharges and hazardous substance releases, including an evaluation of equipment readiness and coordination among responsible public agencies and private organizations; and

(iv) Developing procedures to ensure the coordination of Federal, State, and local governments and private response to oil discharges and releases of hazardous substances, pollutants or contaminants.

(8) The NRT may consider matters referred to it for settlement by an RRT.

(b) The RRT serves as the regional body for planning and preparedness actions before a response action is taken and for coordination and advice during such action. The RRT consists

of regional representatives of the participating agencies and representatives of State governments (and local governments as agreed upon with States).

(1) Except when the RRT is activated for a removal incident, the representatives of EPA and USCG shall act as co-chairmen.

(2) Each participating agency should designate one member and at least one alternate member to the RRT. Participating States may also designate one member and at least one alternate member to the Team. All agencies and States may also provide additional representatives as observers to meetings of the RRT.

(3) RRT members should designate representatives from their agencies to work with OSCs in developing Federal local contingency plans, providing for the use of agency resources, and in responding to discharges and releases (see § 300.43).

(4) Federal regional and Federal local plans should adequately provide the OSC with assistance from the Federal agencies commensurate with agencies' resources, capabilities, and responsibilities 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 as specified in the Federal regional and Federal local contingency plans.

(5) Affected States are encouraged to participate actively in all RRT activities (see § 300.24(a)), to designate representatives to work with the RRT and OSCs in developing Federal regional and Federal local plans, to plan for and make available State resources, and to serve as the contact point for coordination of response with local government agencies whether or not represented on the RRT.

(6) The RRT serves as a standing committee to recommend changes in the regional response organization as needed, to revise the regional plan as needed, and to evaluate the preparedness of the agencies and the effectiveness of local plans for the Federal response to discharges and releases. The RRT should:

(i) Make continuing review of regional and local responses to discharges or releases, considering available legal remedies, equipment readiness and coordination among responsible public agencies and private organizations.

(ii) Based on observations of response operations, recommend revisions of the National Contingency Plan to the NRT.

(iii) Consider and recommend necessary changes based on continuing review of response actions in the region.

(iv) Review OSC actions to help ensure that Federal regional and Federal local contingency plans are developed satisfactorily.

(v) Be prepared to respond to major discharges or releases outside the region.

(vi) Meet at least semi-annually to review response actions carried out during the preceding period, and consider changes in Federal regional and Federal local contingency plans.

(vii) Provide letter reports on their activities to the NRT twice a year, no later than January 31 and July 31. At a minimum, reports should summarize recent activities, organizational changes, operational concerns, and efforts to improve State and local conditions.

(c) The OSC is responsible for developing any Federal local contingency plans for the Federal response in the area of the OSC's responsibility. This may be accomplished in cooperation with the RRT and designated State and local representatives (see § 300.43). Boundaries for Federal local contingency plans shall coincide with those agreed upon between EPA, DOD and the USCG (subject to Executive Order 12316) to determine OSC areas of responsibility and should be clearly indicated in the regional contingency plan. Where practicable, consideration should be given to jurisdictional boundaries established by State and local plans.

(d) Scientific support for the development of regional and local plans is organized by appropriate agencies to provide special expertise and assistance. Generally, the Scientific Support Coordinator (SSC) for plans encompassing the coastal area will be provided by NOAA, and the SSC for the inland area will be provided by EPA or DOI. This delineation of responsibility may be modified within a region by agreement between DOC, DOI, and EPA representatives to the RRT. SSCs may be obtained from other agencies if determined to be appropriate by the RRT.

§ 300.33 Response operations.

(a) EPA and USCG shall designate OSCs for all areas in each region provided, however, that DOD shall designate OSCs for releases from DOD facilities and vessels. DOD will be the immediate removal response authority with respect to incidents involving DOD military weapons and munitions. Immediate removal actions involving nuclear weapons should be conducted in accordance with the joint Department of Defense, Department of Energy, and Federal Emergency Management Agency Agreement for Response to Nuclear Incidents and Nuclear Weapons Significant Incidents, of January 8, 1981. The USCG will furnish or provide OSCs for oil discharges and for the immediate removal of hazardous substances, pollutants, or contaminants into or threatening the coastal zone except that the USCG will not provide predesignated OSCs for discharges and releases from hazardous waste management facilities or in similarly chronic incidents. EPA shall furnish or provide OSCs for oil discharges and hazardous substance releases into or threatening the inland zone and, unless otherwise agreed, for all planned removals and remedial actions.

(b) The OSC directs Federal Fund-financed response efforts and coordinates all other Federal efforts at the scene of a discharge or release subject to Executive Order 12316. As part of the planning and preparation for response, the OSCs shall be predesignated by the regional or district head of the lead agency.

(1) The first official from an agency with responsibility under this plan to arrive at the scene of the discharge or release should coordinate activities under this Plan until the OSC arrives.

(2) The OSC shall, to the extent practicable under the circumstances, collect pertinent facts about the discharge or release, such as its source and cause; the existence of potentially responsible parties; the nature, amount, and location of discharged or released materials; the probable direction and time of travel of discharged or released materials; the pathways to human exposure; potential impact on human health, welfare and safety; the potential impact on natural resources and property which may be affected; priorities for protecting human health, welfare and the environment; and appropriate cost documentation.

(3) The OSC shall direct response operations (see Subparts E and F for descriptive details). The OSC's effort shall be coordinated with other appropriate Federal, State, local and private response agencies.

(4) The OSC shall consult regularly with the RRT in carrying out this Plan and will keep the RRT informed of activities under this Plan.

(5) The OSC shall advise the appropriate State agency (as agreed upon with each State) as promptly as possible of reported discharges and releases.

(6) The OSC shall evaluate incoming information and immediately advise FEMA of potential major disaster situations. In the event of a major disaster or emergency, under the Disaster Relief Act of 1974 (Pub. L. 93-288), the OSC will coordinate any response activities with the Federal Coordinating Officer designated by the President. In addition, the OSC should notify FEMA of situations potentially requiring evacuation, temporary housing, and permanent relocation.

(7) In those instances where a possible public health emergency exists, the OSC should notify the HHS representative to the RRT. Throughout response actions, the OSC may call upon the HHS representative for assistance in determining public health threats and for advice on worker health and safety problems.

(8) All Federal agencies should plan for emergencies and develop procedures for dealing with oil discharges and releases of hazardous substances (designated under section 311(b)(2) of the CWA) from vessels and facilities under their jurisdiction. All Federal agencies, therefore, are responsible for designating the offices that can coordinate response to such incidents in

ccordance with this Plan and applicable Federal regulations and guidelines. f, in the opinion of the OSC, the responsible Federal agency does not act romptly or take appropriate action to espond to a discharge or release aused by a facility or vessels under its urisdiction, the OSC in charge of area here the discharge or release occurs ay conduct appropriate response activities. With respect to discharges or eleases from Department of Defense DOD) facilities and vessels, the OSC hall be furnished by the DOD.

(9) The OSC should advise the affected land managing agency and rustees of natural resources, as romptly as possible, of releases and ischarges affecting Federal resources nder its jurisdiction.

(10) The OSC is responsible for addressing worker health and safety conerns at a response scene, in accordnce with §§ 300.57 and 300.71 of this lan.

(11) The OSC shall submit pollution eports to the RRC and appropriate gencies as significant developments ccur during removal actions.

300.34 Special forces and teams.

(a) The National Strike Force (NSF) onsists of the Strike Teams established by the USCG on the Atlantic, acific and Gulf coasts and includes mergency task forces to provide assistance to the OSC.

(1) The Strike Teams can provide ommunication support, advice and assistance for oil and hazardous substances removal. These teams also ave knowledge of ship salvage, amage control, and diving. Additionally, they are equipped with specialzed containment and removal equipnent, and have rapid transportation vailable. When possible, the Strike eams will train the emergency task orces and assist in the development of egional and local contingency plans.

(2) The OSC may request assistance rom the Strike Teams. Requests for a eam may be made directly to the ommanding Officer of the appropriate team, the USCG member of the RRT, the appropriate USCG Area ommander, or the Commandant of he USCG through the NRC.

(b) Each USCG OSC manages emergency task forces trained to evaluate, monitor, and supervise pollution responses. Additionally, they have limited "initial aid" response capability to deploy equipment prior to the arrival of a clean-up contractor, or other response personnel.

(c)(1) The Emergency Response Team (ERT) is established by EPA in accordance with its disaster and emergency responsibilities. The ERT includes expertise in biology, chemistry, hydrology, geology and engineering.

(2) It can provide access to special de-contamination equipment for chemical releases and advice to the OSC in hazard evaluation; risk assessment; multimedia sampling and analysis program; on-site safety, including development and implementation plans; clean-up techniques and priorities; water supply de-contamination and protection; application of dispersants; environmental assessment; degree of clean-up required; and disposal of contaminated material.

(3) The ERT also provides both introductory and intermediate level training courses to prepare response personnel.

(4) OSC or RRT requests for ERT support should be made to the EPA representative on the RRT; the EPA Headquarters, Director, Office of Emergency and Remedial Response; or the appropriate EPA regional emergency coordinator.

(d) When requested by the OSC, the SSC shall serve as a member of the OSC's staff and assist the OSC in fulfilling responsibilities in support of response actions. The extent and nature of SSC involvement in the operational mode shall be determined by the OSC. The SSC may:

(1) Coordinate response from the scientific community to OSC requests for assistance and to requests from the OSC, as appropriate, for performance of environmental assessment.

(2) Serve as the principal liaison for scientific advice from the scientific community to the OSC. The SSC shall ensure that differing scientific views within the scientific community are communicated to the OSC in a timely manner.

(3) The SSC will assist in responding to requests for assistance from State and Federal agencies regarding scientific studies and environmental assessments. Details on provision of access to scientific support shall be included in regional contingency plans.

(e) The USCG Public Information Assist Team (PIAT) and the EPA Public Affairs Assist Team (PAAT) may help OSCs and regional or district offices meet the demands for public information and participation during major responses. Requests for these teams may be made through the NRC.

(f)(1) The RRT should be activated by the Chairman as an emergency response team when a discharge or release:

(i) Exceeds the response capability available to the OSC in the place where it occurs;

(ii) Transects regional boundaries; or

(iii) May pose a substantial threat to the public health, welfare or to the environment, or to regionally significant amounts of property. Regional contingency plans shall specify detailed criteria for activation of RRTs.

(2) When the RRT is activated for an immediate removal action, the chairman shall be the representative of the lead agency. When the RRT is activated for a Fund-financed planned removal or remedial action, the chairman shall be the representative of EPA.

(3) The RRT may be activated during any pollution emergency by a request from any RRT representative to the chairman of the Team. Request for RRT activation shall later be confirmed in writing. Each representative, or an appropriate alternate, should be notified immediately when the RRT is activated.

(4) During prolonged removal or remedial action, the RRT may not need to be activated or may need to be activated only in a limited sense, or have available only those members of the RRT who are directly affected or can provide direct response assistance.

(5) When the RRT is activated for a discharge or release, agency representatives shall meet at the call of the chairman and may:

(i) Monitor and evaluate reports from the OSC. The RRT may advise the OSC on the duration and extent of Federal response and may recommend to the OSC specific actions to respond to the discharge or release.

(ii) 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.

(iii) Help the OSC prepare information releases for the public and for communication with the NRT.

(iv) If the circumstances warrant, advise the regional or district head of the agency providing the OSC that a different OSC should be designated.

(v) Submit Pollution Reports (POLREPS) to the NRC as significant developments occur.

(6) When the RRT is activated, affected States may participate in all RRT deliberations. State government representatives participating in the RRT have the same status as any Federal member of the RRT.

(7) The RRT can be deactivated by agreement between the EPA and USCG team members. The time of deactivation should be included in the POLREPS.

(g) The NRT should be activated as an emergency response team when an oil discharge or hazardous substance release:

(1) Exceeds the response capability of the region in which it occurs;

(2) Transects regional boundaries;

(3) Involves significant population hazards or national policy issues, substantial amounts of property, or substantial threats to natural resources; or

(4) Is requested by any NRT member.

(h) When activated for a response action, the NRT shall meet at the call of the chairman and may:

(1) Monitor and evaluate reports from the OSC. The NRT may recommend to the OSC, through the RRT, actions to combat the discharge or release.

(2) Request other Federal, State and local governments, or private agencies, to provide resources under their existing authorities to combat a discharge

release or to monitor response operations.

3) Coordinate the supply of equipment, personnel, or technical advice to the affected region from other regions districts.

300.35 Multi-regional responses.

a) If a discharge or release moves from the area covered by one Federal or Federal regional contingency plan into another area, the authority for removal or response actions should likewise shift. If a discharge or release is a substantial threat of discharge or release affects areas covered by two or more regional plans, the response mechanisms of both may be activated. In this case, removal or response actions of all regions concerned shall be fully coordinated as detailed in the regional plans.

b) There shall be only one OSC at any time during the course of a response operation. Should a discharge or release affect two or more areas, the EPA, DOD and USCG, as appropriate, shall give prime consideration to the area vulnerable to the greatest damage. The RRT shall designate the OSC if EPA, DOD and USCG members 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.

c) Where the USCG has provided the OSC for emergency response to a release from hazardous waste management facilities located in the coastal zone, the responsibility for response action shall shift to EPA, in accordance with EPA/USCG agreements.

300.36 Communications.

a) The NRC is the national communications center for activities related to response actions. It is located at USCG Headquarters in Washington, D.C. The NRC receives and relays notices of discharges or releases to the appropriate OSC, disseminates OSC and RRT reports to the NRT when appropriate, and provides facilities for the NRT to use in coordinating a national response action when required.

b) The Commandant, USCG, will provide the necessary communications, plotting facilities, and equipment for the NRC.

(c) Notice of an oil discharge or a release of a hazardous substance in an amount equal to or greater than the reportable quantity must be made immediately in accordance with 33 CFR Part 153, Subpart B and section 103(a) of CERCLA, respectively. Notification shall be made to the NRC Duty Officer, HQ USCG, Washington, D.C. telephone (800) 424-8802 (or current local telephone number). All notices of discharges or releases received at the NRC shall be relayed immediately by telephone to the OSC and State.

(d) The RRC provides facilities and personnel for communications, information storage, and other requirements for coordinating response. Each regional plan will specify the location for the RRC.

§ 300.37 Response equipment.

The Spill Cleanup Inventory (SKIM) system is available to help OSCs and RRTs and private parties gain rapid information as to the location of response and support equipment. This inventory is accessible through the NRC and USCG's OSCs. The inventory includes private and commercial equipment, as well as government resources. The RRTs and OSCs shall ensure that data in the system are current and accurate. The USCG is responsible for maintaining and updating the system with RRT and OSC input.

Subpart D—Plans

§ 300.41 Regional and local plans.

(a) In addition to the National Contingency Plan (NCP), a Federal regional plan shall be developed for each standard Federal region and, where practicable, a Federal local plan shall be developed.

(b) These plans will be available for inspection at EPA regional offices or USCG district offices. Addresses and telephone numbers for these offices may be found in the United States Government Manual (issued annually) or in local telephone directories.

§ 300.42 Regional contingency plans.

(a) The RRTs, working with the States, shall develop Federal regional plans for each standard Federal region. The purpose of these plans is coordination of a timely, effective response by various Federal agencies and other organizations to discharges of oil and releases of hazardous substances, pollutants and contaminants in order to protect public health, welfare and the environment. Regional contingency plans should include information on all useful facilities and resources in the region, from government, commercial, academic and other sources. To the greatest extent possible, regional plans will follow the format of the National Contingency Plan.

(b) SSCs shall organize and coordinate the contributions of scientists of each region to the response activities of the OSC and RRT to the greatest extent possible. SSCs, with advice from RRT members, shall also develop the parts of the regional plan that relate to scientific support.

(c) Regional plans shall contain lines of demarcation between the inland and coastal zones, as mutually agreed upon by USCG and EPA.

§ 300.43 Local contingency plans.

(a) Each OSC shall maintain a Federal local plan for response in his or her area of responsibility, where practicable. In areas in which the USCG provides the OSC, such plans shall be developed in all cases. The plan should provide for a well-coordinated response that is integrated and compatible with the pollution response, fire, emergency and disaster plansof local, State and other non-Federal entities. The plan should identify the probable locations of discharges or releases, the available resources to respond to multi-media incidents, where such resources can be obtained, waste disposal methods and facilities consistent with local and State plans developed under the Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.), and a local structure for responding to discharges or releases.

(b) While the OSC is responsible for developing Federal local plans, a successful planning effort will depend upon the full cooperation of all the agencies' representatives and the development of local capabilities to respond to discharges or releases. Particular attention should be given, during the planning process, to developing a multi-agency local response team for coordinating on-scene efforts. The RRT should ensure proper liaison between the OSC and local representatives.

Subpart E—Operational Response Phases for Oil Removal

§ 300.51 Phase I—Discovery and notification.

(a) A discharge of oil may be discovered through:

(1) A report submitted by the person in charge of the vessel or facility in accordance with statutory requirements;

(2) Deliberate search by patrols; and

(3) Random or incidental observation by government agencies or the public.

(b) Reports of discharges should be made to the NRC or the nearest USCG or EPA office. All reports shall be promptly relayed to the NRC if not previously reported to the responsible OSC. Federal regional and Federal local plans shall provide for prompt reporting to the NRC, RRC, and appropriate State agency (as agreed upon with the State).

(c) Upon receipt of a notification of discharge, the NRC shall promptly notify the OSC. The OSC shall proceed with the following phases as outlined in Federal regional and Federal local plans.

§ 300.52 Phase II—Preliminary assessment and initiation of action.

(a) The OSC for a particular area is responsible for promptly initiating preliminary assessment.

(b) The preliminary assessment shall be conducted using available information, supplemented where necessary and possible by an on-scene inspection. The OSC shall undertake actions to:

(1) Evaluate the magnitude and severity of the discharge or threat to public health and welfare and the environment;

(2) Assess the feasibility of removal;

(3) Determine the existence of potential responsible parties; and

(4) Ensure that jurisdiction exists or undertaking additional response ctions.

(c) The OSC, in consultation with egal authorities when appropriate, hall make a reasonable effort to have he discharger voluntarily and romptly perform removal actions. he OSC shall ensure adequate surveillance over whatever actions are initiated. If effective actions are not eing taken to eliminate the threat, or removal is not being properly done, he OSC shall so advise the responsible party. If the responsible party does ot take proper removal actions, or is nknown, or is otherwise unavailable, he OSC shall, pursuant to section 11(c)(1) of the CWA, determine hether authority for a Federal response exists, and, if so, take appropriate response actions. Where practicable, continuing efforts should be made o encourage response by responsible arties.

(d) The OSC should ensure that the rustees of affected natural resources re notified, in order that the trustees ay initiate appropriate actions when atural resources have been or are kely to be damaged (see Subpart G).

300.53 Phase III—Containment, countermeasures, clean-up, and disposal.

(a) Defensive actions should begin as on as possible to prevent, minimize, r mitigate damage to the public ealth or welfare or the environment. ctions may include: analyzing water mples to determine the source and read of the oil; controlling the urce of discharge; measuring and mpling; damage control or salvage perations; placement of physical barers to deter the spread of the oil or protect endangered species; control f the water discharged from upream impoundment; and the use of hemicals and other materials in accordance with Subpart H, to restrain he spread of the oil and mitigate its ffects.

(b) Appropriate actions should be ken to recover the oil or mitigate its ffects. Of the numerous chemical hysical methods that may be used, he chosen methods should be the most consistent with protecting the public health and welfare and the environment. Sinking agents shall not be used.

(c) Oil and contaminated materials recovered in clean-up operations shall be disposed of in accordance with Federal regional and Federal local contingency plans.

§ 300.54 Phase IV—Documentation and cost recovery.

(a) Documentation shall be collected and maintained to support all actions taken under the CWA and to form the basis for cost recovery. In general, documentation should be sufficient to prove the source and circumstances of the incident, the responsible party or parties, and impact and potential impacts to the public health and welfare and the environment. When appropriate, documentation should also be collected for scientific understanding of the environment and for the research and development of improved response methods and technology. Damages to private citizens (including loss of earnings) are not addressed by this Plan. Evidentiary and cost documentation procedures and requirements are specified in the USCG Marine Safety Manual (Commandant Instruction M16000.3) and 33 CFR Part 153.

(b) The OSC shall ensure the necessary collection and safeguarding of information, samples, and reports. Samples and information must be gathered expeditiously during the response to ensure an accurate record of the impacts incurred. Documentation materials shall be made available to the trustees of affected natural resources where practicable.

(c) Information and reports obtained by the EPA or USCG OSC shall be transmitted to the appropriate offices responsible for follow-up actions.

§ 300.55 General pattern of response.

(a) When the OSC receives a report of a discharge, actions normally should be taken in the following sequence:

(1) Immediately notify the RRT and NRC when the reported discharge is an actual or potential major discharge.

(2) Investigate the report to determine pertinent information such as the threat posed to public health or welfare, or the environment, the type and quantity of polluting material, and the source of the discharge.

(3) Officially classify the size of the discharge and determine the course of action to be followed.

(4) Determine whether a discharger or other person is properly carrying out removal. Removal is being done properly when:

(i) The clean-up is fully sufficient to minimize or mitigate damage to the public welfare (removal efforts are "improper" to the extent that Federal efforts are necessary to prevent further damage).

(ii) The removal efforts are in accordance with applicable regulations and guidelines, including this Plan.

(5) Determine whether a State or political subdivision has the capability to carry out response actions and a contract or cooperative agreement has been established with the appropriate fund administrator for this purpose.

(6) Notify the RRT (including the affected State), SSC, and the trustees of affected natural resources in accordance with the applicable regional plan.

(b) The preliminary inquiry will probably show that the situation falls into one of five classes. These classes and the appropriate response to each are outlined below:

(1) If the investigation shows that no discharge exists, the case shall be considered a false alarm and should be closed.

(2) If the investigation shows a minor discharge with the responsible party taking proper removal action, contact should be established with the party. The removal action should be monitored to ensure continued proper action.

(3) If the investigation shows a minor discharge with improper removal action being taken, the following measures shall be taken:

(i) An immediate effort should be made to stop further pollution.

(ii) The responsible party shall be advised of what action will be so considered appropriate.

(iii) If the responsible party does not properly respond, he shall be notified of his potential liability for Federal response performed under the CWA. This liability includes all costs of removal and may include the costs of assessing and restoring damaged natural resources and other actual or necessary costs of a Federal response.

(iv) The OSC shall notify appropriate State and local officials, keep the RRT advised and initiate Phase III operations as conditions warrant.

(v) Information shall be collected for possible recovery of response costs in accordance with § 300.54.

(4) When the investigation shows that an actual or potential medium oil discharge exists, the OSC shall follow the same general procedures as for a minor discharge. If appropriate, the OSC shall recommend activation of the RRT.

(5) When the investigation shows an actual or potential major oil discharge, the OSC shall follow the same procedures as for minor and medium discharges.

§ 300.56 Pollution reports.

(a) Within 60 days after the conclusion of a major discharge or when requested by the RRT, the EPA or USCG OSC shall submit to the RRT a complete report on the response operation and the actions taken. The OSC shall at the same time send a copy of the report to the NRT. The RRT shall review the OSC's report and prepare an endorsement to the NRT for review. This shall be accomplished within 30 days after the report has been received.

(b) The OSC's report shall accurately record the situation as it developed, the actions taken, the resources committed and the problems encountered. The OSC's recommendations are a source for new procedures and policy.

(c) The format for the OSC's report shall be as follows:

(1) Summary of Events—A chronological narrative of all events, including:

(i) The cause of the discharge;

(ii) The initial situation;

(iii) Efforts to obtain response by responsible parties;

(iv) The organization of the response;
(v) The resources committed;
(vi) The location (water body, State, city, latitude and longitude) of the oil discharge and an indication of whether the discharge was in connection with activities regulated under the Outer Continental Shelf Lands Act (OCSLA), the Trans-Alaska Pipeline Authority Act or Deepwater Port Act;
(vii) Whether it might have or actually did affect natural resources managed or protected by the U.S.;
(vii) Comments on Federal or State efforts to replace or restore damaged natural resources and damage assessment activities; and
(viii) Details of any threat abatement actions taken under section 311 (c) or (d) of the CWA.
(2) Effectiveness of Removal Actions—A candid and thorough analysis of the effectiveness of removal actions taken by:
(i) The responsible party;
(ii) State and local forces;
(iii) Federal agencies and special forces; and
(iv) (If applicable) contractors, private groups and volunteers.
(3) Problems Encountered—A list of problems affecting response with particular attention to problems of intergovernmental coordination.
(4) Recommendations—OSC recommendations, including at a minimum:
(i) Means to prevent a recurrence of the discharge;
(ii) Improvement of response actions;
(iii) Any recommended changes in the National Contingency Plan or Federal regional plan.

300.57 Special considerations.

(a) *Safety of Personnel.* The OSC should be aware of threats to human health and safety and shall ensure that persons entering the response area use proper precautions, procedures, and equipment and that they possess proper training. Federal local plans shall identify sources of information on anticipated hazards, precautions, and requirements to protect personnel during response operations. Names and phone numbers of people with relevant information shall be included. Responsibility for the safety of all Federal employees rests with the heads of their agencies. Accordingly, each Federal employee on the scene must be apprised of and conform with OSHA regulations and other deemed necessary by the OSC. All private contractors who are working on-site must conform to applicable provisions of the Occupational Safety and Health Act and standards deemed necessary by the OSC.

(b) *Waterfowl Conservation.* The DOI representative and the State liaison to the RRT shall arrange for the coordination of professional and volunteer groups permitted and trained to participate in waterfowl dispersal, collection, cleaning, rehabilitation and recovery activities (consistent with 16 U.S.C. 703-712 and applicable State laws). Federal regional and Federal local plans will, to the extent practicable, identify organizations or institutions that are permitted to participate in such activities and operate such facilities. Waterfowl conservation activities will normally be included in Phase III response actions (§ 300.53 of this subpart).

§ 300.58 Funding.

(a) If the person responsible for the discharge does not act promptly or take proper removal actions, or if the person responsible for the discharge is unknown, Federal discharge removal actions may begin under section 311(c)(1) of the CWA. The discharger, if known, is liable for the costs of Federal removal in accordance with section 311(f) of the CWA and other Federal laws.

(b) Actions undertaken by the participating agencies in response to pollution shall be carried out under existing programs and authorities when available. This Plan intends that Federal agencies will make resources available, expend funds, or participate in response to oil discharges under their existing authority. Authority to expend resources will be in accordance with agencies' basic statutes and, if required, through interagency agreements. Specific interagency reimbursement agreements may be signed when necessary to ensure that the Federal

resources will be available for a timely response to a discharge of oil. The ultimate decision as to the appropriateness of expending funds rests with the agency that is held accountable for such expenditures.

(c) The OSC shall exercise sufficient control over removal operations to be able to certify that reimbursement from the following funds is appropriate:

(1) The oil pollution fund, administered by the Commandant, USCG, has been established pursuant to section 311(k) of the CWA. Regulations governing the administration and use of the fund are contained in 33 CFR Part 153.

(2) The fund authorized by the Deepwater Port Act is administered by the Commandant, USCG. Governing regulations are contained in 33 CFR Parts 136 and 150.

(3) The fund authorized by the Outer Continental Shelf Lands Act, as amended, is administered by the Commandant, USCG. Governing regulations are contained in 33 CFR Parts 136 and 150.

(4) The fund authorized by the Trans-Alaska Pipeline Authorization Act is administered by a Board of Trustees under the purview of the Secretary of the Interior. Governing regulations are contained in 43 CFR Part 29.

(d) Response actions other than removal, such as scientific investigations not in support of removal actions or law enforcement, shall be provided by the agency with legal responsibility for those specific actions.

(e) The funding of a response to a discharge from a Federally operated or supervised facility or vessel is the responsibility of the operating or supervising agency.

(f) The following agencies have funds available for certain discharge removal actions:

(1) EPA may provide funds to begin timely discharge removal actions when the OSC is an EPA representative.

(2) The USCG pollution control efforts are funded under "operating expenses." These funds are used in accordance with agency directives.

(3) The Department of Defense has two specific sources of funds which may be applicable to an oil discharge under appropriate circumstances. (This does not consider military resources which might be made available under specific conditions.)

(i) Funds required for removal of a sunken vessel or similar obstruction of navigation are available to the Corps of Engineers through Civil Works Appropriations, Operations and Maintenance, General.

(ii) The U.S. Navy may conduct salvage operations contingent on defense operational commitments, when funded by the requesting agency. Such funding may be requested on a direct cite basis.

