

# West Valley Demonstration Project

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OIL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTES SPILL PREVENTION,  
CONTROL, AND COUNTERMEASURES PLAN

PREPARED BY *K. Keller* K. Keller  
Cognizant Engineer

APPROVED BY *G. G. Baker* G. G. Baker  
Cognizant System Design Manager

APPROVED BY *J. L. Knabenschuh* J. L. Knabenschuh  
Cognizant System Staff Manager



West Valley Nuclear Services Co., Inc.

P.O. Box 191

West Valley, NY 14171-0191

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PDR PROJ  
M-32 PDR

WEST VALLEY DEMONSTRATION PROJECT

OIL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTES SPILL PREVENTION,  
CONTROL, AND COUNTERMEASURES PLAN

WVDP-043  
Rev. 4

PREPARED BY:

ENVIRONMENTAL COMPLIANCE  
WEST VALLEY DEMONSTRATION PROJECT

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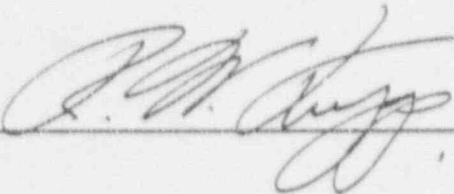
NOTE:

This plan is an adjunct to WVDP-022, the Emergency Plan. The Oil, Hazardous Substance, and Hazardous Waste Spill Prevention, Control, and Countermeasures Plan must be reviewed and updated within three years of date of issue or revision.



CERTIFICATION OF THE WVDP SPILL PREVENTION, CONTROL, AND COUNTER-  
MEASURES PLAN FOR OIL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTES

I hereby certify that I have reviewed the WVDP Spill Prevention, Control, and Countermeasures (SPCC) Plan as revised June 30, 1991; that I am familiar with the requirements specified in 40 CFR Parts 110, 112, 116, 117, 125, 302, 355, 761, and 6 NYCRR 597.2; that I am familiar with the facilities described; and that the SPCC Plan has been prepared in accordance with good engineering practices.

  
\_\_\_\_\_, P.E.



RECORD OF REVISION

PROCEDURE

If there are changes to the procedure, the revision number increases by one. These changes are indicated by placing a heavy vertical black line located in the right-hand margin adjacent to the sentence or paragraph which was revised.

Example:

The vertical line in the margin indicates a change. |

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Original Issue	All	
1	Complete Issue	All	11-88
2	Complete Issue	All	01-90
3	Complete Issue	All	07-91
4	Complete Issue	All	09-91

WVDP-043  
Rev. 4

RECORD OF REVISION (CONTINUATION SHEET)

Rev. No.	Description of Changes	Revision On Page(s)	Dated
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CALL LIST  
for NON-RADIOACTIVE HAZARDOUS MATERIALS RELEASES/SPILLS  
(Reportable Quantities)

<u>TITLE</u>	<u>NOTIFICATION REQUIREMENT</u>	<u>PHONE</u>
U.S. DOE HEADQUARTERS Emergency Operations Ctr	24 hour Notification	202-586-8100 or FTS-7-896-8100
DOE-ID WARNING COMMUNICATIONS CENTER (WCC)	24 hour Notification	208-526-1515 or FTS-7-583-1515 or 173-37 (speed dial)
EPA National Response Ctr	24 hour Notification	800-424-8802 or 202-267-2675 or FTS-7-267-2675
EPA REGION II Emergency Response Team	24 hour Notification	908-548-8730
NEW YORK STATE Emergency Management Office	24 hour Notification	518-457-2200 or 518-457-6811 or 173-41 (speed dial)
CATTARAUGUS COUNTY Emergency Management Warning Point	24 hour Notification	716-938-9191 or 173-50 (speed dial)
ERIE COUNTY Department of Emergency Services	24 hour Notification	716-858-6578

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WESTINGHOUSE CORP. 24 hour Notification	412-642-3444
ENVIRONMENTAL AFFAIRS	
RESPONSE GROUP	

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WESTINGHOUSE CORP. 24 hour Notification	412-374-4019 or
ENERGY CENTER	412-374-4020
SECURITY STATION	

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SEE EIP-27  
FOR LATEST REVISION

CALL LIST  
for RADIOACTIVE RELEASES/SPILLS  
(Reportable Quantities)

<u>TITLE</u>	<u>NOTIFICATION REQUIREMENT</u>	<u>PHONE</u>
U.S. DOE HEADQUARTERS Emergency Operations Center	24 hour Notification	202-586-8500 or FTS-7-896-8500
DOE-ID WARNING COMMUNICATIONS CENTER (WCC)	24 hour Notification	208-526-1515 or FTS-7-583-1515 or
EPA National Response Center	24 hour Notification	800-424-8802 or 202-267-2675 or FTS-7-267-2675
EPA REGION II Emergency Response Team	24 hour Notification	908-548-8730
NUCLEAR REGULATORY COMMISSION Emergency Operations Center	24 hour Notification	202-951-0550
STATE Emergency Management Office	24 hour Notification	518-457-2200 or 518-457-6811

SEE EIP-27  
FOR LATEST REVISION



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CATTARAUGUS COUNTY Emergency Management Warning Point	24 hour Notification	716-938-9191
ERIE COUNTY Department of Emergency Services	24 hour Notification	716-858-6578
WESTINGHOUSE CORP. ENV. AFFAIRS RESPONSE GROUP	24 hour Notification	412-642-3444
WESTINGHOUSE CORP. ENERGY CENTER SECURITY STATION	24 hour Notification	412-374-4019 or 412-374-4020

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WVDP EMERGENCY ORGANIZATION  
EMERGENCY TELEPHONE LISTING  
(Strict Order of Call)

<u>TITLE</u>	<u>NAME</u>	<u>PHONE</u>
EMERGENCY OPERATIONS CENTER DIRECTOR	J. J. BUGGY	648-4710 or 861-1508 or 14 (speed dial)
First Alternate	R. A. Humphrey	592-9498 or 13 (speed dial)
Second Alternate	R. F. Gessner	662-1767 or 34 (speed dial)
Third Alternate	J. L. Knabenschuh	662-2598 or 06 (speed dial)
ASSISTANT EMERGENCY DIRECTOR	E. E. LAWRENCE	662-6618 or 35 (speed dial)
First Alternate	R. F. Gessner	662-1767 or 34 (speed dial)
Second Alternate	J. L. Knabenschuh	662-2598 or 06 (speed dial)
DOE ON-SITE REPRESENTATIVE	T. J. ROWLAND	592-4945 or 866-5862
First Alternate	P. A. VanLoan	662-2620 or 02 (speed dial)
Second Alternate	J. A. Yeazel	648-2511
ASSISTANT DOE ON-SITE REPRESENTATIVE	R. B. PROVENCHER	627-7099 or 861-5860
First Alternate	J. A. Yeazel	648-2511
DOE-WCC COMMUNICATOR	S. KETOLA	353-4743
First Alternate	P. S. VanLoan	662-2620
Second Alternate	R. B. Provencher	627-7099 or 861-5860

WVDP EMERGENCY ORGANIZATION  
EMERGENCY TELEPHONE LISTING  
(Strict Order of Call)

<u>TITLE</u>	<u>NAME</u>	<u>PHONE</u>
NYSERDA REPRESENTATIVE	T. L. Sonntag	649-2005
First Alternate	P. J. Bembia	649-2019
LIAISON MANAGER	L. L. HOWARD	662-1643 or 07 (speed dial)
First Alternate	M. J. Ryan	688-4469 10 (speed dial)
RADIOLOGICAL AND ENVIRONMENTAL ACCIDENT ASSESSMENT MANAGER	J. KNABENSCHUH	662-2598 or 06 (speed dial) or 886-5853
First Alternate	D. J. Harward	992-4950 or 40 (speed dial)
Second Alternate	J. Roberts	662-2537 or 77 (speed dial)
OPERATIONAL ACCIDENT ASSESSMENT MANAGER	R. F. GESSNER	662-1767 or 34 (speed dial)
First Alternate	P. J. Valenti	649-3058 or 80 (speed dial)
Second Alternate	D. J. Sawyer	257-3105 or 23 (speed dial)
ENVIRONMENTAL CONTROL OFFICER	G. G. BAKER	649-8254 or 866-5855
First Alternate	M. K. Lincoln	592-7429
SECURITY MANAGER	W. J. CZYZ	941-5074 or 07 (speed dial) or 861-3894
First Alternate (Off-Duty Lieutenant)	R. D. Love D. J. Gilman D. B. Hammond N. A. Wright R. L. Frentz	676-2611 938-9825 938-9164 699-4538 938-6732

WVDP EMERGENCY ORGANIZATION  
EMERGENCY TELEPHONE LISTING  
(Strict Order of Call)

<u>TITLE</u>	<u>NAME</u>	<u>PHONE</u>
COMMUNITY RELATIONS MANAGER	M. W. DAMEROW	537-9773 or 05 (speed dial)
First Alternate	J. D. Chamberlain	257-9205
SAFETY & ENVIRONMENTAL ASSESSMENT MANAGER	C. J. ROBERTS	662-2537 or 77 (speed dial)
First Alternate	P. G. Nelson	662-5464 or 87 (speed dial)
EMERGENCY PLANNING AND PREPAREDNESS COORDINATOR	R. A. GONZALEZ	823-7976 or 33 (speed dial)
First Alternate	M. Vann	648-3181
COMMUNICATIONS COORDINATOR	J. F. MILLER	353-9941 or 67 (speed dial)
DRAFTING SUPERVISOR	J. R. HORTON	592-7957
First Alternate	C. Gerwitz	942-6578
Second Alternate	J. Lexer	257-9437
DATA RECORDER (Operations)	M. N. BAKER	649-5636 or 09 (speed dial)
First Alternate	D. F. Pezzimenti	372-5829 19 (speed dial)
DATA RECORDER (Radiological and Environmental)	T. M. CONLIN	941-6289
First Alternate	W. V. Schaper	492-1906

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EMERGENCY TELEPHONE LISTING  
(Strict Order of Call)

<u>TITLE</u>	<u>NAME</u>	<u>PHONE</u>
SECRETARIES	W. L. ALLEN	532-4689
	M. C. Wilcox	592-2484
First Alternate	L. A. Przystal	592-2998
FAX OPERATOR	E. C. Wigner	592-5052
First Alternate	M. Schiffhauer	648-2598
Second Alternate	C. C. Silleman	532-9148
<u>TECHNICAL SUPPORT CENTER STAFF</u>		
TECHNICAL SUPPORT CENTER MANAGER	D. K. PLOETZ	592-7735
First Alternate	T. Hughes	897-2195 or 74 (speed dial)
Second Alternate	J. C. Cwynar	662-7658 or 51 (speed dial)
<u>ON-SCENE COMMAND GROUP</u>		
DOE ON-SCENE COORDINATOR	E. A. MATTHEWS	699-4083
First Alternate	C. Leek	699-2645
RADIOLOGICAL CONTROL TEAM LEADER	D. J. HARWARD	992-4950 or 40 (speed dial) or 866-5854
First Alternate	P. A. Szalinski	662-6948 or 91 (speed dial)
Second Alternate	G. H. Metzler	945-2737 or 16 (speed dial)



WVDP EMERGENCY ORGANIZATION  
EMERGENCY TELEPHONE LISTING  
(STRICT ORDER OF CALL)

<u>TITLE</u>	<u>NAME</u>	<u>PHONE</u>
OPERATIONAL SUPPORT MANAGER	R. B. KEEL	941-5300 or 11 (speed dial)
First Alternate	D. K. Ploetz	592-7735 or 26 (speed dial)
Second Alternate	D. H. Garland	649-2749
IRTS OPERATIONS MANAGER	P. J. VALENTI	649-3058 or 80 (speed dial)
First Alternate	J. C. O'Far	662-7658 or 92 (speed dial)
Second Alternate	H. Shaffner	942-3904
WASTE MANAGEMENT OPERATIONS MANAGER (Including Hazardous Waste Management)	H. GARLAND	649-2749
First Alternate	P. M. Vlad	662-3054
Second Alternate	D. G. Feldman	257-3060
MAIN PLANT OPERATIONS MANAGER	D. J. SAWYER	257-3105 or 23 (speed dial)
First Alternate	S. A. MacVean	652-8914
Second Alternate	W. P. Freaney	945-5689 or 26 (speed dial)
VITRIFICATION TEST GROUP MANAGER	P. S. KLANIAN	662-9515 or 59 (speed dial)
First Alternate	J. Paul	941-5653 or 72 (speed dial)
ASSEMBLY AREA COORDINATOR	J. R. GREENQUIST	649-5672



AUTODIALER LIST

R. A. Humphrey 592-9498  
R. E. Lawrence, Jr. 662-6618  
R. F. Gessner 662-1767  
J. L. Knabenschuh 662-2598  
G. G. Baker 662-8254  
T. J. Rowland 662-4945  
E. A. Matthews 999-4083  
S. Ketola 353-4743  
J. A. Yeazel 648-2511  
R. B. Provencher 627-7099  
L. L. Howard 662-1643  
D. J. Harwood 992-4950  
C. J. Roberts 662-2537  
R. B. Keel 941-5300  
W. J. Czyz 941-5074  
M. W. Damarow 537-9773  
D. K. Boetz 592-7735  
R. A. Gonzalez 823-7976  
J. E. Miller 353-9941  
J. R. Horton 592-7957  
M. N. Baker 649-5636  
T. M. Conlin 941-6289  
W. L. Allen 532-4689  
M. C. Wilcox 592-2484  
E. C. Wilber 592-5052

OIL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTES  
SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

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APPENDICES

- A Emergency Guides for Substances Used at the WVDP
- B Distribution Sheet

ACRONYMS

BMPs	Best Management Practices
CB	Catch basin
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
CHRIS	Coast Guard Chemical Response Information System
CWA	Clean Water Act
CSS	Cement Solidification System
DCS	Distributive Control System
DOE	United States Department of Energy
DOT	United States Department of Transportation
EOC	Emergency Operations Center
EMT	Emergency Medical Technician
EPA	United States Environmental Protection Agency
FWPCA	Federal Water Pollution Control Act
HLW	High-Level Waste
HWSF	Hazardous Waste Storage Facility
IWSF	Interim Waste Storage Facility
LLW	Low-Level Radioactive Waste
LLWTF	Low-Level Waste Treatment Facility (O2 Plant)
LWTS	Liquid Waste Treatment System
MH	Manhole
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
NDA	Nuclear Regulatory Commission Licensed Disposal Area
NFPA	National Fire Protection Association
NFS	Nuclear Fuel Services Company, Inc. (original site operator)
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
OHMTA.DS	Oil and Hazardous Material Technical Assistance Data System
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PVS	Permanent Ventilation System
RCRA	Resource Conservation and Recovery Act
RDA	Radiation Detection Alarm
RQ	Reportable Quantity
SAA	Satellite Accumulation Area
SARA	Superfund Amendments and Reauthorization Act
SOP	Standard Operating Procedure
SPCC	Spill Prevention Control and Countermeasure
STS	Supernatant Treatment System
SPDES	State Pollutant Discharge Elimination System
TRU	Transuranic
TSCA	Toxic Substance Control Act

TSDf	Treatment, Storage and Disposal Facility
UPC	Uranium Product Cell
UR	Utility Room
VF	Vitrification Facility
WVDP	West Valley Demonstration Project
WVNS	West Valley Nuclear Services Company Incorporated

## DEFINITIONS

Technical terms used or referred to in the Spill Prevention, Control, and Countermeasures Plan are defined as follows:

1. Best Management Practices (BMPs) - Schedules of activities, maintenance procedures, prohibitions, and other management practices to prevent or reduce pollution of U.S. waters. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge and waste disposal, or drainage from raw materials storage.
2. Combustible Liquid - A liquid having a flash point at or above 100°F (37.8°C) and below 200°F (93.3°C)
3. Container - Any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.
4. Containment - An enclosure or entrapment that prevents further spread of a spilled material.
5. Containment Volume - The volume of a diked or curbed area minus the displacement volume of structures within the diked or curbed area.
6. Contingency Plan - A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of oil or hazardous waste or hazardous waste constituents which could threaten human health or the environment.
7. Dike - An embankment or ridge of either natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other materials.
8. Discharge - Any spill, leak, emission, pumping, pouring, emptying, or dumping from a container, vessel, or dike.
9. Disposal and Transportation of the Spilled Substance - Cleanup of a material from a spill site and transportation of the spilled substance to approved disposal facilities.
10. Environmental Incident - Any accident or occurrence that involves uncontrolled release or has the potential for uncontrolled release of oil or hazardous materials to the environment. This includes violations of a discharge permit.