(4) Pursuant to section 311(c)(2)(H) of the CWA, the State or States affected by a discharge of oil, may act where necessary to remove such discharge and may, pursuant to 33 CFR Part 153, be reimbursed from the pollution revolving fund for the reasonable costs incurred in such a removal.

(i) Removal by a State is necessary within the meaning of section 311(c)(2)(H) of the CWA when the OSC determines that the owner or operator of the vessel, onshore facility, or offshore facility from which the discharge occurs does not effect removal properly, or is unknown, and that:

(A) State action is required to minimize or mitigate significant damage to the public health or welfare which Federal action cannot minimize or mitigate, or

(B) Removal or partial removal can be done by the State at a cost which is less than or not significantly greater than the cost which would be incurred by the Federal departments or agencies.

(ii) State removal actions must be in compliance with this Plan in order to qualify for reimbursement.

(iii) State removal actions are considered to be Phase III actions, under the same definitions applicable to Federal agencies.

(iv) Actions taken by local governments in support of Federal discharge removal operations are considered to be actions of the State for purposes of this section. Federal regional and Federal local plans shall show what funds and resources are available from par-

icipating agencies under various conditions and cost arrangements. Interagency agreements may be necessary o specify when reimbursement is required.

Subpart F—Hazardous Substance Response

§ 300.61 General.

(a) This subpart establishes methods nd criteria for determining the appropriate extent of response authorzed by CERCLA when any hazardous ubstance is released or there is a subtantial threat of such a release into he environment, or there is a release r substantial threat of a release into he environment of any pollutant or ontaminant which may present an mminent and substantial danger to he public health or welfare.

(b) Section 104(a)(1) of CERCLA authorizes removal or remedial action nless it is determined that such renoval or remedial action will be done roperly by the owner or operator of he vessel or facility from which the elease or threat of release emanates, r by any other responsible party.

(c) In determining the need for and n planning or undertaking Fund-fianced action, response personnel hould, to the extent practicable, conider the following:

(1) Encourage State participation in esponse actions (see § 300.63).

(2) Conserve Fund monies by enouraging private party clean-up.

(3) Be sensitive to local community oncerns (in accordance with applicale guidance).

(4) Rely on established technology hen feasible and cost-effective.

(5) Encourage the participation and haring of technology by industry and ther experts.

300.62 State role.

(a) States are encouraged to undertake actions authorized under this ubpart. Section 104(d)(1) of CERCLA uthorizes EPA to enter into contracts r cooperative agreements with the tate to take response actions authorzed under CERCLA, when EPA determines that the State has the capability to undertake such actions.

(b) EPA will provide assistance from the Fund to States pursuant to a contract or cooperative agreement. The agreement can authorize States to undertake most actions specified in this Subpart.

(c)(1) Pursuant to section 104(c)(3) of CERCLA, before any Fund-financed remedial action may be taken, the affected State(s) must enter into a contract or cooperative agreement with the Federal government.

(2) Included in such contract or cooperative agreement must be assurances by the State consistent with requirements of section 104(c)(3) of CERCLA.

(d) Prior to remedial design activity, the State must make a firm commitment, through either a cooperative agreement or a new or amended State contract, to provide funding for remedial implementation by:

(1) Authorizing the reduction of a State credit to cover its share of costs;

(2) Identifying currently available funds earmarked for remedial implementation; or

(3) Submitting a plan with milestones for obtaining necessary funds.

(e) State credits allowed under section 104(c)(3) of CERCLA must be documented on a site-specific basis for State out-of pocket, non-Federal eligible response costs between January 1, 1978, and December 11, 1980. Prior to remedial investigation activity at a site, the State must submit its estimate of these costs as a part of the pre-application package when a cooperative agreement is used, or as a part of the State contract. State credits will be applied against State cost shares for Federally-funded remedial actions. A State cannot be reimbursed from the Fund for credit in excess of its matching share.

(f) Pursuant to section 104(c)(2) of CERCLA, prior to determining any appropriate remedial action, EPA shall consult with the affected State or States.

§ 300.63 Phase I—Discovery and notification.

(a) A release may be discovered through:

(1) Notification in accordance with sections 103(a) or (c) of CERCLA;

(2) Investigation by government authorities conducted in accordance with section 104(e) of CERCLA or other statutory authority;

(3) Notification of a release by a Federal or State permit holder when required by its permit;

(4) Inventory efforts or random or incidental observation by government agencies or the public;

(5) Other sources.

(b) If not reported previously, a release should be promptly reported to the NRC. Section 103(a) of CERCLA requires any person in charge of a vessel or facility to immediately notify the NRC as soon as he has knowledge of a release (other than a federally permitted release) of a hazardous substance from such vessel or facility in an amount equal to or greater than the reportable quantity determined pursuant to section 102(b) of CERCLA. The NRC shall convey the notification expeditiously to appropriate government agencies, and in the case of notices received pursuant to section 103(a), the NRC shall also notify the Governor of any affected State.

(c) Upon receipt of a notification of a release, the NRC shall promptly notify the appropriate OSC.

§ 300.64 Phase II—Preliminary assessment.

(a) A preliminary assessment of a release identified for possible CERCLA response should be undertaken by the lead agency. If the reported release potentially requires immediate removal, the preliminary assessment should be done as promptly as possible. Other releases shall be assessed as soon as practicable. The lead agency should base its assessment on readily available information. This assessment may include:

(1) Evaluation of the magnitude of the hazard;

(2) Identification of the source and nature of the release;

(3) Determination of the existence of a non-Federal party or parties ready, willing, and able to undertake a proper response; and

(4) Evaluation of factors necessar to make the determination of whethe immediate removal is necessary.

(b) A preliminary assessment of re leases from hazardous waste manage ment facilities may include collectio or review of data such as site manage ment practices, information from gen erators, photographs, analysis of his torical photographs, literatur searches, and personal interviews con ducted as appropriate. In addition, perimeter (off-site) inspection may b necessary to determine the potentia for a release. Finally, if more informa tion is needed, a site visit may be per formed, if conditions are such that i may be performed safely.

(c) A preliminary assessment shoul be terminated when the OSC deter mines:

(1) There is no release;

(2) The source is neither a vessel no a facility;

(3) The release involves neither hazardous substance, nor a pollutan or contaminant that may pose an im minent and substantial danger t public health or welfare;

(4) The amount released does no warrant Federal response;

(5) A party responsible for the re lease, or any other person, is providing appropriate response, and on-scene monitoring by the government is not recommended or approved by the lead agency; or

(6) The assessment is completed.

§ 300.65 Phase III—Immediate removal.

(a) In determining the appropriate extent of action to be taken at a given release, the lead agency shall first review the preliminary assessment to determine if immediate removal action is appropriate. Immediate removal action shall be deemed appropriate in those cases in which the lead agency determines that the initiation of immediate removal action will prevent or mitigate immediate and significant risk of harm to human life or health or to the environment from such situations as:

(1) Human, animal, or food chain exposure to acutely toxic substances;

(2) Contamination of a drinking water supply;

(3) Fire and/or explosion; or
(4) Similarly acute situations.
(b) If the lead agency determines hat immediate removal is appropriate, defensive actions should begin as on as possible to prevent or mitigate anger to the public health, welfare, r the environment. Actions may include, but are not limited to:
(1) Collecting and analyzing samples o determine the source and dispersion f the hazardous substance and documenting those samples for possible videntiary use.
(2) Providing alternative water supplies.
(3) Installing security fencing or ther measures to limit access.
(4) Controlling the source of release.
(5) Measuring and sampling.
(6) Moving hazardous substances offte for storage, destruction, treatent, or disposal provided that the bstances are moved to a facility that in compliance with subtitle C of the olid Waste Disposal Act, as amended y the Resource Conservation and Reovery Act.
(7) Placing physical barriers to deter ie spread of the release.
(8) Controlling the water discharge om an upstream impoundment.
(9) Recommending to appropriate uthorities the evacuation of threatned individuals.
(10) Using chemicals and other maerials in accordance with Subpart H o restrain the spread of the substance nd to mitigate its effects.
(11) Executing damage control or alvage operations.
(c) Immediate removal actions are omplete when, in the opinion of the ead agency, the criteria in paragraph a) of § 300.65 are no longer met and ny contaminated waste materials ansported off-site have been treated r disposed of properly.
(d) Immediate removal action shall e terminated after $1 million has een obligated for the action or six onths have elapsed from the date of itial response to a release or threatned release unless it is determined at:
(1) Continued response actions are nmediately required to prevent, limit r mitigate an emergency;
(2) There is an immediate risk to public health or welfare or the environment; and
(3) Such assistance will not otherwise be provided on a timely basis.
(e) If the lead agency determines that the release still may require planned removal or remedial action, the lead agency or a State may initiate, either simultaneously or sequentially, Phase IV or V as appropriate.

§ 300.66 Phase IV—Evaluation and determination of appropriate response—planned removal and remedial action.

(a) The purpose of this phase is to determine the appropriate action when the preliminary assessment indicates that further response may be necessary or when the OSC requests and the lead agency concurs that further response should follow an immediate removal action.
(b) As soon as practicable, an inspection will be undertaken to assess the nature and extent of the release and to assist in determining its priority for Fund-financed response.
(c)(1) Pursuant to section 104 (b) and (e) of CERCLA, the responsible official may undertake investigations, monitoring, surveys, testing and other information gathering as appropriate. These efforts shall be undertaken jointly by the Federal or State officials responsible for providing Fund-financed response and those responsible for enforcing legal requirements.
(2) A major objective of an inspection is to determine if there is any immediate danger to persons living or working near the facility. In general, the collection of samples should be minimized during inspection activities; however, situations in which there is an apparent risk to the public should be treated as exceptions to that practice. Examples of apparent risk include use of nearby wells for drinking water, citizen complaints of unusual taste or odor in drinking water, or chemical odors or unusual health problems in the vicinity of the release. Under those circumstances, a sampling protocol should be developed for the inspection to allow for the earliest possible detection of any human exposure

to hazardous substances. The site inspection may also address:
(i) Determining the need for immediate removal action;
(ii) Assessing amounts, types and location of hazardous substances stored;
(iii) Assessing potential for substances to migrate from areas where they were originally located;
(iv) Determining or documenting immediate threats to the public or environment.
(d) *Methods for Establishing Priorities.* (1) States that wish to submit candidates for the National Priorities List must use the Hazard Ranking System (included in Appendix A) to rank the releases.
(2) EPA will notify States at least thirty days prior to the deadline for submitting candidate releases for the National Priorities List or any subsequent revisions.
(3) Each State may designate a facility as the State's highest priority release by certifying, in writing signed by the Governor or the Governor's designee, that the facility presents the greatest danger to public health, welfare or the environment among known facilities in the State.
(e) *National Priorities List.* (1) Compiling the National Priorities List—EPA Regional Office will review State hazard rankings to ensure uniform application of the Hazard Ranking System and may add, in consultation with the States, any additional priority releases known to EPA. The States' priorities will be reviewed and consolidated by EPA Headquarters into a National Priorities List pursuant to section 105(8) of CERCLA. To the extent practicable, each State's designated top priority facility will be included among the one hundred highest priority facilities.
(2) No facilities presently owned by the Federal Government will be included on the National Priorities List.
(3) EPA will submit the recommended National Priorities List to the NRT for review and comment.
(4) EPA will publish a proposed National Priorities List for public comment.
(5) The National Priorities List is presented in Appendix B.
(6) Ranking of Releases—Similar hazard ranking scores assigned to releases cannot accurately differentiate among risks represented by the releases. Thus, in order to avoid misleading the public that real differences in risk exist, similar scores may be grouped on the National Priorities List.
(7) EPA will revise and publish the National Priorities List at least once annually. In addition, revisions will give notice of the deletion (if any) of releases previously listed.

§ 300.67 Phase V—Planned removal.

(a) Planned removal may be undertaken pursuant to a contract or cooperative agreement when the lead agency determines that:
(1) There would be a substantial cost savings by continuing a response action with the equipment and resources mobilized for an immediate removal action taken pursuant to § 300.64, but terminate pursuant to § 300.64(c); or
(2) The public and/or environment will be at risk from exposure to hazardous substances if response is delayed at a release not on the National Priorities List.
(b) Planned removal must be requested by the Governor of the affected State or his designee. Requests must include:
(1) A description of the nature and extent of the release;
(2) A description of actions taken or underway at the site;
(3) A description of the proposed planned removal; and
(4) Assurances that the State will pay at least 10 percent of the costs of the action, including all future maintenance, or at least 50 percent or such greater amount as EPA may determine appropriate, taking into account the degree of responsibility of the State or political subdivision, of any sums expended in response to a release at a facility that was owned at the time of any disposal of hazardous substances therein by the State or a political subdivision thereof.
(c) Among the factors that EPA will use to determine whether a planned

removal is appropriate under § 300.67(a)(2) are the following:

(1) Actual or potential direct contact with hazardous substances by nearby population;

(2) Contaminated drinking water at the tap;

(3) Hazardous substances in drums, barrels, tanks, or other bulk storage containers, that are known to pose a serious threat to public health or the environment;

(4) Highly contaminated soils largely at or near surface, posing a serious threat to public health or the environment;

(5) Serious threat of fire or explosion; or

(6) Weather conditions that may cause substances to migrate and pose a serious threat to public health or the environment.

(d) Planned removal actions shall be terminated when the lead agency determines that the risk to the public health or the environment has been abated. In making this determination, the lead agency shall consider whether the factors listed in § 300.66(c) continue to apply to the release and whether any contaminated waste materials transported off-site have been treated or disposed of properly.

(e) Unless the EPA finds that (1) continued response actions are immediately required to prevent, limit or mitigate an emergency, (2) there is an immediate risk to public health or welfare or the environment, and (3) such assistance will not otherwise be provided on a timely basis, obligations from the Fund, other than those authorized by section 104(b) of CERCLA, shall not continue after $1 million has been obligated for response actions or six months has elapsed from the date of initial response to the release.

§ 300.68 Phase VI—Remedial action.

(a) Remedial actions taken pursuant to this section (other than responses at Federal facilities) are those responses to releases on the National Priorities List that are consistent with permanent remedy to prevent or mitigate the migration of a release of hazardous substances into the environment.

(b) States are encouraged to undertake Fund-financed remedial actions in accordance with § 300.62 of this Plan.

(c) As an alternative or in addition to Fund-financed remedial action, the lead agency may seek, through voluntary agreement or administrative or judicial process, to have those persons responsible for the release clean up in a manner that effectively mitigates and minimizes damage to, and provides adequate protection of, public health, welfare, and the environment. The lead agency shall evaluate the adequacy of clean-up proposals submitted by responsible parties or determine the level of clean-up to be sought through enforcement efforts, by consideration of the factors discussed in paragraphs (e) through (j) of this section. The lead agency will not, however, apply the cost balancing considerations discussed in paragraph (k) of this section to determine the appropriate extent of responsible party clean-up.

(d)(1) The lead agency, in cooperation with State(s), will examine available information and determine, based on the factors in paragraph (g) of this section, the type or types of remedial response that may be needed to remedy the release. This scoping will serve as the basis for requesting funding for a remedial investigation and feasibility study:

(i) In the case of initial remedial measures, a single request may be made by a State for funding the remedial investigation, feasibility study, design and implementation, in order that such measures may be expedited while continuing the remainder of the remedial planning process.

(ii) In the case of source control or off-site remedial action, the initial funding request should be for the remedial investigation and feasibility study. Requests for funding of design and implementation should be made after the completion of the feasibility study.

(2) As a remedial investigation progresses, the project may be modified if the lead agency determines that, based on the factors in § 300.68(e), such modifications would be appropriate.

(e) In determining the appropriate extent of remedial action, the following factors should be used to determine the type or types of remedial action that may be appropriate:

(1) In some instances, initial remedial measures can and should begin before final selection of an appropriate remedial action if such measures are determined to be feasible and necessary to limit exposure or threat of exposure to a significant health or environmental hazard and if such measures are cost-effective. Compliance with § 300.67(b) is a prerequisite to taking initial remedial measures. The following factors should be used in determining whether initial remedial measures are appropriate:

(i) Actual or potential direct contact with hazardous substances by nearby population. (Measures might include fences and other security precautions.)

(ii) Absence of an effective drainage control system (with an emphasis on run-on control). (Measures might include drainage ditches.)

(iii) Contaminated drinking water at the tap. (Measures might include the temporary provision of an alternative water supply.)

(iv) Hazardous substances in drums, barrels, tanks, or other bulk storage containers, above surface posing a serious threat to public health or the environment. (Measures might include transport of drums off-site.)

(v) Highly contaminated soils largely at or near surface, posing a serious threat to public health or the environment. (Measures might include temporary capping or removal of highly contaminated soils from drainage areas.)

(vi) Serious threat of fire or explosion or other serious threat to public health or the environment. (Measures might include security or drum removal.)

(vii) Weather conditions that may cause substances to migrate and to pose a serious threat to public health or the environment. (Measures might include stabilization of berms, dikes or impoundments.)

(2) Source control remedial actions may be appropriate if a substantial concentration of hazardous substances remain at or near the area where they were originally located and inadequate barriers exist to retard migration of substances into the environment. Source control remedial actions may not be appropriate if most substances have migrated from the area where originally located or if the lead agency determines that the substances are adequately contained. Source control remedial actions may include alternatives to contain the hazardous substances where they are located or eliminate potential contamination by transporting the hazardous substances to a new location. The following criteria should be assessed in determining whether and what type of source control remedial actions should be considered:

(i) The extent to which substances pose a danger to public health, welfare, or the environment. Factors which should be considered in assessing this danger include:

(A) Population at risk;

(B) Amount and form of the substance present;

(C) Hazardous properties of the substances;

(D) Hydrogeological factors (e.g. soil permeability depth to saturated zone, hydrologic gradients, proximity to a drinking water aquifer); and

(E) Climate (rainfall, etc.).

(ii) The extent to which substances have migrated or are contained by either natural or man-made barriers.

(iii) The experiences and approaches used in similar situations by State and Federal agencies and private parties.

(iv) Environmental effects and welfare concerns.

(3) In some situations it may be appropriate to take action (referred to as offsite remedial actions) to minimize and mitigate the migration of hazardous substances and the effects of such migration. These actions may be taken when the lead agency determines that source control remedial actions may not effectively mitigate and minimize the threat and there is a significant threat to public health, welfare, or the environment. These situations typically will result from contamination that has migrated beyond the area where the hazardous substances were originally located. Offsite measures may include provision of permanent alternative water supplies, management of

a drinking water aquifer plume or treatment of drinking water aquifers. The following criteria should be used in determining whether and what type of offsite remedial actions should be considered:

(i) Contribution of the contamination to an air, land or water pollution problem.

(ii) The extent to which the substances have migrated or are expected to migrate from the area of their original location and whether continued migration may pose a danger to public health, welfare or environment.

(iii) The extent to which natural or man-made barriers currently contain the hazardous substances and the adequacy of the barriers.

(iv) The factors listed in paragraph (e)(2)(i) of this section.

(v) The experiences and approaches used in similar situations by State and Federal agencies and private parties.

(iv) Environmental effects and welfare concerns.

(f) A remedial investigation should be undertaken by the lead agency (or responsible party if the responsible party will be developing a clean-up proposal) to determine the nature and extent of the problem presented by the release. This includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for and proposed extent of remedial action. During the remedial investigation, the original scoping of the project may be modified based on the factors in § 300.68(e). Part of the remedial investigation involves assessing whether the threat can be mitigated and minimized by controlling the source of the contamination at or near the area where the hazardous substances were originally located (source control remedial actions) or whether additional actions will be necessary because the hazardous substances have migrated from the area of their original location (offsite remedial actions).

(g) *Development of Alternatives.* A limited number of alternatives should be developed for either source control or offsite remedial actions (or both) depending upon the type of response that has been identified under paragraphs (e) and (f) of this section as being appropriate. One alternative may be a no-action alternative. No-action alternatives are appropriate, for example, when response action may cause a greater environmental or health danger than no action. These alternatives should be developed based upon the assessment conducted under paragraphs (e) and (f) of this section and reflect the types of source control or offsite remedial actions determined to be appropriate under paragraphs (e) and (f) of this section.

(h) *Initial Screening of Alternatives.* The alternatives developed under paragraph (g) of this section will be subjected to an initial screening to narrow the list of potential remedial actions for further detailed analysis. Three broad criteria should be used in the initial screening of alternatives:

(1) *Cost.* For each alternative, the cost of installing or implementing the remedial action must be considered, including operation and maintenance costs. An alternative that far exceeds (e.g. by an order of magnitude) the costs of other alternatives evaluated and that does not provide substantially greater public health or environmental benefit should usually be excluded from further consideration.

(2) *Effects of the Alternative.* The effects of each alternative should be evaluated in two ways: (i) Whether the alternative itself or its implementation has any adverse environmental effects; and (ii) for source control remedial actions, whether the alternative is likely to achieve adequate control of source material, or for offsite remedial actions, whether the alternative is likely to effectively mitigate and minimize the threat of harm to public health, welfare or the environment. If an alternative has significant adverse effects, it should be excluded from further consideration. Only those alternatives that effectively contribute to protection of public health, welfare, or the environment should be considered further.

(3) *Acceptable Engineering Practices.* Alternatives must be feasible for the location and conditions of the release, applicable to the problem, and represent a reliable means of addressing the problem.

(i) *Detailed Analysis of Alternatives.*

(1) A more detailed evaluation will be conducted of the limited number of alternatives that remain after the initial screening in paragraph (h).

(2) The detailed analysis of each alternative should include:

(A) Refinement and specification of alternatives in detail, with emphasis on use of established technology;

(B) Detailed cost estimation, including distribution of costs over time;

(C) Evaluation in terms of engineering implementation, or constructability;

(D) An assessment of each alternative in terms of the extent to which it is expected to effectively mitigate and minimize damage to, and provide adequate protection of, public health, welfare, and the environment, relative to the other alternatives analyzed; and

(E) An analysis of any adverse environmental impacts, methods for mitigating these impacts, and costs of mitigation.

(3) In performing the detailed analysis of alternatives, it may be necessary to gather additional data in order to complete the analysis.

(j) The appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost-effective (i.e. the lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment).

(k) Section 104(c)(4) of CERCLA requires that the need for protection of public health, welfare and the environment at the facility under consideration be balanced against the amount of money available in the Fund to respond to other sites which present or may present a threat to public health or welfare or the environment, taking into consideration the need for immediate action. Accordingly, in determining the appropriate extent of remedy for Fund-financed response, the lead agency also must consider the need to respond to other releases with Fund monies.

§ 300.69 Phase VII—Documentation and cost recovery.

(a) During all phases, documentation shall be collected and maintained to support all actions taken under this Plan, and to form the basis for cost recovery. In general, documentation should be sufficient to provide the source and circumstances of the condition, the identity of responsible parties, accurate accounting of Federal costs incurred, and impacts and potential impacts to the public health, welfare and environment.

(b) The information and reports obtained by the lead agency for Fund-financed response action should be transmitted to the RRC. Copies can then be forwarded to the NRT, members of the RRT, and others as appropriate.

§ 300.70 Methods of remedying releases.

(a) The following section lists methods for remedying releases that may be considered by the lead agency in taking response action. This list of methods should not be considered inclusive of all possible methods of remedying releases.

(b) *Engineering Methods for On-Site Actions*—(1)(i) *Air emissions control.* The control of volatile gaseous compounds should address both lateral movement and atmospheric emissions. Before gas migration controls can be properly installed, field measurements to determine gas concentrations, pressures, and soil permeabilities should be used to establish optimum design for control. In addition, the types of hazardous substances present, the depth to which they extend, the nature of the gas and the subsurface geology of the release area should, if possible, be determined. Typical emission control techniques include the following:

(A) Pipe vents;

(B) Trench vents;

(C) Gas barriers;

(D) Gas collection systems;

(E) Overpacking.

(ii) *Surface water controls.* These are remedial techniques designed to reduce waste infiltration and to control runoff at release areas. They also serve to reduce erosion and to stabilize

the surface of covered sites. These types of control technologies are usually implemented in conjunction with other types of controls such as the elimination of ground water infiltration and/or waste stabilization, etc. Technologies applicable to surface water control include the following:

(A) Surface seals;

(B) Surface water diversion and collection systems:

(*1*) Dikes and berms;

(*2*) Ditches, diversions, waterways;

(*3*) Chutes and downpipes;

(*4*) Levees;

(*5*) Seepage basins and ditches;

(*6*) Sedimentation basins and ponds;

(*7*) Terraces and benches.

(C) Grading;

(D) Revegetation.

(iii) *Ground water controls.* Ground water pollution is a particularly serious problem because, once an aquifer has been contaminated, the resource cannot usually be cleaned without the expenditure of great time, effort and resources. Techniques that can be applied to the problem with varying degrees of success are as follows:

(A) Impermeable barriers:

(*1*) Slurry walls;

(*2*) Grout curtains;

(*3*) Sheet pilings.

(B) Permeable treatment beds;

(C) Ground water pumping:

(*1*) Water table adjustment;

(*2*) Plume containment.

(D) Leachate control—Leachate control systems are applicable to control of surface seeps and seepage of leachate to ground water. Leachate collection systems consist of a series of drains which intercept the leachate and channel it to a sump, wetwell, treatment system, or appropriate surface discharge point. Technologies applicable to leachate control include the following:

(*1*) Subsurface drains;

(*2*) Drainage ditches;

(*3*) Liners.

(iv) *Contaminated water and sewer lines.* Sanitary sewers and municipal water mains located down gradient from hazardous waste disposal sites may become contaminated by infiltration of leachate or polluted ground water through cracks, ruptures, or poorly sealed joints in piping. Technologies applicable to the control of such contamination to water and sewer lines include:

(A) Grouting;

(B) Pipe relining and sleeving;

(C) Sewer relocation.

(2) *Treatment technologies*—(i) *Gaseous emissions treatment.* Gases from waste disposal sites frequently contain malodorous and toxic substances, and thus require treatment before release to the atmosphere. There are two basic types of gas treatment systems:

(A) Vapor phase adsorption;

(B) Thermal oxidation.

(ii) *Direct waste treatment methods.* In most cases, these techniques can be considered long-term permanent solutions. Many of these direct treatment methods are not fully developed and the applications and process reliability are not well demonstrated. Use of these techniques for waste treatment may require considerable pilot plant work. Technologies applicable to the direct treatment of wastes are:

(A) Biological methods:

(*1*) Treatment via modified conventional wastewater treatment techniques;

(*2*) Anaerobic, aerated and facultative lagoons;

(*3*) Supported growth biological reactors.

(B) Chemical methods:

(*1*) Chlorination;

(*2*) Precipitation, flocculation, sedimentation;

(*3*) Neutralization;

(*4*) Equalization;

(*5*) Chemical oxidation.

(C) Physical methods:

(*1*) Air stripping;

(*2*) Carbon absorption;

(*3*) Ion exchange;

(*4*) Reverse osmosis;

(*5*) Permeable bed treatment;

(*6*) Wet air oxidation;

(*7*) Incineration.

(iii) *Contaminated soils and sediments.* In some cases where it can be shown to be cost-effective, contaminated sediments and soils will be treated on the site. Technologies available include:

(A) Incineration;

(B) Wet air oxidation;

(C) Solidification;

(D) Encapsulation;

(E) In situ treatment:

(*1*) Solution mining, (soil washing or soil flushing);

(*2*) Neutralization/detoxification;

(*3*) Microbiological degradation.

(c) *Offsite Transport for Storage, Treatment, Destruction or Secure Disposition*—(1) *General.* Offsite transport or storage, treatment, destruction, or secure disposition offsite may be provided in cases where EPA determines that such actions:

(i) Are more cost-effective than other forms of remedial actions;

(ii) Will create new capacity to manage, in compliance with Subtitle C of the Solid Waste Disposal Act, hazardous substances in addition to those located at the affected facility; or

(iii) Are necessary to protect public health, welfare, or the environment from a present or potential risk which may be created by further exposure to the continued presence of such substances or materials.

(2) *Contaminated soils and sediments may be removed from the site.* Technologies used to remove contaminated sediments on soils include:

(i) Excavation;

(ii) Hydraulic dredging;

(iii) Mechanical dredging.

(d) *Provision of Alternative Water Supplies.* Alternative water supplies can be provided in several ways:

(1) Provision of individual treatment units;

(2) Provision of water distribution system;

(3) Provision of new wells in a new location or deeper wells;

(4) Provision of cisterns;

(5) Provision of bottled or treated water;

(6) Provision of upgraded treatment for existing distribution systems.

(e) *Relocation.* Permanent relocation of residents, businesses, and community facilities may be provided where it is determined that human health is in danger and that, alone or in combination with other measures, relocation would be cost-effective and environmentally preferable to other remedial response. Temporary relocation may also be taken in appropriate circumstances.

§ 300.71 Worker health and safety.

Lead agency personnel should be aware of hazards, due to a release of hazardous substances, to human health and safety and exercise great caution in allowing civilian or government personnel into an affected area until the nature of the release has been ascertained. Accordingly, the OSC or responsible official must conform to applicable OSHA requirements and other guidance. All private contractors who are working at the scene of a release must conform to applicable provisions of the Occupational Safety and Health Act and any other requirements deemed necessary by the lead agency.

Subpart G—Trustees for Natural Resources

§ 300.72 Designation of Federal trustees.

When natural resources are lost or damaged as a result of a discharge of oil or release of a hazardous substance, the following officials are designated to act as Federal trustees pursuant to section 111(h)(1) of CERCLA for purposes of sections 111(h)(1), 111(b) and 107(f) of CERCLA:

(a)(1) *Natural Resource Loss.* Damage to resources of any kind located on, over or under land subject to the management or protection of a Federal land managing agency, other than land or resources in or under United States waters that are navigable by deep draft vessels, including waters of the contiguous zone and parts of the high seas to which the National Contingency Plan is applicable and other waters subject to tidal influence.

(2) *Trustee.* The head of the Federal land managing agency, or the head of any other single entity designated by it to act as trustee for a specific resource.

(b)(1) *Natural Resource Loss.* Damage to fixed or non-fixed resources subject to the management or protection of a Federal agency, other than land in resources in or under United States waters that are navigable by deep draft vessels, including waters of the contiguous zone and parts of the high seas to which the

National Contingency Plan is applicable and other waters subject to tidal influence.

(2) *Trustee.* The head of the Federal agency authorized to manage or protect these resources by statute, or the head of any other single entity designated by it to act as trustee for a specific resource.

(c)(1) *Natural Resource Loss.* Damage to resource of any kind subject to the management or protection of a Federal agency and lying in or under United States waters that are navigable by deep draft vessels, including waters of the contiguous zone and parts of the high seas to which the National Contingency Plan is applicable and other waters subject to tidal influence, and upland areas serving as habitat for marine mammals and other species subject to the protective jurisdiction of NOAA.

(2) *Trustee.* The Secretary of Commerce or the head of any other single Federal entity designated by it to act as trustee for a specific resource; provided, however, that where resources are subject to the statutory authorities and jurisdictions of the Secretaries of the Departments of Commerce or the Interior, they shall act as co-trustees.

(d)(1) *Natural Resource Loss.* Damages to natural resources protected by treaty (or other authority pertaining to Native American tribes) or located on lands held by the United States in trust for Native American communities or individuals.

(2) *Trustee.* The Secretary of the Department of the Interior, or the head of any other single Federal entity designated by it to act as trustee for specific resources.

§ 300.73 State trustees.

Pursuant to section 111(h)(1) of CERCLA and for purposes of sections 111(h)(1), 111(b) and 107(f) of CERCLA, States may act as trustee for damage to resources within the boundary of a State belonging to, managed by, controlled by, or appertaining to such State.

§ 300.74 Responsibilities of trustees.

(a) The Federal trustees for natural resources shall be responsible for assessing damages to the resources in accordance with regulations promulgated under section 301(c) of CERCLA, seeking recovery for the losses from the person responsible or from the Fund, and devising and carrying out restoration, rehabilitation and replacement plans pursuant to CERCLA.

(b) Where there are multiple trustees, because of co-existing or contiguous natural resources or concurrent jurisdictions, they shall coordinate and cooperate in carrying out these responsibilities.

Subpart H—Use of Dispersants and Other Chemicals

SOURCE: 49 FR 29197, July 18, 1984, unless otherwise noted.

§ 300.81 General.

(a) Section 311(c)(2)(G) of the Clean Water Act requires that EPA prepare a schedule of dispersants and other chemicals, if any, that may be used in carrying out the plan. This subpart makes provisions for such a schedule.

(b) This subpart applies to the navigable waters of the United States and adjoining shorelines, the waters of the contiguous zone, and the high seas beyond the contiguous zone in connection with activities under the Outer Continental Shelf Lands Act, activities under the Deep Water Port Act of 1974, or activities that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Fishery Conservation and Management Act of 1976).

(c) This subpart applies to the use of any chemical agents or other additives as hereinafter defined that may be used to remove or control oil discharges.

§ 300.82 Definitions.

For the purposes of this subpart:

(a) *Chemical agents,* in general, are those elements, compounds, or mixtures that coagulate, disperse, dissolve, emulsify, foam, neutralize, precipitate, reduce, solubilize, oxidize, concentrate, congeal, entrap, fix, make the pollutant mass more rigid or viscous, or otherwise facilitate the mitigation of deleterious effects or removal of the pollutant from the water.

(b) *Dispersants* are those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column.

(c) *Surface collecting agents* are those chemical agents that form a surface film to control the layer thickness of oil.

(d) *Biological additives* are microbiological cultures, enzymes, or nutrient additives that are deliberately introduced into an oil discharge for the specific purpose of encouraging biodegradation to mitigate the effects of the discharge.

(e) *Burning agents* are those additives that, through physical or chemical means, improve the combustibility of the materials to which they are applied.

(f) *Sinking agents* are those additives applied to oil discharges to sink floating pollutants below the water surface.

(g) *Navigable water* means the water of the United States, including the territorial seas. "Territorial seas" means the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles.

§ 300.83 NCP Product Schedule.

(a) *Oil discharges.* (1) EPA shall maintain a schedule of dispersants and other chemical or biological products that may be authorized for use on oil discharges in accordance with the procedures set forth in § 300.84, below. This schedule, called the NCP Product Schedule, may be obtained from the Emergency Response Division, U.S. Environmental Protection Agency, Washington, D.C. 20460. Phone (202) 382-2196.

(2) Products may be added to the NCP Product Schedule by the process specified in § 300.86.

(b) *Hazardous substance Releases.* [Reserved]

§ 300.84 Authorization of use.

(a) The OSC, with the concurrence of the EPA representative to the RRT and the concurrence of the States with jurisdiction over the navigable waters polluted by the oil discharge, may authorize the use of dispersants, surface collecting agents, and biological additives on the oil discharge, provided that the dispersants, surface collecting agents, or additives are on the NCP Product Schedule.

(b) The OSC, with the concurrence of the EPA representative to the RRT and the concurrence of the States with jurisdiction over the navigable waters polluted by the oil discharge, may authorize the use of burning agents on a case-by-case basis.

(c) The OSC may authorize the use of any dispersant, surface collecting agent, other chemical agent, burning agent, or biological additive (including products not on the NCP Product Schedule) without obtaining the concurrence of the EPA representative to the RRT or the States with jurisdiction over the navigable waters polluted by the oil discharge, when, in the judgment of the OSC, the use of the product is necessary to prevent or substantially reduce a hazard to human life. The OSC is to inform the EPA RRT representative and the affected States of the use of a product as soon as possible and, pursuant to the provisions in paragraph (a) of this section, obtain their concurrence for its continued use once the threat to human life has subsided.

(d) Sinking agents shall not be authorized for application to oil discharges.

(e) RRTs should consider, as part of their planning activities, the appropriateness of using the dispersants, surface collecting agents, or biological additives listed on the NCP Product Schedule, and the appropriateness of using burning agents. Regional contingency plans should address the use of such products in specific contexts. If the RRT and the States with jurisdiction over the waters of the area to which a plan applies approve in advance the use of certain products as described in the plan, the OSC may authorize the use of the products

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without obtaining the concurrence of the EPA representative to the RRT or of the States.

§ 300.85 Data requirements.

(a) *Dispersants.* (1) Name, brand, or trademark, if any, under which the dispersant is sold.

(2) Name, address, and telephone number of the manufacturer, importer, or vendor.

(3) Name, address, and telephone number of primary distributors or sales outlets.

(4) Special handling and worker precautions for storage and field application. Maximum and minimum storage temperatures, to include optimum ranges as well as temperatures that will cause phase separations, chemical changes, or other alterations to the effectiveness of the product.

(5) Shelf life.

(6) Recommended application procedures, concentrations, and conditions for use depending upon water salinity, water temperature, types and ages of the pollutants, and any other application restrictions.

(7) Dispersant Toxicity—Use standard toxicity test methods described in Appendix C.

(8) Effectiveness—Use standard effectiveness test methods described in Appendix C. Manufacturers are also encouraged to provide data on product performance under conditions other than those captured by these tests.

(9) Flash Point—Select appropriate method from the following: ASTM—D 56-77; ASTM—D 92-78; ASTM—D 93-77; ASTM—D 1310-72; ASTM—D 3278-78.[1]

(10) Pour Point—Use ASTM—D 97-66.[1]

(11) Viscosity—Use ASTM—D 445-74.[1]

(12) Specific Gravity—Use ASTM—D 1298-67.[1]

(13) pH—Use ASTM—D 1293-78.[1]

(14) Dispersing Agent Components. Itemize by chemical name and percentage by weight each component of the total formulation. The percentages will include maximum, minimum, and average weights in order to reflect quality control variations in manufacture or formulation. Identify at least the following major components: surface active agents; solvents; additives.

(15) Heavy Metals, Cyanide, and Chlorinated Hydrocarbons. Using standard test procedures, state the concentrations or upper limits of the following materials:

(i) Arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, plus any other metals that may be reasonably expected to be in the sample. Atomic absorption methods should be used and the detailed analytical methods and sample preparation shall be fully described.

(ii) Cyanide. Standard colorimetric procedures should be used.

(iii) Chlorinated hydrocarbons. Gas chromatography should be used and the detailed analytical methods and sample preparation shall be fully described.

(16) The technical product data submission shall include the identity of the laboratory that performed the required tests, the qualifications of the laboratory staff (including professional biographical information for individuals responsible for any tests), and laboratory experience with similar tests. Laboratories performing toxicity tests for dispersant toxicity must demonstrate previous toxicity test experience in order for their results to be accepted. It is the responsibility of the submitter to select competent anaytical laboratories based on the guidelines contained herein. EPA reserves the right to refuse to accept a submission of technical product data because of lack of qualification of the analytical laboratory, significant variance between submitted data and any laboratory confirmation performed by EPA, or other circumstances that would result in inadequate or inaccurate information on the dispersing agent.

(b) *Surface collecting agents.* (1) Name, brand, or trademark, if any, under which the dispersant is sold.

(2) Name, address, and telephone number of the manufacturer, importer, or vendor.

[1] *1981 Annual Book of ASTM Standards.* American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

(3) Name, address, and telephone number of primary distributors or sales outlets.

(4) Special handling and worker precautions for storage and field application. Maximum and minimum storage temperatures, to include optimum ranges as well as temperatures that will cause phase separations, chemical changes, or other alterations to the effectiveness of the product.

(5) Shelf life.

(6) Recommended application procedures, concentrations, and conditions for use depending upon water salinity, water temperature, types and ages of the pollutants, and any other application restrictions.

(7) Toxicity—Use standard toxicity test methods described in Appendix C.

(8) Flash Point—Select appropriate method from the following: ASTM—D 56-77; ASTM—D 92-78; ASTM—D 93-77; ASTM—D 1310-72; ASTM—D 3278-78.[1]

(9) Pour Point—Use ASTM—D 97-66.[1]

(10) Viscosity—Use ASTM—D 445-74.[1]

(11) Specific Gravity—Use ASTM—D 1298-67.[1]

(12) pH—Use ASTM—D 1298-78.[1]

(13) Test to Distinguish Between Surface Collection Agents and Other Chemical Agents.

(i) Method Summary—Five (5) milliliters of the chemical under test are mixed with ninety-five (95) milliliters of distilled water and allowed to stand undisturbed for one hour. Then the volume of the upper phase is determined to the nearest one (1) milliliter.

(ii) Apparatus.

(A) Mixing Cylinder: 100 milliliter subdivisions and fitted with a glass stopper.

(B) Pipettes: Volumetric pipette, 5.0 milliliter.

(C) Timers.

(iii) Procedure—Add 95 milliliters of distilled water at 22 °C+3 °C to a 100 milliliter mixing cylinder. To the surface of the water in the mixing cylinder, add 5.0 milliliters of the chemical under test. Insert the stopper and invert the cylinder five (5) times in 10 seconds. Set upright for one (1) hour at 22 °C+3 °C and then measure the chemical layer at the surface of the water. The major portions of the chemical added (75 percent) should be at the water surface as a separate and easily distinguished layer.

(14) Surface Collecting Agent Components. Itemize by chemical name and percentage by weight each component of the total formulation. The percentages should include maximum, minimum, and average weights in order to reflect quality control variations in manufacture or formulation. Identify at least the following major components: surface active agents; solvents; additives.

(15) Heavy Metals, Cyanide, and Chlorinated Hydrocarbons. Follow specifications in § 300.85(a)(15).

(16) Analytical Laboratory Requirements for Technical Product Data. Follow specifications in § 300.85(a)(16).

(c) *Biological Additives.* (1) Name, brand, or trademark, if any, under which the dispersant is sold.

(2) Name, address, and telephone number of the manufacturer, importer, or vendor.

(3) Name, address, and telephone number of primary distributors or sales outlets.

(4) Special handling and worker precautions for storage and field application. Maximum and minimum storage temperatures.

(5) Shelf life.

(6) Recommended application procedures, concentrations, and conditions for use depending upon water salinity, water temperature, types and ages of the pollutants, and any other application restrictions.

(7) Statements and supporting data on the expected effectiveness of the additive, including degradation rates, the test conditions, and data on effectiveness.

(8) For microbiological cultures furnish the following information:

(i) Listing of all microorganisms by species.

(ii) Percentage of each species in the composition of the additive.

(iii) Optimum pH, temperature, and salinity ranges for use of the additive,

[1] *1981 Annual Book of ASTM Standards.* American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

and maximum and minimum pH, temperature, and salinity levels above or below which the effectiveness of the additive is reduced to half its optimum capacity.

(iv) Special nutrient requirements, if any.

(v) Separate listing of the following, and test methods for such determinations: Salmonella, fecal coliform, Shigella, Staphylococcus Coagulase positive, and Beta Hemolytic Streptococci.

(9) For enzyme additives furnish the following information:

(i) Enzyme name(s).

(ii) International Union of Biochemistry (I.U.B.) number(s).

(iii) Source of the enzyme.

(iv) Units.

(v) Specific Activity.

(vi) Optimum pH, temperature, and salinity ranges for use of the additive, and maximum and minimum pH, temperature, and salinity levels above or below which the effectiveness of the additive is reduced to half its optimum capacity.

(vii) Enzyme shelf life.

(viii) Enzyme optimum storage conditions.

(10) Laboratory Requirements for Technical Product Data. Follow specifications in § 300.85(a)(16).

(d) *Burning Agents.* EPA does not require technical product data submissions for burning agents and does not include burning agents on the NCP Product Schedule.

§ 300.86 Addition of products to schedule.

(a) To add a dispersant, surface collecting agent, or biological additive to the NCP Product Schedule, the technical product data specified in § 300.85 must be submitted to the Emergency Response Division, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460. If EPA determines that the data submitted meet the relevant requirements, EPA will add the product to the schedule.

(b) EPA will inform the submitter in writing, within 60 days of the receipt of technical product data, of its decision on adding the product to the schedule.

(c) The submitter may assert that certain information in technical product data submissions is confidential business information. EPA will handle such claims pursuant to the provisions in 40 CFR Part 2, Subpart B. Such information must be submitted separately from non-confidential information, clearly identified, and clearly marked "Confidential Business Information." If the submitter fails to make such a claim at the time of submittal, EPA may make the information available to the public without further notice.

(d) The submitter must notify EPA of any changes in the composition or formulation of the dispersant, surface collecting agent, or biological additive. On the basis of this data, EPA may require retesting of the product if the change is likely to affect the effectiveness or toxicity of the product.

(e) The listing of a product on the NCP Product Schedule does not constitute approval of the product. To avoid possible misinterpretation or misrepresentation, any label, advertisement, or technical literature that refers to the placement of the product on the NCP schedule must either reproduce in its entirety EPA's written statement, referred to in Subsection (b), that the product has been listed on the schedule, or include the following disclaimer, which must be conspicuous and must be fully reproduced as follows:

DISCLAIMER

[PRODUCT NAME] is on the U.S. Environmental Protection Agency's NCP Product Schedule. This listing does *NOT* mean that EPA approves, recommends, licenses, certifies, or authorizes the use of [product name] on an oil discharge. This listing means *only* that data have been submitted to EPA as required by Subpart H of the National Contingency Plan, § 300.85.

Failure to comply with these restrictions or any other improper attempt to demonstrate EPA approval of the product shall constitute grounds for removing the product from the NCP Product Schedule.

APPENDIX A—UNCONTROLLED HAZARDOUS WASTE SITE RANKING SYSTEM; A USERS MANUAL

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1.0 Introduction

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (Pub. L. 96-510) requires the President to identify the 400 facilities in the nation warranting the highest priority for remedial action. In order to set the priorities, CERCLA requires that criteria be established based on relative risk or danger, taking into account the population at risk; the hazardous potential of the substances at a facility; the potential for contamination of drinking water supplies, for direct human contact, and for destruction of sensitive ecosystems; and other appropriate factors.

This document describes the Hazard Ranking System (HRS) to be used in evaluating the relative potential of uncontrolled hazardous substance facilities to cause health or safety problems, or ecological or environmental damage. Detailed instructions for using the HRS are given in the following sections. Uniform application of the ranking system in each State will permit EPA to identify those releases of hazardous substances that pose the greatest hazard to humans or the environment. However, the HRS by itself cannot establish priorities for the allocation of funds for remedial action. The HRS is a means for applying uniform technical judgment regarding the potential hazards presented by a facility relative to other facilities. It does not address the feasibility, desirability, or degree of cleanup required. Neither does it deal with the readiness or ability of a State to carry out such remedial action as may be indicated, or to meet other conditions prescribed in CERCLA.

The HRS assigns three scores to a hazardous facility:

- S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving ground water, surface water, or air. It is a composite of separate scores for each of the three routes.
- S_{FE} reflects the potential for harm from substances that can explode or cause fires.
- S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

The score for each hazard mode (migration, fire and explosion and direct contact) or route is obtained by considering a set of factors that characterize the potential of the facility to cause harm (Table 1). Each factor is assigned a numerical value (on a scale of 0 to 3, 5 or 8) according to pre-

cribed guidelines. This value is then multiplied by a weighting factor yielding the actor score. The factor scores are then ombined: scores within a factor category re added; then the total scores for each factor category are multiplied together to develop a score for ground water, surface water, air, fire and explosion, and direct contact.

TABLE 1

COMPREHENSIVE LIST TO RATING FACTORS

HAZARD MODE	FACTOR CATEGORY	FACTORS		
		GROUND WATER ROUTE	SURFACE WATER ROUTE	AIR ROUTE
Migration	Route Characteristics	• Depth to Aquifer of Concern • Net Precipitation • Permeability of Unsaturated Zone • Physical State	• Facility Slope and Intervening Terrain • One-Year 24-Hour Rainfall • Distance to Nearest Surface Water • Physical State	
	Containment	• Containment	• Containment	
	Waste Characteristics	• Toxicity/Persistence • Hazardous Waste Quantity	• Toxicity/Persistence • Hazardous Waste Quantity	• Reactivity/Incompatibility • Toxicity • Hazardous Waste Quantity
	Targets	• Ground Water Use • Distance to Nearest Well/ Population Served	• Surface Water Use • Distance to Sensitive Environment • Population Served/Distance to Water Intake Downstream	• Land Use • Population Within 4-Mile Radius • Distance to Sensitive Environment
Fire and Explosion	Containment	• Containment		
	Waste Characteristics	• Direct Evidence • Ignitability • Reactivity • Incompatibility • Hazardous Waste Quantity		
	Targets	• Distance to Nearest Population • Distance to Nearest Building • Distance to Nearest Sensitive Environment • Land Use • Population Within 2-Mile Radius • Number of Buildings Within 2-Mile Radius		
Direct Contact	Observed Incident	• Observed Incident		
	Accessibility	• Accessibility of Hazardous Substances		
	Containment	• Containment		
	Toxicity	• Toxicity		
	Targets	• Population Within 1-Mile Radius • Distance to Critical Habitat		

In computing S_{FE} or S_{DC}, or an individual migration route score, the product of its factor category scores is divided by the maximum possible score, and the resulting ratio is multiplied by 100. The last step puts all scores on a scale of 0 to 100.

S_M is a composite of the scores for the three possible migration routes:

$$S_M = \frac{1}{1.73}\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$$

where:
S_{gw} = ground water route score
S_{sw} = surface water route score
S_a = air route score

The effect of this means of combining the route scores is to emphasize the primary (highest scoring) route in aggregating route scores while giving some additional consideration to the secondary or tertiary routes if they score high. The factor 1/1.73 is used simply for the purpose of reducing S_M scores to a 100-point scale.

The HRS does not quantify the probability of harm from a facility or the magnitude of the harm that could result, although the factors have been selected in order to approximate both those elements of risk. It is a procedure for ranking facilities in terms of the potential threat they pose by describing:

- The manner in which the hazardous substances are contained,
- The route by which they would be released,
- The characteristics and amount of the harmful substances, and
- The likely targets.

The multiplicative combination of factor category scores is an approximation of the more rigorous approach in which one would express the hazard posed by a facility as the product of the probability of a harmful occurrence and the magnitude of the potential damage.

The ranking of facilities nationally for remedial action will be based primarily on S_M. S_{FE} and S_{DC} may be used to identify facilities requiring emergency attention.

2.0 Using the Hazard Ranking System—General Considerations

Use of the HRS requires considerable information about the facility, its surroundings, the hazardous substances present, and the geological character of the area down to the aquifers that may be at risk. Figure 1 illustrates a format for recording general information regarding the facility being evaluated. It can also serve as a cover sheet for the work sheets used in the evaluation.

Where there are no data for a factor, it should be assigned a value of zero. However, if a factor with no data is the only factor in a category (e.g., containment), then the factor is given a score of 1. If data are lacking for more than one factor in connection with the evaluation of either S_{gw}, S_{sw}, S_a, S_{FE}, or S_{DC}, that route score is set at zero.

The following sections give detailed instructions and guidance for rating a facility. Each section begins with a work sheet designed to conform to the sequence of steps required to perform the rating. Guidance for evaluating each of the factors then follows. Using the guidance provided, attempt to assign a score for each of the three possible migration routes. Bear in mind that if data are missing for more than one factor in connection with the evaluation of a route, then you must set that route score at 0 (i.e., there is no need to assign scores to factors in a route that will be set at 0).

Facility name: _____

Location: _____

EPA Region: _____

Person(s) in charge of the facility: _____

_____

_____

Name of Reviewer: _____ Date: _____

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

_____

_____

_____

_____

_____

_____

_____

Scores: S_M = (S_{gw} = S_{sw} = S_a =)

S_{FE} =

S_{DC} =

FIGURE 1
HRS COVER SHEET

3.0 Ground Water Migration Route

3.1 *Observed Release.* If there is direct evidence of release of a substance of concern from a facility to ground water, enter a score of 45 on line 1 of the work sheet for the ground water route (Figure 2); then you need not evaluate route characteristics and containment factors (lines 2 and 3). Direct evidence of release must be analytical. If a contaminant is measured (regardless of frequency) in ground water or in a well in the vicinity of the facility at a significantly (in terms of demonstrating that a release has occurred, not in terms of potential effects) higher level than the background level, then quantitative evidence exists, and a release has been observed. Qualitative evidence of release (e.g., an oily or otherwise objectionable taste or smell in well water) constitutes direct evidence only if it can be confirmed that it results from a release at the facility in question. If a release has been observed, proceed to "3.4 *Waste Characteristics*" to continue scoring. If direct evidence is lacking, enter a value of 0 on line 1 and continue the scoring procedure by evaluating *Route Characteristics.*

3.2 *Route Characteristics. Depth to aquifer of concern* is measured vertically from the lowest point of the hazardous substances to the highest seasonal level of the saturated zone of the aquifer of concern (Figure 3). This factor is one indicator of the ease with which a pollutant from the facility could migrate to ground water. Assign a value as follows:

Distance (feet)	Assigned value
>150	0
76 to 150	1
21 to 75	2
0 to 20	3

Net precipitation (precipitation minus evaporation) indicates the potential for leachate generation at the facility. Net seasonal rainfall (seasonal rainfall minus seasonal evaporation) data may be used if available. If net precipitation is not measured in the region in which the facility is located, calculate it by subtracting the mean annual lake evaporation for the region (obtained from Figure 4) from the normal annual precipitation for the region (obtained from Figure 5). EPA Regional Offices will have maps for areas outside the continental U.S. Assign a value as follows:

Net precipitation (inches)	Assigned value
<−10	0
−10 to +5	1
+5 to +15	2
>+15	3

Permeability of unsaturated zone (or intervening geological formations) is an indicator of the speed at which a contaminant could migrate from a facility. Assign a value from Table 2.

TABLE 2—PERMEABILITY OF GEOLOGIC MATERIALS[1]

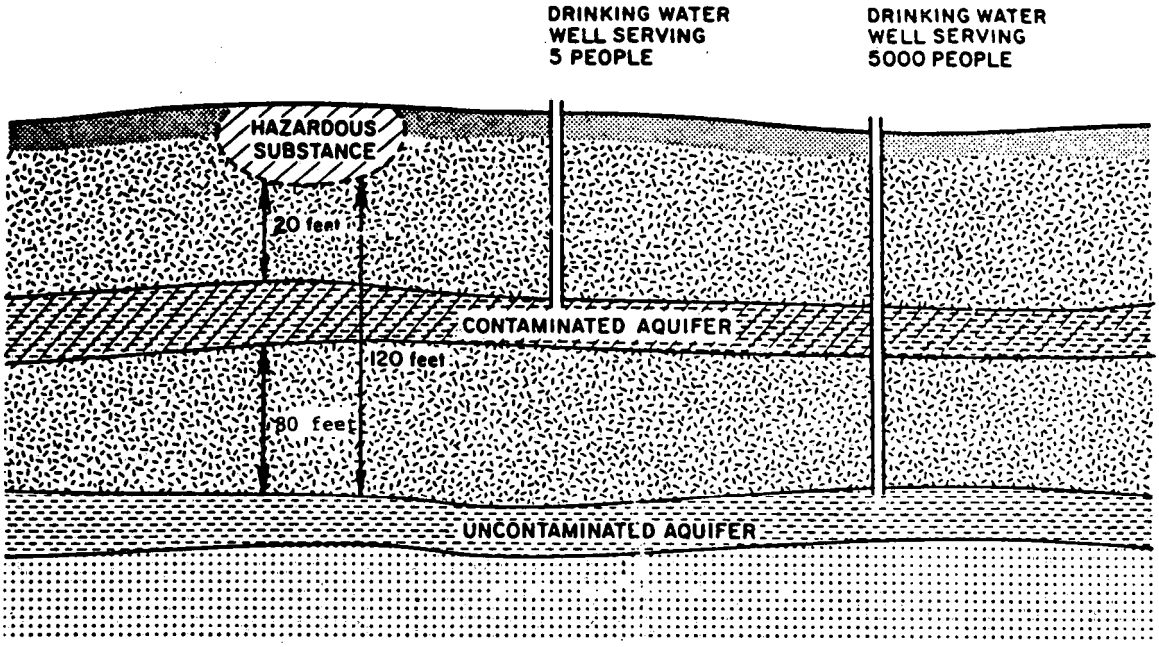
Type of material	Approximate range of hydraulic conductivity	Assigned value
Clay, compact till, shale; unfractured metamorphic and igneous rocks.	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till.	$<10^{-6}>10^{-7}$ cm/sec.	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till.	$<10^{-3}>10^{-6}$ cm/sec.	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite.	$>10^{-3}$ cm/sec	3

[1] Derived from: Davis, S. N., *Porosity and Permeability of Natural Materials in Flow-Through Porous Media*, R.J.M. DeWeat ed., Academic Press, New York, 1969; Freeze, R.A. and J.A. Cherry, *Groundwater*, Prentice-Hall, Inc., New York, 1979.