11. Flammable Liquid - A liquid having a flash point below 100°F (37.8°C) and a vapor pressure not exceeding 40 psia (absolute) at 100°F.
12. Harmful Oil Discharges - Defined in 40 CFR 110.3 [in compliance with Statute Sect. 311(6)(3) of the Clean Water Act], as discharges that "(a) violate applicable water quality standards or (b) cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines."
13. Hazard Label - A visual indicator consisting of easily recognized and understood markings which identify tank and process equipment contents and indicate the degree of hazard.
14. Hazardous Material or Substance - 1) Any substance that may pose a threat to safety, health, environment, or property; 2) any substance designated pursuant to Statute Sect. 311(b)(2)(a) of the Federal Water Pollution Control Act (FWPCA); 3) any hazardous waste having the characteristics under or listed pursuant to Statute Sect. 3001 of the Solid Waste Disposal Act; 4) any toxic pollutant listed under Statute Sect. 307(a) of the FWPCA; and 5) any imminently hazardous chemical substance or mixture of substances set forth in the Toxic Substances Control Act (TSCA).
15. Hazardous Waste (HW) - A solid waste that meets the criteria listed in 40 CFR 261.3.
16. Hazardous Waste Storage Facility (HWSF) - a facility designated for the interim storage (<90 days) of hazardous wastes prior to off-site shipment to a permitted Treatment, Storage, or Disposal Facility (TSDF).
17. Material Safety Data Sheet (MSDS) - Description of the physical properties and hazards of a chemical, prepared in accordance with paragraph (9)(g) of 29 CFR 1910.1200, Occupational Safety and Health Administration (OSHA).
18. Mixture - Any combination of two or more elements and/or compounds in solid, liquid, or gaseous form, except where such substances have undergone a chemical reaction so as to become inseparable by physical means.
19. Navigable Waters - Defined in section 502(7) of the Clean Water Act (CWA) to mean "waters of the United States, including the territorial seas," and including, but is not limited to: (1) All waters which are presently used, or were



used in the past, or may be susceptible to use as a means to transport interstate or freight commerce, including all waters which are subject to the ebb and flow of the tide, and including adjacent wetlands. The term "wetlands" as used in this regulation shall include those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. The term "adjacent" means bordering, contiguous, or neighboring. (2) Tributaries of navigable waters of the United States such as interstate lakes, rivers, streams, mudflats, sandflats and wetlands, the use, degradation or destruction of which affect interstate commerce including, but not limited to:

- (i) Interstate lakes, rivers, streams, and wetlands which are utilized by interstate travelers for recreational or other purposes;
  - (ii) Interstate lakes, rivers, streams, and wetlands from which fish or shellfish are or could be taken and sold in interstate commerce; and
  - (iii) Interstate lakes, rivers, streams, and wetlands which are utilized for industrial purposes by industries in interstate commerce.
20. Oil - 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.
21. PCB-Contaminated Electrical Equipment - Any electrical equipment, including but not limited to transformers, capacitors, circuit breakers, reclosures, voltage regulators, switches, electromagnets, and cable that contain 50 ppm or greater PCBs but less than 500 ppm PCBs. Oil-filled electrical equipment other than circuit breakers, reclosures, and cable whose PCB concentration is unknown must be assumed to be PCB-contaminated electrical equipment.
22. PCB Transformer - Any transformer containing 500 ppm of PCBs or greater.
23. Primary Containment - The tank or container for holding hazardous materials, hazardous wastes, or oils.
24. Reportable Quantity (RQ) - Quantity of a substance that may be harmful as set forth in 40 CFR 117.3 and 40 CFR 302. The

discharge of an RQ is a violation of the FWPCA and must be reported to EPA.

25. Satellite Accumulation Area (SAA) - An area where hazardous waste is accumulated, located at the point of initial generation of the hazardous waste.
26. Secondary Containment - A containment system which is capable of holding and collecting any spills, leaks, rainwater, and/or fire protection water (e.g., sprinkler system discharge) originating from primary containment vessels and other process equipment.
27. Sheen - An iridescent appearance on the surface of water.
28. Sludge - An aggregate of oil or oil and other matter of any kind, in any form other than dredged soil, having a combined specific gravity equivalent to or greater than that of water.
29. SPDES Permit - State Pollutant Discharge Elimination System Permit required by the Environmental Protection Agency (EPA).
30. Transfer Station - Location or facility where hazardous materials/wastes are transferred to and from portable containers or tankers into tanks and/or process equipment.

## OIL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTES SPILL PREVENTION CONTROL, AND COUNTERMEASURES PLAN

### 1.0 SUMMARY

The U.S. Department of Energy (DOE) specifically mandates Spill Prevention Control and Countermeasures (SPCC) Plans in ID Order 5480.1, Chap. V, c.d., which states that DOE sites must comply with regulations presented in Code of Federal Regulations (CFR) 40 112.7, for owners and operators of facilities having a potential for discharge of harmful quantities of oils to navigable waters. Following discovery of a discharge or potential discharge, the sequence of follow-up actions should comply with 40 CFR 1510.e. Similar provisions mandated by 40 CFR 761 apply to the discharge of materials contaminated with polychlorinated biphenyls (PCBs). Similar provisions mandated by 40 CFR 302 and 355 and by 6 NYCRR 597.2 apply to the release of hazardous and extremely hazardous substances. This document addresses the requirements set forth in the above regulations. Regulations also mandate that this plan be reviewed and updated every three years.

The SPCC Plan consists of two parts: 1) owner/operator plans for preventing unintentional discharges oil or hazardous materials; and 2) owner/operator plans for response in the event of an unintentional discharge of oil or hazardous materials.

Spill prevention and control is achieved through a comprehensive program of planning, design, operations, inspection, and training, all directed towards spill avoidance and quick response for containment, mitigation, and cleanup should a spill occur. The plan describes the engineered features and administrative controls used to preclude spills of oil, hazardous substances, and hazardous wastes, and response procedures developed to minimize deleterious effects of a spill.

Section 2 provides background information on the West Valley Demonstration Project (WVDP) in West Valley, New York. Included are descriptions of process waste streams, site drainage, sanitary and storm sewer systems, and a spill history.

Section 3 presents information on oil, hazardous substances, and hazardous waste storage facilities on the site, including information on secondary containment and tertiary containment provisions.

Section 4 presents information on potential releases, including identification of sources and migration pathways in the event of a spill.

## 2.0 BACKGROUND INFORMATION

This SPCC plan has been developed in accordance with 40 CFR 112, which has been defined as the applicable regulation by DOE Order 5480.1. According to 40 CFR 112, spill containment can be provided by secondary containment systems including dikes, berms, retaining walls, or curbing (CFR 112.7[c][i]), or by culverting, gutters, or other drainage systems (CFR 112.7 [c][iii]). As outlined in this SPCC Plan and as demonstrated in the few major spill events that have occurred in the past at the WVDP, all oil and hazardous materials storage facilities at the WVDP are provided with secondary containment through one or both of these methods of containment. This containment system also would provide containment in the event of a release during transportation or material transfer operations.

The WVDP is an activity of the DOE Idaho Operations Office and is being operated pursuant to the West Valley Demonstration Project Act (P.L. 96-368). The operating contractor for the DOE Idaho Operations Office is the West Valley Nuclear Services Co., Inc. (WVNS), a wholly owned subsidiary of the Westinghouse Electric Corporation.

The Western New York Nuclear Services Center (WNYNSC) is a 1,335-hectare reservation owned by the State of New York. The WVDP is located on a 64-hectare parcel within the WNYNSC (see Figure 2-1). The WVDP includes a process building and support facilities that were formerly operated by Nuclear Fuel Services Co. (NFS) for reprocessing fuel but have not been used for reprocessing nuclear fuel since 1972.

The objectives of the Project are: to solidify 2.2 million liters of high-level radioactive waste (HLW) stored at the WNYNSC; to dispose of the low-level radioactive waste (LLW) and transuranic (TRU) waste generated in conjunction with the Project; and then to decontaminate and decommission the facilities used during the Project.

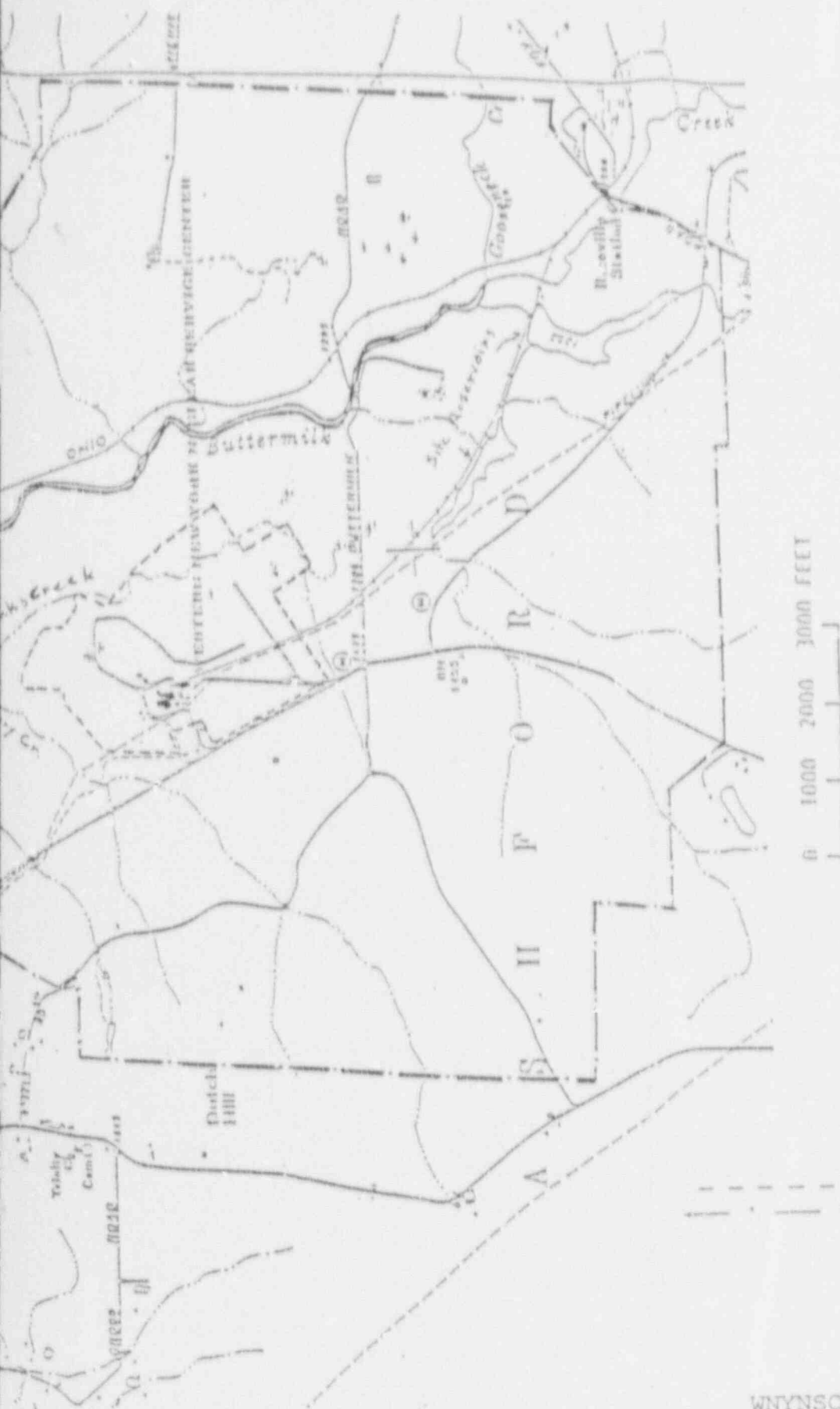
The facilities were maintained in a shut-down condition from 1972 to 1982, when the WVDP began decontamination of the facilities in preparation for their reuse in the Vitrification and Integrated Radioactive Waste Treatment systems. Other facilities at the WVDP were specifically constructed for the Project.

In February 1975, NFS prepared and submitted an SPCC Plan for the reprocessing facility. The 1975 plan was amended in April 1977 when two existing boiler steam condensate tanks were refitted for use as oil storage tanks. These two tanks were drained and removed from service in 1984. In June of 1985, an update and expansion of the NFS SPCC plan was issued by WVDP as WVDP-043. The WVDP plan covered hazardous materials (as identified in





WVDP-043  
Rev. 4



0 1000 2000 3000 FEET

## SI APERTURE CARD

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### KEY

----- WVDP Boundary  
----- WNYNSC Boundary

FIGURE 2-1

WNYNSC and WVDP Locations

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40 CFR 116) in addition to oil and other petroleum products. This revision updates the 1985 plan to cover tanks added since that time and existing tanks that have been used since that time for storage of materials covered in 40 CFR 112, and 116, 302.4, 355 and 6 NYCRR 597.2, or may be used for such purposes. The current revision includes identification of Satellite Accumulation Areas (SAAs), the Interim Waste Storage Facility (IWSF), and the Hazardous Waste Storage Lockers.

## 2.1 Site Topography and Drainage

Figure 2-1 shows major drainage pathways for the WNYNSC and the WVDP.

The Project area is drained by three creeks, namely, Erdman Brook, Quarry Creek, and Frank's Creek. The WNYNSC is drained by these three creeks, as well as Buttermilk Creek, and Cattaraugus Creek. Erdman Brook and Quarry Creek are tributaries to Frank's Creek; Frank's Creek is a tributary of Buttermilk Creek; Buttermilk Creek is a tributary of Cattaraugus Creek.

Buttermilk Creek originates south of the town of West Valley, New York, enters the WNYNSC at Riceville Station and flows through the site in a generally northwesterly direction until it joins Cattaraugus Creek some eight stream kilometers later. The WVDP facilities are at an elevation of slightly over 431.3 m above mean sea level (MSL). The elevation of Buttermilk Creek at its entrance to the site is about 365.8 m, and the elevation at the confluence with Cattaraugus Creek is slightly over 335.3 m. The total drainage area of Buttermilk Creek is estimated to be 48,215 hectares (ha), with an average flow rate of 46.5 ft<sup>3</sup>/sec.

Cattaraugus Creek flows in a generally westerly direction from the site to Lake Erie some 63 km away. The total drainage area of Cattaraugus Creek is estimated to be 877,350 ha. The drainage area of the Cattaraugus above the confluence with Buttermilk Creek is estimated to be 344,600 ha. Thus, the average flow in Cattaraugus Creek past the site may be estimated to be fifty percent of the average flow rate, or 354 ft<sup>3</sup>/sec.

No public water supplies use Buttermilk or Cattaraugus Creeks as a source of potable water. The Village of Springville operates a dam/hydroelectric generating station on Cattaraugus Creek approximately 4 km below the confluence of Buttermilk and Cattaraugus Creeks.

Figure 2-2 shows site topography and additional drainage details, and identifies major Project facilities involved in storage of oil, hazardous substances, or hazardous wastes. No significant Project construction beyond the facilities shown in this figure is currently envisioned.

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## 2.2 Hydrosphere

The West Valley Site is underlain by at least two water regimes, neither of which is considered highly permeable. The upper regime consists of the saturated portion of the surficial sand, silt, gravel, clay, and weathered till, ranging in thickness from about 1.5 m to 6.0 m. The upper regime is underlain by unweathered glacial till that ranges in thickness up to about 30 m. The unweathered till is underlain by a lower water regime a few meters thick, consisting of decomposed shale and bedrock. The lower water regime is underlain by bedrock.

The upper water region is involved in the surface hydrologic cycle. The approximate direction of groundwater flow in the surficial unit, based upon water level measurements, is easterly or northeasterly from the western boundary of the site. Most of the water in this unit drains into Frank's Creek, either directly or via one of its tributaries.

Figure 2-3 depicts groundwater flow patterns on the site as constructed by Yager (1987). The arrows indicate the pathways along which groundwater might be expected to flow within the water table upper aquifer. Much of the groundwater from the upper aquifer discharges at the seeps indicated on the figure.

The surface water regime of the WVDP includes several small tributaries of Buttermilk Creek, the onsite LLW treatment lagoons, and the two water supply reservoirs, in addition to the Buttermilk Creek tributaries of Frank's Creek, Quarry Creek, and Erdman Brook. The plateau on which the Project facilities are located is dissected by the steep-walled valleys of these streams. Surface runoff from plant areas is directed into these channels via drainage ditches and culverts.