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
[1] Observed Release	0 45	1		45	3.1
If observed release is given a score of 45, proceed to line [4]. If observed release is given a score of 0, proceed to line [2].					
[2] Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
[3] Containment	0 1 2 3	1		3	3.3
[4] Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 18	1		18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				26	
[5] Targets					3.5
Ground Water Use	0 1 2 3	3		9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1		40	
Total Targets Score				49	
[6] If line [1] is 45, multiply [1] x [4] x [5] If line [1] is 0, multiply [2] x [3] x [4] x [5]				57,330	
[7] Divide line [6] by 57,330 and multiply by 100			S_{gw} =		

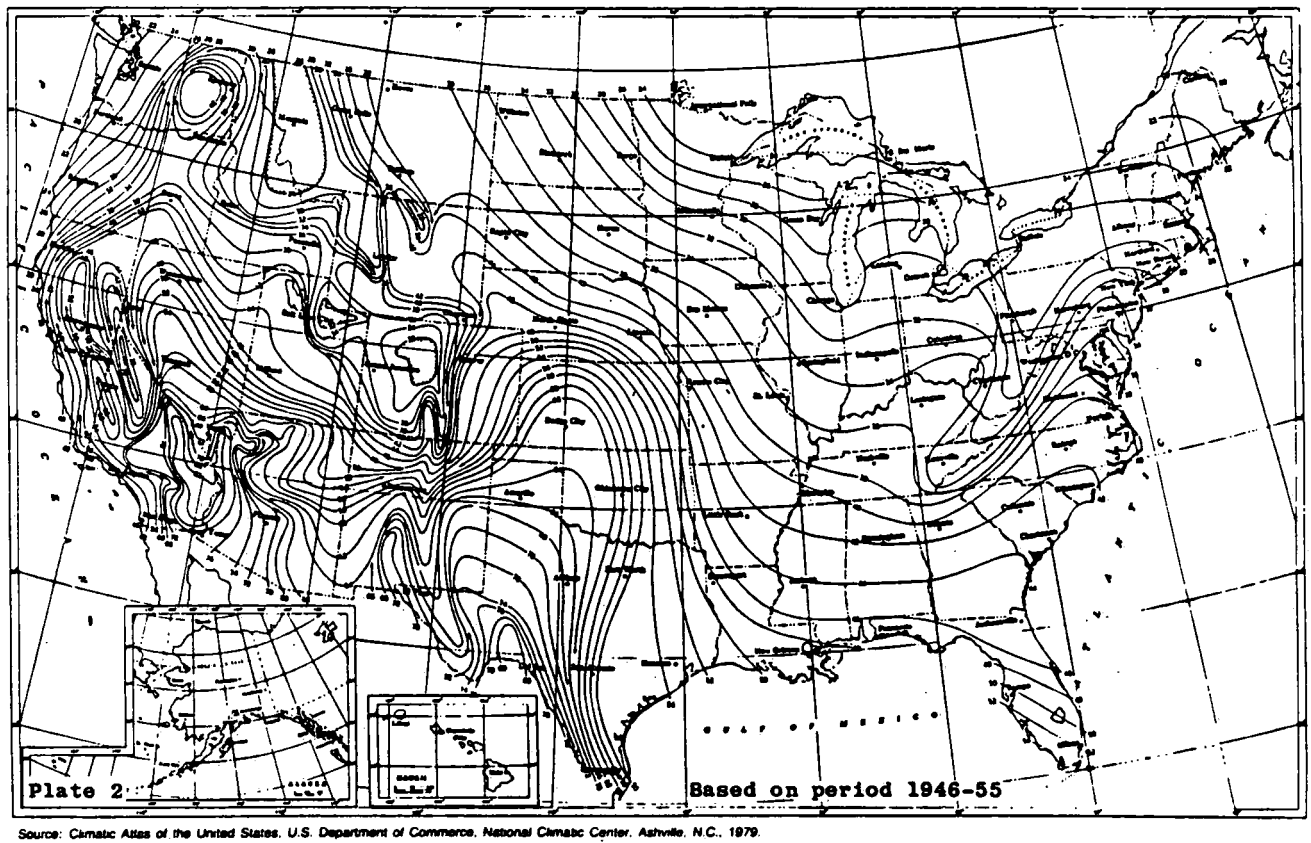
FIGURE 2
GROUND WATER ROUTE WORK SHEET



*Treat target and route characteristics factors consistently. For example, if the upper aquifer is the aquifer of concern, then the "depth to aquifer of concern" is 20 feet and the "population served" is 5 persons. If the lower aquifer is "of concern", the "depth" is 120 feet (assuming no known contamination below the indicated "hazardous substance") and the "population" is 5000 persons. If the upper aquifer is contaminated and the lower aquifer is "of concern", the "depth" would be 80 feet (vertical distance between hazardous substance and aquifer of concern) and the population would be 5000 persons.

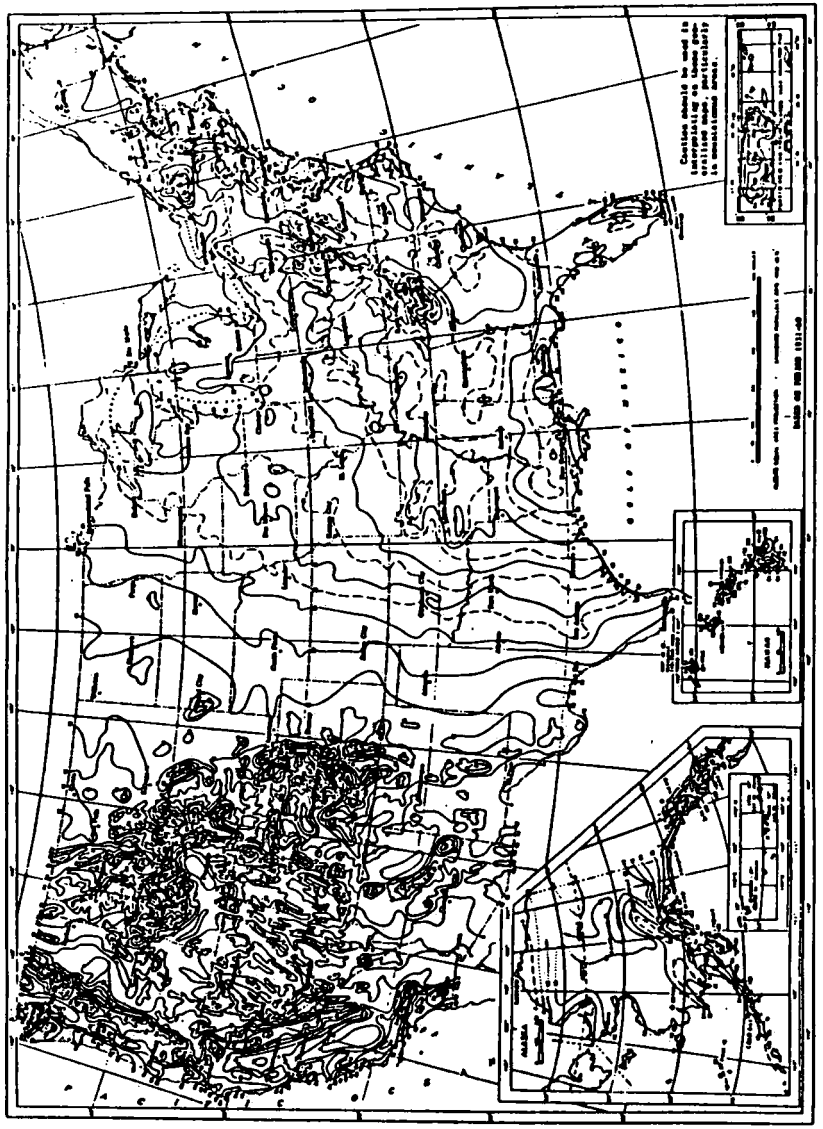
FIGURE 3

Depth to Aquifer of Concern



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

FIGURE 4
MEAN ANNUAL LAKE EVAPORATION
(IN INCHES)



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

FIGURE 5
NORMAL ANNUAL TOTAL PRECIPITATION
(INCHES)

Physical state refers to the state of the hazardous substances at the time of disposal, except that gases generated by the hazardous substances in a disposal area should be considered in rating this factor. Each of the hazardous substances being evaluated is assigned a value as follows:

Physical state	Assigned value
Solid, consolidated or stabilized	0
Solid, unconsolidated or unstabilized	1
Powder or fine material	2
Liquid, sludge or gas	3

3.3 Containment

Containment is a measure of the natural or artificial means that have been used to minimize or prevent a contaminant from entering ground water. Examples include liners, leachate collection systems, and sealed containers. In assigning a value to this rating factor (Table 3), consider all ways in which hazardous substances are stored or disposed at the facility. If the facility involves more than one method of storage or disposal, assign the highest from among all applicable values (e.g., if a landfill has a containment value of 1, and, at the same location, a surface impoundment has a value of 2, assign containment a value of 2).

TABLE 3—CONTAINMENT VALUE FOR GROUND WATER ROUTE

Assign containment a value of 0 if: (1) all the hazardous substances at the facility are undertain by an essentially non permeable surface (natural or artificial) and adequate leachate collection systems and diversion systems are present; or (2) there is no ground water in the vicinity. The value "0" does not indicate no risk. Rather, it indicates a significantly lower relative risk when compared with more serious sites on a national level. Otherwise, evaluate the containment for each of the different means of storage or disposal at the facility, using the following guidance.

	Assigned value
A. Surface Impoundment	
Sound run-on diversion structure, essentially non permeable liner (natural or artificial) compatible with the waste, and adequate leachate collection system	0
Essentially non permeable compatible liner with no leachate collection system; or inadequate freeboard	1
Potentially unsound run-on diversion structure; or moderately permeable compatible liner	2
Unsound run-on diversion structure; no liner; or incompatible liner	3
B. Containers	
Containers sealed and in sound condition, adequate liner, and adequate leachate collection system	0

TABLE 3—CONTAINMENT VALUE FOR GROUND WATER ROUTE—Continued

Assign containment a value of 0 if: (1) all the hazardous substances at the facility are undertain by an essentially non permeable surface (natural or artificial) and adequate leachate collection systems and diversion systems are present; or (2) there is no ground water in the vicinity. The value "0" does not indicate no risk. Rather, it indicates a significantly lower relative risk when compared with more serious sites on a national level. Otherwise, evaluate the containment for each of the different means of storage or disposal at the facility, using the following guidance.

	Assigned value
Containers sealed and in sound condition, no liner or moderately permeable liner	1
Containers leaking, moderately permeable liner	2
Containers leaking and no liner or incompatible liner	3
C. Piles	
Piles uncovered and waste stabilized; or piles covered, waste unstabilized, and essentially non permeable liner	0
Piles uncovered, waste unstabilized, moderately permeable liner, and leachate collection system	1
Piles uncovered, waste unstabilized, moderately permeable liner, and no leachate collection system	2
Piles uncovered, waste unstabilized, and no liner	3
D. Landfill	
Essentially non permeable liner, liner compatible with waste, and adequate leachate collection system	0
Essentially non permeable compatible liner, no leachate collection system, and landfill surface precludes ponding	1
Moderately permeable, compatible liner, and landfill surface precludes ponding	2
No liner or incompatible liner; moderately permeable compatible liner; landfill surface encourages ponding; no run-on control	3

3.4 *Waste Characteristics.* In determining a waste characteristics score, evaluate the most hazardous substances at the facility that could migrate (i.e., if scored, containment is not equal to zero) to ground water. Take the substance with the highest score as representative of the potential hazard due to waste characteristics. Note that the substance that may have been observed in the release category can differ from the substance used in rating waste characteristics. Where the total inventory of substances in a facility is known, only those present in amounts greater than the reportable quantity (see CERCLA Section 102 for definition) may be evaluated.

Toxicity and Persistence have been combined in the matrix below because of their important relationship. To determine the overall value for this combined factor, evaluate each factor individually as discussed below. Match the individual values assigned with the values in the matrix for the combined rating factor. Evaluate several

of the most hazardous substances at the facility independently and enter only the highest score in the matrix on the work sheet.

Value for toxicity	Value for persistence			
	0	1	2	3
0	0	0	0	0
1	3	6	9	12
2	6	9	12	15
3	9	12	15	18

Persistence of each hazardous substance is evaluated on its biodegradability as follows:

Substance	Assigned value
Easily biodegradable compounds	0
Straight chain hydrocarbons	1
Substituted and other ring compounds	2
Metals, polycyclic compounds and halogenated hydrocarbons	3

More specific information is given in Tables 4 and 5.

Toxicity of each hazardous substance being evaluated is given a value using the rating scheme of Sax (Table 6) or the National Fire Protection Association (NFPA) (Table 7) and the following guidance:

Toxicity	Assigned value
Sax level 0 or NFPA level 0	0
Sax level 1 or NFPA level 1	1
Sax level 2 or NFPA level 2	2
Sax level 3 or NFPA level 3 or 4	3

Table 4 presents values for some common compounds.

Hazardous waste quantity includes all hazardous substances at a facility (as received) except that with a containment value of 0. Do not include amounts of contaminated soil or water; in such cases, the amount of contaminating hazardous substance may be estimated.

On occasion, it may be necessary to convert data to a common unit to combine them. In such cases, 1 ton=1 cubic yard=4 drums and for the purposes of converting bulk storage, 1 drum=50 gallons. Assign a value as follows:

Tons in cubic yards	Number of drums	Assigned value
0	0	0
1–10	1–40	1
11–62	41–250	2
63–125	251–500	3
126–250	501–1,000	4
251–625	1,001–2,500	5
626–1,250	2,501–5,000	6
1,251–2,500	5,001–10,000	7
>2,500	>10,000	8

TABLE 4—WASTE CHARACTERISTICS VALUES FOR SOME COMMON CHEMICALS

Chemical/Compound	Toxicity[1]	Persistence[2]	Ignitability[3]	Reactivity[3]
Acetaldehyde	3	0	3	2
Acetic Acid	3	0	2	1
Acetone	2	0	3	0
Aldrin	3	3	1	0
Ammonia, Anhydrous	3	0	1	0
Aniline	3	1	2	0
Benzene	3	1	3	0
Carbon Tetrachloride	3	3	0	0
Chlordane	3	3	*0	*0
Chlorobenzene	2	2	3	0
Chloroform	3	3	0	0
Cresol-O	3	1	2	0
Cresol-M&P	3	1	1	0
Cyclohexane	2	2	3	0
Endrin	3	3	1	0
Ethyl Benzene	2	1	3	0
Formaldehyde	3	0	2	0
Formic Acid	3	0	2	0
Hydrochloric Acid	3	0	0	0
Isopropyl Ether	3	1	3	1
Lindane	3	3	1	0
Methane	1	1	3	0
Methyl Ethyl Ketone	2	0	3	0
Methyl Parathion in Xylene Solution	3	Δ0	3	2
Naphthalene	2	1	2	0
Nitric Acid	3	0	0	0
Parathion	3	Δ0	1	2
PCB	3	3	Δ0	Δ0
Petroleum, Kerosene (Fuel Oil No. 1)	3	1	2	0
Phenol	3	1	2	0
Sulfuric Acid	3	0	0	2
Toluene	2	1	3	0
Trichlorobenzene	2	3	1	0
α-Trichloroethane	2	2	1	0
Xylene	2	1	3	0

[1] Sax, N. I., *Dangerous Properties of Industrial Materials*, Van Nostrand Rheinhold Co., New York, 4th ed., 1975. The highest rating listed under each chemical is used.

[2] JRB Associates, Inc., *Methodology for Rating the Hazard Potential of Waste Disposal Sites*, May 5, 1980.

[3] National Fire Protection Association, National Fire Codes, Vol 13, No. 49, 1977.

* Professional judgment based on information contained in the U.S. Coast Guard CHRIS Hazardous Chemical Data, 1978.

Δ Professional judgment based on existing literature.

TABLE 5—PERSISTENCE (BIODEGRADABILITY) OF SOME ORGANIC COMPOUNDS*

Value=3 Highly Persistent Compounds	
aldrin	heptachlor
benzopyrene	heptachlor epoxide
benzothiazole	1,2,3,4,5,7,7-heptachloronorbornene
benzothiophene	hexachlorobenzene
benzyl butyl phythalate	hexachloro-1,3-butadiene
bromochlorobenzene	hexachlorocyclohexane
bromoform butanal	hexachloroethane
bromophenyl phyntyl ether	methyl benzothiazole
chlordane	pentachlorobiphenyl
chlorohydroxy benzephenone	pentachlorophenol
bis-chloroisoprophyl ether	1,1,3,3-tetrachloroacetone
m-chloronitrobenzene	tetrachlorophenyl
DDE	thiomethylbenzothiazole
DDT	trichlorobenzene
dibromobenzene	trichlorobiphenyl
dibutyl phthalate	trichlorofluromethane
1,4-dichlorobenzene	2,4,6-trichlorophenol
dichlorodifluoroethane	triphenyl phosphate
dieldrin	bromodichloromethane
diethyl phthalate	bromoform
di(2-ethylhexyl)phthalate	carbon tetrachloride
dihexyl phthalate	chloroform
di-isobutyl phthalate	chloromochloromethane
dimethyl phthalate	dibromodichloroethane
4,6-dinitro-2-aminophenol	tetrachloroethane
dipropyl phythalate	1,1,2-trichloroethane
endrin	

Value=2 Persistent Compounds	
acenaphthylene	cis-2-ethyl-4-methyl-1,3-dioxolane
atrazine	trans-2-ethyl-4-methyl-1,3-dioxolane
(diethyl) atrazine	guaiacol
barbital	2-hydroxyadiponitrile
borneol	isophorone
bromobenzene	indene
camphor	isoborneol
chlorobenzene	isoprophenyl-r-isopropyl benzene
1,2-bis-chloroethoxy ethane	2-methoxy biphenyl
b-chloroethyl methyl ether	methyl biphenyl
chloromethyl ether	methyl chloride
chloromethyl ethyl ether	methylindene
3-chloropyridine	methylene chloride
di-t-butyl-p-benzoquinone	nitroanisole
dichloroethyl ether	nitrobenzene
dihyrocarvone	1,1,2-trichloroethylene
dimethyl sulfoxide	trimethyl-trioxo-hexahydro-triazine isomer
2,6-dinitrotoluene	

Value=1 Somewhat Persistent Compounds	
acetylene dichloride	limonene
behenic acid, methyl ester	methyl ester of lignoceric acid
benzene	methane
benzene sulfonic acid	2-methyl-5-ethyl-pyridine
butyl benzene	methyl naphthalene
butyl bromide	methyl palmitate
e-caprolactam	methyl phenyl carbinol
carbon-disulfide	methyl stearate
o-cresol	naphthalene
decane	nonane
1,2-dichloroethane	octane
1,2-dimethoxy benzene	octyl chloride

TABLE 5—PERSISTENCE (BIODEGRADABILITY) OF SOME ORGANIC COMPOUNDS*—Continued

1,3-dimethyl naphthalene	pentane
1,4-dimethyl phenol	phenyl benzoate
dioctyl adipate	phthalic anhydride
n-decane	propylbenzene
ethyl benzene	1-terpineol
2-ethyl-n-hexane	toluene
o-ethyltoluene	vinyl benzene
isodecane	xylene
isoprophyl benzene	

Value=0 Nonpersistent Compounds	
acetaldehyde	methyl benzoate
acetic acid	3-methyl butanol
acetone	methyl ethyl ketone
acetophenone	2-methylpropanol
benzoic acid	octadecane
di-isobutyl carbinol	pentadecane
docosane	pentanol
eicosane	propanol
ethanol	propylamine
ethylamine	tetradecane
hexadecane	n-tridecane
methanol	n-undecane

* JRB Associates, Inc., *Methodology for Rating the Hazard Potential for Waste Disposal Sites*, May 5, 1980.

TABLE 6—SAX TOXICITY RATINGS

0=No Toxicity* (None)**

This designation is given to materials which fall into one of the following categories:

(a) Materials which cause no harm under any conditions of normal use.

(b) Materials which produce toxic effects on humans only under the most unusual conditions or by overwhelming dosage.

1=Slight Toxicity* (Low)**

(a) *Acute local.* Materials which on single exposures lasting seconds, minutes, or hours cause only slight effects on the skin or mucous membranes regardless of the extent of the exposure.

(b) *Acute systemic.* Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which produce only slight effects following single exposures lasting seconds, minutes, or hours, or following ingestion of a single dose regardless of the quantity absorbed or the extent of exposure.

TABLE 6—SAX TOXICITY RATINGS—Continued

(c) *Chronic local.* Materials which on continuous or repeated exposures extending over periods of days, months, or years cause only slight and usually reversible harm to the skin or mucous membranes. The extent of exposure may be great or small.

(d) *Chronic systemic.* Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which produce only slightly usually reversible effects extending over days, months, or years. The extent of the exposure may be great or small.

In general, those substances classified as having "slight toxicity" produce changes in the human body which are readily reversible and which will disappear following termination of exposure, either with or without medical treatment.

2=Moderate Toxicity* (Mod)**

(a) *Acute local.* Materials which on single exposure lasting seconds, minutes, or hours cause moderate effects on the skin or mucous membranes. These effects may be the result of intense exposure for a matter of seconds or moderate exposure for a matter of hours.

(b) *Acute systemic.* Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and produce moderate effects following single exposures lasting seconds, minutes, or hours, or following ingestion of a single dose.

(c) *Chronic local.* Materials which on continuous or repeated exposures extending over periods of days, months, or years cause moderate harm to the skin or mucous membranes.

(d) *Chronic systemic.* Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which produce moderate effects following continuous or repeated exposures extending over periods of days, months, or years.

Those substances classified as having "moderate toxicity" may produce irreversible as well as reversible changes in the human body. These changes are not of such severity as to threaten life or to produce serious physical impairment.

3=Severe Toxicity* (High)**

(a) *Acute local.* Materials which on single exposure lasting seconds or minutes cause injury to skin or mucous membranes of sufficient severity to threaten life or to cause permanent physical impairment or disfigurement.

(b) *Acute systemic.* Materials which can be absorbed into the body by inhalation, ingestion, or through the skin and which can cause injury of sufficient severity to threaten life following a single exposure lasting seconds, minutes, or hours, or following ingestion of a single dose.

(c) *Chronic local.* Materials which on continuous or repeated exposures extending over periods of days, months, or years can cause injury to skin or mucous membranes of sufficient severity to threaten life or cause permanent impairment, which disfigurement, or irreversible change.

(d) *Chronic systemic.* Materials which can be absorbed into the body by inhalation, ingestion or through the skin and which can cause death or serious physical impairment following continuous or repeated exposures to small amounts extending over periods of days, months, or years.

*Sax, N. I., Dangerous Properties of Industrial Materials, Van Nostrand Rheinhold Co., New York, New York, 4th edition, 1975.

**Sax, N. I., Dangerous Properties of Industrial Materials, Van Nostrand Rheinhold Co., New York, New York, 5th edition, 1979.

TABLE 7—NFPA TOXICITY RATINGS*

0 Materials which on exposure under fire conditions would offer no health hazard beyond that of ordinary combustible material.

1 Materials only slightly hazardous to health. It may be desirable to wear self-contained breathing apparatus.

2 Materials hazardous to health, but areas may be entered freely with self-contained breathing apparatus.

3 Materials extremely hazardous to health, but areas may be entered with extreme care. Full protective clothing, including self-contained breathing apparatus, rubber gloves, boots and bands around legs, arms and waist should be provided. No skin surface should be exposed.

4 A few whiffs of the gas or vapor could cause death, or the gas, vapor, or liquid could be fatal on penetrating the fire fighters' normal full protective clothing which is designed for resistance to heat. For most chemicals having a Health 4 rating, the normal full protective clothing available to the average fire department will not provide adequate protection against skin contact with these materials. Only special protective clothing designed to protect against the specific hazard should be worn.

*National Fire Protection Association. *National Fire Codes*, Vol. 13, No. 49, 1977.

3.5 *Targets. Ground water use* indicates the nature of the use made of ground water drawn from the aquifer of concern within 3 miles of the hazardous substance, including the geographical extent of the measurable concentration in the aquifer. Assign a value using the following guidance:

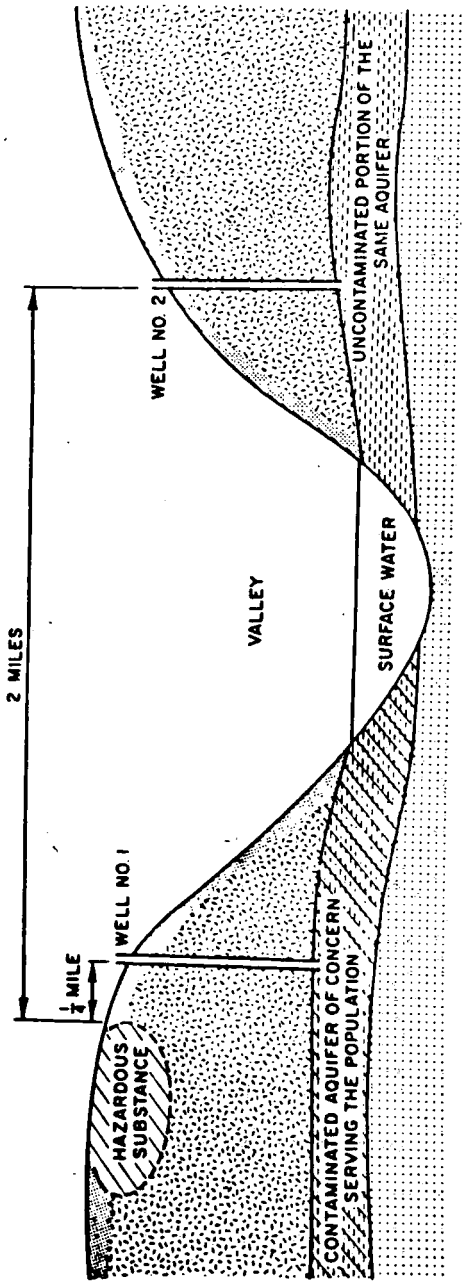
Ground water use	Assigned value
Unusable (e.g., extremely saline aquifer, extremely low yield, etc.)	0
Commercial, industrial or irrigation and another water source presently available; not used, but usable	1
Drinking water with municipal water from alternate unthreatened sources presently available (i.e., minimal hookup requirements); or commercial, industrial or irrigation with no other water source presently available	2
Drinking water; no municipal water from alternate unthreatened sources presently available	3

Distance to nearest well and population served have been combined in the matrix below to better reflect the important relationship between the distance of a population from hazardous substances and the size of the population served by ground water that might be contaminated by those substances. To determine the overall value for this combined factor, score each individually as discussed below. Match the individual values assigned with the values in the matrix for the total score.

Value for population served	Value for distance to nearest well				
	0	1	2	3	4
0	0	0	0	0	0
1	0	4	6	8	10
2	0	8	12	16	20
3	0	12	18	24	30
4	0	16	24	32	35
5	0	20	30	35	40

Distance to nearest well is measured from the hazardous substance (not the facility boundary) to the nearest well that draws water from the aquifer of concern. If the actual distance to the nearest well is unknown, use the distance between the hazardous substance and the nearest occupied building not served by a public water supply (e.g., a farmhouse). If a discontinuity in the aquifer occurs between the hazardous substance and all wells, give this factor a score of 0, except where it can be shown that the contaminant is likely to migrate beyond the discontinuity. Figure 6 illustrates how the distance should be measured. Assign a value using the following guidance:

Distance	Assigned value
>3 miles	0
2 to 3 miles	1
1 to 2 miles	2
2001 feet to 1 mile	3
<2000 feet	4



In the situation depicted above, the distance between the hazardous substance and the nearest well (No. 1) is ¼ mile. If well No. 1 did not exist, the distance to well No. 2 would be immaterial since there is a discontinuity in the aquifer (surface water) between it and the hazardous substance. Under such circumstances, the factor score would be "0". However, if it could be demonstrated that the contaminent had bridged the discontinuity, then the distance to the nearest well would be 2 miles (assuming well No. 1 does not exist).

FIGURE 6

Distance to Nearest Well

Population served by ground water is an indicator of the population at risk, which includes residents as well as others who would regularly use the water such as workers in factories or offices and students. Include employees in restaurants, motels, or campgrounds but exclude customers and travelers passing through the area in autos, buses, or trains. If aerial photography is used, and residents are known to use ground water, assume each dwelling unit has 3.8 residents. Where ground water is used for irrigation, convert to population by assuming 1.5 persons per acre of irrigated land. The well or wells of concern must be within three miles of the hazardous substances, including the area of known aquifer contamination, but the "population served" need not be. Likewise, people within three miles who do not use water from the aquifer of concern are not to be counted. Assign a value as follows:

Population	Assigned value
0	0
1 to 100	1
101 to 1,000	2
1,001 to 3,000	3
3,001 to 10,000	4
>10,000	5

4.0 Surface Water Route

4.1 *Observed Release.* Direct evidence of release to surface water must be quantitative evidence that the facility is releasing contaminants into surface water. Quantitative evidence could be the measurement of levels of contaminants from a facility in surface water, either at the facility or downhill from it, that represents a significant (in terms of demonstrating that a release has occurred, not in terms of potential effects) increase over background levels. If direct evidence of release has been obtained (regardless of frequency), enter a value of 45 on line 1 of the work sheet (Figure 7) and omit the evaluation of the route characteristics and containment factors. If direct evidence of release is lacking, enter a value of 0 on line 1 and continue with the scoring procedure.