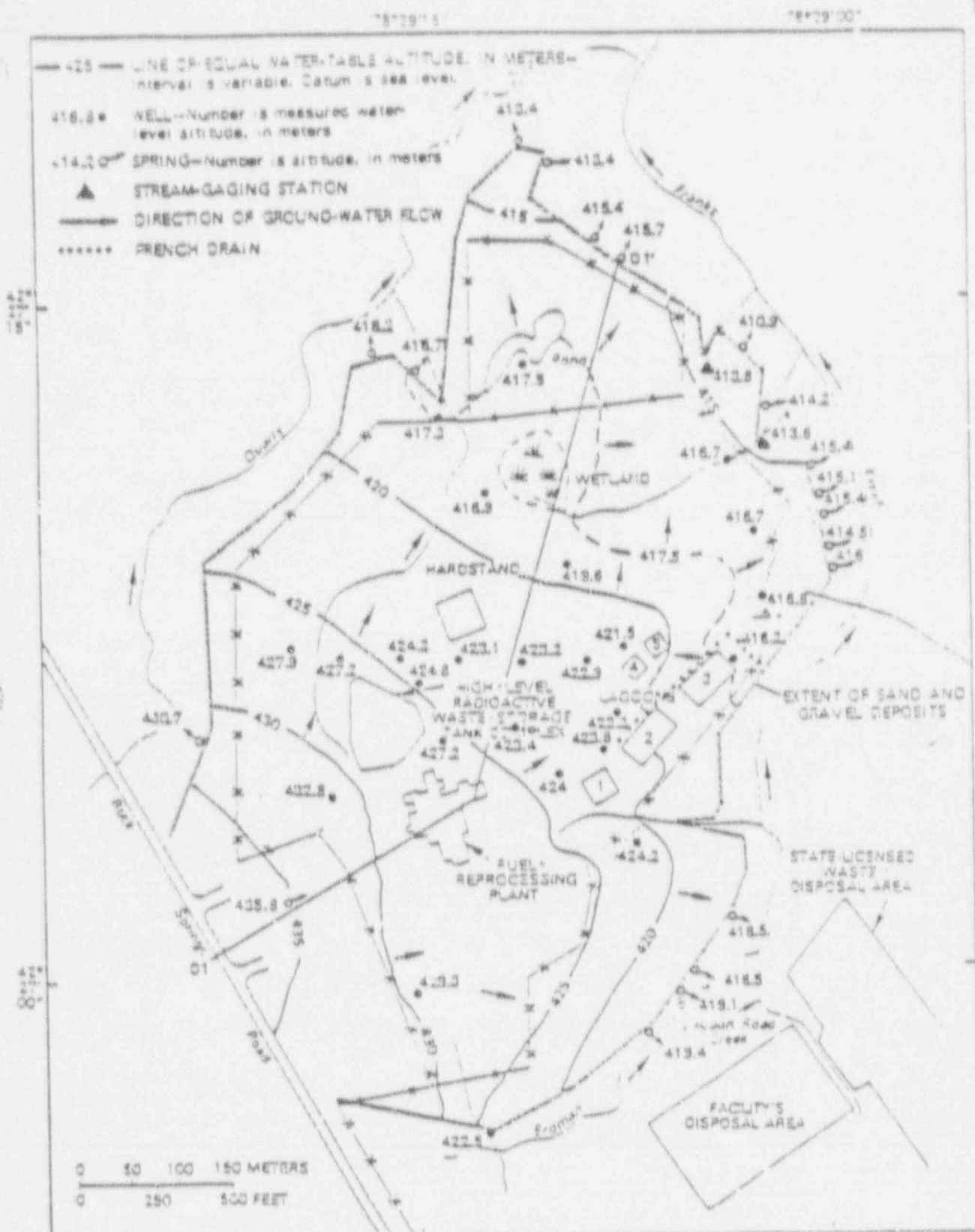
The onsite low-level waste water treatment facility (LLWTF) includes four lagoons (numbers 2, 3, 4 and 5), the largest of which contains a controllable discharge pipe to Erdman Brook. Of these four lagoons, numbers 4 and 5 are small feed and effluent holding basins. Lagoon 2 can hold 12.2 million liters and Lagoon 3 can hold 13.4 million liters.

Two onsite reservoirs, (see Figure 2-1), were created by damming branches of Buttermilk Creek to an elevation of 414.5 m above seal level (MSL) impounding 824,100 m<sup>3</sup> of water.

## 2.3 Effects of Local Intense Precipitation

Probable Maximum Precipitation (PMP) events have been estimated for the plant site, Buttermilk Creek, and the plant reservoirs,





PROBABLE SUBSURFACE SPILL MIGRATION  
PATHWAYS

FIGURE 2-3

based upon Hydrometeorological Report 33 and the following drainage basin areas:

Buttermilk Creek	7,903 hectares
Plant Site	606 hectares
Plant Reservoirs	1,257 hectares

The water levels in Buttermilk Creek for the PMP event were at least 50 meters below the plant elevation and therefore could not influence the plant area.

The plant site was evaluated in a similar manner. With the PMP increased by 50 percent, water levels in Frank's Creek would reach a maximum elevation of 53 meters below plant grade.

The winter PMP (snow and liquid) for the WVDP was estimated in Nicholas and Eagan (1983) using 100-year snowpack depths from Syracuse, New York, and the snowpack density conversion method of Bilello (1969), using a density of 0.25 with water equivalent snowpack depths of 44.5 and 36.8 cm for February and March, corresponding to snowloads of 444.3 kg/m<sup>3</sup> and 368.6 kg/m<sup>3</sup> respectively.

#### 2.4 Floods

Because Buttermilk and Cattaraugus Creeks lie in deep valleys, little area is available for farming or housing; thus the effects of any flooding of the flood plain have been minimal and no history of floods in the area is available.

The Chief, Flood Plain Management Services, Buffalo District, Corps of Engineers, stated in a letter to NFS, quoted in the NFS 1973 Safety Appraisal Report:

We do not feel that the 100-year flood stage of Buttermilk Creek will affect your proposed plant as it is at least 120 feet above the creek. The drainage area of Buttermilk Creek, upstream of your plant, is too small to be able to provide enough water to raise the creek stage the necessary 120 feet. In addition, before the creek stage could rise even 110 feet, it would spill over the divide on the west bank and flow down the valley of a tributary.

#### 2.5 Probable Maximum Flood

As indicated above, flooding of the plant area is not a possibility because of the deep valleys of Buttermilk and Cattaraugus Creeks.

June 1984, when the underground caustic transfer pipe between caustic storage Tank 14D-2 and the LLWTF released up to 3,800 liters of a 50 percent sodium hydroxide solution. This spilled material was routed into the LLWTF lagoon system, where it was neutralized prior to discharge via SPDES Outfall 001. The leaking pipe was excavated, repaired, and pressure-tested prior to being returned to service.

A spill of radioactive wastewater occurred on March 15, 1985. This incident involved the release of approximately 500 gallons of radioactive condensate. The spill occurred during the transfer of HLW tank farm off-gas condensate from Tank 8D-1 to HLW storage tank 8D-2. It resulted from a corroded flange in the transfer line. The release was largely contained within the waste tank farm by erecting dams over drainage culverts to contain runoff and divert run-on. The affected area was decontaminated and the lines repaired and tested. As a result of this incident, operations policy was changed to provide testing and repair prior to use of all underground transfer lines that had not been used within the previous three months.

In July 1986, a small spill of diesel fuel in a construction laydown area occurred approximately 30 meters northeast of the waste water treatment lagoons. This spill consisted of a release of 30 to 50 gallons of fuel from a parked dump truck. The cause of the leak was a perforated fuel line on the truck. Corrective action consisted of collecting the spilled fuel in buckets and on clay absorbent and securing the leaking fuel line. This event was confined to the immediate area and resulted in no release to surface waters.

There have been no reportable spills (as defined by 40 CFR 110) at the WVDP within the past year. Monthly spill reporting requirements to the DEC are detailed in Section 6.2 of this document.



### 3.0 STORAGE FACILITY CONSTRUCTION, INSTRUMENTATION, AND SPILL CONTAINMENT

The following sections describe the major outdoor storage tanks, underground tanks and other sources with a potential for environmental releases of oil, hazardous substances or hazardous wastes. These installations are summarized in Table 3-1. The locations of these tanks (or buildings containing tanks) are shown on figures 3-1 and 3-1A.

#### 3.1 Fuel Oil Tank 31D-2

##### 3.1.1 Construction

Tank 31D-2 is a 38,000-liter carbon steel vessel, 2.8 m in diameter by 6.1 m long. It is used to store No. 2 fuel oil for emergency operation of the boilers and is steam-heated to allow the oil to flow freely upon demand. The tank is elevated above a diked earthen spill basin by two reinforced concrete piers. The basin is equipped with a six-inch drain which is controlled by a manually operated gate valve.

##### 3.1.2 Instrumentation

Tank 31D-2 is equipped with level indicator and temperature instrumentation. Sight glasses, which are on the east side of the vessel, allow direct readout of the level in the vessel. More accurate level indication is provided by an air-purged instrument mounted off the lower connection of the sight glasses. A temperature gauge displays the temperature inside the vessel.

##### 3.1.3 Operation

This tank is normally filled via a hose from a tank truck into the top of the tank, which places everything but the tank truck inside the diked area. An alternative fill method is via a line to an elevated platform on the west side of the tank alongside railroad tracks. Valves are located at the top of this line and the point where the line enters the tank. This line is outside the diked area.

Instructions for receiving fuel in Tank 31D-2 are presented in Project Standard Operating Procedure (SOP) 31-2, "Steam Generation." This procedure requires the operator to observe the level in the tank before and after material transfer and provides a detailed sequence of instructions to minimize the likelihood of spills or overflows during transfer. Tank filling is a manual operation requiring operator attendance throughout the entire procedure. Thus, any spills during the transfer should be immediately identified and corrective action implemented.

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
F01 31-D-2 (see Section 3.1)	2.8 m diameter x 6.1 m long; elevated above basin by 2 reinforced concrete piers, steam coil heated, carbon steel	38,000 10,000	Yard East of UR	Fuel Oil No. 2	Spill basin, 84,700 L capacity	Sight glasses and level indicator
14-D-1 (see Section 3.2)	Stainless steel 4.1 m diameter x 3.7 m high	45,500 12,000	Yard east of UR	empty; formerly contained 14M nitric acid	Spill pad with drain line to interceptors	Level indicator
14-D-2 (see Section 3.3)	Carbon steel 4.1 m diameter x 3.7 m high steam coil heated spray insulated exterior	45,500 12,000	Yard east of UR	Empty; formerly contained 50% sodium hydroxide	Spill pad with drain lines to interceptors	Level indicator
14-D-2A (see Section 3.3)	Carbon steel, steam coil heated; spray insulated exterior	1,900 500	Yard east of UR	empty (formerly contained) 25% sodium hydroxide	Spill pad with drain lines to interceptors	Level indicator
G01-G03 Gasoline Storage Tanks (3) (see Section 3.4)	Carbon steel	7,500 2,000 (each)	South and west of warehouse	(1) unleaded+ gas (1) unleaded gas (1) diesel fuel	Silty till	Periodic leak testing.

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
35157 Sulfuric Acid Tank (see Section 3.5)	Polyethylene	11,000 3,000	Adjacent (south) to LLWTF	Sulfuric acid 93%	Curbed concrete spill pad	Level gauge
G04 STS bulk fuel oil tank (see Section 3.6)	Steel double- walled under- ground tank with bitumastic coating	2,100 550	Underground northeast of STS building	Diesel Fuel	Double-walled construction	Leak detection sensor with air, water, and hydrocarbon indicators in PVS. Alarm in STS control room
8D-1 (see Section 3.7)	Carbon steel tank	2.8 million 740,000	Waste tank farm	Housea STS process tanks	Carbon steel pan; concrete vault; silty till	Pan has moisture sump; tank has level and pressure indicators and alarms
8D-2 (see Section 3.7)	Carbon steel tank	2.8 million 740,000	Waste tank farm	Neutralized high level radioactive waste see Tables 3-2 and 3-3	Carbon steel pan; concrete vault; silty till	Pan has moisture sump; tank has level and pressure indicators and alarms
8D-3 (see Section 3.8)	Stainless steel tank	57,000 15,000	Waste tank farm	STS processed supernatant storage tank Table 3-2 less cesium	Stainless steel pan and concrete vault (shares with 8D-4); silty till	Pan is equipped with an alarmed sump; tank has level and pressure indicators and alarms

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	Nominal Capacity (liters) (gallons)	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment*</u>	<u>Instrumentation Associated with Spill Control</u>
8D-4 (see Section 3.8)	Stainless steel tank	57,000 15,000	Waste tank farm	Acidic waste produced from THOREX process (Table 3-4)	Stainless steel pan and concrete vault (shared with 8D-3); silty till	Pan is equipped with an alarmed sump; tank has level and pressure indicators and alarms
North Interceptor (see Section 3.9)	Concrete, lined w/SS	87,000 23,000	East of main process building	Collects liquid from plant drains and sumps (radioactive wastewater)	Silty till, overflow to old interceptor	High level alarm
South Interceptor (see Section 3.9)	Concrete, lined w/SS	87,000 23,000	East of main process building	Collects liquid from plant drains and sumps (radioactive wastewater)	Silty till, overflow to old interceptor	High level alarms
Neutraliza- tion Pit (see Section 3.9)	Concrete, lined w/SS	1,900 500	East of main process building	Adjusts pH of incoming wastes (radioactive wastewater)	Silty till	None
Old Interceptor (see Section 3.9)	Concrete	56,850 15,000	East of main process building	Temporary storage of off- spec effluent	Silty till	None
15-D-6 (see Section 3.10)	1.8 m diameter x 2.4 m high stainless steel	5,700 1,500	Underground adjacent to east side of contact size reduction facility	HEV and decon shop waste catch tank (radioactive wastewater)	None	Monitoring well, level recorder, high level alarm

APPENDIX 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
7-D-13 (see Section 3.11)	SA 240/307 L SS 1.4 m diameter x 4.1 m long	7,500 2,000	Underground adjacent to east side of contact size reduction facility	Low level waste catch tank drum flush from CSS (radioactive wastewater)	None	Level recorder, high level alarm
33012 Recycle Tank (see Section 3.12)	Stainless steel	29,000 7,650	Concrete pad south of LLWTF	Low-level radioactive wastewater	Concrete, curbed pad	High, low alarm level indicator
48070 Flocculator Clarifier) (see Section 3.17)	Stainless steel	64,450 17,000	Concrete pad south of LLWTF	pH adjusted low level wastewater	Concrete, curbed pad	Auto system overflow
35105 Clarified Water Surge Tank (see Section 3.12)	Stainless steel	3,500 950	Concrete pad south of LLWTF	Clarified low-level wastewater	Concrete, curbed pad	High, low alarm, level indicator, recorder, auto system overflow
48091 Clarified Water Filter (see Section 3.12)	Stainless steel	18,950 5,000	Concrete pad south of LLWTF	Clarified low-level wastewater	Concrete, curbed pad	Level indicator, recorder, level alarm, auto system overflow
Waste Oil Collection Tank (see Section 3.13)	Carbon steel	660 175	NDA container storage area	Waste engine lubricating oil	Carbon steel box with herculite liner, 2120 L spill capacity	None

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
<u>Future Vitrifaction Facility Tanks</u>						
<u>Additional Vit System Tanks and VIT "Pit" Tanks (See Section 3.14.1 and 3.14.4)</u>						
63-V-11	304 SS	22,237 6,000	VF "Pit"	Melter Feed Hold Tank	VIT "Pit"	Level and density indicators and high, low alarms
63-V-01	Hastelloy	32,930 9,000	VF "Pit"	Concentrator Feed Makeup Tank	VIT "Pit"	Level and density indicators and high, low alarms
S&S Receiver 63-V-031	304 SS	5,488 1,500	VF "Pit"	Melter Off-gas Scrub Solution	VIT "Pit"	Level and density indicators and high, low alarms
<u>VIT Vessels in 0-14 Building Containment Cell (See Section 3.14.2)</u>						
64-D-01 Primary Surge Tank	304 SS	1,722 500	0-14 Containment Cell	Dilute $\text{HNO}_3$ Solution	01-14 Cell	Level and density indicators and high/low level alarms
64-D-03 Secondary Surge Tank	304 SS	1,722 500	01-14 Containment Cell	Dilute $\text{HNO}_3$ Solution	01-14 Cell	Level and density indicators and high/low alarms
64-D-05 Primary Storage Tank	304 SS	1,987 500	01-14 Containment Cell	Dilute $\text{HNO}_3$ Solution	01-14 Cell	Level and density indicators and high/low alarms
64-D-09 Secondary Storage Tank	304 SS	1,987 500	01-14 Containment Cell	Dilute $\text{HNO}_3$ Solution	01-14 Cell	Level and density indicators and high/low level alarms

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
(2) DT1, DT2 Diesel Fuel Day Tanks (see Section 3.14.3)	Carbon Steel	121 32 (each)	01-14 Bldg. 144 ft level (4th floor)	Diesel Fuel	Overflows back to supply tank	Field mounted level indicators
VIT Generator Diesel Fuel Tank and Day Tank (See Section 3.14.4)	Carbon steel	28,200 7,450	Northwest of VIT Building	Diesel Fuel	Concrete berm and pad	High level alarm
	Carbon steel	758 200	In VIT diesel generator room		In VIT diesel generator room	High level alarm
<u>Additional VIT System Tanks and VIT "Pit" Tanks (See Section 3.14.1 and 3.14.5)</u>						
61-D-08	304 SS	1,628 430	VIT Test Facility	Off-Gas Scrubber	Vit Building Floor	None
61-D-07	304 SS	22,710 6,000	Outside of VIT Test Facility	West of VF	Concrete berm and pad	Level gauge
<u>Scaled Vitrification System (SVS) III Future Tanks (See Section 3.14.6)</u>						
61-D-01	304 SS	4,180 1,100	VIT Test Facility	Melter Feeder	In VIT Test Facility	High and low level alarm
61-D-02	Fiberglass reinforced	1,722 450	VIT Test Facility	Test Slurry	In VIT Test Facility	High level indicator and alarm
61-D-03; and Day Tank	304L SS 304L SS	1,900 500 950 250	VIT Test Facility	Nitric Acid for slurry makeup	In VIT Test Facility	High level indicator and alarm



TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
61-D-04	304L SS	950 250	VIT Test Facility	Slurry Feed Hold Tank	In VIT Test Facility	High and low level indicators, alarms; automatic shutoff
V044T	Titanium	1,672 450	VIT Test Facility	Acidic Solution	In VIT Test Facility	Level indicator
61-D-06	304L SS	210 55	VIT Test Facility	Slurry Feed Hold Tank	In VIT Test Facility	High and low level indicators alarms; automatic shutoff
<u>Cold Chemical Systems Tanks</u> (See Section 3.14.7)						
65-D-01	304L SS	41,365 11,000	Cold Chem Building	Off-spec chemical hold Tank	Cold Chem Building	Sump alarm
65-D-02	304L SS	21,000 5,500	Cold Chem Building	Slurry Hold Tank	Cold Chem Building	High level alarm
65-D-03	304L SS	21,000 5,500	Cold Chem Building	Slurry Hold Tank	Cold Chem Building	High level alarm
65-D-04	304L SS	1,900 500	Cold Chem Building	Slurry Hold Tank	Cold Chem Building	High level alarm
65-D-05	304L SS	5,700 1,500	Cold Chem Building	Nitric Acid Day Tank	Cold Chem Building	High level alarm, visual, audio
65-D-06	316 SS	1,900 500	Cold Chem Building	Caustic Day Tank	Cold Chem Building	High level alarm, visual, audio
65-D-07	304L SS	3,790 1,000	Cold Chem Building	Decontamination Tank	Cold Chem Building	High level alarm, visual, audio

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
65-D-08	304L SS	950 250	Cold Chem Building	Decontamination Tank	Cold Chem Building	High level alarm, visual, audio
65-D-09	304L SS	950 250	Cold Chem Building	Decontamination Tank	Cold Chem Building	High level alarm, visual audio
65-D-10	304L SS	380 100	Cold Chem Building	Scrub Solution Tank	Cold Chem Building	High level alarm, visual, audio
<u>Supernatant Treatment System (See Section 3.15)</u>						
50-C-001 - 50-C-004	Stainless steel		8D-1	Zeolite IX columns	8D-1, carbon steel pan concrete vault	Temperature, pressure indicators low, high level alarms
50-F-001	316 L and 300 stainless steel		8D-1	Prefilter	8D-1, carbon steel pan concrete vault	Pressure indicators
50-F-002	Stainless steel		8D-1	Sand postfilter	8D-1, carbon steel pan concrete vault	Pressure indicators high alarm
50-E-001	Stainless steel		8D-1	Supernatant cooler	8D-1, carbon steel pan concrete vault	High alarm
50-D-001	Stainless steel	6,435 1,700	8D-1	Supernatant feed tank	8D-1, carbon steel pan concrete vault	Level, density, pH, conductivity, pressure indicators, high, high alarm
50-D-004	Stainless steel	8,110 2,150	8D-1	Supernatant sluice lift tank	CD-1, carbon steel pan concrete vault	High, high and low level alarms

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
50-D-005	Stainless steel		STS Valve Aisle	Process upset safeguard tank	STS Valve Aisle sump; drains to 8D-2	High and low level alarms
50-D-006	Stainless steel		STS Valve Aisle	Process upset safeguard tank	STS Valve Aisle sump; drains to 8D-2	Sight gauge
50-D-008	Stainless steel	57 15	STS Operating Aisle	Brine solution of Sodium Nitrate	Concrete berm, operating aisle sump; drains to 8D-1	Sight gauge
50-E-002	Stainless steel	220 58	STS Operating Aisle	Brine solution of Sodium Nitrate	Concrete berm; operating aisle sump; drains to tank 8D-1	Pressure gauges
35104 (see Section 3.16.1)	SA 240/304 L SS	22,000 6,000	GCR extension	Low level waste collection tank	LWC; sump	Level recorder, high and low level alarms, sump has high level alarm
7D-2 (see Section 3.16.2)	SA 240/304 L SS	32,220 8,500	LWC	Low level waste collection tank	LWC; sump	Level recorder, high and low level alarms, sump has high level alarm
13-D-8 (see Section 3.16.2)	SA 240/304 L SS	2,500 660	LWC	Cell sump reciever	LWC; sump	Level recorder, indicator and high level alarm
3-D-2 (see Section 3.16.2)	304 L SS	3,785 1,000	LWC	Sample collection tank	LWC; sump	Level recorder, high and low level alarms

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITY: 2S

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
4-D-8 (see Section 3.16.2)	304 L SS	2,278 600	LWC	Rad. waste catch tank	LWC; sump	Level recorder
4-D-10 (see Section 3.16.2)	304 L SS	10,540 3,000	LWC	PMC and GPC sump collector	LWC; sump	Level recorder
4-D-13 (see Section 3.16.2)	304 L SS	10,760 3,000	LWC	Rad waste catch tank	LWC; sump	Level recorder
7-D-8 (see Section 3.16.2)	304 L SS	11,580 3,000	LWC	Rework evaporator feed tank	LWC; sump	Level recorder
7-D-14 (see Section 3.16.2)	304 L SS	1,979 500	LWC	Hot analytical drain tank	LWC; sump	Level recorder, alarm
13-D-7 (see Section 3.16.2)	304 L SS	2,599 700	LWC	Rad. waste catch tank	LWC; sump	Level recorder
<u>Tanks with the Vessel Off Gas Cell (See Section 3.16.3)</u>						
6D-3	304 L SS	858 225	OGC	VOG condensate catch tank	Leak to OGC sump; overflows to 7D-8	None
6C-3	304 L SS	1577 400	OGC	Demineralizer recirculator	Leaks to OGC sump; overflows to 7D-8	Level indicator

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
Sodium Silicate Bulk Storage and Day Tank (see Section 3.16.4)	Polyethylene	5,685 1,500	CSS change room	Sodium Silicate	berm	Level indicator
	Carbon Steel	1,043 275			None	Low level alarm on day tank
<u>Liquid Waste Treatment System Tanks within the Uranium Process Cell (UPC) (See Section 3.16.5)</u>						
5-D-15A1	SA 240/304 L SS	38,150 10,000	UPC	Evaporator Concentrates	UPC, sump	Level recorder, indicator, low and high alarms, UPC sump high level alarm
5-D-15A2	SA 240/304 L SS	18,990 5,000	UPC	Evaporator Concentrates	UPC, sump	Level recorder, indicator, low and high alarms, UPC sump high level alarm
5-D-15B	SA 240/304 L SS	56,950 15,000	UPC	Evaporator Feed Tank	UPC, sump	Level recorder, indicator, low and high alarms, UPC sump high level alarm
<u>Tanks and Vessels within Extraction Cell (XC3) (See Section 3.16.6)</u>						
71-D-001	SA 240/304 L SS		XC3	Organic IX (low TDS)	XC3; sump	Sump high level alarm
71-D-002	SA 240/304 L SS		XC3	Zeolite IX (low TDS)	XC3; sump	Sump high level
71-D-003	SA 240/304 L SS		XC3	Zeolite IX (high TDS)	XC3; sump	Sump high level alarm
71-D-005	SA 240/304 L SS	3,785 1,000	XC3	Distillate surge	XC3; sump	Sump high level alarm, level indicators

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	Nominal Capacity (liters) (gallons)	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
71-D-006	SA 240/304 L SS	4,650 1,200	XC3	Spent resin receiver	XC3; sump	Level indicator, sump high level alarm
71-D-007	SA 240/304 L SS	4,650 1,200	XC3	Spent zeolite receiver	XC3; sump	Level indicator, sump high level alarm
71-D-008	SA 240/304 L SS	2,950 800	XC3	Filter back wash receiver	XC3; sump	Level indicator, high level alarm, sump high level alarm
71-D-009	SA 240/304 L SS	380 100	XC3	Feed sample tank	XC3; sump	Level indicator, high level alarm, sump high level alarm
71-V-010	SA 240/304 L SS	400 100	XC3	Low TDS filter	XC3; sump	Sump high level alarm
71-D-011	SA 240/304 L SS	380 100	XC3	Low TDS feed tank	XC3; sump	Level indicator high/low alarms, sump high level alarm
31017	SA 240/304 L SS	5,680 1,500	XC3	High TDS evaporator	XC3; sump	Level recorder, indicating controller, high/low alarms, sump high level alarm
14-D-7 (see Section 3.16.7)	SA 240/304 L SS	375 100	LXA	Nitric Acid	LXA, drains to interceptor	Level indicator, high level alarm
14-D-18 (see Section 3.16.7)	SA 240/304 L SS	375 100	LXA	Sodium hydroxide	LXA, drains to interceptor	Level indicator, high level alarm



TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
70-D-001 (see Section 3.16.8)	304 stainless steel	1,900 (usable) 500	WDC	Waste dispensing vessel	WDC; sump	Level recorder, indicator, low, high, high alarms, temperature indicator, sump has high level alarm
31008 (see Section 3.16.9)	SA 240/304 L SS	510 130	PCR	Roof top evaporator	XC3; sump	Level recorder, indicating controller, high/low alarms, sump high level alarm
5V-1 (see Section 3.16.10)	Stainless steel	19,000 5,000	ULO	Presently contains residual simulated supernatant	ULO floor	Liquid level detection in ULO floor
<u>Low Level Waste Treatment Facility (See Section 3.17)</u>						
Potassium Ferrate Mix Tanks(2)	Polyethylene	210 55	LLWTF	Potassium Ferrate	LLWTF Building sump	Level indicator
33013	Stainless steel	910 250	LLWTF	Acid hold tank 30% nitric	LLWTF; building sump	None
Ion Exchange Columns I01 and I02	Carbon steel polylined	3,525 each 1,000	In LLWTF Building	Ion exchange columns for process wastewater	LLWTF; Building sump;	Pressure gauges
<u>Trench Interceptor Project (TIP) Pretreatment Tanks (See Section 3.18)</u>						
82-D-01	Carbon steel	3,790 1,000	TIP Bldg.	Physical separation tanks of recovered groundwater	Containment basin alarms	Low and high level indicators, (remote and local, visual and audio) automatic shutoff switches



TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
82-D-02	Carbon steel	3,790 1,000	TIP Bldg.	Physical separation tanks of recovered groundwater	Containment basin alarms	Low and high level indicators, (remote and local, visual and audio) automatic shutoff switches
82-D-03	Carbon steel	18,950 5,000	TIP Bldg.	Pretreatment Feed Tank	Containment basin alarms	Low and high level indicators, (remote and local, visual and audio) automatic shutoff switches
82-D-04	Carbon steel	3,790 1,000	TIP Bldg.	Post Treatment Hold Tank	Containment basin alarms	Low and high level indicators, (remote and local, visual and audio) automatic shutoff switches
82-D-05	Carbon steel	3,790 1,000	TIP Bldg.	Post Treatment Hold Tank	Containment basin alarms	Low and high level indicators, (remote and local, visual and audio) automatic shutoff switches
82-C-01	Carbon steel	2,653 700	TIP Bldg.	GAC Filter	Containment basin	Pressure gauge
82-C-02	Carbon steel	3,790 1,000	TIP Bldg.	GAC Filter	Containment basin	Pressure gauge
Transfer tanks (3) (see Section 3.19.1)	(2) poly-ethylene (1) 304 stainless steel	757 200 (each) 1900 500	Portable	Temporary transfer of miscellaneous liquids	None, used only for transfers	Visual level indicator

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
Diesel fuel tank (portable) (see Section 3.19.2)	Carbon steel	1,136 300	Portable (filled from underground tank; trans- ported to area south of UR)	Diesel fuel, refuels air compressor and fire pump	Carbon steel pan constructed around tank	None
URF 48066-A (see Section 3.19.3)	Carbon steel, on concrete saddles	1,098 300	Utility room	Fuel oil No. 2	UR floor drains (to interceptors)	Float level gauge
7C-5 (See Section 3.19.4)	304 L SS	7580 2000	Acid recovery cell	Low level wastewater	ARC cells; sump	Level indicator and recorder
7D-1 (See Section 3.19.5)	304 L SS	6876 1800	Extraction Cell 1	empty; formerly contained high level wastewater	XCl cell; sump	Tagged out of service
<u>Tanks Located Within the Waste Tank Farm Shelter (See Section 3.19.6)</u>						
8C-1	Carbon Steel	2,650 700	WTF shelter	Con. Ed. off- gas caustic scrubber	WTF shelter overflow to Tanks 8D-6	High, low level alarms
8D-6	Carbon Steel	1,893 500	WTF shelter	Off-gas KO pot	WTF shelter overflow to Tanks 8D-1 or 8D-2	High level alarm

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
8D-7	Carbon Steel	950 250	WTF shelter	Off-gas relief tank	WTF shelter overflow to Tanks 8D-2	Level indicator
<u>Zinc Bromide Shield Windows (See Section 3.19.7)</u>						
Scrap removal window	Rectangular glass plates gasketed into carbon steel frames	360 100	SR	Zinc bromide	WMOA floor to pit for condensate pumps	N/A (level visible)
Mechanical crane room window	Rectangular glass plates gasketed into carbon steel frames	340 100	Analytical aisle	Zinc bromide	Down stairs to GOA floor, to GOA sump	N/A (level visible)
(5) Analytical cell Windows	Rectangular glass plates gasketed into carbon steel frames	340 100	Analytical aisle	Zinc bromide	ANA floor (floor drains covered)	N/A (level visible)
FPH Fire pump day tank (see Section 3.19.8)	Carbon steel	1040 275	Fire pump house	Fuel oil No. 2	Pump house floor	Float level indicator
SDT STS day tank (see Section 3.19.9)	Carbon steel	380 100	STS generator room	Diesel Fuel	Generator room floor	Float level indicator

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
Receiving Warehouse Flammable Storage Cabinets (7) (see Section 3.19.10)	Steel	170 45	Receiving Warehouse	Segregated cabinets of paints, thinners, acids	Built-in spill basin - 2" sill	None
New Main Warehouse (see Section 3.19.11)	Concrete	6537 1800 ea. room's spill containment volume	West of Receiving Warehouse	5 segregated rooms for oxidizers, flammables, corrosives, acids and health hazards	Containment basins beneath steel grate floors	None
Cargo Unit Trailer Body (see Section 3.19.12)	Wood and Steel		South and west of Warehouse	55 gal drums, 5 gal pails of oils and greases	8' x 40' cargo trailer	None
Hazardous Waste Satellite Accumulation Areas (see Section 3.20)			Various locations	Temporary storage of hazardous wastes at or near the point of generation	Various methods	None
Interim Waste Storage Facility (IWSF) (see Section 3.21)	Pre-engineered metal bldg. 34' x 34'	21,650 5,700 of bermed, secondary containment capacity	at the NDA, southeast of the Main Plant	Temporary storage of wastes prior to chemical, radiological characterization	Bermed concrete floor	None

TABLE 3-1 WVDP OIL, HAZARDOUS SUBSTANCE, HAZARDOUS WASTE STORAGE FACILITIES

<u>Tank/Vessel</u>	<u>Construction</u>	<u>Nominal Capacity (liters) (gallons)</u>	<u>Location</u>	<u>Contents and/or Function</u>	<u>Spill Containment</u>	<u>Instrumentation Associated with Spill Control</u>
Hazardous Waste Lockers 2-Non-flammable 2-Flammable (see Section 3.22)		4758 1265 each locker containment	East of STS Building	4 separate locker containing hazardous and non-hazardous solid and liquid wastes	Built-in spill basin 10% of total volume	Audio, visual alarms
Portable Holding Tanks (see Section 3.23)	Carbon steel	3790 1,000	Various locations	Temporary storage	Contained in steel boxes when necessary	None
General Oil Windows (See Section 3.24)	Rectangular Glass Plates gasketed into carbon steel frames	285-417 75-110	Various locations	Mineral oil	Within main plant building	N/A Level visible
Waste Tank 8D-2 Caustic Transfer Staging Area (See Section 3.25)	Vendor tank	17,000- 18,500 4500-5000	North of the high level waste tanks	caustic soda	10' x 10' portable-berm, 7000 gallon capacity inflatable berm if necessary	None
RAM Equipment Room (REM) (See Section 3.26)			First floor of main plant west of FRS	Special nuclear materials	REM room floor drains to interceptors	None





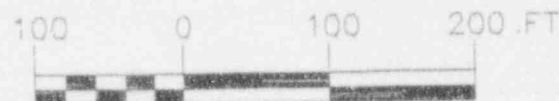


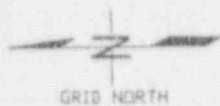
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## Figure 3-1 Tank, Storage and Process Area Locations

- | Area | Description  |
|------|--|
| 1    | Yard tanks - nitric tank 14B-1, caustic tanks 14B-2 and 2A, fuel oil tank 31B-2        |
| 2    | Below ground gasoline storage tanks  |
| 3    | DS plant (LLVTF)   |
| 4    | STS bulk underground fuel oil tank   |
| 5    | High level waste tank farm   |
| 6    | Interceptors and neutralization pit  |
| 7    | Mandatory repair shop waste catch 15D-6  |
| 8    | Low level waste catch tank 7D-12   |
| 9    | Waste oil collection tank (Fig. 2-4A)  |
| 10   | Vitrification facility   |
| 11   | Vitrification test building  |
| 12   | Supernatant treatment system building (valve aisle, operating aisle, and control room) |
| 13   | Tank 8D-1  |
| 14   | Liquid waste cell (LWC), lower extraction aisle (LXA)                                  |
| 15   | Uranium product cell (UPC), lower extraction aisle (LXA)                               |
| 16   | Extraction cell 3 (XC3)  |
| 17   | Waste dispensing vessel 79D-001  |
| 18   | Tank 5V-1  |
| 19   | Utility room   |
| 20   | Tank 6D-3  |
| 21   | Fine pump house  |
| 22   | Interim waste storage facility (IWSF) (Fig. 2-4A)                                      |
| 23   | Receiving warehouse  |
| 24   | New warehouse  |
| 25   | Hazardous waste storage lockers  |
| 26   | VIT Cold chemical building   |





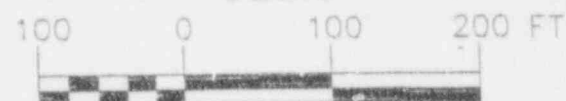
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## Figure 3-1A Tank, Storage and Process Area Locations

Area	Description
1	Yard tank (40-L caustic tank 140-2 and 2A fuel oil tank 310-2)
2	Below ground gasoline storage tanks
3	02 plant (LVT)
4	STS bulk underground fuel oil tank
5	High level waste tank farm
6	Interceptors and neutralization pit
7	Handpump repair shop waste catch 150-6
8	Low level waste catch tank 70-12
9	Waste oil collection tank
10	Vitrification facility
11	Vitrification test building
12	Supernatant treatment system building (valve aisle, operating aisle, and control room)
13	Tank 80-1
14	Liquid waste cell (LWC), lower extraction aisle (LXA)
15	Uranium product cell (UPC), lower extraction aisle (LXA)
16	Extraction cell 3 (EC3)
17	Waste dispensing vessel 700-001
18	Tank 5V-1
19	Utility room
20	Tank 61-3
21	Fire pump house
22	Interim waste storage facility (IWSF)
23	Receiving warehouse
24	New warehouse

Scale



The fuel oil tank supplies fuel to the boilers in the Utility Room (UR) via underground pipes and the diesel blower fuel tank in the 01-14 Building via hard piping. (The boilers are normally fueled by natural gas.)