4.2. *Route Characteristics. Facility slope and intervening terrain* are indicators of the potential for contaminated runoff or spills at a facility to be transported to surface water. The facility slope is an indicator of the potential for runoff or spills to leave the facility. Intervening terrain refers to the average slope of the shortest path which would be followed by runoff between the facility boundary and the nearest downhill surface water. This rating factor can be assessed using topographic maps. Table 8 shows values assigned to various facility conditions.

One-year 24-hour rainfall (obtained from Figure 8) indicates the potential for area storms to cause surface water contamination as a result of runoff, erosion, or flow over dikes. Assign a value as follows:

Amount of rainfall (inches)	Assigned value
<1.0	0
1.0 to 2.0	1
2.1 to 3.0	2
>3.0	3

TABLE 8—VALUES FOR FACILITY SLOPE AND INTERVENING TERRAIN

Facility slope	Intervening terrain				
	Terrain average slope				Site in surface water
	<3 pct[1]	3 to 5 pct	5 to 8 pct	> 8 pct	
Facility is closed basin	0	0	0	0	3
Facility has average slope (<3 pct)	0	1	1	2	3
Average slope (3 to 5 pct)	0	1	2	2	3
Average slope (5 to 8 pct)	0	2	2	3	3
Average slope (> 8 pct)	0	2	3	3	3

[1] Terrain average slope <3 pct; or site separated from water body by areas of higher elevation.

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1		45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 18	1		18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				26	
5 Targets					4.5
Surface Water Use	0 1 2 3	3		9	
Distance to a Sensitive Environment	0 1 2 3	2		6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1		40	
Total Targets Score				55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5				64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{SW} =				

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

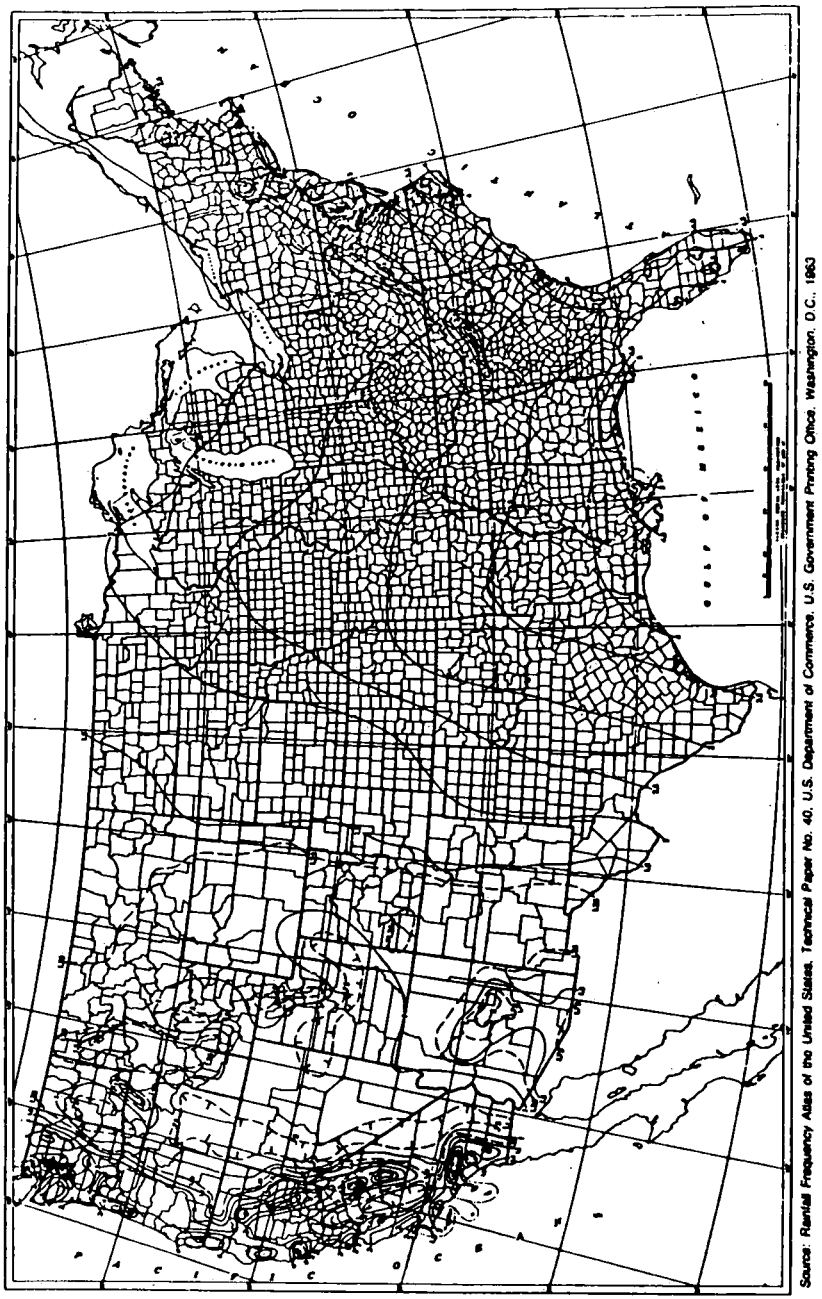


FIGURE 8
1-YEAR 24-HOUR RAINFALL (INCHES)

Distance to the nearest surface water is the shortest distance from the hazardous substance, (not the facility or property boundary) to the nearest downhill body of surface water (e.g., lake or stream) that is on the course that runoff can be expected to follow and that at least occasionally contains water. Do not include man-made ditches which do not connect with other surface water bodies. In areas having less than 20 inches of normal annual precipitation (see Figure 5), consider intermittent streams. This factor indicates the potential for pollutants flowing overland and into surface water bodies. Assign a value as follows:

Distance	Assigned value
>2 miles	0
1 to 2 miles	1
1000 feet to 1 mile	2
<1000 feet	3

Physical state is assigned a value using the procedures in Section 3.2.

4.3 *Containment. Containment* is a measure of the means that have been taken to minimize the likelihood of a contaminant entering surface water either at the facility or beyond the facility boundary. Examples of containment are diversion structures and the use of sealed containers. If more than one type of containment is used at a facility, evaluate each separately (Table 9) and assign the highest score.

TABLE 9—CONTAINMENT VALUES FOR SURFACE WATER ROUTE

Assign containment a value of 0 if: (1) all the waste at the site is surrounded by diversion structures that are in sound condition and adequate to contain all runoff, spills, or leaks from the waste; or (2) intervening terrain precludes runoff from entering surface water. Otherwise, evaluate the containment for each of the different means of storage or disposal at the site and assign a value as follows:

	Assigned value
A. Surface Impoundment	
Sound diking or diversion structure, adequate freeboard, and no erosion evident	0
Sound diking or diversion structure, but inadequate freeboard	1
Diking not leaking, but potentially unsound	2
Diking unsound, leaking, or in danger of collapse	3
B. Containers	
Containers sealed, in sound condition, and surrounded by sound diversion or containment system	0
Containers sealed and in sound condition, but not surrounded by sound diversion or containment system	1
Containers leaking and diversion or containment structures potentially unsound	2

TABLE 9—CONTAINMENT VALUES FOR SURFACE WATER ROUTE—Continued

Assign containment a value of 0 if: (1) all the waste at the site is surrounded by diversion structures that are in sound condition and adequate to contain all runoff, spills, or leaks from the waste; or (2) intervening terrain precludes runoff from entering surface water. Otherwise, evaluate the containment for each of the different means of storage or disposal at the site and assign a value as follows:

	Assigned value
Containers leaking, and no diversion or containment structures or diversion structures leaking or in danger of collapse	3
C. Waste Piles	
Piles are covered and surrounded by sound diversion or containment system	0
Piles covered, wastes unconsolidated, diversion or containment system not adequate	1
Piles not covered, wastes unconsolidated, and diversion or containment system potentially unsound	2
Piles not covered, wastes unconsolidated, and no diversion or containment or diversion system leaking or in danger or collapse	3
D. Landfill	
Landfill slope precludes runoff, landfill surrounded by sound diversion system, or landfill has adequate cover material	0
Landfill not adequately covered and diversion system sound	1
Landfill not covered and diversion system potentially unsound	2
Landfill not covered and no diversion system present, or diversion system unsound	3

4.4 *Waste Characteristics.* Evaluate waste characteristics for the surface water route with the procedures described in Section 3.4 for the ground water route.

4.5 *Targets. Surface water use* brings into the rating process the use being made of surface water downstream from the facility. The use or uses of interest are those associated with water taken from surface waters within a distance of three miles from the location of the hazardous substance. Assign a value as follows:

Surface water use (fresh or salt water)	Assigned value
Not currently used	0
Commercial or industrial	1
Irrigation, economically important resources (e.g., shellfish), commercial food preparation, or recreation (e.g., fishing, boating, swimming)	2
Drinking Water	3

Distance to a senstitive environment refers to the distance from the hazardous substance (not the facility boundary) to an area containing an important biological resource or to a fragile natural setting that could suffer an especially severe impact from pollution. Table 10 provides guidance on assigning a value to this rating factor.

TABLE 10—VALUES FOR SENSITIVE ENVIRONMENT (SURFACE WATER)

Assigned value =	0	1	2	3
Distance to Wetlands[1] (5 acre minimum)				
Coastal	>2 miles	1 to 2 miles	½ to 1 mile	<½ mile.
Fresh Water	>1 mile	¼ to 1 mile	100 feet to ¼ mile	<100 feet.
Distance to Critical Habitat (of endangered species)[2]	>1 mile	½ to 1 mile	⅛ to ½ mile	<¼ mile.

[1] Wetland is defined by EPA in the Code of Federal Regulations 40 CFR Part 230, Appendix A, 1980.
[2] Endangered species are designated by the U.S. Fish and Wildlife Service.

Population served by surface water with water intake within 3 miles downstream from facility (or 1 mile in static surface water such as a lake) is a rough indicator of the potential hazard exposure of the nearby population served by potentially contaminated surface water. Measure the distance from the probable point of entry to surface water following the surface water (stream miles). The population includes residents as well as others who would regularly use the water such as workers in factories or offices and students. Include employees in restaurants, motels, or campgrounds but exclude customers and travelers passing through the area in autos, buses and trains. The distance is measured from the hazardous substance, including observations in stream or sediment samples, regardless of facility boundaries. Where only residential houses can be counted (e.g., from an aerial photograph), and residents are known to be using surface water, assume 3.8 individuals per dwelling unit. Where surface water is used for irrigation, convert to population by assuming 1.5 persons per acre of land irrigated. Assign a value as follows:

Population	Distance to surface water				
	>3 miles	2-3 miles	1-2 miles	200'-1 mile	0-2,000 feet
0	0	0	0	0	0
1-100	0	4	6	8	10
101-1,000	0	8	12	16	20
1,001-3,000	0	12	18	24	30
3,001-10,000	0	16	24	32	35
>10,000	0	20	30	35	40

5.0 Air Route

5.1 *Observed Release.* The only acceptable evidence of release for the air route is data that show levels of a contaminant at or in the vicinity of the facility that significantly exceed background levels, regardless of the frequency of occurrence. If such evidence exists, enter a value of 45 on line 1 of the work sheet (Figure 9); if not, assign line 1 a 0 value and then $S_a = 0$. Record the date, location, and the sampling protocol for monitoring data on the work sheet. Data based on transitory conditions due to facility disturbance by investigative personnel are not acceptable.

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1		45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
Total Targets Score				39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100		S_a =			

FIGURE 9
AIR ROUTE WORK SHEET

5.2 *Waste Characteristics.* The hazardous substance that was observed for scoring the release category may be different from the substance used to score waste characteristics.

Reactivity and incompatibility, measures of the potential for sudden releases of concentrated air pollutants, are evaluated independently, and the highest value for either is recorded on the work sheet.

Reactivity provides a measure of the fire/explosion threat at a facility. Assign a value based on the reactivity classification used by NFPA (see Table 11). Reactivity ratings for a number of common compounds are given in Table 4.

TABLE 11—NFPA REACTIVITY RATINGS

NFPA level	Assigned value
0 Materials which are normally stable even under fire exposure conditions and which are not reactive with water	0
1 Materials which in themselves are normally stable but which may become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently	1
2 Materials which in themselves are normally unstable and readily undergo violent chemical change but do not detonate. Includes materials which can undergo chemical change with rapid release of energy at normal temperatures and pressures or which can undergo violent chemical change at elevated temperatures and pressures. Also includes those materials which may react violently with water or which may form potentially explosive mixtures with water	2
3 Materials which in themselves are capable of detonation or of explosive decomposition or of explosive reaction but which requires a strong initiating source or which must be heated under confinement before initiation. Includes materials which are sensitive to thermal or mechanical shock at elevated temperatures and pressures or which react explosively with water without requiring heat or confinement	3
4 Materials which in themselves are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. Includes materials which are sensitive to mechanical or localized thermal shock	3

TABLE 12—INCOMPATIBLE MATERIALS

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

Group 1-A	Group 1-B
Acetylene sludge	Acid sludge.
Alkaline caustic liquids	Acid and water.
Alkaline cleaner	Battery acid.
Alkaline corrosive liquids	Chemical cleaners.
Alkaline corrosive battery fluid.	Electrolyte acid.
Caustic wastewater	Etching acid liquid or solvent.
Lime sludge and other corrosive alkalies.	Pickling liquor and other corrosive acids.
Lime wastewater	Spent acid.
Lime and water	Spent mixed acid.
Spent caustic	Spent sulfuric acid.

Potential consequences: Heat generation; violent reaction.

TABLE 12—INCOMPATIBLE MATERIALS—Continued

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

Group 2-A	Group 2-B
Aluminum	Any waste in Group 1-A or 1-B.
Beryllium	
Calcium	
Lithium	
Potassium	
Sodium	
Zinc powder	
Other reactive metals and metal hydrides.	

Potential consequences: Fire or explosion; generation of flammable hydrogen gas.

Group 3-A	Group 3-B
Alcohols	Any concentrated waste in Groups 1-A or 1-B.
Water	Calcium.
	Lithium.
	Metal hydrides.
	Potassium.
	SO_2Cl_2, $SOCl_2$, PCl_3, CH_3SiCl_3.
	Other water-reactive waste.

Potential consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

Group 4-A	Group 4-B
Alcohols	Concentrated Group 1-A or 1-B wastes.
Aldehydes	Group 2-A wastes.
Halogenated hydrocarbons	
Nitrated hydrocarbons	
Unsaturated hydrocarbons	
Other reactive organic compounds and solvents.	

Potential consequences: Fire, explosion, or violent reaction.

Group 5-A	Group 5-B
Spent cyanide and sulfide solutions.	Group 1-B wastes.

Potential consequences: Generation of toxic hydrogen cyanide or hydrogen sulfide gas.

Group 6-A	Group 6-B
Chlorates	Acetic acid and other organic acids.

TABLE 12—INCOMPATIBLE MATERIALS—Continued

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

Chlorine	Concentrated mineral acids.
Chlorites	Group 2-A wastes.
Chromic acid	Group 4-A wastes.
Hyphochlorites	Other flammable and combustible wastes.
Nitrates	
Nitric acid, fuming	
Perchlorates	
Permanganates	
Peroxides	
Other strong oxidizers	

Potential consequences: Fire, explosion, or violent reaction.

Source: Hazardous Waste Management Law, Regulations, and Guidelines for the Handling of Hazardous Waste. California Department of Health, Sacramento, California, February 1975.

Incompatibility provides a measure of the increased hazard when hazardous substances are mixed under uncontrolled conditions, leading to production of heat, pressure, fire, explosion, violent reaction, toxic dusts, mists, fumes or gases, or flammable fumes or gases. Table 12 provides examples of incompatible combinations of materials.

Land use indicates the nature and level of human activity in the vicinity of a facility. Assign highest applicable value from Table 13.

6.0 Computing the Migration Hazard Mode Score, S_M

To compute S_M, complete the work sheet (Figure 10) using the values of S_{gw}, S_{sw} and S_a obtained from the previous sections.

7.0 Fire and Explosion

Compute a score for the fire and explosion hazard mode, S_{FE}, when either a state or local fire marshal has certified that the facility presents a significant fire or explosion threat to the public or to sensitive environments or there is a demonstrated fire and explosion threat based on field observations (e.g., combustable gas indicator readings). Document the threat.

7.1 *Containment. Containment* is an indicator of the measures that have been taken to minimize or prevent hazardous substances at the facility from catching fire or exploding. Normally it will be given a value of 3 on the work sheet (Figure 11). If no hazardous substances that are individually ignitable or explosive are present and those that may be hazardous in combination are segregated and isolated so that they cannot come together to form incompatible mixtures, assign this factor a value of 1.

7.2 *Waste Characteristics. Direct evidence* of ignitability or explosion potential may exist in the form of measurements with appropriate instruments. If so, assign this factor a value of 3; if not, assign a value of 0.

Additional information can be obtained from *A Method for Determining the Compatibility of Hazardous Wastes*, H. K. Hatayama, *et al.*, EPA-600/2-80-076 (1980). Assign a value using the following guidance:

Incompatibility	Assigned value
No incompatible substances are present	0
Present but do not pose a hazard	1
Present and may pose a future hazard	2
Present and posing an immediate hazard	3

Toxicity should be rated for the most toxic of the substances that can reasonably be expected to be transported away from the facility via the air route. Using the information given in Tables 4, 6, and 7, assign values as follows:

Toxicity	Assigned value
Sax level 0 or NFPA level 0	0
Sax level 1 or NFPA level 1	1
Sax level 2 or NFPA level 2	2
Sax level 3 or NFPA levels 3 or 4	3

Hazardous Waste Quantity

Assign hazardous waste quantity a value as described in Section 3.4.

5.3 *Targets. Population within a four-mile radius* is an indicator of the population which may be harmed should hazardous substances be released to the air.

The distance is measured from the location of the hazardous substances, not from the facility boundary. The population to be counted includes persons residing within the four-mile radius as well as transients such as workers in factories, offices, restaurants, motels, or students. It excludes travelers passing through the area. If aerial photography is used in making the count, assume 3.8 individuals per dwelling unit. Select the highest value for this rating factor as follows:

DISTANCE TO POPULATION FROM HAZARDOUS SUBSTANCE

Population	0-4 miles	0-1 mile	0-½ mile	0-¼ mile
0	0	0	0	0
1 to 100	9	12	15	18
101 to 1,000	12	15	18	21
1,001 to 3,000	15	18	21	24
3,001 to 10,000	18	21	24	27
More than 10,000	21	24	27	30

Distance to sensitive environment is an indicator of the likelihood that a region that contains important biological resources or that is a fragile natural setting would suffer serious damage if hazardous substances were to be released from the facility. Assign a value from Table 10.

Land use indicates the nature and level of human activity in the vicinity of a facility. Assign highest applicable value from Table 13.

6.0 Computing the Migration Hazard Mode Score, S_M

To compute S_M, complete the work sheet (Figure 10) using the values of S_{gw}, S_{sw} and S_a obtained from the previous sections.

7.0 Fire and Explosion

Compute a score for the fire and explosion hazard mode, S_{FE}, when either a state or local fire marshall has certified that the facility presents a significant fire or explosion threat to the public or to sensitive environments or there is a demonstrated fire and explosion threat based on field observations (e.g., combustible gas indicator readings). Document the threat.

7.1 *Containment. Containment* is an indicator of the measures that have been taken to minimize or prevent hazardous substances at the facility from catching fire or exploding. Normally it will be given a value of 3 on the work sheet (Figure 11). If no hazardous substances that are individually ignitable or explosive are present and those that may be hazardous in combination are segregated and isolated so that they cannot come together to form incompatible mixtures, assign this factor a value of 1.

7.2 *Waste Characteristics. Direct evidence* of ignitability or explosion potential may exist in the form of measurements with appropriate instruments. If so, assign this factor a value of 3; if not, assign a value of 0.

TABLE 13—VALUES FOR LAND USE (AIR ROUTE)

Assigned value =	0	1	2	3
Distance to Commercial-Industrial	> 1 mile	½ to 1 mile	¼ to ½ mile	< ¼ mile.
Distance to National/State Parks, Forests, Wildlife Reserves, and Residential Areas.	> 2 miles	1 to 2 miles	¼ to 1 mile	< ¼ mile.
Distance to Agricultural Lands (in Production within 5 years):				
Ag land	> 1 mile	½ to 1 mile	¼ to ½ mile	< ¼ mile.
Prime Ag Land [1]	> 2 miles	1 to 2 miles	½ to 1 mile	< ½ mile.
Distance to Historic/Landmark Sites (National Register of Historic Places and National Natural Landmarks).				Within view of site or if site is subject to significant impacts.

[1] Defined in the Code of Federal Regulations, 7 CFR 657.5, 1981.

	S	S^2
Groundwater Route Score (S_{gw})		
Surface Water Route Score (S_{sw})		
Air Route Score (S_a)		
$S_{gw}^2 + S_{sw}^2 + S_a^2$		
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100			S_{FE} =		

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Ignitability is an indicator of the threat of fire at a facility and the accompanying potential for release of air contaminants. Assign this rating factor a value based on the NFPA classification scheme (Table 14). Table 4 gives values for a number of common compounds. Assign values as follows:

Ignitability	Assigned value
Flashpoint > 200°F, or NFPA level 0	0
Flashpoint 140°F to 200°F or NFPA level 1	1
Flashpoint 80°F to 140°F or NFPA level 2	2
Flashpoint < 80°F or NFPA levels 3 or 4	3

Reactivity. Assign values as in Section 5.2.

Incompatibility. Assign values as in Section 5.2.

Hazardous Waste Quantity. Assign values as in Section 3.4.

TABLE 14—NFPA IGNITABILITY LEVELS AND ASSIGNED VALUES

NFPA level	Assigned value
4 Very flammable gases, very volatile flammable liquids, and materials that in the form of dusts or mists readily form explosive mixtures when dispersed in air	3
3 Liquids which can be ignited under all normal temperature conditions. Any materials that ignites spontaneously at normal temperatures in air	
2 Liquids which must be moderately heated before ignition will occur and solids that readily give off flammable vapors	2
1 Materials that must be preheated before ignition can occur. Most combustible solids have a flammability rating of 1	1
0 Materials that will not burn	0

7.3 *Targets. Distance to nearest population* is the distance from the hazardous substance to the nearest building or area in which one or more persons are likely to be located either for residential, educational, business, occupational, or recreational purposes. It is an indicator of the potential for harm to humans from fire and explosion. The building or area need not be off-site. Assign values as follows:

Distance	Assigned value
> 2 miles	0
1 mile to 2 mile	1
½ mile to 1 miles	2
201 feet to ½ mile	3
51 feet to 200 feet	4
0 to 50 feet	5

Distance to nearest building is an indicator of the potential for property damage as a result of fire or explosion. Assign a value as follows:

Distance	Assigned value
> ½ mile	0
201 feet to ½ mile	1
51 feet to 200 feet	2
0 to 50 feet	3

Distance to nearest sensitive environment is measured from the hazardous substances, not from the facility boundary. It is an indicator of potential harm to a sensitive environment from fire or explosion at the facility. Select the highest value using the guidance provided in Table 15 *except* assign a value of 3 where fire could be expected to spread to a sensitive environment even though that environment is more than 100 feet from the hazardous substance.

TABLE 15—VALUES FOR SENSITIVE ENVIRONMENTS (FIRE AND EXPLOSION)

Assigned value =	0	1	2	3
Distance to Wetlands[1]	> 100 feet			< 100 feet.
Distance to Critical Habitat[2]	> ½ mile	1000 feet to ½ mile.	100 to 1000 feet	< 100 feet.

[1] Wetland is defined by EPA in the Code of Federal Regulations 40 CFR Part 230, Appendix A, 1980.
[2] Designated by the U.S. Fish and Wildlife Service.

Land Use. Assign values as in Section 5.3.

Population within two-mile radius (measured from the location of the hazardous substance, not from the facility boundary) is a rough indicator of the population at risk in the event of fire or explosion at a facility. The population to be counted includes those residing within the two mile radius as well as people regularly in the vicinity such as workers in factories, offices, or students. It does not include travelers passing through the area. If aerial photography is used in making the count, assume 3.8 individuals per dwelling. Assign values as follows:

Population	Assigned value
0	0
1 to 100	1
101 to 1,000	2
1,001 to 3,000	3
3,001 to 10,000	4
> 10,000	5

Number of buildings within two mile radius (measured from the hazardous substance, not from the facility boundary) is a rough indicator of the property damage that could result from fire and explosion at a facility. Assign values to this factor as follows:

Number of buildings	Assigned value
0	0
1 to 26	1
27 to 260	2
261 to 790	3
791 to 2600	4
> 2600	5

8.0 Direct Contact. The direct contact hazard mode refers to the potential for injury by direct contact with hazardous substances at the facility.

8.1 *Observed Incident.* If there is a confirmed instance in which contact with hazardous substances at a facility has caused injury, illness, or death to humans or domestic or wild animals, enter a value of 45 on line 1 of the work sheet (Figure 12) and proceed to line 4 (toxicity). Document the incident giving the date, location and pertinent details. If no such instance is known, enter "0" on line 1 and proceed to line 2.

8.2 *Accessibility. Accessibility to hazardous substance* refers to the measures taken to limit access by humans or animals to hazardous substances. Assign a value using the following guidance:

Barrier	Assigned value
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or an artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility)	0
Security guard, but no barrier	1
A barrier, but no separate means to control entry	2
Barriers do not completely surround the facility	3

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Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 45	1		45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1		3	8.2
3 Containment	0 15	1		15	8.3
4 Waste Characteristics Toxicity	0 1 2 3	5		15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4		20	
Distance to a Critical Habitat	0 1 2 3	4		12	
Total Targets Score				32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7 Divide line 6 by 21,600 and multiply by 100	S_{DC} =				

FIGURE 12
DIRECT CONTACT WORK SHEET

8.3 *Containment. Containment* indicates whether the hazardous substance itself is accessible to direct contact. For example, if the hazardous substance at the facility is in surface impoundments, containers (sealed or unsealed), piles, tanks, or landfills with a cover depth of less than 2 feet, or has been spilled on the ground or other surfaces easily contacted (e.g., the bottom of shallow pond or creek), assign this rating factor a value of 15. Otherwise, assign a value of 0.

8.4 *Waste Characteristics. Toxicity.* Assign a value as in Section 3.4.