In normal operations, the spill basin collects rainwater and discharge from the internal steam heating system. The basin gate valve is closed except when collected water is being drained from the basin. Before the basin is drained, standing liquids are first examined for surface sheen to make sure they do not contain oil. The liquid (rainwater) is sampled and released per SOP 15-51, allowing the collected liquid to drain into the Utility Room (UR) drainage ditch.

#### 3.1.4 Spill Containment

The fuel oil tank is mounted on concrete pedestals within a diked earthen spill basin. This basin is a depression in the ground surface capable of holding a volume of 84,740 liters. Upgrades to this basin completed in FY 1989 included excavating and berming to provide a containment capacity of approximately 110 percent of the tank capacity.

#### 3.2 Tank 14D-1

##### 3.2.1 Construction

Tank 14D-1 is a stainless steel vessel 4.1 m in diameter by 3.7 m high, with a capacity of 45,500 liters. It is situated on a concrete pad and is enclosed within a spill basin that drains to the interceptors in the LLWTF system.

All piping and fittings are welded stainless steel with stainless steel nuts and bolts. The pump connection flanges contain stainless steel-wound teflon gaskets with stainless steel nuts and bolts. The pump is a stainless steel wetted surfaces pump suitable for high concentrations of nitric acid. Its electrical service is conduit that is outside the spill basin, with an acid resistant rubber electrical cord from the bottom of the switch to the pump. The switch is mounted on a painted steel pedestal three feet above the floor of the spill basin.

##### 3.2.2 Instrumentation

Tank 14D-1 is equipped with a level indicator, which consists of a float connected by a cable to an indicator bar that reads out against a calibrated gauge.



### 3.2.3 Operation

Tank 14D-1 is currently out of service. There is no existing discharge line from the discharge pump and the tank is empty.

### 3.2.4 Spill Containment

See section 3.3.4.

## 3.3 Caustic Tank 14D-2 and Caustic Day Tank 14D-2A

### 3.3.1 Construction

The caustic storage tank (14D-2) was formerly used for the storage and distribution of concentrated (50 percent) sodium hydroxide. The caustic day tank (14D-2A) was formerly used to make up dilute (25 percent) caustic that was used for pH control in the interceptor. Tank 14D-2 has a capacity of 45,500 liters, and Tank 14D-2A has a capacity of 1,900 liters. Both tanks are of carbon steel and were provided with steam heat via internal coils to maintain the viscosity of the solution.

### 3.3.2 Instrumentation

Tank 14D-2 is equipped with level indicator and temperature gauges. A temperature gauge capable of measuring from 0 to 250 degrees F is mounted approximately 30 cm up from the base of the tank. Tank 14D-2 is also equipped with an automatic control valve that controls the flow of steam through the internal steam coil to maintain the vessel temperature at 100 F.

Tank 14D-2A is also equipped with level and temperature indicators. The level indicator is an air-purged dial instrument mounted on top of the tank. The temperature indicator is identical to the one on Tank 14D-2. Tank 14D-2A is also equipped with a temperature control valve.

### 3.3.3 Operation

Both these tanks are out of service. The filling of Tank 14D-2 was conducted in accordance with SOP 14-1, "Receipt and Distribution of Bulk Liquid Chemicals." This is the same procedure mentioned in section 3.2 for the nitric acid storage tank. The transfer of material to Tank 14D-2A, to the neutralizer pit, and to the LLWTF are described in SOP 02-1, "Low-Level Waste Treatment Cold Chemical Makeup," and SOP 15-13, "Interceptor Operation."

### 3.3.4 Spill Containment

Tanks 14D-1, 14D-2, and 14D-2A are located in close proximity to each other and utilized a common transfer station but separate lines for filling. These tanks were originally on a common spill pad, consisting of a concrete mat surrounded by a concrete curb 15 cm high. Separate drains were provided for the two halves of the pad. The drains are routed to the LLW basins. The tanks were elevated several inches above the pad on concrete pedestals.

The pad has been refurbished and upgraded to provide separate spill basins, one for 14D-1, and one for 14D2 and 14D-2A. Currently, the caustic tanks are separated from the 14D-1 tank by a concrete curb and splash barrier. The separate spill basins are each capable of retaining approximately 2,000 liters, which would be sufficient to contain small spills or slow leaks. (These basins would not be adequate to contain the volume of either tank in the event of a rapid release of material from a major leak or catastrophic failure of the tank.) Larger containment capacity is provided by the interceptors, which receive all runoff and rainwater from these basins via the floor drains and sump drains in each basin.

Fill lines to the storage tanks (14D-1 and 14D-2) are located outside the containment area. There is one line for each tank from the elevated platform alongside the railroad, and one for each tank for unloading from a truck. The fill lines enter the tank at a point above the overflow line. The caustic day tank is filled from the caustic storage tank, with all piping inside the containment.

Each of these vessels also has an overflow line that is routed into a concrete enclosure at the base of the tank. Splash control concrete curbing is provided at the base of 14D-1 for that tank and at the base of 14D-2 for that tank and 14D-2A.

The caustic tanks are equipped with internal steam coils. Condensate from the steam is discharged to the overflow drains, which are routed to the interceptors. If any leaks were to occur in the heating coils, the caustic could become contaminated with water, but would be contained within the LLWTF system.

### 3.4 Gasoline Storage Tanks

#### 3.4.1 Construction

Two underground gasoline storage tanks and one underground diesel storage tank are located at the hardstand across from the warehouse. Each tank has a capacity of 7,500 liters and is made of carbon steel. These tanks were installed in January 1985. The tanks are strapped to a concrete ballast, and are provided



with a bitumastic coating. All excavation around the tanks was backfilled with sand. Pumps for each tank are installed directly above the tanks, and fill pipes are located at grade. The fill pipes are color-coded to indicate the contents of the associated tank.

#### 3.4.2 Instrumentation

These tanks are not equipped with instrumentation. Inventory records are maintained by warehouse personnel to track current volumes. A monitoring well installed in the backfill is sampled quarterly for petroleum contamination.

#### 3.4.3 Operation

Gasoline and diesel fuel are supplied to these tanks by an off-site vendor. The fuel delivery person refills the storage tanks using valves and hoses which are part of the vendor tank truck equipment. The tanks are refilled usually every two to three weeks, depending on usage.

Fuel is pumped from the tanks through a metered dispensing pump with a standard hose and nozzle. Access to the pumps is limited. Keys to locks are controlled by warehouse personnel and the security force.

#### 3.4.4 Spill Containment

The gasoline and diesel fuel tanks are buried within silty till below alluvial fan surface material. The silty till is very impermeable (hydraulic conductivity on the order of  $1 \times 10^{-8}$  cm/sec) and is acceptable as a containment barrier for underground petroleum storage tanks, per criteria listed in 6 NYCRR 613, "Underground Petroleum Storage Facilities and Minimum Standards." The alluvial fan material, although more permeable than the till, is sufficiently "tight" to retard fuel migration long enough to allow its detection (via inventory and monitoring data) and effect its recovery.

### 3.5 Sulfuric Acid Tank 35157

#### 3.5.1 Construction

The concentrated sulfuric acid tank is a molded polyethylene tank with chlorinated polyvinyl chloride or stainless steel piping and fittings. The tank has a capacity of 11,000 liters. It is located on a concrete pad within the concrete spill basin immediately south of the LLWTF (02) building. The tank is held in place by cables anchored with eye bolts into the spill basin pad.

### 3.5.2 Instrumentation

The sulfuric acid tank is equipped with a calibrated level gauge strip adhered to the side of the tank. The tank walls are translucent and the level of the contents is readily observable.

### 3.5.3 Operation

The sulfuric acid storage tank is operated in accordance with SOP 02-2, "Ion Exchange Bed Operation," and SOP 14-1, "Receipt and Distribution of Bulk Liquid Chemicals."

### 3.5.4 Spill Containment

The concentrated sulfuric acid storage tank is located on a curbed concrete spill containment pad adjacent to the LLWTF building. The capacity of this spill basin is approximately one third that of the tank, but the basin is equipped with a drain to the LLWTF process sump, which overflows to Lagoon 2. This would prevent an off-site discharge.

## 3.6 STS Bulk Underground Fuel Oil Tank

### 3.6.1 Construction

The STS bulk fuel oil tank is a carbon steel, double walled underground tank with a bituminous coating. The tank is located to the northwest of the Supernatant Treatment System Ventilation Building. It has a capacity of 2,100 liters. The tank is used to store diesel fuel for emergency power.

### 3.6.2 Instrumentation

This tank is equipped with a leak detection conductivity probe in the annular space between the tank walls. The sensor indicators are located in the Permanent Ventilation System Building and an alarm annunciates in the STS control room if the sensor detects hydrocarbons. The monitoring system is checked annually by WVNS maintenance.

### 3.6.3 Operation

The diesel fuel is only needed in emergency conditions. The level is routinely checked by Operations personnel prior to use. The tank is supplied and refilled by an off-site vendor.

### 3.6.4 Spill Control

The tank is stamped with the manufacturer's confirmation that it conforms with "6 NYCRR Part 615", thus indicating that the tank, welds, seams, and connecting fittings have been factory tested

for tightness using standard engineering practices. It also requires that the tank is sufficiently protected against corrosion, and has some means of secondary containment (in this case the double-walled structure of the tank serves as secondary containment).

### 3.7 High Level Waste Tanks 8D-1 and 8D-2

#### 3.7.1 Construction

High level waste (HLW) tanks 8D-1 and 8D-2 are carbon steel and located in adjacent waterproofed, reinforced, underground concrete vaults (the tops of the vaults are 2.4 m underground) in the highly impermeable silty till characteristic of the area. Each tank has a capacity of 2.8 million liters and rests on a 30 cm layer of perlite blocks, which is on 7.6 cm layer of pea gravel in a carbon steel pan 23 m in diameter and 1.6 m in height, within the concrete vault. The pan rests on a second 7.6 cm layer of pea gravel on the vault floor. The vault pad is 69 cm thick, with a thicker ring under the columns that support the vault roof. The vault pad rests on a 10 cm leveling slab.

Under the concrete vault is a 1.2 m layer of pea gravel that is kept saturated with water to prevent effects of distortion of the silty till.

#### 3.7.2 Instrumentation

Tanks 8D-1 and 8D-2 are equipped with level, pressure, and temperature indicators. Pressure indicators are located in the tanks, and level indicators are in the pan.

#### 3.7.3 Operation

Operation of the HLW tanks system is governed by SOP 8-01. Various SOPs govern the operation of waste tank farm support systems. Tank 8D-2 contains approximately 2.3 million liters of neutralized HLW sludge and supernatant that resulted from the PUREX process that NFS used (the composition of the PUREX supernatant is provided in Table 3-2 and the composition of the PUREX sludge is provided in Table 3-3). Measured variables are monitored and recorded once per shift. Tank 8D-1 contains zeolite columns used in stripping radioactive cesium from the supernatant. All interconnecting pipes and support systems are double contained.

#### 3.7.4 Spill Containment

The HLW tanks are provided with secondary containment consisting of a carbon steel pan below each tank, a reinforced concrete vault surrounding each tank and pan, and highly permeable,

Table 3-2

## PUREX Supernatant Chemical Composition

<u>Compound</u>	<u>Total kg</u> <u>in supernatant</u>
NaN <sub>3</sub>	602,659
NaNO <sub>2</sub>	311,326
Na <sub>2</sub> SO <sub>4</sub>	76,261
NaHCO <sub>3</sub>	42,557
KNO <sub>3</sub>	36,274
Na <sub>2</sub> CO <sub>3</sub>	25,249
NaOH	17,537
K <sub>2</sub> CrO <sub>4</sub>	5,113
NaCl	4,684
Na <sub>3</sub> PO <sub>4</sub>	3,799
Na <sub>2</sub> MoO <sub>4</sub>	691
Na <sub>3</sub> SO <sub>3</sub>	597
CsNO <sub>3</sub>	534
NaF	503
Sn(NO <sub>3</sub> ) <sub>4</sub>	245
Na <sub>2</sub> U <sub>2</sub> O <sub>7</sub>	231
Si(NO <sub>3</sub> ) <sub>4</sub>	230
NaTcO <sub>4</sub>	177
RbNO <sub>3</sub>	119
Na <sub>2</sub> TeO <sub>4</sub>	82
AlF <sub>3</sub>	77
Fe(NO <sub>3</sub> ) <sub>3</sub>	43
Na <sub>2</sub> SeO <sub>4</sub>	15
LiNO <sub>3</sub>	14
H <sub>2</sub> CO <sub>3</sub>	9
Cu(NO <sub>3</sub> ) <sub>2</sub>	6
Sr(NO <sub>3</sub> ) <sub>2</sub>	4
Mg(NO <sub>3</sub> ) <sub>2</sub>	2
TOTAL	1,129,038
H <sub>2</sub> O (by difference)	1,727,164

NOTE: pH = 10

Table 3-3

PUREX HIGH-LEVEL SLUDGE SOLIDS CHEMICAL COMPOSITION

<u>Component</u>	<u>Reference (kg)</u>
Fe(OH) <sub>3</sub>	66,040
FePO <sub>4</sub>	6,351
Al(OH) <sub>3</sub>	5,852
AlF <sub>3</sub>	536
MnO <sub>2</sub>	4,581
CaCO <sub>3</sub>	3,208
UO <sub>2</sub> (OH) <sub>2</sub>	3,087
Ni(CH) <sub>2</sub>	1,088
<sup>2</sup>	1,263
Zr(OH) <sub>4</sub>	159(a)
MgCO <sub>3</sub>	826
Cu(OH) <sub>2</sub>	376
Zn(OH) <sub>2</sub>	128
Cr(OH) <sub>3</sub>	65
Hg(OH) <sub>2</sub>	23
<u>Fission Products</u>	
F.P. hydroxide	1,485
R.E. hydroxide	1,484
F.P. hydroxides	520
<u>Transuranics</u>	
NpO <sub>2</sub>	42
PuO <sub>2</sub>	37
AmO <sub>2</sub>	27
CmO <sub>2</sub>	0.3
Total	97,178

(a) Excludes fission product zirconium

saturated silty till surrounding the vaults. The pan under each tank contains a level indicator and high-level alarm that would detect leakage from groundwater, the storage tank, or the transfer piping. Each tank vault complex includes five 20 cm diameter standpipes positioned around the outside of the vault. These standpipes extend into a layer of gravel which is below the vault foundation, and can be used to monitor groundwater around the vaults. In addition, the gravel around the vaults is saturated with water so that any leakage through the vault would be into rather than out of the vault.

### 3.8 Tanks 8D-3 and 8D-4

#### 3.8.1 Construction

Tanks 8D-3 and 8D-4 are located in a single reinforced underground concrete vault with outside dimensions of 9.8 m by 5.8 m by 7.7 m high. The vault is surrounded by silty till and covered with an earth layer approximately 2.4 m thick. The vault is lined to a height of 46 cm with stainless steel, which forms a pan, which is equipped with a sump. The storage tank (8D-4) and its spare (8D-3) are similar in construction and instrumentation. The tanks are composed of 304 and 304L stainless steel and have a nominal capacity of 57,000 liters. They were designed for a working volume of 51,000 liters (90 percent of nominal capacity). Tank 8D-4 presently contains about 45,000 liters of acidic thorium-bearing waste called THOREX. The composition of the THOREX waste is provided in Table 3-4.

To maintain the solution temperature below 60 degrees C, each tank has two side-mounted cooling coils and one bottom cooling coil, with a total heat removal capacity of about 600,000 Btu/hr. The coils are 3.8 cm, seamless stainless steel. The temperature of the stored THOREX waste is controlled manually by adjusting the cooling water flow to the cooling coils. At present, partial flow through the bottom coil alone is adequate to maintain the temperature at 37.8 to 48.9 degrees C.

#### 3.8.2 Instrumentation

Each tank is equipped with pressure and level indicators and alarms, and the stainless steel pan in which both tanks are situated is equipped with an alarmed sump. The level in Tank 8D-3 can be read in the STS Control Room and the Waste Tank Farm (WTF) shelter.

#### 3.8.3 Operation

Tank 8D-3 is used as a holding tank for supernatant that has been processed through the zeolite system in the zeolite system in Tank 8D-1, prior to being transferred to Tank 35104. The



Table 3-4

THOREX Waste Chemical Composition

A. Solution

<u>Compound</u>	<u>Mass (kg)</u>	<u>Compound</u>	<u>Mass (kg)</u>
Th(NO <sub>3</sub> ) <sub>4</sub>	11,633	NaTcO <sub>4</sub>	12
Fe(NO <sub>3</sub> ) <sub>3</sub>	8,462	Sm(NO <sub>3</sub> ) <sub>3</sub>	14
Al(NO <sub>3</sub> ) <sub>3</sub>	4,175	Zr(NO <sub>3</sub> ) <sub>3</sub>	12
HNO <sub>3</sub>	2,129	Y(NO <sub>3</sub> ) <sub>4</sub>	11
Cr(NO <sub>3</sub> ) <sub>3</sub>	1,918	Rh(NO <sub>3</sub> ) <sub>4</sub>	11
Ni(NO <sub>3</sub> ) <sub>2</sub>	791	Zn(NO <sub>3</sub> ) <sub>2</sub>	10
H <sub>3</sub> BO <sub>3</sub>	480	Pd(NO <sub>3</sub> ) <sub>2</sub>	8
NaNO <sub>3</sub>	227	UO <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub>	6
Na <sub>2</sub> SO <sub>4</sub>	180	RbNO <sub>3</sub>	6
KNO <sub>3</sub>	128	NaTeO <sub>4</sub>	5
Na <sub>2</sub> SiO <sub>3</sub>	126	Co(NO <sub>3</sub> ) <sub>2</sub>	3
KMnO <sub>4</sub>	122	Na <sub>2</sub> SeO <sub>4</sub>	1
Mg(NO <sub>3</sub> ) <sub>2</sub>	57	NaF	1
Na <sub>2</sub> MoO <sub>4</sub>	54	Eu(NO <sub>3</sub> ) <sub>3</sub>	1
NaCl	50	Sn(NO <sub>3</sub> ) <sub>3</sub>	0.9
Nd(NO <sub>3</sub> ) <sub>3</sub>	46	Cu(NO <sub>3</sub> ) <sub>2</sub>	0.8
Ce(NO <sub>3</sub> ) <sub>4</sub>	43	Pu(NO <sub>3</sub> ) <sub>3</sub>	0.7
Ru(NO <sub>3</sub> ) <sub>4</sub>	42	Gd(NO <sub>3</sub> ) <sub>3</sub>	0.3
Ca(NO <sub>3</sub> ) <sub>2</sub>	30	X*(NO <sub>3</sub> ) <sub>4</sub>	0.3
CsNO <sub>3</sub>	28	Cd(NO <sub>3</sub> ) <sub>2</sub>	0.3
Ba(NO <sub>3</sub> ) <sub>2</sub>	27	Sb(NO <sub>3</sub> ) <sub>3</sub>	0.1
La(NO <sub>3</sub> ) <sub>3</sub>	22	AgNO <sub>3</sub>	0.1
Pr(NO <sub>3</sub> ) <sub>3</sub>	21	In(NO <sub>3</sub> ) <sub>3</sub>	0.04
Sr(NO <sub>3</sub> ) <sub>2</sub>	16	Pm(NO <sub>3</sub> ) <sub>2</sub>	0.02
Na <sub>3</sub> PO <sub>4</sub>	12		
		TOTAL	43,587
		H <sub>2</sub> O (by diff)	12,663

B. Solids

Th(NO <sub>3</sub> ) <sub>4</sub>	19,421
INSolubles	35

\* Np, Am, and Cm

transfers are performed by Operations personnel according to SOPs. Measured variables are monitored and recorded once each shift.

### 3.8.4 Spill Containment

If a spill or leak were to occur in either tank, the contents would enter the stainless steel pan, which is equipped with an alarmed sump. In addition, the concrete vault provides tertiary containment of the pan and tank. In addition, the vault is surrounded by highly impermeable saturated silty till, which would prevent leakage out of the vault.

## 3.9 Interceptors and Neutralization Pit

### 3.9.1 Construction

The north and south interceptors and the neutralization pit are each constructed of reinforced concrete lined with stainless steel. The neutralization pit has a capacity of 1,900 liters; the north and south interceptors each have a capacity of 87,000 liters.

In addition, the old interceptor is constructed of reinforced concrete. It has a capacity of 56,850 liters.

All these facilities are located to the east of the process building.

### 3.9.2 Instrumentation

The north and south interceptors are equipped with high-level alarms that signal in the UR.

### 3.9.3 Operation

The neutralization pit is used to measure the pH of low level waste from plant drains, sumps, etc., before transfer to one of the two new interceptors, where it is held for sampling. From the interceptors, the waste is transferred to Lagoon 2. From Lagoon 2 it is pumped to the Low Level Waste Treatment (LLWT) plant, where it is treated. SOP 15-1 and 15-13 contain the procedures for the operation of this system.

Waste streams which may be over the specified limit for release from the interceptor are diverted directly to the old interceptor. From there they are sampled and transferred, in batches, to one of the new interceptors.

The old interceptor effluent volume is normally checked once a shift (three times a day). Records of volume measurements are maintained by Main Plant Operations.

#### 3.9.4 Spill Containment

There is an overflow connection between the north and south interceptors. Should one become too full, it would overflow into the other. In addition, if one of the interceptors became full, the high-level alarm would sound in the UR.

### 3.10 Manipulator Repair Shop Waste Catch Tank 15D-6

#### 3.10.1 Construction

Tank 15D-6, the waste catch tank for the manipulator repair shop, is a 5,700-liter underground stainless steel tank. It measures 1.8 m in diameter by 2.4 m high. It is located directly to the east of the contact size reduction facility.

#### 3.10.2 Instrumentation

Tank 15D-6 is equipped with a level recorder and a high-level alarm. A stainless steel monitoring well is installed adjacent to the tank.

#### 3.10.3 Operation

Tank 15D-6 receives radioactive waste waters from the manipulator repair shop, contact size reduction facility, and head end ventilation system. Wastewater collected in this tank is sampled via an installed sampler. Transfer of wastewater to Tank 8D-2 is possible, if necessary.

Main Plant Operations is responsible for monitoring and operation of this tank. Operations are controlled by SOP 7-08.

#### 3.10.4 Spill Containment

This is an underground tank, but otherwise has no associated spill containment provisions.

### 3.11 Low-Level Waste Catch Tank 7D-13

#### 3.11.1 Construction

Tank 7D-13 is an underground tank located southwest of the process building. The tank is constructed of 304L stainless steel and has a 7,500-liter capacity. It measures 1.4 m in diameter by 4.1 m long.

### 3.11.2 Instrumentation

Tank 7D-13 is equipped with a level recorder and high-level alarm.

### 3.11.3 Operation

Tank 7D-13 receives low-level radioactive solutions from the Analytical and Process Chemistry Laboratories drains and drum flush solutions from the Cement Solidification System (CSS). Waste waters collected in this tank are routed to the LLWTF interceptors.

### 3.11.4 Spill Containment

Tank 7D-13 has no associated spill containment provisions. However, it is located within a confined area bounded on two sides by the process building, on the third by Building 01-14, and on the fourth by the off-gas trench. Thus, any leak would be contained in a relatively small area long enough to effect a cleanup.

## 3.12 Low-Level Waste Treatment Facility Outside Tanks

There are four LLWTF outside tanks, namely:

- 48070 - Flocculator/Clarifier
- 48091 - Clarified Water Filter
- 35105 - Clarified Water Surge Tank
- 33012 - Recycle Tank

These tanks range in size from 3,500 liters to 64,500 liters.

### 3.12.1 Construction

These tanks are constructed of stainless steel and are supported either on concrete pedestals or carbon steel legs. Each of these tanks is located within a curbed spill pad.

### 3.12.2 Instrumentation

Automated instrumentation controls plant flow rates to these tanks, appropriate influent and effluent pH adjustments, tank levels, and line pressure. Alarms are installed on these process tanks to indicate high or low levels. These alarms signal at the LLWTF.

### 3.12.3 Operation

The operation of the LLWTF is the responsibility of Main Plant Operations. These operations are conducted in accordance with SOPs 02-01 through 02-08 and 02-11.

The flocculator/clarifier receives LLW water from Lagoon 2 and potassium ferrate solution, caustic, and polyelectrolyte. These additives form a floc with particulates in the wastewater and the floc settles to the tank bottom where it is extracted for dewatering in the centrifuge. The clarified water is transferred to Tank 35105 and then to the clarified water filter (48091) for additional cleanup prior to ion exchange.

Off-specification treated wastewater and other waste solutions from the treatment process are routed to Tank 33012, the recycle tank, for reintroduction to the system.

### 3.12.4 Spill Containment

All four of these tanks are located on a curbed concrete pad. This pad has a sump which overflows to Lagoon 2; thus, if any tank were to spill or leak, the spilled material would be collected in Lagoon 2.

## 3.13 Waste Oil Collection Tank

### 3.13.1 Construction

The Waste Oil Collection tank is 660 liters in capacity and is constructed of carbon steel.

### 3.13.2 Instrumentation

This tank is not equipped with any level indication instrumentation.

### 3.13.3 Operation

Waste lubricating oils are temporarily stored in the IWSF, pending chemical (TCLP) and radiological release limit analyses. Following determination that they meet chemical and radiological regulatory limits, they are placed in the collection tank. Waste Management Operations arranges with a spent-oil recycling company to collect the contents of this tank on an as-needed basis.

### 3.13.4 Spill Containment

The waste oil accumulation tank is completely contained inside a steel box that is lined with Herculite<sup>®</sup>. The box is covered to preclude accumulation of rainfall.



### 3.14 Future Vittrification Facility Tanks

#### 3.14.1 Tanks to be Located Within the Vittrification Facility Pit

The Vittrification Facility (VF) pit measures 15.2 m x 11.6 m x 4.3 m deep. It is constructed of concrete, lined with stainless steel, and is equipped with a sump with level indicator and alarm. The sump level indicator is located on Instrument Rack 1C in the VF north aisle, 100 ft level. In addition, an audible high level alarm is located on the alarm panel on Instrument Rack 6 in the north aisle, 110 ft level. This alarm is also tied into the VF trouble alarm located on the alarm panel in the East Mechanical Operating Aisle of the process building.

Tanks to be located within the VF pit include:

- o Melter Feed Hold Tank (63V-11)
- o Concentrator Feed Makeup Tank (63V-01)
- o Submerged Bed Scrubber/Receiver (63V-031)

Tanks 63V-11 and 63V-01 will hold simulated HLW and various glass formers of the general composition identified in Table 3-5. Tank 63V-031 collects solution from the aqueous quenching/scrubbing of the melter off-gas. This is primarily a nitric acid solution with minor amounts of particulate.

If any of these tanks should overflow, the contents would be contained within the pit and the pit sump high-level alarm would activate. If the pit sump high-level alarm activated, the audible alarms on the north aisle 110 ft level in the VF and the VF trouble Alarm in the East Mechanical Operating Aisle of the process building would sound and cause Operations personnel to respond and investigate.

If the pit sump should become full, a portable pump and hose would be used to empty the sump into a tank or vessel that would be designated by the Vittrification operations supervisor.

#### 3.14.2 Tanks and Vessels in 01-14 Building Containment Cell

The 01-14 Building Containment Cell is constructed of concrete walls lined with stainless steel and has a capacity of 9,700 liters. The cell houses the following vessels:

- o Primary Surge Tank (64D-01),
- o Primary Storage Tank (64D-05),
- o Secondary Surge Tank (64D-03), and
- o Secondary Storage Tank (64D-09).



Table 3-5 TYPICAL MELTER FEED HYDROXIDE SLURRY

<u>Chemicals</u>	<u>% in Feed Mixture</u>
Aluminum Hydroxide	5.92
Sodium Tetraborate	20.82
Barium Hydroxide	0.06
Calcium Carbonate	0.18
Cerium Hydroxide	0.66
Chromium Oxide	0.13
Cesium Hydroxide	0.09
Ferric Hydroxide	12.24
Potassium Hydroxide	3.36
Lanthanum Oxide	0.03
Lithium Hydroxide	6.88
Magnesium Hydroxide	0.91
Manganese Dioxide	0.94
Sodium Hydroxide	5.30
Neodymium Oxide	0.13
Nickel Hydroxide	0.24
Sodium Phosphate	3.11
Sodium Sulphate	0.32
Silicon Dioxide	29.17
Strontium Hydroxide	0.02
Titanium Dioxide	0.60
Yttrium Oxide	0.02
Zirconium Nitrate	3.89
Sodium Molybdate	0.05
Copper Hydroxide	0.06
Zinc Oxide	0.02
Zeolite (IE-95)	4.84

These tanks are currently empty and are scheduled for removal. They are not scheduled for reuse. However, these tanks are hard-piped and potentially functional.

These tanks formerly contained the waste solutions from aqueous scrubbing of NOx-laden off-gas from the Vitrification System. The solution was primarily composed of dilute nitric acid and small amounts of hydrogen peroxide.

All four tanks are equipped with level and density indicators, which are located on the south wall of the second floor of the 01-14 Building. Level and temperature indicators can also be accessed from the Distributed Control System (DCS).

If a tank overfilled, the contents would back up into the vent line to either the primary or secondary scrubber column. The primary column has a capacity of 4,920 liters, and the secondary column has a capacity of 3,255 liters. A high level in any of the tanks would activate an audible and visual alarm on the DCS.

If the containment cell sump became full, the contents would be sampled. The sump is equipped with a steam eductor to jet the contents to the interceptors.

### 3.14.3 Diesel Fuel Storage Tanks Located in the 01-14 Building

Two 121-liter diesel fuel day tanks are located in the 01-14 Building on the 144 ft level. Both tanks are of carbon steel and measure 0.4 m in diameter by 0.9 m long, and are equipped with level indicators. One supplies fuel to the CSS blower. The other supplied fuel to the vitrification blower, but is now drained and isolated. It will function as originally designed when vitrification operations resume.

The CSS tank operation is controlled by CSS operating procedures. The blower system is tested quarterly for operability per Operational Safety Requirement OSR/TR-GP-5.

Filling of the vitrification tank is governed by the "Integrated Operation of component Test Stand and Off-Gas Equipment Run Plan." The level of the tank is recorded in the vitrification operations logbook and associated data sheets. During blower operations, the tank level is checked every four hours and recorded on the appropriate data sheet.

The tanks are designed so that if overfilling occurred, the fuel would recycle back to the diesel fuel supply tank.

#### 3.14.4 Generator Diesel Fuel Tank and Day Tank

A 28,200-liter fuel tank (FOD-11) will be located aboveground northwest of the Vitrification Building. It will supply diesel fuel to the 758-liter day tank (FOD-12) within the diesel generator room of the Vitrification Building. The diesel fuel will be used to operate the generator as a backup source of power to the Vitrification Building in the event of an electrical power outage. Tank FOD-11 will be constructed of carbon steel and situated on a concrete pad within a concrete berm capable of containing greater than 110 percent of the volume of the tank. The tank will be equipped with a high-level alarm to prevent overfilling.

Tank FOD-12 will be constructed of carbon steel and located within a spill basin in the generator room. The generator room contains a sump to collect liquids in the event of a spill. The tank and the sump are equipped with high-level alarms that signal in the Vitrification Building control room.