8.5 *Targets. Population within one-mile radius* is a rough indicator of the population that could be involved in direct contact incidents at an uncontrolled facility. Assign a value as follows:

Population	Assigned value
0	0
1 to 100	1
101 to 1,000	2
1,001 to 3,000	3
3,001 to 10,000	4
>10,000	5

Distance to a critical habitat (of an endangered species) is a rough measure of the probability of harm to members of an endangered species by direct contact with hazardous substance. Assign a value as follows:

Distance	Assigned value
<1 mile	0
⅛ to 1 mile	1
¼ to ½ mile	2
>¼ mile	3

Appendix B—National Priorities List

GROUP 1

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #			
1	02	NJ	Lipari Landfill	Pitman	V	R	E	
2	03	DE	Tybouts Corner Landfill *	New Castle County		R	E	
3	03	PA	Bruin Lagoon	Bruin Borough		R		
4	02	NJ	Helen Kramer Landfill	Mantua Township		R		
5	01	MA	Industri-Plex	Woburn	V	R	E	
6	02	NJ	Price Landfill *	Pleasantville		R	E	
7	02	NY	Pollution Abatement Services *	Oswego		R		
8	07	IA	LaBounty Site	Charles City	V	R	E	
9	03	DE	Army Creek Landfill	New Castle County				D
10	02	NJ	CPS/Madison Industries	Old Bridge Township			E	
11	01	MA	Nyanza Chemical Waste Dump	Ashland		R		
12	02	NJ	Gems Landfill	Gloucester Township		R		
13	05	MI	Berlin & Farro	Swartz Creek	V	R	E	
14	01	MA	Baird & McGuire	Holbrook		R	E	
15	02	NJ	Lone Pine Landfill	Freehold Township		R		
16	01	NH	Somersworth Sanitary Landfill	Somersworth		R		
17	05	MN	FMC Corp. (Fridley Plant)	Fridley	V			
18	06	AR	Vertac, Inc.	Jacksonville	V	R	E	
19	01	NH	Keefe Environmental Services	Epping		R	E	
20	08	SD	Whitewood Creek *	Whitewood	V			
21	08	MT	Silver Bow Creek	Sil Bow/Deer Lodge		R		
22	06	TX	French, Ltd.	Crosby		R		
23	01	NH	Sylvester *	Nashua		R	E	
24	05	MI	Liquid Disposal, Inc.	Utica		R		
25	03	PA	Tysons Dump	Upper Merion Twp		R		
26	03	PA	McAdoo Associates *	McAdoo Borough		R		
27	06	TX	Motco Inc. *	La Marque		R		
28	05	OH	Arcanum Iron & Metal	Darke County		R		
29	08	MT	East Helena Site	East Helena			E	
30	06	TX	Sikes Disposal Pits	Crosby		R		
31	04	AL	Triana/Tennessee River	Limestone/Morgan	V		E	
32	09	CA	Stringfellow *	Glen Avon Heights		R	E	
33	01	ME	McKin Co.	Gray		R		
34	06	TX	Crystal Chemical Co.	Houston		R	E	
35	02	NJ	Bridgeport Rental & Oil Services	Bridgeport		R	E	
36	08	CO	Sand Creek Industrial	Commerce City			E	
37	06	TX	Geneva Industries/Fuhrmann Energy	Houston		R	E	
38	01	MA	W. R. Grace & Co. (Acton Plant)	Acton	V		E	
39	05	MN	Reilly Tar (St. Louis Park Plant)	St. Louis Park		R		
40	02	NJ	Burnt Fly Bog	Marlboro Township		R	E	
41	02	NJ	Vineland Chemical Co., Inc.	Vineland	V			
42	04	FL	Schuylkill Metals Corp.	Plant City				D
43	05	MN	New Brighton/Arden Hills	New Brighton		R	E	
44	02	NY	Old Bethpage Landfill	Oyster Bay	V			
45	02	NJ	Shieldalloy Corp.	Newfield Borough		R	E	
46	04	FL	Reeves SE Galvanizing Corp.	Tampa				D
47	08	MT	Anaconda Co. Smelter	Anaconda	V	R	E	
48	10	WA	Western Processing Co., Inc.	Kent	V	R	E	
49	05	WI	Omega Hills North Landfill	Germantown				D
50	04	FL	American Creosote Works	Pensacola		R		

#: V = VOLUNTARY OR NEGOTIATED RESPONSE; R = FEDERAL AND STATE RESPONSE;
E = FEDERAL AND STATE ENFORCEMENT; D = ACTIONS TO BE DETERMINED.
* = STATES' DESIGNATED TOP PRIORITY SITES.

GROUP 2

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #			
51	02	NJ	Caldwell Trucking Co.	Fairfield		R		
52	02	NY	GE Moreau	South Glen Falls	V		E	
53	05	IN	Seymour Recycling Corp. *	Seymour	V	R	E	
54	05	OH	United Scrap Lead Co., Inc.	Troy				D
55	06	OK	Tar Creek (Ottawa County)	Ottawa County		R		
56	07	KS	Cherokee County	Cherokee County		R		
57	02	NJ	Brick Township Landfill	Brick Township	V			
58	05	MI	Northernaire Plating	Cadillac		R	E	
59	05	WI	Janesville Old Landfill	Janesville				D
60	10	WA	Frontier Hard Chrome, Inc.	Vancouver		R		
61	04	SC	Independent Nail Co.	Beaufort				D
62	04	SC	Kalama Specialty Chemicals	Beaufort			E	
63	05	WI	Janesville Ash Beds	Janesville				D
64	04	FL	Davie Landfill	Davie				D
65	05	OH	Miami County Incinerator	Troy		R	E	
66	04	FL	Gold Coast Oil Corp.	Miami	V			
67	05	WI	Wheeler Pit	La Prairie Township				D
68	09	AZ	Tucson Intl Airport Area	Tucson	V	R		
69	02	NY	Wide Beach Development	Brant		R		
70	09	CA	Iron Mountain Mine	Redding		R		
71	02	NJ	Scientific Chemical Processing	Carlstadt			E	
72	08	CO	California Gulch	Leadville			E	
73	02	NJ	D'Imperio Property	Hamilton Township		R		
74	05	MI	Gratiot County Landfill *	St. Louis	V			
75	01	RI	Picillo Farm *	Coventry		R	E	
76	01	MA	New Bedford Site *	New Bedford	V	R	E	
77	06	LA	Old Inger Oil Refinery *	Darrow		R		
78	05	OH	Chem-Dyne *	Hamilton	V	R	E	
79	04	SC	SCRDI Bluff Road *	Columbia	V	R	E	
80	01	CT	Laurel Park, Inc. *	Naugatuck Borough			E	
81	08	CO	Marshall Landfill *	Boulder County			E	
82	05	IL	Outboard Marine Corp. *	Waukegan		R	E	
83	06	NM	South Valley *	Albuquerque		R	E	
84	01	VT	Pine Street Canal *	Burlington				D
85	03	WV	West Virginia Ordnance *	Point Pleasant		R		
86	07	MO	Ellisville Site *	Ellisville		R		
87	08	ND	Arsenic Trioxide Site *	Southeastern N.D.		R		
88	09	TT	PCB Wastes *	Pacific Trust Terr		R		
89	03	VA	Matthews Electroplating *	Roanoke County		R		
90	07	IA	Aidex Corp. *	Council Bluffs		R	E	
91	09	AZ	Mountain View Mobile Homes *	Globe		R	E	
92	09	AS	Taputimu Farm *	American Samoa		R		
93	04	TN	North Hollywood Dump *	Memphis		R		
94	04	KY	A.L. Taylor (Valley of Drums) *	Brooks		R		
95	04	NC	PCB Spills *	210 Miles of Roads		R	E	
96	09	GU	Ordot Landfill *	Guam		R		
97	04	MS	Flowood Site *	Flowood				D
98	08	UT	Rose Park Sludge Pit *	Salt Lake City	V			
99	07	KS	Arkansas City Dump *	Arkansas City		R		
100	09	CM	PCB Warehouse *	Marianas		R		

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GROUP 3

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #		
101	05	MN	Oakdale Dump	Oakdale	V		E
102	05	IL	A & F Material Reclaiming, Inc.	Greenup	V	R	E
103	03	PA	Douglassville Disposal	Douglassville		R	
104	02	NJ	Krysowaty Farm	Hillsborough		R	
105	05	MN	Koppers Coke	St. Paul			D
106	01	MA	Plymouth Harbor/Cannon Engnrng	Plymouth		R	E
107	10	ID	Bunker Hill Mining & Metallurg	Smelterville			E
108	02	NY	Hudson River PCBs	Hudson River		R	E
109	02	NJ	Universal Oil Products(Chem Div)	East Rutherford			E
110	09	CA	Aerojet General Corp.	Rancho Cordova			E
111	10	WA	Com Bay, South Tacoma Channel	Tacoma		R	E
112	03	PA	Osborne Landfill	Grove City			E
113	01	CT	Old Southington Landfill	Southington	V		E
114	02	NY	Syosset Landfill	Oyster Bay			D
115	09	AZ	Nineteenth Avenue Landfill	Phoenix			E
116	10	OR	Teledyne Wah Chang	Albany			D
117	02	NY	Sinclair Refinery	Wellsville		R	E
118	04	AL	Mowbray Engineering Co.	Greenville		R	
119	05	MI	Spiegelberg Landfill	Green Oak Township		R	
120	04	FL	Miami Drum Services	Miami		R	E
121	02	NJ	Reich Farms	Pleasant Plains		R	E
122	10	ID	Union Pacific Railroad Co.	Pocatello			D
123	02	NJ	South Brunswick Landfill	South Brunswick	V		
124	04	AL	Ciba-Geigy Corp. (McIntosh Plant)	McIntosh			D
125	04	FL	Kassauf-Kimerling Battery	Tampa		R	
126	05	IL	Wauconda Sand & Gravel	Wauconda		R	
127	01	NH	Ottati & Goss/Kingston Steel Drum	Kingston	V	R	E
128	05	MI	Ott/Story/Cordova	Dalton Township		R	E
129	02	NJ	NL Industries	Pedricktown			E
130	05	MN	St. Regis Paper Co.	Cass Lake	V		
131	02	NJ	Ringwood Mines/Landfill	Ringwood Borough	V		
132	04	FL	Whitehouse Oil Pits	Whitehouse		R	
133	04	GA	Hercules 009 Landfill	Brunswick			D
134	05	MI	Velsicol Chemical (Michigan)	St. Louis	V		E
135	05	OH	Summit National	Deerfield Township	V	R	E
136	02	NY	Love Canal	Niagara Falls		R	E
137	05	IN	Fisher-Calo	LaPorte	V		E
138	04	FL	Pioneer Sand Co.	Warrington		R	E
139	05	MI	Springfield Township Dump	Davisburg		R	
140	03	PA	Hranica Landfill	Buffalo Township			D
141	04	NC	Martin Marietta, Sodyeco, Inc.	Charlotte			D
142	04	FL	Zellwood Ground Water Contam	Zellwood		R	
143	05	MI	Packaging Corp. of America	Filer City		R	D
144	05	WI	Muskego Sanitary Landfill	Muskego			D
145	02	NY	Hooker (S Area)	Niagara Falls	V		E
146	03	PA	Lindane Dump	Harrison Township			D
147	08	CO	Central City-Clear Creek	Idaho Springs		R	
148	02	NJ	Ventron/Velsicol	Wood Ridge Borough		R	E
149	04	FL	Taylor Road Landfill	Seffner			E
150	01	RI	Western Sand & Gravel	Burrillville		R	E

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GROUP 4

RANK	EPA RLG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #		
151	04	SC	Koppers Co., Inc (Florence Plant)	Florence			E
152	02	NJ	Maywood Chemical Co.	Maywood/Rochelle Pk			E
153	02	NJ	Nascolite Corp.	Millville	V	R	
154	06	OK	Hardage/Criner	Criner		R	E
155	05	MI	Rose Township Dump	Rose Township		R	
156	05	MN	Waste Disposal Engineering	Andover	V		E
157	02	NJ	Kin-Buc Landfill	Edison Township	V	R	E
158	05	OH	Bowers Landfill	Circleville		R	
159	02	NJ	Ciba-Geigy Corp.	Toms River			D
160	05	MI	Butterworth #2 Landfill	Grand Rapids			E
161	02	NJ	American Cyanamid Co.	Bound Brook			E
162	03	PA	Heleva Landfill	North Whitehall Twp		R	
163	02	NJ	Ewan Property	Shamong Township			D
164	02	NY	Batavia Landfill	Batavia			E
165	05	MN	Boise Cascade/Onan/Medtronics	Fridley			E
166	01	RI	L&RR, Inc.	North Smithfield			E
167	04	FL	NW 58th Street Landfill	Hialeah		R	E
168	02	NJ	Delilah Road	Egg Harbor Township		R	E
169	03	PA	Mill Creek Dump	Erie		R	
170	04	FL	Sixty-Second Street Dump	Tampa		R	
171	05	MI	G&H Landfill	Utica		R	
172	02	NJ	Metaltec/Aerosystems	Franklin Borough		R	E
173	05	WI	Schmalz Dump	Harrison			D
174	02	NJ	Lang Property	Pemberton Township			D
175	02	NJ	Sharkey Landfill	Parsippany Troy Hls		R	
176	09	CA	Selma Treating Co.	Selma			E
177	06	LA	Cleve Reber	Sorrento		R	
178	05	IL	Velsicol Chemical (Illinois)	Marshall	V		
179	05	MI	Tar Lake	Mancelona Township		R	
180	08	CO	Lowry Landfill	Arapahoe County	V	R	E
181	05	MN	MacGillis & Gibbs/Bell Lumber	New Brighton			E
182	02	NJ	Combe Fill North Landfill	Mount Olive Twp		R	
183	01	MA	Re-Solve, Inc.	Dartmouth		R	E
184	02	NJ	Goose Farm	Plumstead Township		R	E
185	04	TN	Velsicol Chem (Hardeman County)	Toone			D
186	02	NY	York Oil Co.	Moira		R	E
187	04	FL	Sapp Battery Salvage	Cottondale		R	E
188	04	SC	Wamchem, Inc.	Burton			D
189	02	NJ	Chemical Leaman Tank Lines, Inc.	Bridgeport			D
190	05	WI	Master Disposal Service Landfill	Brookfield			E
191	07	KS	Doepke Disposal Site (Holliday)	Johnson County		R	
192	02	NJ	Florence Land Recontouring LF	Florence Township		R	E
193	01	RI	Davis Liquid Waste	Smithfield		R	E
194	01	MA	Charles-George Reclamation Lf	Tyngsborough		R	E
195	02	NJ	King of Prussia	Winslow Township			D
196	03	VA	Chisman Creek	York County		R	
197	05	OH	Nease Chemical	Salem			D
198	02	NJ	W. R. Grace & Co. (Wayne Plant)	Wayne Township		R	
199	02	NJ	Chemical Control	Elizabeth		R	E
200	04	SC	Leonard Chemical Co., Inc.	Rock Hill			E

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GROUP 4—Continued

EPA region	State	Site name	City	Response # category	Cleanup @ status
2	NJ	Glen Ridge Radium Site	Glen Ridge	R	O
2	NJ	Montclair/West Orange Radium Site	Montclair/West Orange	R	O

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@: I=Implementation activity underway, one or more operable units; O=One or more operable units completed, others may be underway; C=Implementation activity completed for all operable units.

GROUP 5

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #
201	05	OH	Allied Chemical & Ironton Coke	Ironton	V
202	05	MI	Verona Well Field	Battle Creek	R
203	01	CT	Beacon Heights Landfill	Beacon Falls	R E
204	04	AL	Stauffer Chem (Cold Creek Plant)	Bucks	D
205	05	MN	Burlington Northern (Brainerd)	Brainerd/Baxter	D
206	03	PA	Malvern TCE	Malvern	D
207	02	NY	Facet Enterprises, Inc.	Elmira	V
208	03	DE	Delaware Sand & Gravel Landfill	New Castle County	R
209	04	TN	Murray-Ohio Dump	Lawrenceburg	V E
210	05	IN	Envirochem Corp.	Zionsville	V R E
211	05	IN	MIDCO I	Gary	R E
212	05	OH	South Point Plant	South Point	D
213	04	FL	Coleman-Evans Wood Preserving Co.	Whitehouse	E
214	03	PA	Dorney Road Landfill	Upper Macungie Twp	R
215	05	IN	Northside Sanitary Landfill, Inc	Zionsville	E
216	04	FL	Florida Steel Corp.	Indiantown	D
217	09	AZ	Litchfield Airport Area	Goodyear/Avondale	R E
218	02	NJ	Spence Farm	Plumstead Township	R
219	06	AR	Mid-South Wood Products	Mena	R E
220	09	CA	Atlas Asbestos Mine	Fresno County	D
221	09	CA	Coalinga Asbestos Mine	Coalinga	D
222	04	FL	Brown Wood Preserving	Live Oak	V E
223	02	NY	Port Washington Landfill	Port Washington	V
224	02	NJ	Combe Fill South Landfill	Chester Township	R
225	02	NJ	JIS Landfill	Jamesburg/S. Brnswck	E
226	03	PA	Centre County Kepone	State College Boro	E
227	05	OH	Fields Brook	Ashtabula	R
228	01	CT	Solvents Recovery Service	Southington	V E
229	08	CO	Woodbury Chemical Co.	Commerce City	R
230	01	MA	Hocomonco Pond	Westborough	R
231	04	KY	Distler Brickyard	West Point	R
232	02	NY	Ramapo Landfill	Ramapo	V
233	09	CA	Coast Wood Preserving	Ukiah	E
234	02	NY	Mercury Refining, Inc.	Colonie	E
235	04	FL	Hollingsworth Solderless Terminal	Fort Lauderdale	D
236	02	NY	Olean Well Field	Olean	R
237	04	FL	Varsol Spill	Miami	V R
238	05	MN	Joslyn Manufacturing & Supply Co.	Brooklyn Center	E
239	08	CO	Denver Radium Site	Denver	R
240	04	FL	Tower Chemical Co.	Clermont	R E
241	07	MO	Syntex Facility	Verona	V E
242	08	MT	Milltown Reservoir Sediments	Milltown	R
243	05	MN	Arrowhead Refinery Co.	Hermantown	R
244	02	NJ	Pijak Farm	Plumstead Township	R
245	02	NJ	Syncon Resins	South Kearny	R
246	09	CA	Liquid Gold Oil Corp.	Richmond	E
247	09	CA	Purity Oil Sales, Inc.	Malaga	R
248	01	NH	Tinkham Garage	Londonderry	R
249	04	FL	Alpha Chemical Corp.	Galloway	D
250	02	NJ	Bog Creek Farm	Howell Township	R

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GROUP 6

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #		
251	01	ME	Saco Tannery Waste Pits	Saco		R	
252	04	FL	Pickettville Road Landfill	Jacksonville			D
253	01	MA	Iron Horse Park	Billerica			D
254	03	PA	Palmerton Zinc Pile	Palmerton		R	
255	05	IN	Neal's Landfill (Bloomington)	Bloomington	V		E
256	05	WI	Kohler Co. Landfill	Kohler			D
257	01	MA	Silresim Chemical Corp.	Lowell		R	E
258	01	MA	Wells G&H	Woburn		R	E
259	02	NJ	Chemsol, Inc.	Piscataway			D
260	05	WI	Lauer I Sanitary Landfill	Menomonee Falls			E
261	05	MI	Petoskey Municipal Well Field	Petoskey			E
262	05	MN	Union Scrap	Minneapolis			E
263	02	NJ	Radiation Technology, Inc.	Rockaway Township			E
264	02	NJ	Fair Lawn Well Field	Fair Lawn	V		
265	05	IN	Main Street Well Field	Elkhart	V		
266	05	MN	Lehillier/Mankato Site	Lehillier		R	
267	10	WA	Lakewood Site	Lakewood			E
268	03	PA	Industrial Lane	Williams Township		R	
269	05	WI	Onalaska Municipal Landfill	Onalaska			D
270	02	NJ	Monroe Township Landfill	Monroe Township			E
271	02	NJ	Rockaway Borough Well Field	Rockaway Township			D
272	05	IN	Wayne Waste Oil	Columbia City			E
273	10	ID	Pacific Hide & Fur Recycling Co.	Pocatello		R	E
274	07	IA	Des Moines TCE	Des Moines		R	
275	02	NJ	Beachwood/Berkley Wells	Berkley Township		R	
276	02	NY	Vestal Water Supply Well 4-2	Vestal			E
277	02	PR	Vega Alta Public Supply Wells	Vega Alta		R	
278	05	MI	Sturgis Municipal Wells	Sturgis			D
279	05	MN	Washington County Landfill	Lake Elmo			D
280	09	AZ	Indian Bend Wash Area	Scottsdale/Tempe		R	E
281	09	CA	San Gabriel Valley (Area 1)	El Monte		R	
282	09	CA	San Gabriel Valley (Area 2)	Baldwin Park Area		R	
283	10	WA	Com Bay, Near Shore/Tide Flats	Pierce County		R	E
284	05	IL	LaSalle Electric Utilities	LaSalle		R	
285	05	IL	Cross Brothers Pail (Pembroke)	Pembroke Township		R	
286	02	PR	Upjohn Facility	Barceloneta	V		
287	09	CA	McColl	Fullerton		R	E
288	03	PA	Henderson Road	Upper Merion Twp		R	
289	10	WA	Colbert Landfill	Colbert		R	
290	06	LA	Petro-Processors	Scotlandville	V	R	E
291	02	PR	Frontera Creek	Rio Abajo			D
292	02	PR	Barceloneta Landfill	Florida Afuera			D
293	03	MD	Sand, Gravel & Stone	Elkton		R	
294	05	MI	Spartan Chemical Co.	Wyoming			E
295	02	NJ	Roebling Steel Co.	Florence		R	
296	03	PA	East Mount Zion	Springettsbury Twp		R	
297	04	TN	Amnicola Dump	Chattanooga			D
298	02	NJ	Vineland State School	Vineland		R	
299	03	PA	Enterprise Avenue	Philadelphia		R	
300	01	MA	Groveland Wells	Groveland		R	E

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GROUP 7

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #		
301	02	NY	General Motors (Cent Foundry Div)	Massena		R	
302	04	SC	SCRDI Dixiana	Cayce		R	E
303	07	MO	Fulbright Landfill	Springfield			D
304	03	PA	Presque Isle	Erie			D
305	02	NJ	Williams Property	Swainton		R	
306	02	NJ	Renora, Inc.	Edison Township			D
307	02	NJ	Denzer & Schafer X-Ray Co.	Bayville			D
308	02	NJ	Hercules, Inc. (Gibbstown Plant)	Gibbstown			
309	05	IN	Ninth Avenue Dump	Gary	V		E
310	06	AR	Gurley Pit	Edmondson			D
311	01	RI	Peterson/Puritan, Inc.	Lincoln/Cumberland	V		E
312	07	MO	Times Beach Site	Times Beach		R	
313	05	MI	Wash King Laundry	Pleasant Plains Twp			D
314	05	MN	Whittaker Corp.	Minneapolis			D
315	05	MN	NL Industries/Taracorp/Golden	St. Louis Park	V		
316	01	CT	Kellogg-Deering Well Field	Norwalk	V	R	E
317	01	MA	Cannon Engineering Corp. (CEC)	Bridgewater		R	E
318	02	NY	Niagara County Refuse	Wheatfield			D
319	04	FL	Sherwood Medical Industries	Deland			D
320	04	AL	Olin Corp. (McIntosh Plant)	McIntosh			D
321	05	MI	Southwest Ottawa County Landfill	Park Township			E
322	02	NY	Kentucky Avenue Well Field	Horseheads		R	
323	02	NJ	Asbestos Dump	Millington		R	
324	04	KY	LEE'S LANE LANDFILL	LOUISVILLE		R	E
325	06	AR	Frit Industries	Walnut Ridge	V		E
326	05	OH	Fultz Landfill	Jackson Township			D
327	04	FL	Tri-City Oil Conservationist, Inc	Tampa		R	
328	05	OH	Coshocton Landfill	Franklin Township		R	E
329	03	PA	Lord-Shope Landfill	Girard Township			E
330	10	WA	FMC Corp. (Yakima Pit)	Yakima	V		
331	05	WI	Northern Engraving Co.	Sparta			D
332	01	MA	PSC Resources	Palmer	V		
333	05	MI	Forest Waste Products	Otisville		R	
334	03	PA	Drake Chemical	Lock Haven		R	
335	01	NH	Kearsarge Metallurgical Corp.	Conway	V		E
336	04	SC	Palmetto Wood Preserving	Dixianna			D
337	05	MI	Clare Water Supply	Clare	V		
338	03	PA	Havertown PCP	Haverford		R	
339	03	DE	New Castle Spill	New Castle County			D
340	05	MN	Morris Arsenic Dump	Morris		R	
341	05	IN	Lake Sandy Jo (M&M Landfill)	Gary		R	
342	05	IL	Johns-Manville Corp.	Waukegan	V	R	E
343	05	MI	Chem Central	Wyoming Township			D
344	05	MI	Novaco Industries	Temperance			E
345	02	NJ	Jackson Township Landfill	Jackson Township			E
346	05	MI	K&L Avenue Landfill	Oshtemo Township	V		E
347	10	WA	Kaiser Aluminum Mead Works	Mead	V		
348	05	MN	Perham Arsenic Site	Perham		R	
349	05	MI	Charlevoix Municipal Well	Charlevoix		R	
350	02	NJ	Montgomery Township Housing Dev	Montgomery Township			D

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GROUP 8

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #
351	02	NJ	Rocky Hill Municipal Well	Rocky Hill Borough	E
352	02	NY	Brewster Well Field	Putnam County	R
353	02	NY	Vestal Water Supply Well 1-1	Vestal	R
354	05	MN	Nutting Truck & Caster Co.	Faribault	V D
355	02	NJ	U.S. Radium Corp.	Orange	R
356	06	TX	Highlands Acid Pit	Highlands	R
357	03	PA	Resin Disposal	Jefferson Borough	D
358	08	MT	Libby Ground Water Contamination	Libby	D
359	04	KY	Newport Dump	Newport	E
360	03	PA	Moyers Landfill	Eagleville	R E
361	04	FL	Parramore Surplus	Mount Pleasant	D
362	01	NH	Savage Municipal Water Supply	Milford	D
363	05	IN	Poer Farm	Hancock County	R
364	05	MI	Hedblum Industries	Oscoda	D
365	06	TX	United Creosoting Co.	Conroe	R
366	08	WY	Baxter/Union Pacific Tie Treating	Laramie	D
367	02	NJ	Sayreville Landfill	Sayreville	D
368	01	NH	Dover Municipal Landfill	Dover	R
369	02	NY	Ludlow Sand & Gravel	Clayville	R
370	05	WI	City Disposal Corp. Landfill	Dunn	D
371	02	NJ	Tabernacle Drum Dump	Tabernacle Twp	E
372	02	NJ	Cooper Road	Voorhees Township	D
373	07	MO	Minker/Stout/Romaine Creek	Imperial	R
374	01	CT	Yaworski Waste Lagoon	Canterbury	R E
375	03	WV	Leetown Pesticide	Leetown	R
376	04	FL	Cabot/Koppers	Gainesville	R
377	02	NJ	Evor Phillips Leasing	Old Bridge Township	D
378	03	PA	Wade (ABM)	Chester	R E
379	03	PA	Lackawanna Refuse	Old Forge Borough	R E
380	06	OK	Compass Industries (Avery Drive)	Tulsa	R
381	02	NJ	Mannheim Avenue Dump	Galloway Township	D
382	02	NY	Fulton Terminals	Fulton	R
383	01	NH	Auburn Road Landfill	Londonderry	R E
384	03	WV	Fike Chemical, Inc.	Nitro	E
385	05	MN	General Mills/Henkel Corp.	Minneapolis	V
386	05	OH	Laskin/Poplar Oil Co.	Jefferson Township	R E
387	05	OH	Old Mill	Rock Creek	R
388	07	KS	Johns' Sludge Pond	Wichita	V E
389	09	CA	Del Norte Pesticide Storage	Crescent City	R
390	02	NJ	De Rewal Chemical Co.	Kingwood Township	D
391	02	NJ	Swope Oil & Chemical Co.	Pennsauken	V R
392	04	GA	Monsanto Corp. (Augusta Plant)	Augusta	D
393	01	NH	South Municipal Water Supply Well	Peterborough	D
394	01	ME	Winthrop Landfill	Winthrop	E
395	06	AR	Cecil Lindsey	Newport	R
396	05	OH	Zanesville Well Field	Zanesville	D
397	05	WI	Eau Claire Municipal Well Field	Eau Claire	D
398	04	GA	Powersville Site	Peach County	D
399	05	MI	Grand Traverse Overall Supply Co.	Greilickville	D
400	05	MI	Metamora Landfill	Metamora	D

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GROUP 9

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #
401	05	MI	Whitehall Municipal Wells	Whitehall	E
402	05	MN	South Andover Site	Andover	D
403	02	NJ	Diamond Alkali Co.	Newark	V R E
404	05	MI	Kentwood Landfill	Kentwood	E
405	05	MI	Electrovoice	Buchanan	D
406	02	PR	Fibers Public Supply Wells	Jobos	D
407	05	IN	Marion (Bragg) Dump	Marion	R
408	05	OH	Pristine, Inc.	Reading	E
409	05	WI	Mid-State Disposal, Inc. Landfill	Cleveland Township	R
410	08	CO	Broderick Wood Products	Denver	R E
411	05	OH	Buckeye Reclamation	St. Clairsville	D
412	06	TX	Bio-Ecology Systems, Inc.	Grand Prairie	R
413	02	NJ	Woodland Route 532 Dump	Woodland Township	D
414	05	IN	American Chemical Service, Inc.	Griffith	D
415	01	VT	Old Springfield Landfill	Springfield	R E
416	02	NY	Solvent Savers	Lincklaen	R E
417	03	VA	U.S. Titanium	Piney River	R E
418	05	IL	Galesburg/Koppers Co.	Galesburg	D
419	02	NY	Hooker (Hyde Park)	Niagara Falls	V E
420	05	MI	SCA Independent Landfill	Muskegon Heights	E
421	09	CA	MGM Brakes	Cloverdale	E
422	06	LA	Bayou Sorrell	Bayou Sorrell	R E
423	05	MI	Duell & Gardner Landfill	Dalton Township	R
424	02	NJ	Ellis Property	Evesham Township	R
425	04	KY	Distler Farm	Jefferson County	R
426	10	WA	Harbor Island (Lead)	Seattle	D
427	05	WI	Lemberger Transport & Recycling	Franklin Township	E
428	05	OH	E.H. Schilling Landfill	Hamilton Township	D
429	05	MI	Cliff/Dow Dump	Marquette	R E
430	10	WA	Queen City Farms	Maple Valley	V
431	05	WI	Scrap Processing Co., Inc.	Medford	E
432	06	NM	Homestake Mining Co.	Milan	V E
433	05	MI	Mason County Landfill	Pere Marquette Twp	E
434	05	MI	Cemetery Dump	Rose Center	R
435	02	NJ	Hopkins Farm	Plumstead Township	D
436	01	RI	Stamina Mills, Inc.	North Smithfield	R E
437	05	IN	Reilly Tar (Indianapolis Plant)	Indianapolis	D
438	01	ME	Pinette's Salvage Yard	Washburn	R
439	06	TX	Harris (Farley Street)	Houston	V E
440	02	NJ	Wilson Farm	Plumstead Township	D
441	03	PA	Old City of York Landfill	Seven Valleys	E
442	05	IL	Byron Salvage Yard	Byron	R
443	03	PA	Stanley Kessler	King of Prussia	E
444	02	NJ	Friedman Property	Upper Freehold Twp	R
445	02	NJ	Imperial Oil/Champion Chemicals	Morganville	
446	02	NJ	Myers Property	Franklin Township	R
447	02	NJ	Pepe Field	Boonton	D
448	05	MI	Ossineke Ground Water Contam	Ossineke	E
449	03	WV	Follansbee Site	Follansbee	D
450	09	CA	Koppers Co., Inc. (Oroville Plant)	Oroville	E