#### 3.14.5 Additional Vitrification System Tanks

Two tanks used during vitrification cold testing, the 1,628-liter Condensate Collection Tank, now designated Tank 61-D-08, and the 22,710-liter tank now designated Tank 61-D-07, will be used in the Vitrification Test Facility. The Vitrification Test Facility has a concrete floor with a three-inch high berm, and the floor is sloped toward the north wall, providing a temporary storage capacity of approximately 11,370 liters. The tanks are currently located in the Hardstand area, a temporary outdoor staging area for tanks, equipment, and other hardware.

#### 3.14.6 Scaled Vitrification System Tanks

The Scaled Vitrification System is currently in the design phase. The following tanks are planned for use in the Scaled Vitrification System:

- o Melter Feed Tank (in design) (61-D-01)
- o Test Slurry Hold Tank (existing) (61-D-02)
- o Acid Slurry Makeup Tank (in design) (61-D-03)
- o Dilute Acid Tank (existing) (V044T)
- o Anhydrous Ammonia Tank (outside Vitrification Test Facility - in design) (61-D-13)
- o Slurry Feed Hold Tank (in design) (61-D-04)
- o Slurry Feed Hold Tank (existing) (61-D-06)

The Scaled Vitrification System and all the above tanks except the Anhydrous Ammonia Tank will be contained in the Vitrification Test Facility.

### 3.14.7 Cold Chemical System Tanks

The Cold Chemical Building is a 37.6 ft x 36 ft building with a concrete foundation and concrete walls extending to an average height of two feet, above which the construction is steel frame and aluminum siding. The floor is coated with a chemical-resistant covering.

The following tanks are in the Cold Chemical Building:

- o Chemical Waste Hold Tank (65-D-01)
- o Slurry Hold Tank (65-D-02)
- o Slurry Hold Tank (65-D-03)
- o Slurry Hold Tank (65-D-04)
- o Nitric Acid Day Tank (65-D-05)
- o Caustic Day Tank (65-D-06)
- o Decontamination Tank (65-D-07)
- o Decontamination Tank (65-D-08)
- o Decontamination Tank (65-D-09)
- o Scrub Solution Tank (65-D-10)

The two-foot concrete walls provide a berm capacity of approximately 65,450 liters, exceeding the capacity of the largest single tank of 41,365 liters (additional tank capacities are provided in Table 3-1). In addition, the Nitric Acid Day Tank and the Caustic Day Tank are individually bermed. These berms have a capacity of 5,640 liters each. The floor is sloped so that any liquid would flow to a central catch drain, and then would flow to a sump that is equipped with an alarm. Liquids accumulated in the sump would be pumped to Tank 65-D-01.

### 3.15 Supernatant Treatment System Tanks

#### 3.15.1 Tanks and Vessels in Tank 8D-1

The following Supernatant Treatment System (STS) tanks and vessels are located in Tank 8D-1:

- o Ion exchange columns (50-C-001, 50-C-002, 50-C-003, and 50-C-004)
- o Prefilter (50-F-001)
- o Postfilter (50-F-002)
- o Supernatant Cooler (50-E-001)
- o Supernatant Feed Tank (50-D-001)
- o Sluice Lift Tank (50-D-004)

STS operations are closely controlled by a series of SOPs prepared specifically for STS operations (SOPs in the 50-xxx series), and STS systems are monitored by a programmable logic controller. The contents of these vessels are filter media and zeolite ion exchange media used to remove cesium from the PUREX

supernatant. The containment for these vessels is Tank 8D-1 and its previously described layers of containment. The cesium-loaded zeolite is stored underwater at the bottom of Tank 8D-1.

### 3.15.2 Tanks and Vessels in the Valve Aisle

Tanks 50-D-005 and 50-D-006, which are stainless steel, are located in the STS Valve Aisle. They function as backflow prevention vessels in the event of process upsets. In the event of a spill, any liquid would drain to the valve aisle sump, which in turn drains to Tank 8D-2.

### 3.15.3 Tanks and Vessels in the Operating Aisle

The Brine Chiller Expansion Tank (50-D-008) and the Brine/Heat Exchanger (50-E-002) are stainless steel tanks located in the STS Operating Aisle within a 2,250-liter capacity concrete berm. The berm is equipped with a sump that drains to the Operating Aisle sump, then to 8D-1.

## 3.16 Liquid Waste Treatment System (including Cement Solidification System)

The LWTS consists of two subsystems: a water treatment system utilizing filtration, ion exchange, and evaporation; and the Cement Solidification System (CSS). LWTS treatment is performed on decontaminated supernatant (constituents listed in Table 3-2, minus cesium) and will be performed on other radioactive wastewaters now being treated in the LLWTF or 02 Plant. The LWTS includes the tanks and vessels listed below.

### 3.16.1 Tank 35104

Tank 35104 is a 22,000-liter tank made of 304 L stainless steel in a vault attached to the General Crane Room (GCR) in the process building. It receives liquid waste which has been processed through the STS (constituents listed in Table 3-2, minus cesium). A spill or leak in the tank would be revealed by the tank level indicator and cell sump level indicator. Released materials would be contained within the GCR sump. Tank level is indicated on the STS control panel and recorded on the LWTS control panel. A tank high level would signal in the STS and LWTS control rooms. In addition, on high level, the STS waste inlet valve automatically closes, stopping the STS waste inflow. A tank low level would signal in the LWTS control room. A high level in the pump pit would activate an alarm in the LWTS control room.

Prior to transfer of decontaminated and diluted supernatant, STS operators check the indicated level of 35104 to assure that sufficient volume is available to transfer the desired batch.

Confirmation is required from the LWTS control room prior to initiating the transfer. On high tank level, the STS waste inlet valve closes automatically, stopping the waste inflow. The STS pump operates independently of this system.

### 3.16.2 Tanks Located Within the Liquid Waste Cell

The following tanks are located within the Liquid Waste Cell (LWC):

- o Sample Collection Tank (3D-2)
- o Rework Evaporator Feed Tank (7D-8)
- o PMC and GPC Sump Collector (4D-10)
- o Radioactive Waste Catch Tank (4D-13)
- o Low Level Waste Collection Tank (7D-2)
- o Radioactive Waste Catch Tank (4D-8)
- o Hot Analytical Drain Tank (7D-14)
- o Radioactive Waste Catch Tank (13D-7)
- o Cell Sump Receiver (13D-8)

All these tanks are equipped with level indicators. Any tank overflow would discharge into Tank 6D-3 in the Off-Gas Cell (OGC). If a release should occur from Tank 6D-3, it would be contained within the OGC, which is equipped with a sump. Any tank leak from the above tanks would be contained in the LWC sump. An eductor is used to transfer the sump contents to Tank 4D-10. The contents of Tank 4D-10 could then be transferred to tanks 7D-2 or 7D-8.

### 3.16.3 Tanks Located in the Vessel Off-Gas Cell

Condensate Catch Tank 6D-3 and Scrubber Tank 6C-3 are located in the Off-Gas Cell (OGC). Tank 6D-3 is constructed of stainless steel and has a capacity of 858 liters. It functions as a condensate collection tank. Tank 6C-3 is constructed of stainless steel and has a capacity of 1,577 liters. It was formerly used as a neutralizing scrubber tank for acid vapors. It currently is used as a recirculating tank for demineralizer water.

Any leak from these tanks would be collected in the OGC sump. This sump can be jetted to Tank 13D-8 in the LWC. The contents of Tank 13D-8 can be transferred to either Tank 7D-2 or Tank 7D-8, both of which are located in the LWC.

### 3.16.4 Sodium Silicate Bulk Storage and Day Tank

The Sodium Silicate Bulk Storage Tank (5,685 liters) and Day Tank (1,043 liters) are located in the CSS change room. They are constructed of carbon steel and contain sodium silicate, a cement enhancer utilized to maintain the cement recipe in a liquid



state. In case of a release, the bulk storage tank is surrounded by a spill containment barrier sufficient to hold its entire contents.

### 3.16.5 Tanks Located in the Uranium Process Cell (UPC)

- o Evaporator Concentrates Receiver (5D-15A1)
- o Evaporator Concentrates Receiver (5D-15A2)
- o Evaporator Feed Tank (5D-15B)

These tanks are constructed of stainless steel. Tank 5D-15A1 has a capacity of 38,150 liters; 5D-15A2 has a capacity of 18,990 liters, and 5D-15B has a capacity of 56,950 liters. The tanks are equipped with level indicators and recorders and low and high level alarms. The instrumentation is located on the LWTS control panel.

The UPC has floor drains which drain to the interceptors. The UPC is also equipped with a sump; however, the sump pump has not yet been installed. It is intended to pump to the interceptors. The sump will be equipped with a high level alarm on the LWTS control panel.

### 3.16.6 Tanks and Vessels Located Within Extraction Cell 3

- o Organic Ion Exchange (Low TDS) (71D-001)
- o Zeolite Ion Exchange (Low TDS) (71D-002)
- o Zeolite Ion Exchange (High TDS) (71D-003)
- o Distillate Surge (71D-005)
- o Spent Resin Receiver (71D-006)
- o Spent Zeolite Receiver (71D-007)
- o Filter Back Wash Receiver (71D-008)
- o Feed Sample Tank (71D-009)
- o Low TDS Filter (71V-010)
- o Low TDS Feed Tank (71V-011)
- o High TDS Evaporator (31017)

If a spill occurred from any of these tanks, the contents would be contained within Extraction Cell 3 (XC3). XC3 is equipped with a sump. When the sump is full, the contents are jetted to Tank 13D-8 in the LWC. In addition, the XC3 sump is equipped with a high-level alarm that signals in the LWTS control room. From Tank 13D-8, the contents can be transferred to either Tanks 7D-2 or 7D-8.

Tanks associated with the Low TDS System have never contained hazardous product. The system was assembled and post checkout and testing was conducted. However, the system has not been operated and is not scheduled for operation.

### 3.16.7 Tanks Located Within the Lower Extraction Aisle

- o Nitric Acid Day Tank (14D-7)
- o Caustic Day Tank (14D-18)

Each of these tanks is constructed of 304 L stainless steel and has a capacity of 375 liters. The tanks are equipped with level indicators and alarms. If a spill or leak occurred from one of the tanks, the released material initially would be contained within a concrete bermed area (one for each tank) in the Lower Extraction Aisle (LXA). If the spilled material overflowed the bermed area, it would flow to the floor of the LXA, which is drained to the interceptors.

The tanks rest on carbon steel supports, however, which could corrode over time if the tanks were to leak.

Neither of these tanks has ever been used, but they are scheduled for future use.

### 3.16.8 Waste Dispensing Vessel (70D-001)

Tank 70D-001 is located in the Waste Dispensing Cell (WDC). It is constructed of 304L stainless steel, and has a capacity of 1,900 liters. Any spill or leakage would flow to the cell sump. The sump is equipped with a high-level alarm, and its contents can be pumped to Tank 7D-13 (an LLW catch tank [see Section 3.11]) and from there to either Tank 5D-15B, in the UPC, or the interceptors.

### 3.16.9 Roof Top Evaporator (31008)

Evaporator 31008 is located outside on the roof of the process building, near the Process Chemical Room (PCR). It is constructed of SA240/304L stainless steel, and has a capacity of 510 liters. This unit is not in operation. It is part of the LWTS Low TDS system, which has never been operated except for checkout and testing.

### 3.16.10 Tank 5V-1

Tank 5V-1 is a 1,900-liter stainless steel vessel located in the uranium loadout (ULO) area of the process building. The vessel contains residual simulated supernatant from testing of the LWTS and STS. The tank does not have any intended future use. A spill of residual material would flow to the ULO floor and then towards the entrance/exit doorway, where it would be detected by a liquid detection instrument suspended above the doorway. This detection device signals in the control room. In the event of a release, the released material would flow out the door of the ULO, into a hallway of the process building, and out a rear

door of the process building. From there it would flow into a nearby catch basin and exit at an outfall north of the old interceptor. It would then flow southeast to a surface drainage swale north of the effluent mixing basin. The swale leads to a culvert. Secondary containment would be provided by diking this culvert, creating a temporary storage basin.

### 3.17 Tanks Located Within the Low-Level Waste Treatment Facility

#### 3.17.1 Acid Hold Tank (33013) and Two Potassium Ferrate Tanks

The Acid Hold Tank (33013) is constructed of stainless steel and contains 14 molar nitric acid for system line flush. The capacity of the tank is 910 liters. The tank is situated on the chemical tank platform in the southeast area of the second floor of the 02 building. The tank is equipped with a sight glass, sample tap, and drain line. All lines, valves, nuts and bolts, and the sight glass associated with this tank are stainless steel and gaskets are teflon in flanged connections. The valves to the sight glass are right angle valves. The valve retainer nuts and packing nuts are rusted slightly, indicating they are not stainless but a high grade steel. These valves have been in place for some time and no physical breaks or pits are evident in the nuts. The rust seems to be only surface rust. All wetted parts are welded stainless steel except for flange connections to the sight glass and the drain to decommissioned and nonfunctional Acid Mix Tank (33154), located within the bermed area outside the 02 Plant.

The tank is placed within a stainless steel pan which is 14 cm larger than the tank radius and 5 cm deep. The pan is equipped with a 5 cm stainless steel drain to the process sump. A 5 cm floor drain is located approximately 120 cm east of the tank and the floor slopes to the drain. This drain also flows to the sump.

The potassium ferrate mix tanks are located on the second floor of the LLWTF Building. They are molded polyethylene tanks with polyvinyl chloride or stainless steel fittings, and each tank has a capacity of 210 liters. Each tank is equipped with a calibrated level gauge built into the molded design of the tank. The tank walls are translucent and the level of the contents is readily observable. The tanks provide potassium ferrate to the clarifier/flocculator to expedite flocculation of solids within the LLWTF waste stream.

#### 3.17.2 Ion Exchange Columns 101 and 102

The ion exchange columns within the LLWTF Building are carbon steel polylined vessels of 3,520-liter capacity each. They contain the ion exchange resins used to remove the radioactive

components of the process waste stream. They are equipped with individual pressure gauges.

Any spills or leaks from these tanks would drain to and be contained in the building's sump. When the process is running, the sump contents are recirculated back into the process. When the process is not running, the sump overflows to Lagoon 2.

### 3.18 Trench Interceptor Project Pretreatment Tanks

Tanks associated with the Trench Interceptor Project (TIP) Groundwater Treatment System include:

- o Separation Tank (82-D-01)
- o Separation Tank (82-D-02)
- o Pretreatment Feed Tank (82-D-03)
- o Post Treatment Hold Tank (82-D-04)
- o Post Treatment Hold Tank (82-D-05)
- o Granulated Activated Charcoal (GAC) Filters (82-C-01)
- o Granulated Activated Charcoal Filter (82-C-02)

The TIP is an engineered system to recover and pretreat groundwater from the NDA. This system is designed to remove (through physical separation and GAC filtration) tributyl phosphate (TBP), n-dodecane (a kerosene-type petroleum product), and radioactive contaminants from groundwater, prior to treatment at the LLWTF.

Tanks 82-D-01 and 82-D-02 receive groundwater from a trench via a sump and function as physical separation tanks, separating the n-dodecane from the water. They have a capacity of 3,790 liters each and are constructed of carbon steel.

Tank 82-D-03 is a carbon steel 18,950-liter feed tank that holds liquids prior to GAC filtration.

Tanks 82-C-01 and 82-C-02 are carbon steel 2,653-liter GAC filters. Wastewater is processed through the filters and then passed to tanks 82-D-04 and 82-D-05, which hold the treated water for sampling prior to discharge to the LLWTF. Tanks 82-D-04 and 82-D-05 have a capacity of 3,790 liters each and are constructed of carbon steel.

Two separate berms exist to contain spills from these tanks. Each berm is 24 feet x 24 feet x 1.5 feet high, providing approximately 24,635 liters of spill containment capacity. Tanks 82-C-01, 82-C-02, 82-D-04, and 82-D-05 are contained within one of the berms, and tanks 82-D-01, 82-D-02, and 82-D-03 are in the other.

Tanks 82-D-01, 82-D-02, 82-D-03, 82-D-04, and 82-D-05 are all equipped with low level indicators, local and remote audio and visual alarms, and automatic shutoff switches.

Tanks 82-C-01 and 82-C-02 are equipped with local pressure gauges.

### 3.19 Miscellaneous Facilities

#### 3.19.1 Transfer Tanks

Two 757-liter cross-linked, high density polyethylene tanks and one 1,900-liter 304 stainless steel tank are in use at the VF for transfer of liquids on an as-needed basis. All pipe fittings used are stainless steel or VITON. These tanks are attached to a modified skid arrangement for stable transport by forklift.

These tanks are not equipped with any instrumentation. The polyethylene tanks are translucent and the level of the contents can be viewed from the outside.

#### 3.19.2 Portable Diesel Fuel Tank

This tank has a capacity of 1,136 liters and is constructed of carbon steel. It is 1.8 m long and 0.9 m in diameter. This tank is not equipped with any instrumentation, and spill containment is provided by a carbon steel pan constructed around the tank.

The tank is filled from the underground diesel fuel tank, located to the southeast of the new warehouse. It is then transferred by forklift to the area south of the UR. A hand pump is used to pump out the fuel. The fuel is used to refuel the air compressor and fire pump.