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GROUP 10

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #		
451	05	MI	U.S. Aviex	Howard Township		E	
452	03	PA	Walsh Landfill	Honeybrook Township	R		
453	02	NJ	Landfill & Development Co.	Mount Holly		E	
454	02	NJ	Upper Deerfield Township Slf	Upper Deerfield Twp	V	E	
455	06	NM	AT & SF (Clovis)	Clovis	V	E	D
456	02	NY	American Thermostat Co.	South Cairo		E	
457	04	TN	Lewisburg Dump	Lewisburg			D
458	05	MI	McGraw Edison Corp.	Albion		E	
459	04	KY	Airco	Calvert City			D
460	03	PA	Metal Banks	Philadelphia	V		
461	04	KY	B.F. Goodrich	Calvert City			D
462	05	MI	Organic Chemicals, Inc.	Grandville		E	
463	01	MA	Sullivan's Ledge	New Bedford			D
464	02	PR	Juncos Landfill	Juncos	V	R	
465	05	IN	Bennett Stone Quarry	Bloomington		E	
466	04	FL	Munisport Landfill	North Miami			D
467	04	AL	Stauffer Chem (Le Moyne Plant)	Axis			D
468	02	NJ	M&T Delisa Landfill	Asbury Park	V		
469	04	SC	Geiger (C & M Oil)	Rantowles			D
470	05	WI	Moss-American(Kerr-McGee Oil Co.)	Milwaukee			D
471	05	WI	Waste Research & Reclamation Co.	Eau Claire		E	
472	10	OR	Gould, Inc.	Portland		E	
473	05	MN	St. Louis River Site	St. Louis County		E	
474	05	MI	Auto Ion Chemicals, Inc.	Kalamazoo	R		
475	04	SC	Carolawn, Inc.	Fort Lawn	R	E	
476	03	PA	Berks Sand Pit	Longswamp Township	R		
477	05	MI	Sparta Landfill	Sparta Township		E	
478	05	IL	ACME Solvent (Morristown Plant)	Morristown	R		
479	04	FL	Hipps Road Landfill	Duval County	R		
480	04	FL	Pepper Steel & Alloys, Inc.	Medley	R		
481	01	ME	O'Connor Co.	Augusta			D
482	05	WI	Oconomowoc Electroplating Co. Inc	Ashippin		E	
483	05	MI	Rasmussen's Dump	Green Oak Township	R		
484	03	PA	Westline Site	Westline	R		
485	05	OH	Powell Road Landfill	Dayton			D
486	05	MI	Ionia City Landfill	Ionia	R		
487	08	CO	Lincoln Park	Canon City			D
488	05	IN	Wedzeb Enterprises, Inc.	Lebanon		E	
489	02	PR	GE Wiring Devices	Juana Diaz	V		
490	05	OH	New Lyme Landfill	New Lyme	R		
491	02	NJ	Woodland Route 72 Dump	Woodland Township			D
492	02	PR	RCA Del Caribe	Barceloneta			D
493	03	PA	Brodhead Creek	Stroudsburg	R		
494	10	OR	United Chrome Products, Inc.	Corvallis	R		
495	05	MI	Anderson Development Co.	Adrian		E	
496	05	MI	Shiawassee River	Howell		E	
497	03	PA	Taylor Borough Dump	Taylor Borough	R		
498	03	DE	Harvey & Knott Drum, Inc.	Kirkwood	R		
499	04	TN	Gallaway Pits	Gallaway	R	E	
500	05	OH	Big D Campground	Kingsville		E	

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GROUP 11

RANK	EPA REG	ST	SITE NAME *	CITY/COUNTY	RESPONSE STATUS #		
501	03	DE	Wildcat Landfill	Dover	R		
502	05	MI	Burrows Sanitation	Hartford		E	
503	03	PA	Blosenski Landfill	West Caln Township	R		
504	03	DE	Delaware City PVC Plant	Delaware City	V		
505	03	MD	Limestone Road	Cumberland	R	E	
506	02	NY	Hooker (102nd Street)	Niagara Falls		E	
507	03	DE	New Castle Steel	New Castle County			D
508	06	NM	United Nuclear Corp.	Church Rock	R	E	
509	06	AR	Industrial Waste Control	Fort Smith	R	E	
510	09	CA	Celtor Chemical Works	Hoopa	R		
511	04	AL	Perdido Ground Water Contam	Perdido			D
512	02	NY	Marathon Battery Corp.	Cold Springs	R		
513	03	PA	Lehigh Electric & Engineering Co.	Old Forge Borough	R	E	
514	05	OH	Skinner Landfill	West Chester			D
515	04	NC	Chemtronics, Inc.	Swannanoa			D
516	07	MO	Shenandoah Stables	Moscow Mills		E	
517	06	LA	Bayou Bonfouca	Slidell	R		
518	03	VA	Saltville Waste Disposal Ponds	Saltville	R		
519	03	PA	Kimberton Site	Kimberton Borough			D
520	03	MD	Middletown Road Dump	Annapolis	R	E	
521	10	WA	Pesticide Lab (Yakima)	Yakima			D
522	05	IN	Lemon Lane Landfill	Bloomington	R		
523	10	ID	Arrcom (Drexler Enterprises)	Rathdrum			D
524	03	PA	Fischer & Porter Co.	Warminster	V		
525	09	CA	Jibboom Junkyard	Sacramento	R		
526	02	NJ	A. O. Polymer	Sparta Township		E	
527	02	NJ	Dover Municipal Well 4	Dover Township			D
528	02	NJ	Rockaway Township Wells	Rockaway	R		
529	05	WI	Delavan Municipal Well #4	Delavan			D
530	09	CA	San Gabriel Valley (Area 3)	Alhambra	R		
531	09	CA	San Gabriel Valley (Area 4)	La Puente	R		
532	10	WA	American Lake Gardens	Tacoma	V		
533	10	WA	Greenacres Landfill	Spokane County			D
534	06	TX	Triangle Chemical Co.	Bridge City	R	E	
535	02	NJ	PJP Landfill	Jersey City		E	
536	03	PA	Craig Farm Drum	Parker			D
537	03	PA	Voortman Farm	Upper Saucon Twp	R		
538	05	IL	Belvidere Municipal Landfill	Belvidere	R		

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[49 FR 37085, Sept. 21, 1984, as amended at 50 FR 6322, Feb. 14, 1985]

EFFECTIVE DATE NOTE: At 49 FR 37085, Sept. 21, 1984, the National Oil and Hazardous Substances Contingency Plan, (NCP), was amended by revising Part 300, Appendix B—National Priorities List. The promulgation date for this amendment to the NCP was September 21, 1984. However, under section 305 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, amendments to the NCP cannot take effect until Congress has had at least 60 "calendar days of continuous session" from the date of promulgation in which to review the amended Plan. EPA will publish a document in the FEDERAL REGISTER announcing the effective date of Part 300, App. B—National Priorities List.

APPENDIX C TO PART 300—REVISED STANDARD DISPERSANT EFFECTIVENESS AND TOXICITY TESTS

TABLE OF CONTENTS

1.0 Introduction

1.1 *Scope and Application.* These methods apply to "dispersants," involving Subpart H (Use of Dispersants and Other Chemicals) in 40 CFR Part 300 (National Oil and Hazardous Substances Pollution Contingency Plan). They are revisions to the EPA's Standard Dispersant Effectiveness and Toxicity Tests (1). Note that the toxicity test is also used for collecting agents and other chemicals.

1.2 *Definition.* Dispersants are defined as those chemical agents that emulsify, disperse, or solubilized oil into the water column or act to further the surface spreading of oil slicks in order to facilitate dispersal of oil into the water column.

2.0 Revised Standard Dispersant Effectiveness Test

2.1 *Summary of Method.* The test oil (100 ml) is applied to the surface of synthetic seawater contained in a cylindrical tank. The dispersant (3, 5, or 25 ml) is applied to the oil in a fine stream, and 3.0 minutes are allowed for the dispersant to contact the oil. The oil, dispersant, and seawater are mixed by hosing with a pressurized water stream for 1.0 minute. The contents of the tank are recirculated by a pump, and samples are withdrawn from the recirculation system after 10 minutes and after 2 hours of recirculation. The amount of oil dispersed is determined by measuring the absorbance of visible light after extraction of the dispersed oil with chloroform. Each test is repeated three times.

2.2 *Apparatus. Test Tank.* Construct the cylindrical test tank, 24 inches (600 mm) inside diameter by 28 inches (710 mm) high, of 16-gauge stainless steel. Install, as shown in Figure 1, the associated piping, valve, and pump for recirculation of dispersed oil and for sample collection.

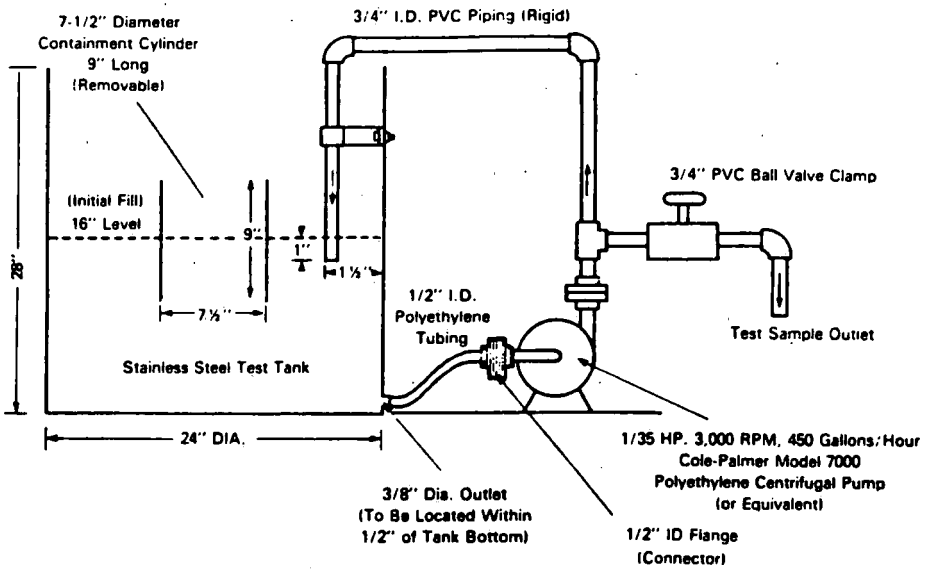


Figure 1. Test Tank

Oil Containment Cylinder. Use a 16-gauge stainless steel containment cylinder 7.5 inches (190 mm) in diameter and 9 inches (229 mm) long to contain the oil while the oil contacts the dispersant. Suspend the cylinder vertically in the center of the test tank with its midpoint 16 inches (406 mm) above the base of the tank. The design should be such that the cylinder can be removed from the tank in less than 10 seconds.

Hosing System. Provide a pressurized hosing system suitable for delivering synthetic seawater to the oil/dispersant mixture in the test tank. A suggested hosing system is shown in Figure 2. Deliver hosing water through a hose with a ½-inch (12.7 mm) inside diameter, which is connected to a shut-off nozzle with a discharge tip approximately with a 5/16-inch (4.8-mm) inside diameter [Akron Brass Company, Style 111 shutoff valve with Style 558, 5/16-inch tip, or equivalent].

The hosing system must be adjusted to deliver 15.1±0.8 liters/min at 140 kPa (4.0±0.2 gpm at 20 psig). Measure the flow by hosing synthetic seawater at 23±1°C into a calibrated container for the predetermined time. Set the proper flow rate by adjusting the pressure in the pressurized tank or a suitable valve in the hose line. The delivery pressure should be determined by means of a pressure gauge in the line immediately before the nozzle.

Corrosion buildup within the nozzle may change hosing pressure and alter test results. To prevent this, remove and flush the nozzle with fresh water at the end of each day's tests.

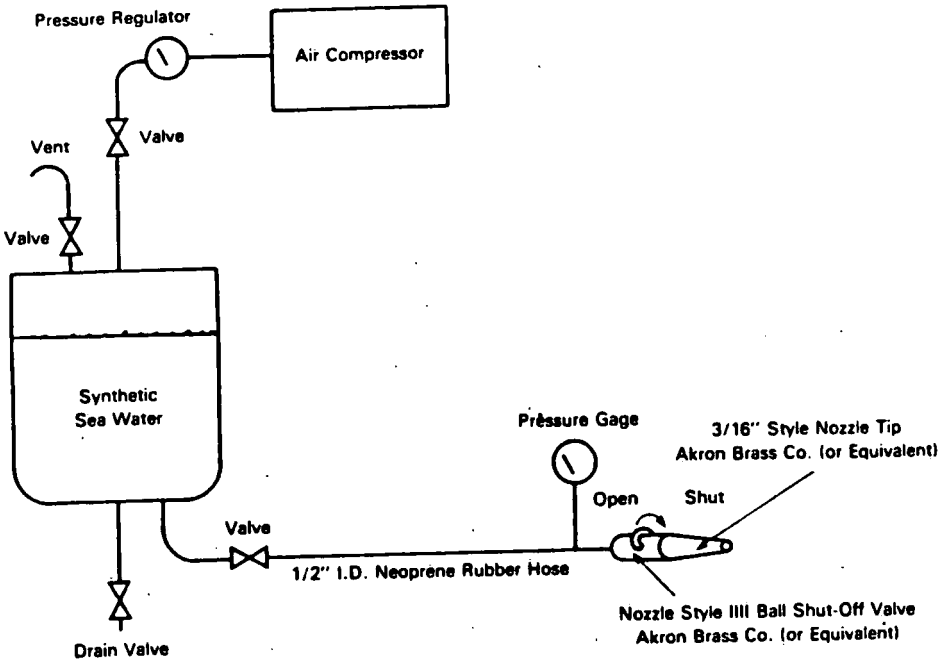


Figure 2. Suggested Hosing System

Spectrophotometer. Use a spectrophotometer suitable for measurement at 620 nanometers to determine photochemically the oil concentration of the oil/chloroform mixture. A Bausch and Lomb Spectronic 20 spectrophotometer (or equivalent) is acceptable for this purpose.

Filter Paper. Use a filter paper suitable for filtering the oil/chloroform extract. Whatman No. 1 filter paper (or equivalent) is acceptable for this purpose.

Glassware. Glassware should consist of 5-, 10-, 25-, 100-, and 500-ml graduated cylinders; two 1,000-ml separatory funnels with Teflon stopcocks; 10-, 100-, and 1,000-ml volumetric flasks and two 250-ml Erlenmeyer flasks.

2.3 *Reagents. Synthetic Seawater.* Prepare a batch of concentrated synthetic seawater using the components listed in Table 1, which are added to 379 liters (100 gal) of tap water having a hardness less than 50 mg/liter.

Chloroform Reagent Grade.

Sodium Sulfate, Anhydrous Reagent Grade.

Oils. Test the dispersant with 100 ml of No. 6 fuel oil that has the characteristics given in Table 2.

2.4 *Pretest Preparation. Calibration of Spectrophotometer.* Prepare a stock solution by adding 3.50 g of the test oil to a 1,000-ml volumetric flask. Dissolve the oil in about 900 ml of chloroform, then dilute to the mark with choloroform. The resulting concentration of test oil is 3,500 mg/liter.

Prepare standard solutions of No. 6 fuel oil by pipetting 5, 10, 25, and 50 ml of the test oil stock solution into 10-ml volumetric flasks. Dilute each flask to the mark with chloroform. The concentration of test oil in each flask is given in Table 3:

TABLE 1—SYNTHETIC SEAWATER (EFFECTIVENESS TEST)

Salt [a]	Composition	
	Concentrate [b] (kg/379 liter)	Diluted seawater (g/liter)
NaCl	20.25	17.10
$MgCl_2 \cdot 6H_2O$	9.17	7.44
Na_2SO_4	3.38	2.85
$CaCl_2$	0.952	0.802
KCl	0.573	0.483
$NaHCO_3$	0.166	0.140

[a] If any salt other than those listed above is used, allowance must be made for water of crystallization.

[b] Concentrate is prepared by dissolving the indicated amount of salt in 379 liters (100 gal.) of tap water.

TABLE 2—TEST OIL CHARACTERISTICS: NO. 6 FUEL OIL

Characteristics	No. 6 fuel oil	
	Minimum	Maximum
Gravity (°API)		16.9
Viscosity—Furol at 122°F (SFS)	101	200
Flash Point (°F)	160	
Pour Point (°F)		35
Sulfur (wt %)		2.73
Carbon residue (wt %)		12.3
Water (vol %)		0.20
Sediment (wt %)		0.10
Ash (wt %)		0.10
Asphaltenes (wt %)		10.0
Neutralization No		2.5

TABLE 3—PREPARATION OF STANDARDS FOR CALIBRATION

Volume of stock solution used (ml)	Concentration of test oil (mg/liter)
5	175
10	350
25	875
50	1,750
100 (neat)	3,500

Determine the absorbance of the stock solution and the diluted aliquots at a wavelength of 620 nanometers. If a Bausch and Lomb Spectronic 20 spectrophotometer is used, the ½-inch (12.7-mm) cell is recommended. Plot the calibration curve for the test oil as mg/liter of test oil versus absorbance.

Measurement of Specific Gravity of the Test Oils and Dispersant. Equilibrate samples of the test oil and dispersant at 23±1 °C

Weigh two dry 10-ml volumetric flasks on a balance capable of weighing to ±1 mg or better. Add enough test oil to one flask and enough dispersant to the second flask to fill them to the mark. Reweigh each flask. The density of the oil and dispersant is:

$$\text{Density (g/ml)} = \frac{\text{Weight of test oil or dispersant (g)}}{\text{volume of the flask (ml)}} \quad (1)$$

2.5 *Dispersant Effectiveness Test Procedure.* The dispersant effectiveness test procedures are as follows in steps 1-16:

1. Add 38±1 liters (10±0.25 gal) of the seawater concentrate to the test tank. Dilute the concentrate to a depth of 16±0.25 inches (410±5 mm) with hot and cold water in the proper amounts to bring the temperature of the diluted seawater to 23±1° C. Adjust the pH of the seawater to 8.0±0.1 with concentrated HCl or NaOH. The salinity of the water should be 25.00±0.15 parts per thousand (ppt).

2. Insert the oil containment cylinder into the test tank. Position the cylinder in the center of the tank with its midpoint 16±0.25 inches (410±5 mm) above the base of the tank.

3. Select one of the following graduated cylinders, a 5-, 10-, or 25-ml graduated cylinder, as appropriate for addition of the dispersant and a 100-ml graduated cylinder for addition of the test oil.

4. Fill the 100-ml graduated cylinder with 100 ml of the test oil. Drain the Cylinder for 3.0 minutes. Weigh the drained cylinder and record the weight. Calculate the weight of 100 ml of test oil [weight (g) = density (g/ml) × volume (ml)] and add this amount of test oil to the drained cylinder. Record the weight of the cylinder and oil.

NOTE.—The precision of the effectiveness test is increased substantially if exactly the same weight of test oil or dispersant is added for each test. The purpose of Step 4 is to determine the amount of test oil or dis-

persant that will be left in the graduated cylinder after the addition.

5. Slowly and gently add the 100 ml of the test oil from the graduated cylinder directly onto the water surface within the center of the oil containment cylinder. Move the graduated cylinder in a circular motion to distribute the oil uniformly over the surface. Be careful that oil is not lost below the containment cylinder and that oil does not splash, drip onto, or contact the containment cylinder wall above the waterline during application.

Allow the oil to drain from the graduated cylinder for 3.0 minutes.

Weigh the drained graduated cylinder. Calculate the weight of oil actually added to the test tank. Check the weight to be sure that 100.0 ± 0.5 ml of test oil was added to the test tank.

6. Fill either the 5-, 10-, or 25-ml graduated cylinder with 3, 10, or 25 ml of dispersant, respectively. Drain it for 3.0 minutes and weigh the drained cylinder. Calculate the weight of 3, 10, or 25 ml of dispersant required [weight (g) = density (g/ml) × volume (ml)] and add this amount of dispersant to the drained cylinder. Record the weight of the cylinder and dispersant.

7. From the graduated cylinder gently add the dispersant at 23±1°C onto the oil surface within the containment cylinder. Move the graduated cylinder in a circular motion to distribute the dispersant uniformly over the surface. Carefully apply the dispersant onto the oil surface only and not through the oil surface or onto the containment cylinder walls. Allow the dispersant to drain from the graduated cylinder for 3.0 minutes.

Weigh the drained graduated cylinder. Calculate the weight of dispersant added to the test tank. Check the weight to be sure that the correct volume of dispersant, ± 3 percent, was added to the test tank.

8. Activate the hosing system, adjust nozzle pressure to 140 kPa, and apply a stream of synthetic seawater at 23±1°C to the oil/dispersant mixture within the containment cylinder. Immediately lift the cylinder all the way out above the water surface, and simultaneously hose off any oil adhering to the cylinder's inner surface. Remove the cylinder completely and continue to hose and agitate the oil/dispersant mixture for a total hosing period of 1.0 minute. The flow rate of hosing nozzle must be 15.1±0.8 liters/min at 140 kPa (4.0±0.2 gpm at 20 psig).

NOTE.—(1) Removing the containment cylinder must take no longer than 10 seconds. (2) To hose the oil/dispersant mixture, hold the discharge tip of the nozzle approximately level with the top edge of the test tank and pointed vertically downward. Move the nozzle rapidly in a random manner from side to side, backwards and forwards, and around the inner wall of the tank, as necessary, to facilitate continuous hosing and agitation of the entire oil/dispersant surface.

9. Immediately after hosing, start the recirculation pump and continue recirculation for 2.0 hours.

10. After 10.0 minutes of recirculation, withdraw a 500-ml sample into a 500-ml graduated cylinder and discard. Immediately collect another 500-ml sample for determining "initial dispersion."

11. After 2.0 hours of recirculation, withdraw a 500-ml sample into a 500-ml graduated cylinder and discard. Immediately collect another 500-ml sample for determining "final dispersion."

12. Transfer the 500-ml sample to a 1,000-ml separatory funnel. Add 25 ml of chloroform to the separatory funnel, stopper the funnel, and shake vigorously for 50 strokes. After shaking, place the funnel in a rack, vent, and allow a setting time of 2 to 3 minutes.

After the settling period, lift the funnel from the rack and gently invert it several times. While holding the funnel, allow the contents to settle and then gently swirl with a circular motion to afford additional settling of the oil/chloroform mixture. Transfer the oil/chloroform mixture to a 250-ml Erlenmeyer flask that contains anhydrous Na_2SO_4 for drying the extract.

Repeat the extractions using a total of at least three 25-ml portions of chloroform.

After the oil extraction is complete, filter the combined extracts from the Erlenmeyer flask through dry filter paper into an appropriate volumetric flask (100 ml, 250 ml, or 500 ml depending on the amount of chloroform used to complete the extraction).

Rinse the Na_2SO_4 and filter paper with small portions of chloroform to remove entrained oil. After removing, fill the volumetric flask to the mark with chloroform, invert and thoroughly mix contents.

13. Spectrophotometrically determine the absorbance of the extract using the identical wavelength and cell used to calibrate the spectrophotometer. From the calibration curve, determine the concentration of oil in the chloroform.

Compute the concentration of oil in the sample as follows:

$$C_{do} = \frac{C_1 \times (\text{volume of sample})}{(\text{volume of chloroform used})} \quad (2)$$

where:

C_{do} is the concentration of dispersed oil in the sample and

C_1 is the measured concentration of oil in the chloroform extract.

Note that the standard sample volume is 500 ml and the volume of chloroform used should also be expressed in ml.

Repeat Steps 1 through 13 at least three times for each of the three required volumes of dispersant.

2.6 *Blank Correction Determination.*

14. Clean the test tank and prepare the synthetic seawater at 23±1°C as described in Step 1. Do not install the containment cylinder and do not use any test oil. Add 25 ml of the dispersant to the tank as described in Steps 6 and 7 and continue the test procedure as described in Steps 8 through 12.

15. Spectrophotometrically determine the absorbance of the extract using the identical wavelength and cell used to calibrate the spectrophotometer. From the calibration curve, determine the corresponding concentration of oil in the chloroform. Compute the dispersant blank correction for 25 ml of dispersant as follows:

$$D = \frac{C_2 \times (\text{volume of sample})}{(\text{volume of chloroform used})} \quad (3)$$

where:

D is the blank correction for 25 ml of dispersant, and

C_2 is the measured concentration of oil in the chloroform extract:

Note that the standard sample volume is 500 ml and the volume of chloroform used should also be expressed in ml. The Dispersant Blank Correction (DBC) for other volumes of dispersant used in a test may then be computed as:

$$DBC = \frac{D \times (\text{volume in ml of dispersants used})}{25 \text{ ml}} \quad (4)$$

16. Clean the test tank and prepare the synthetic seawater at 23±1°C as described in Step 1. Do not install the containment cylinder. Prepare 100 ml of test oil as described in Steps 4 and 5, and add it to the test tank. Continue the test procedure as described in Steps 8 through 13. The Oil Blank Correction (OBC) is:

$$OBC = \frac{C_3 \times (\text{volume of sample})}{(\text{volume of chloroform used})} \quad (5)$$

2.7 *Calcualtions.* The concentrations of test oil equivalent to 100 percent dispersion is:

$$C_{100} = \frac{(\text{weight of test oil})}{(133.6 \text{ liter synthetic seawater})} \quad (6)$$

The weight of the test oil should be expressed in milligrams, so that resulting C_{100} will be in mg/liter.

The percent of oil dispersed is then:

$$\text{Percent dispersed} = \frac{(C_{do} - OBC - DBC)}{C_{100}} \times 100\% \quad (7)$$

2.8 *Report of the Effectiveness Test Results.* Based on 100 ml of oil, determine the percent dispersion of the test oil caused by 3, 10, and 25 ml of dispersant: (a) after 10 minutes recirculation ("initial dispersion") and (b) after 2 hours recirculation ("final dispersion").

Determine the mean of at least three replicate tests for each of the three dispersant dosages. If the percent dispersion value found (after the 10-minute recirculation period only) for any of the three replicate tests varies from the mean value by more than ±8 percent, discard that result and run another replicate.

For each test oil, using percent dispersion as the ordinate and dispersant dosage (ml) as the abscissa, plot two curves on one chart, one for "initial dispersion" and the other for "final dispersion." Draw the graphs by plotting mean percent dispersion values for each of the dispersant dosages of 3, 10, and 25 ml and connecting the corresponding data points for each sampling time (10 minutes or 2 hours) with straight lines. From the "initial dispersion" graph, determine the dispersant dosage (ml) causing 50 percent dispersion. From the "final dispersion" graph, determine the dispersant dosage (ml) causing 25 percent dispersion.

Report the data in the format given in Table 4.

TABLE 4—REQUIRED DISPERSANT EFFECTIVENESS TESTS RESULTS

Volume Dispersant (ml)	Initial Dispersion (10 minutes)		Final Dispersion (2 hours)	
	Percent dispersion for Replicate Number	Mean Percent Dispersion	Percent Dispersion for Replicate Number	Mean Percent Dispersion
3	1— 2— 3—	——	1— 2— 3—	——
10	1— 2— 3—	——	1— 2— 3—	——
25	1— 2— 3—	——	1— 2 3—	——
	Dosage (ml) causing 50 percent dispersion (from "initial dispersion" graph) ——ml.		Dosage (ml) causing 25 percent dispersion (from "final dispersion" graph) —— ml.	

2.9 *Comments on Revisions to Dispersant Effectiveness Tests.* The comments discussed here refer only to these revisions to the dispersant effectiveness test described by McCarthy et al. (1).

Addition to Test Oil and Dispersant. Rewick et al. (2), (3), found that the method described in the revised method for adding the same amount of test oil and dispersant significantly improved the precision of the test. The percent standard deviation of the initial and final amount of oil dispersed was determined for dispersant C, E, and F using the method described in McCarthy et al. (1). The data for dispersants A, B, and D were obtained using the weighing method for the oil and dispersant described in the revised procedure. The average percent standard deviation was reduced from 41.6 percent to 4.9 percent for No. 6 fuel oil. Additional testing of dispersants on EPA's NCP Product Schedule recently has been initiated to determine the precision of the Revised Standard Dispersant Effectiveness Test Procedures.

Inclusion of the Oil Blank. Rewick et al. (2) found that the optical density of the oil blank was significantly higher than the dispersant blank. Including an oil blank increased the accuracy of the test because it corrects for the light absorption of the water-soluble components of the fuel (amount of test oil dispersed into the water column in the absence of a dispersant is low).

Dispersant-to-Oil Ratio. The maximum effectiveness of many dispersants occurs at dispersant-to-oil (D/O) ratios of less than 0.10 or 0.25 (10 or 25 ml dispersant) (see Figure 1, Rewick et al. (3)). Furthermore, the manufacturer's recommended application rates are usually less than D/O=0.10, and the actual application rates in a real spill may be less than a D/O=0.10 specifically when applied by aircraft. Therefore, the revised method specifies testing the dispersants at D/O=0.03, 0.10, and 0.25.

3.0 Revised Standard Dispersant Toxicity Test

3.1 *Summary of Method.* The standard toxicity test for dispersants involves exposing two species (*Fundulus heteroclitus* and *Artemia salina*) to five concentrations of the test dispersant and No. 2 fuel oil alone and in a 1:10 mixture of dispersant to oil. To aid in comparing results from assays performed by different workers, reference toxicity tests are conducted using dodecyl sodium sulfate as a reference toxicant. The test length is 96 hours for *Fundulus* and 48 hours for *Artemia*. LC50s are calculated based on mortality date at the end of the exposure period (for method of calculation, see section 3.6 below).

3.2 *Selection and Preparation of test Materials. Test Organisms. Fundulus heteroclitus.* Obtain test fish from a single source for each series of toxicity tests. Report any known unusual condition to which fish were exposed before use (e.g., pesticides or chemotherapeutic agents); avoid if possible. Use small fish 2.5 to 3.8 cm (1 to 1.5 inches) in length and weighing about 1 gram. The longest individual fish should be no more than 1.5 times the length of the smallest.

Acclimate test fish to a temperature of 20±1°C, a pH of 8.0±0.2, and 20 ± 2ppt salinity for 10 to 14 days before using them for the toxicity tests. Eliminate groups of fish having more than 20 percent mortality

during the first 48 hours, and more than five percent thereafter. During acclimation, feed all species a balanced diet. Dry, pelleted, commercially available fishfood containing 30 percent to 45 percent protein is satisfactory. The pellets should be easily consumable by the test fish. Feed the fish twice daily to satiation, but not for 24 hours before or during the bioassay test. Use only those organisms that feed actively and appear to be healthy. Discard any fish injured or dropped while handling.

Artemia Salina. To ensure uniformity of *Artemia* (brine shrimp), use eggs from the San Francisco Bay area. Since the eggs of *Artemia* may be kept disiccated for long periods in a viable state, required numbers of the organism can be secured at any time for use in the bioassay tests through the use of proper hatching procedures.

A rectangular tray (plastic, glass, or enamel) having 200 square inches of bottom surface is suitable for hatching *Artemia* eggs. Divide this tray into two parts by a partition that extends from the top down to about 1.9 to 1.3 cm (0.75 to 0.5 inch) from the bottom. This partition may be of any opaque, biologically inert material (a pasteboard strip, sealed with paraffin wrapping, is satisfactory). Raise one end of the tray about 1.27 cm (0.5 inch) and add 3 liters of the synthetic seawater formulation (see Table 5).

Spread 0.5 gram of *Artemia* eggs in the shallow end of the tray. Cover this end of the tray with a piece of cardboard to keep the eggs in darkness until hatching is complete. About 20 hours after the eggs hatch, direct a narrow beam of light across the uncovered portion of the tray. Since brine shrimp are phototactic, they will swim beneath the partition into the illuminated end of the chamber and congregate in the beam of light. The *Artemia* concentrated in the beam of light can be easily collected with the use of a collecting pipette or siphon connected to a 30-cm (12-inch) rubber tube and mouthpiece. Transfer them to a beaker containing a small amount of the artificial seawater.

An alternative method for hatching *Artemia* eggs is to use a separator funnel. A small air line is placed in the botton of the funnel and air is bubbled at a rate sufficient to keep the eggs from settling to the bottom. After the eggs hatch, the air line is removed and the newly hatched nauplii will settle to the bottom of the funnel where they can be drawn off without disturbing the empty egg cases, which will have floated to the surface.

Preparation of Experimental Water. Because large quantities of dilution water will be used in these tests, formulate the experimental water in large batches to ensure uniformity and constant conditions for the various tests. To prevent contamination, prepare and store the experimental water in inert containers of suitable size.

Synthetic Seawater Formation. To prepare standard seawater, mix technical-grade salts with 900 liters of distilled or demineralized water in the order and quantities listed in Table 5. These ingredients must be added in the order listed and each ingredient must be dissolved before another is added. Stir constantly after each addition during preparation until dissolution is complete.

Add distilled or demineralized water to make up to 1,000 liters. The pH should now be 8.0 ± 0.2. To attain the desired salinity of 20 ± 1 ppt, dilute again with distilled or demineralized water at time of use.

3.3 *Sampling and Storage of Test Materials.* Toxicity tests are performed with No. 2 fuel oil having the characteristics defined in Table 6. Store oil used in toxicity tests in sealed containers to prevent the loss of volatiles and other changes. For ease in handling and use, it is recommended that 1,000-ml glass containers be used. To ensure comparable results in the bioassay tests, use oils packaged and sealed at the source. Dispose of unused oil in each open container on completion of dosing to prevent its use at a later date when it may have lost some of its volatile components. Run all tests in a bioassay series with oil from the same container and with organisms from the same group collected or secured from the same source.

TABLE 5—SYNTHETIC SEAWATER

[Toxicity test]

Salt	(g) [1]
NaF	1.9
$SrCl_2 \cdot 6H_2O$	13.0
H_3BO_3	20.0
KBr	67.0
KCl	466.0
$CaCl_2 \cdot 2H_2O$	733.0
Na_2SO_4	2,660.0
$MgCl_2 \cdot 6H_2O$	3,330.0
NaCl	15,650.0
$Na_2SiO_3 \cdot 9H_2O$	13.0
EDTA [2]	0.4
$NaHCO_3$	133.0

[1] Amount added to 900 liters of water, as described in the text.
[2] Ethylenediaminetetraacetate tetrasodium salt.

TABLE 6—TEST OIL CHARACTERISTICS: NO. 2 FUEL OIL

Characteristic	Minimum	Maximum
Gravity (°API)	32.1	42.8
Viscosity kinematic at 100°F (cs)	2.35	3.00
Flash point (°F)	150	.....
Pour point (°F)	.....	0
Cloud point (°F)	.....	10
Sulfur (wt %)	.....	0.35

TABLE 6—TEST OIL CHARACTERISTICS: NO. 2 FUEL OIL—Continued

Characteristic	Minimum	Maximum
Aniline point (°F)	125	180
Carbon residue (wt %)		0.16
Water (vol %)		0
Sediment (wt %)		0
Aromatics (vol %)	10	15
Distillation:		
IBP (°F)	347	407
10% (°F)	402	456
50% (°F)	475	530
90% (°F)	542	606
End Point (°F)	596	655
Neutralization No.		0.05

3.4 *General Test Conditions and Procedures for Toxicity Tests. Temperature.* For these toxicity tests, use test solutions with temperatures of 20 ± 1°C.

Dissolved Oxygen and Aeration. Fundulus. Because oils and dispersants contain toxic, volatile materials, and because the toxicity of some water-soluble fractions of oil and degradation products are changed by oxidation, special care must be used in the oxygenation of test solutions. A 2 liter volume of solution is used for the *Fundulus* test. Initiate aeration to provide dissolved oxygen (DO)) and mixing after the fish are added. The DO content of test solutions must not drop below 4 ppm. Aerate at a rate of 100 ± 15 bubbles per minute supplied from a 1-ml serological pipette. At this rate and with the proper weight of fish, DO concentration should remain slightly above 4 ppm over a 96-hour period. Take DO measurements daily.

Artemia. Achieve sufficient DO by ensuring the surface area to volume ratio of the test solution exposed is large enough. Oxygen content should remain high throughout the test because of the small quantity of test substances added and the low oxygen demand of organisms in each dish.

Controls. With each fish or *Artemia* test or each series of simultaneous tests of different solutions, perform a concurrent control test in exactly the same manner as the other tests and under the conditions prescribed or selected for those tests. Use the diluent water alone as the medium in which the controls are held. There must be no more than 10 percent mortality among the controls during the course of any valid test.

Reference Toxicant. To aid in comparing results from tests performed by different workers and to detect changes in the condition of the test organisms that might lead to different results, perform reference toxicity tests with reagent grade dodecyl sodium sulfate (DSS) in addition to the usual control tests. Prepare a stock solution of DSS immediately before use by adding 1 gram of DSS per 500 ml of test water solution. Use exploratory tests before the full scale tests are begun to determine the amount of reference standard to be used in each of the five different concentrations.

Number of Organisms. For the toxicity test procedures using *Fundulus*, place two fish in each jar. For the toxicity tests using *Artemia*, place 20 larvae in each container.

Transfer of Organisms. Transfer *Fundulus* from the acclimatizing aquaria to the test containers only with small-mesh dip nets of soft material, and do not rest the net on any dry surface. Do not hold fish out of the water longer than necessary. Discard any specimen accidentally dropped or otherwise mishandled during transfer.

Artemia can be conveniently handled and transferred with a small pipette connected to a 30-cm (12-inch) length of rubber tubing and mouthpiece or with a Pasteur pipette equipped with a small rubber squeeze bulb. To have the necessary *Artemia* ready for the study, transfer 20 *Artemia* apiece into small beakers containing 20 ml of artificial seawater. Hold these batches of *Artemia* until they are 24 hours old; at that time, place them in the respective series of test concentrations set up for the toxicity test.

To avoid large fluctuations in the metabolic rate of organisms and the fouling of test solutions with metabolic waste products and uneaten food, do not feed organisms during tests.

Test Duration and Observations. Fish. Observe the number of dead fish in each test container and record at the end of each 24-hour period. Fish are considered dead upon cessation of respiratory and all other overt movements, whether spontaneous or in response to mild mechanical prodding. Remove dead fish as soon as observed.

Also note and report when the behavior of test fish deviates from that of control fish. Such behavioral changes would include variations in opercular movement, coloration, body orientation, movement, depth in container, schooling tendencies, and others. Abnormal behavior of the test organisms (especially during the first 24 hours) is a desirable parameter to monitor in a toxicity test because changes in behavior and appearance may precede mortality. Toxicants can reduce an organism's ability to survive natural stresses. In these cases, the mortality is not directly attributed to the toxicant, but most certainly is an indirect effect. Reports on behavioral changes during a toxicity test can give insight into the nonacute effects of the tested material.

At the end of the 96-hour period, terminate the fish tests and determine the LC50 values.

Artemia. Terminate the *Artemia* test after 48 hours of incubation. To count the dead animals accurately and with relative ease, place the test dishes on a black surface and hold a narrow beam of light parallel to the bottom of the dish. Most of the dead *Artemia* will be on the bottom of the test dish and can be readily seen against the black background. Also search the top of the liquid for *Artemia* trapped there by surface tension. Exercise caution when determining death of the animals. Occasionally, an animal appears dead, but closer observation shows slight movement of an appendage or a periodic spasm of its entire body. For this test, animals exhibiting any movement when touched with a needle are considered alive. Account for all test animals to ensure accuracy since some *Artemia* may disintegrate. Consider individuals not accounted for as dead.

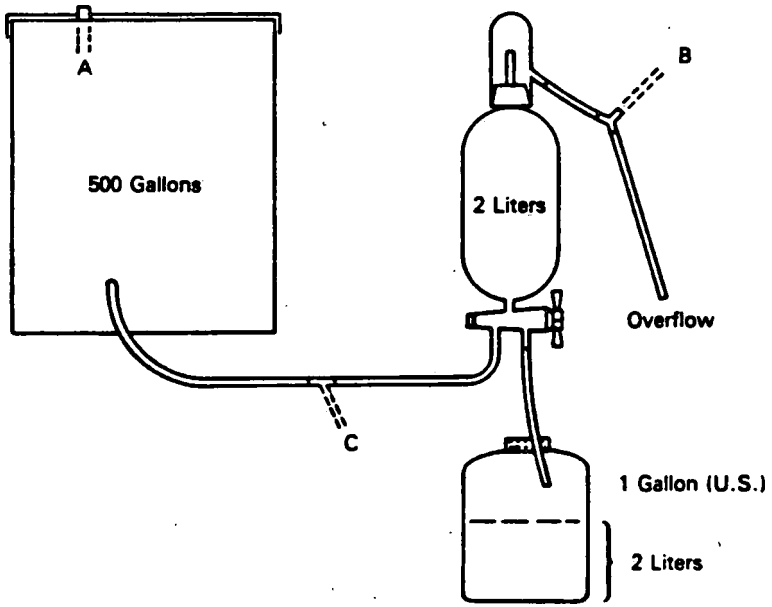
At the end of 48 hours of exposure, terminate the *Artemia* assay and determine the LC50 values.

Physical and Chemical Determinations. Fundulus. Determine the temperature, DO, and pH of the test solutions before the fish are added and at 24-, 72-, and 96-hour exposure intervals. It is necessary to take measurements from only one of the replicates of each of the toxicant series.

Artemia. Determine the temperature, DO, and pH of the test solutions before the nauplii are added and at the 48-hour exposure interval. Measure DO and pH in only one of the replicates of each of the toxicant series.

Testing Laboratory. An ordinary heated or air-conditioned laboratory room with thermostatic controls suitable for maintaining the prescribed test temperatures generally will suffice to conduct the toxicity tests. Where ambient temperatures cannot be controlled to 20 ±1°C, use water baths with the necessary temperature controls.

Test Containers. For fish tests, use 4-liter glass jars measuring approximately 22.5 cm in height, 15 cm in diameter and 11 cm in diameter at the mouth. The jars are to have screw top lids, lined with Teflon. In conducting the test, add to each of the jars 2 liters of the synthetic seawater formulation aerated to saturation with DO. To add the 2 liters easily and accurately, use a 2-liter-capacity, automatic dispensing pipette (Figure 3).



A = Inflow from Large Holding Reservoir

B = Overflow from Other Units in Series

C = Inflow to Other Units

Figure 3. Schematic Diagram of Automatic Dispensing Pipette System

For the *Artemia* tests, use Carolina culture dishes (or their equivalent) having dimensions approximately 8.9 cm by 3.8 cm (3.5 by 1.5 inches).

Process all required glassware before each test. Immerse in normal hexane for 10 minutes. Follow this with a thorough rinse with hot tap water, three hot detergent scrubs, an additional hot tap-water rinse, and three rinses with distilled water. Oven or air dry the glassware in a reasonably dust-free atmosphere.

3.5 *Preparation of Test Concentrations. Fundulus.* Place the test jars containing 2 liters of synthetic seawater on a reciprocal shaker. The shaker platform should be adapted to hold firmly six of the toxicity test jars. Add the desired amount of the petroleum product under test directly to each test jar. Dispense the appropriate amount of toxicant into the jars with a pipette. Tightly cap the test jars and shake for 5 minutes at approximately 315 to 333 2-cm (0.75-inch) strokes per minute in a reciprocal shaker or at approximately 150 to 160 rpm on orbital shakers. At the completion of shaking, remove the jars from the shaker to a constant-temperature water bath or room, remove the lids, take water quality measurements, add two test fish, and initiate aeration.

Artemia. To prepare test solutions for dispersants and oil/dispersant mixtures, blend or mix the test solutions with an electric blender having: speeds of 10,000 rpm or less, a stainless-steel cutting assembly and a 1-liter borosilicate jar. To minimize foaming, blend at speeds below 10,000 rpm.

For the dispersant test solution, add 550 ml of the synthetic seawater to the jar, then with the use of a gas-tight calibrated glass syringe with a Teflon-tipped plunger, add 0.55 ml of the dispersant and mix for 5 seconds.

For the oil test solution, add 550 ml of the synthetic seawater to the jar, then with the use of a gas-tight calibrated glass syringe equipped with a Teflon-tipped plunger, add 0.55 ml of the oil and mix for 5 seconds.

For the oil/dispersant mixture, add 550 ml of the synthetic seawater to the mixing jar. While the blender is in operation, add 0.5 ml of the oil under study with the use of calibrated syringe with Teflon-tipped plunger and then 0.05 ml of the dispersant as indicated above. Blend for 5 seconds after addition of dispersant. These additions provide test solutions of the dispersant, oil, and the oil/dispersant mixture at concentrations of 1,000 ppm.

Immediately after the test solutions are prepared, draw up the necessary amount of test solution with a gas-tight Teflon-tipped glass syringe of appropriate size and dispense into each of the five containers in each series. If the series of five concentrations to be tested are 10, 18 32, 56, and 100 ppm, the amount of the test solution in the order of the concentrations listed above would be as follows: 1.0, 1.8, 3.2, 5.6, and 10.0 ml.

Each time a syringe is to be filled for dispensing to the series of test containers, start the mixer and withdraw the desired amount in the appropriate syringe while the mixer is in operation. Turn off immediately after the sample is taken to limit the loss of volatiles.

Use exploratory tests before the full-scale test is set up to determine the concentration of toxicant to be used in each of the five different concentrations. After adding the required amounts of liquid, bring the volume in each of the test containers up to 80 ml with the artificial seawater. To ensure keeping each of the series separate, designate on the lid of each container the date, the material under test, and its concentration.

When the desired concentrations are prepared, gently release into each dish the 20 test *Artemia* (previously transferred into 20 ml of medium). This provides a volume of 100 ml in each test chamber. A pair of standard cover glass forceps with flat, bent ends is an ideal tool for handling and tipping the small beaker without risk of contaminating the medium.

After adding the test animals, incubate the test dishes at 20 ± 1°C for 48 hours. Recommended lighting is 2,000 lumens/m² (200 ft-c) of diffused, constant, fluorescent illumination coming from beneath the culture dishes during incubation. Because *Artemia* are phototactic, bottom lighting should keep them from direct contact with the oil that sometimes layers on top.

Wash the blender thoroughly after use and repeat the above procedures for each series of tests. Wash the blender as follows: rinse with normal hexane, pour a strong solution of laboratory detergent into the blender to cover the blades, fill the container to about half of its volume with hot tap water, operate the blender for about 30 seconds at high speed, remove and rinse twice with hot tap water, mixing each rinse for 5 seconds at high speed, and then rinse twice with distilled water, mixing each rinse for 5 seconds at high speed.

3.6 *Calculating and Reporting.* At the end of the test period, the toxicity tests are terminated and the LC50 values are determined.

Calculations. The LC50 is the concentration lethal to 50 percent of the test population. It can be calculated as an interpolated value based on percentages of organisms surviving at two or more concentrations, at which less than half and more than half survived. The LC50 can be estimated with the aid of computer programs or graphic techniques (log paper). The 95 percent confidence intervals for the LC50 estimate should also be determined.

Reporting. The test dispersant and oil and their source and storage are described in the toxicity test report. Note any observed changes in the experimental water or the test solutions. Also include the species of fish used; the sources, size, and condition of the fish; data of any known treatment of the fish for disease or infestation with parasites before their use; and any observations on the fish behavior at regular intervals during tests. In addition to the calculated LC50 values, other data necessary for interpretation (e.g., DO, pH, other physical parameters, and the percent survival at the end of each day of exposure at each concentration of toxicant) should be reported.

3.7 *Summary of Procedures.*

Fundulus:

1. Prepare adequate stocks of the appropriate standard dilution water.

2. Add 2 liters of the standard dilution water to the 4-liter test jars. Each test consists of 5 replicates of each of 5 concentrations of the test material, a control series of 5 dishes, and a standard reference series of 5 different concentrations for a total of 35 dishes. Simultaneous performance of toxicity tests on the oil, dispersant, and oil/dispersant mixture requires a total of 105 dishes.

3. Add the determined amount (quarter points on the log scale) of test material to the appropriate jars. Preliminary tests will be necessary to define the range of definitive test concentrations.

4. Cap the jars tightly with the Teflon-lined screw caps and shake for 5 minutes at 315 to 333 2-cm (0.75-inch) strokes per minute on a reciprocal shaker.

5. Remove the jars from the shaker, take water quality data, and add two acclimated fish per jar.

6. Aerate with 100±15 bubbles per minute through a 1-ml serological pipette.

7. Observe and record mortalities, water quality, and behavioral changes each 24 hours.

8. After 96 hours, terminate the test, and calculate LC50 values and corresponding confidence limits.

Artemia:

1. Initiate the procedure for hatching the *Artemia* in sufficient time (approximately 48 hours) before the toxicity test is to be conducted so that 24-hour-old larvae are available.

2. With the use of a small pipette, transfer 20 *Artemia* into small beakers, each containing 20 ml of the proper synthetic seawater.

3. To prepare the test stock dispersant and oil solutions, add 550 ml of the artificial seawater to the prescribed blender jar. By means of a gas-tight glass syringe with a Teflon-tipped plunger, add 0.55 ml of the dispersant (or oil) and mix at 10,000 rpm for 5 seconds. To prepare the test stock oil/dispersant mixture, add 550 ml of the standard seawater to the blender jar. While the blender is in operation (10,000 rpm), add 0.5 ml of the oil, then 0.05 ml of the dispersant with the use of a calibrated syringe with a Teflon-tipped plunger. Blend for 5 seconds after adding the dispersant. One ml of these stock solutions added to the 100 ml of standard seawater in the test containers yields a concentration of 10 ppm dispersant, oil, or oil/dispersant combination (the test will be in a ratio of 1 part dispersant to 10 parts of oil).

4. Each test consists of 5 replications of each of 5 concentrations of the material under study, a control series of 5 dishes, and a standard reference series of 5 different concentrations, a total of 35 dishes. Simultaneous performance of toxicity tests on the oil, dispersant, and oil/dispersant mixture requires a total of 105 dishes. Immediately after preparing the test solution of the dispersant or oil/dispersant solution, and using an appropriately sized syringe, draw up the necessary amount of test solution and dispense into each of the five containers in each series.

Each time a syringe is to be filled for dispensing to the series of test containers, start the mixer and withdraw the desired amount in the appropriate syringe while the mixer is in operation. Turn mixer off immediately after the sample is taken to limit the loss of volatiles. After adding the required amount of the test oil/dispersant or dispersant mixture, bring the volume of liquid in each of the test containers up to 80 ml with the artificial seawater.

When the desired concentrations have been prepared, gently release into each dish the 20 nauplii previously transferred into 20 ml of medium. This provides a volume of 100 ml in each test chamber. Use a pair of standard cover glass forceps for handling and tipping the small beaker.

5. Wash the blender as prescribed for each series of tests.

6. Incubate the test dishes at 20 ±1°C for 48 hours with the prescribed lighting.

7. Terminate the experiment after 48 hours, observe and record the mortalities, and determine the LC50s and corresponding confidence limits.

4.0 Summary Technical Product Test Data Format

The purpose of this format is to summarize in a standard and convenient presentation the technical product test data required by the U.S. Environmental Protection Agency (EPA) before a product may be added to EPA's NCP Product Schedule, that may be used in carrying out the National Oil and Hazardous Substances Pollution Contingency Plan. This format, however, is not to preclude the submission of all the laboratory data used to develop the data summarized in this format. Sufficient data should be presented on both the effectiveness and toxicity tests to enable EPA to evaluate the adequacy of the summarized data.

A summary of the technical product test data should be submitted in the following format. The numbered headings should be used in all submissions. The subheadings indicate the kinds of information to be supplied. The listed subheadings, however, are not exhaustive; additional relevant information should be reported where necessary. As noted some subheadings may apply only to particular types of agents.

I. *Name, Brand, or Trademark:*

II. *Name, Address, and Telephone Number of Manufacturer:*

III. *Name, Address, and Telephone Numbers of Primary Distributors:*

IV. *Special Handling and Worker Precautions for Storage and Field Application*

1. Flammability.
2. Ventilation.
3. Skin and eye contact; protective clothing; treatment in case of contact.
4. Maximum and minimum storage temperatures; optimum storage temperature range; temperatures of phase separations and chemical changes.

V. *Shelf Life.*

VI. *Recommended Application Procedure.*

1. Application method.
2. Concentration, application rate (e.g., gallons of dispersant per ton of oil).

3. Conditions for use: water salinity, water temperature, types and ages of pollutants.

VII(a). *Toxicity (Dispersants and Surface Collecting Agents):*

Materials tested	Species	LC50 (ppm)
Product	*Fundulus heteroclitus*	——96-hr.
	Artemia salina	——48-hr.
No. 2 fuel oil	*Fundulus heteroclitus*	——96-hr.
	Artemia salina	——48-hr.
Product and No. 2 fuel oil (1:10).	*Fundulus heteroclitus*	——96-hr.
	Artemia salina	——48-hr.

VII(b). *Effective (Dispersants):*

STANDARD EFFECTIVENESS TEST WITH NO. 6 FUEL OIL

Volume (ml) dispersant	Initial (10 min) mean percent dispersion	Final (2 hrs) mean percent dispersion
3		
10		
25		

Dosage causing 50 percent dispersion (from initial dispersion graph) is ——ml.

Dosage causing 25 percent dispersion (from initial dispersion graph) is ——ml.

VIII. *Microbiological Analysis (Biological Additives).*

IX. *Physical Properties of Dispersant/Surface Collecting Agent:*

1. *Flash Point:* (°F)
2. *Pour Point:* (°F).
3. *Viscosity:*——*at*——°F (furol seconds).
4. *Specific Gravity:*——*at*——°F.
5. *pH:* (10 percent solution if hydrocarbon based).
6. *Surface Active Agents (Dispersants).*[1]
7. *Solvents (Dispersants):*[1]
8. *Additives (Dispersants):*
9. *Solubility (Surface Collecting Agents):*

X. *Analysis for Heavy Metals and Chlorinated Hydrocarbons (Dispersants and Surface Collecting Agents):*

Compounds	Concentration (ppm)
Arsenic	
Cadmium	
Chromium	
Copper	
Lead	
Mercury	
Nickel	
Zinc	
Cyanide	
Chlorinated Hydrocarbons	

[1] If the submitter claims that the information presented under this subheading is confidential, this information should be submitted on a separate sheet of paper clearly labeled according to the subheading and entitled "Confidential Information."

REFERENCES

(1) L.T. McCarthy, Jr., I. Wilder, and J.S. Dorrier. *Standard Dispersant Effectiveness and Toxicity Tests.* EPA Report EPA-R2-73-201 (May 1973).

(2) R.T. Rewick, H.C. Bailey, and J.H. Smith. *Evaluation of Oil Spill Dispersant Testing Requirements,* draft report submitted in partial fulfillment of EPA Contract No. 68-03-2621. U.S. Environmental Protection Agency, Oil and Hazardous Materials Spills Branch, Edison, New Jersey (September 1982).

(3) R.T. Rewick, K.A. Sabo, J. Gates, J.H. Smith, and L.T. McCarthy, Jr. "An Evaluation of Oil Spill Dispersant Testing Requirements." *Proceedings, 1981 Oil Spill Conference,* Publication No. 4334. American Petroleum Institute, 1220 L Street, NW., Washington, DC 20005 (1981).

[49 FR 29199, July 18, 1984]

PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION

Sec.

AUTHORITY: Sec. 102 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9602; secs. 311 and 501(a) of the Federal Water Pollution Control Act, 33 U.S.C. 1321 and 1361.

SOURCE: 50 FR 13474, Apr. 4, 1985, unless otherwise noted.

EFFECTIVE DATE NOTE: At 50 FR 13474, Apr. 4, 1985, Part 302 was added, effective July 3, 1985.

§ 302.1 Applicability.

This regulation designates under section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("the