#### 3.19.3 Utility Room Diesel Day Tank (48066-A)

The UR diesel tank is 1.5 m long and 0.9 m in diameter. It is constructed of carbon steel and rests on concrete saddles. It has a capacity of 1,098 liters and contains No. 2 fuel oil. Any leak would flow to the UR floor and drain to the interceptors.

#### 3.19.4 Vessel Off-Gas Condensate Catch Tank (6D-3)

Tank 6D-3 is located in the Off-Gas Cell (OGC). It is constructed of stainless steel and has a capacity of 858 liters. If this tank were to leak, the contents would be collected in the OGC sump. This sump can be jetted to 13D-8 in the LWC. The contents of 13D-8 can be transferred to either tanks 7D-2 or 7D-8, also in the LWC.



### 3.19.5 Tanks Located Within the Waste Tank Farm Shelter

The following tanks are located within the Waste Tank Farm Shelter:

- o Con. Ed. Off-Gas Scrubber (8C-1)
- o Off-Gas Knock Out Pot (8D-6)
- o Off-Gas Relief Tank (8D-7)

These tanks are located in the waste tank farm shelter and collect mildly radioactive condensate and scrub solutions from the HLW tank farm off-gas system. The drain on 8D-6 is normally open and drains to HLW Tank 8D-2. If the drain were to be closed and there were an overflow, the material would go to Tank 8D-1. Tank 8C-1 overflows to Tank 8D-6.

### 3.19.6 Zinc Bromide Shield Windows

Shield windows in various cells in the process building consist of two thick layers of glass forming a tank that contains zinc bromide, which is a clear, dense, extremely corrosive liquid. The window tank includes an epoxy coated carbon steel frame. Gaskets are used to seal the frame.

The level of zinc bromide in the window is readily apparent. Any leaks would also be apparent along the frame. Any spill or leaked material would be contained in process aisles or inside the cell where the window is installed. Any zinc bromide entering floor drains would be collected in the cells or cell sumps. From the sumps it would be transferred to waste catch tanks.

A summary of the locations of these windows and the volumes of zinc bromide contained in them is provided in Table 3-1.

### 3.19.7 Fire Pump Day Tank

The fire pump day tank is a 1,040-liter carbon steel tank located inside the pump house south of the UR. The tank contains No. 2 fuel oil and is equipped with a level indicator. No berm or spill basin is provided for this tank. However, the tank is inspected on every shift, and if a leak occurred, it would be promptly discovered. Any release would flow from the pump house to the adjacent surface drainageway to the south, then east past the yard tanks into the surface drainage swale north of the effluent mixing basin. The swale leads to a culvert. Secondary containment would be provided by diking this culvert, creating a temporary storage basin.

The tank is filled from a vendor tank truck through a fill nozzle located on the north side of the pump house. The fire pump



(using fuel from the day tank) is operated periodically to ensure that it would function properly in the event of a fire. For extended firefighting operations, fuel oil from Tank 31D-2 would be used to supply fuel for the fire pump. Aboveground hoses would be utilized in this event.

### 3.19.8 STS Day Tank

The STS day tank is a 380-liter carbon steel tank located in the STS generator room, which is in the STS ventilation system building. The tank contains diesel fuel and is equipped with a level indicator. The tank is filled from the STS bulk fuel oil tank. A leak or spill from the day tank would be contained within the STS generator room.

### 3.19.9 Receiving Warehouse Storage Cabinets for Flammable Liquids

The Receiving Warehouse contains seven storage cabinets for flammable liquids. Paints, thinners, chemicals and acids are segregated and contained within individual cabinets. Not all cabinets contain flammables. Five-gallon pails are the single largest type of container in any individual cabinet. Each cabinet is 43 inches x 18 inches x 65 inches in dimensions, with a 2 inch deep sill at the bottom for spill containment. These cabinets will be moved to a storage area in the New Main Warehouse sometime in 1991.

### 3.19.10 New Main Warehouse

The New Main Warehouse contains five engineered segregated storage areas for corrosives, acids, oxidizers, flammables, and health hazards (poisons). Each storage area is equipped with a 6-inch deep basin below a steel grate floor to contain spills. Each area also has a separate ventilation system and fire suppression system and alarm. The flammable storage area also contains explosion-proof doors and blowout panels built into the walls. Materials stored in these areas will be in their original shipping containers, and no container larger than 55 gallons in capacity will be stored in the building.

### 3.19.11 Cargo Unit Trailer Body

The cargo unit trailer body is a 8' x 40' tractor trailer body functioning as a storage area for motor oils, hydraulic oils and greases. The body is constructed of steel and wood, with a panelled wooden floor. Fifty-five-gallon drums of motor oils and greases, as well as smaller pails of lube oil and hydraulic oils are stored here. There is little or no partial removal of product from these containers within the trailer. Entire

containers/and or drums are removed from the trailer and taken to the area of use prior to product removal.

### 3.20 Hazardous Waste Satellite Accumulation Areas

As part of the WVDP Hazardous Waste Management Program, SAAs have been established at the point of generation of identified hazardous wastes. SAAs are listed by location, material they contain, and type of container or containers in Table 3-6.

Spills or leaks from containers in the SAAs will be confined to the immediate area of the containers. Each of these SAAs is located within or adjacent to an active work area and so is subject to constant observation by workers in the area. Moreover, all of the SAAs incorporate secondary containment measures. Such measures include an enclosed cabinet, tray, or box, or building curbing and the building drainage control system.

### 3.21 Interim Waste Storage Facility (IWSF)

The Interim Waste Storage Facility (IWSF) functions as a temporary storage facility for wastes that require radiological and/or chemical analysis. The IWSF is a pre-engineered metal structure measuring approximately 34 feet x 34 feet. It is supported by a clear span frame and anchored to a bermed, concrete slab foundation. An 8 inch high concrete curb encloses the inner perimeter, providing approximately 21,630 liters of secondary containment capacity in the event of a spill or leak. Fifty-five-gallon drums, 5-gallon pails, and smaller containers of wastes are contained within the building temporarily, pending the results of analysis. There are three cabinets dedicated for the storage of flammable wastes, two dedicated corrosives (one for caustics, one for acids), and a refrigerator to preserve samples within the structure. A complete inventory and floor plan of wastes contained within the building is maintained and updated routinely by the Waste Management Operations Department.

### 3.22 Four Hazardous Waste Lockers

The Hazardous Waste Lockers are pre-engineered lockers containing segregated 55-gallon drums, 10- and 5-gallon pails of hazardous and nonhazardous wastes. Each locker is identical in size, with dimensions of 8 ft x 15 ft x 8 ft. Each contains a spill basin beneath a steel grate floor with a capacity of 474 liters or 10% of the volume of material stored in the locker. Two of the lockers are designed to contain flammable materials. They are equipped with fire suppression devices, remote and local fire alarm systems, explosion-proof electrical components, and explosion-proof vents. Acids, oils, solvents and other industrial (nonhazardous) and hazardous wastes are stored in appropriate lockers.

Table 3-6

Hazardous Waste Satellite Accumulation Areas

<u>LOCATION</u>	<u>MATERIAL</u>	<u>CONTAINER</u>
Blueprint	Area Ammo Developer Solution	20-gal drum 30-gal drum
Hot Lab	Pu extraction waste (xylene, toluene, toluene, mission product)	1-liter glass bottle
Hot Lab	Pu distillation waste (P-terphenyl, PPOP, HPEHP, toluene, Pn)	1-gal glass or high density poly bottle
Main Entrance	Oily wipes	55-gal drum
Dair Room	Developer solution	1-gal poly jugs
CTS Lab	Acidic waste from TCLP/EP Tox tests	10-liter poly bottle

### 3.23 Portable Holding Tanks

Twelve skid-mounted carbon steel temporary holding tanks are found at various locations throughout the site and are frequently relocated depending on site requirements. These tanks have a capacity of 3,790 liters each. They are used on an as-needed basis, typically to contain accumulated water during construction activities. The contents of the tanks are sampled prior to discharge. If secondary containment is required in a particular application, the tanks are placed in yellow carbon steel boxes.

### 3.24 Mineral Oil Windows

There are a number of leaded glass shield window tanks that contain mineral oil to enhance clarity. These include four in the CPC (three containing 110 gallons of mineral oil, one containing 75 gallons), seven in the Process Mechanical Cell, five in the General Construction Aisle, and four in the Analytical Cell. Mineral oil is not a hazardous material.

### 3.25 Waste Tank 8D-2 Caustic Transfer Staging Area

A 4,500- to 5,000-gallon vendor truck will be periodically staged north of the HLW tanks to provide caustic additions to Tank 8D-2 during sludge wash operations. These operations are scheduled to commence in October 1991. For routine transfer operations, the truck will enter a staging area that may include a 10 ft by 10 ft port-a-berm system. For non-routine operations in which the truck would reside in the staging area more than seven days, a 45 ft by 16 ft by 1.3 ft inflatable berm will be utilized, providing a spill containment capacity of approximately 7,000 gallons. Aboveground hard piping will be used to route the caustic to Tank 8D-2.

### 3.26 Ram Equipment Room

The Ram Equipment Room (REM) is located west of the FRS on the first floor of the main plant. It is used to store special nuclear materials, e.g., drums of waste plutonium nitrate solutions and PU wastes. Approximately thirty lined 55-gallon overpack drums containing 30-gallon drums of the above materials are contained in this room. The room is equipped with floor drains that would route any spilled material to the LLWTF interceptors.



#### 4.0 POTENTIAL OIL, HAZARDOUS SUBSTANCE, OR HAZARDOUS WASTE RELEASE SCENARIOS

##### 4.1 Sources

Potential sources of releases of oil, hazardous substances, or hazardous waste include all the storage facilities listed in Section 3.0. However, no realistic potential exists for releases to the environment from facilities inside buildings. Therefore, this section will only consider facilities not enclosed in buildings. Some of these outdoor facilities are provided with secondary containment mechanisms such as containment basins and berms. However, in the event of a release, all of the outdoor facilities would also be provided with containment by means of blockage of the spill migration pathway. The remainder of this section focuses on spill migration pathways (including available locations for blockage) in the event of a spill from one of the outdoor tanks.

Underground tanks at the WVDP are maintained in compliance with state and federal underground storage tank regulations, which require leak prevention and detection by various means such as regular monitoring, cathodic protection, double containment, etc. However, this section will consider surface migration pathways due to spills as the result of filling or discharging from these tanks.

In addition, the WVDP comprehensive groundwater monitoring program would also serve to identify any subsurface spill migration. The monitoring includes collection of samples at regular intervals from areas that would be likely to be impacted by site activities. The samples are analyzed for radioactivity as well as EPA drinking water standards and groundwater quality parameters.

##### 4.2 Migration Pathways

Releases in the majority of the plant area would flow east into surface depressions and eventually, if not blocked, to Erdman Brook or Franks Creek. These migration pathways and available blockage points, and the containment basin that would be formed in the event of blockage, are shown on Figure 4-1. A release in the northwest area of the site would flow northeast into a surface depression and eventually, if not blocked, into Quarry Creek. These migration pathways and available blockage point, and the containment basin that would be formed in the event of blockage, are also shown on Figure 4-1.

Figure 4-1 also shows paths of underground storm sewers (dashed lines). Storm sewer outlets generally lead to surface ditches, through culverts, and to topographical depressions leading to



Also Available On  
Aperture Card



Effluent Mixing Basin

WVDP-043  
Rev. 4

Demineralizer  
Ponds

Below Ground  
Fuel Tanks

Receiving  
Warehouse

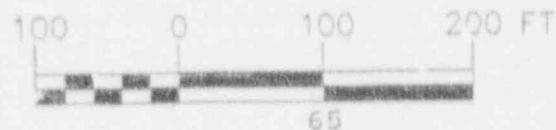
New Warehouse

## Figure 4-1

Storm Water System  
Local Spill Migration  
Pathways and Diversion  
Basins

### Legend

- : Diversion, flow suppression device
- : Containment basin created by flow suppression
- : Surface spill migration pathway



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creeks. The storm sewer system and continuing topographical drainageways represent a further containment system in the event of a release.

The containment basins which could be developed by culvert or ditch closure range from extremely large (e.g., 7.5 million gallons, by blocking a culvert southeast of the warehouse) to several hundred gallons (e.g., some minor ditches).

In addition, any surface spill would also seep into ground to some extent. However, soils in the plant area are of sufficiently low permeability (as discussed in Section 2.0) that the aboveground portion of the spill would be detected before seepage that would affect groundwater could occur, and thus the containment issue would primarily involve surface flow.

The nitric acid tank (14D-1, permanently out-of-service as a hazardous substance storage tank); caustic tanks (14D-2 and 14D-2A, the latter which is permanently out-of-service); and fuel oil tank (31D-2) are located in the yard southeast of the process building. These tanks are contained in bermed areas. A spill or a leak that overflowed the berm containments would flow over the road and drain into the Utility Room drainage ditch. This ditch leads to the southeast, crosses under the security road, runs into another drainage ditch and into Erdman Brook. Normal transport time for liquid to flow along this path is on the order of several minutes. Blocking this drainage path at the culvert under the security road would prevent off-site migration of spilled material.

The north and south interceptors and the neutralization pit are below grade concrete basins lined with stainless steel located across the road from and to the east of the caustic tanks. Spills from these described in the previous paragraphs. Overflow from these facilities would flow into Lagoon 2 or the same surface depression as described for the caustic tanks. Blocking this drainage path at the culvert under the security road would prevent off-site migration of spilled material.

The underground gasoline and diesel fuel tanks are located directly south of the process building and southwest of the warehouse. A substantial surface spill of material from these tanks would flow south several meters to a drainage ditch alongside a roadway, then flow in the ditch another 100 meters south to a culvert under the road. On the other side of the road it would flow south along a railroad bed another several hundred meters to a culvert under the rails and to a topographical depression that leads into Erdman Brook. However, the flow could be blocked at either of the culverts. Blocking the drainage path would allow cleanup before the spill material could migrate off-site. The transit time for material to flow from the area of the

fuel pumps to Erdman Brook is on the order of minutes to hours, depending on conditions.

Located adjacent to the gasoline pump area is the new warehouse building. This facility is used to store packaged chemicals. Small spills would be contained within the building and the cement floor affords easy cleanup. In the event of a fire in the warehouse, however, resultant runoff (water or other fire suppression materials mixed with chemicals) would flow into the drainage pathway described for the fuel tanks, and could be blocked at the same points, allowing cleanup before the materials could flow off-site.

Spills from the hazardous waste storage lockers in the northwest part of the plant area would flow east along a roadway and then northeast into a topographical depression leading toward Fra.ks Creek. However, the flow could be blocked in the topographical depression, creating a containment basin that would permit cleanup of the spilled material before it could flow off-site.

The sulfuric acid tank and tanks 48070 (flocculator-clarifier), 35105 (clarified water surge tank), 48091 (clarified water filter), and 33012 (recycle tank) are located on a concrete spill pad adjacent to the LLWTF. Spills from this unit would be contained within the concrete spill basin, which has a drain system to the LLWTF feed sump, which flows to Lagoon 2.

If a substantial spill were to occur within this basin, the spilled material might overflow the berm, whereupon it would flow east to the drainage ditch alongside the lagoon system. This ditch runs several hundred meters toward Erdman Brook. However, prior to the spilled material reaching the brook, the ditch could be blocked at a culvert under the security road, and a trench could be cut to divert the material to Lagoon 2, preventing it from flowing off-site.

## 5.0 SPILL PREVENTION PROGRAM

### 5.1 Training Program

Training at the WVDP is a formally organized and continuing program of employee indoctrination and instruction to ensure that personnel receive a level of training consistent with work assignments and responsibilities.

Several training programs are provided, namely:

- o For operating system supervisors and system operators (Main Plant, STS, CSS, Low-Level Waste Treatment System, and Vitrification Operations);
- o For decontamination supervisors and operators;
- o For fissile material handlers;
- o For radiation and safety technicians;
- o For maintenance and custodial personnel;
- o For the general employee; and
- o For other plant contractor and visitor personnel in areas where special restrictions are applied for safety reasons.

Emphasis is placed on formal qualification in radiation protection of workers who may be occupationally exposed to radiation. Additional training requirements for personnel involved in various operation are developed based on the specific operations.

All WVDP training programs meet the requirements of DOE Order 5480.1A, Chapter 5. Training programs are evaluated and upgraded based on management observations and appraisal of on-the-job performance of individuals and operating crews and teams. These evaluations include the use of written and oral examinations and the identification of deficiency areas that may require retraining/retesting.

The total qualification training programs for the various departments consist of:

- o Formal classroom training;
- o Plant orientation;
- o On-the-job training;
- o Proficiency testing;
- o Comprehensive oral and/or written examinations; and
- o Continuing training.



- o Continuing training.

## 5.2 General Training

All new employees are required to attend a general orientation program that consists of a combined safety and security orientation, and an introduction to the project scope, purpose, organizational responsibilities, and management.

Radiation Worker Training is required for individuals working routinely in radiologically controlled areas. This training identifies basic initial spill response measures, identified by the acronym SWIMS, which stands for: Stop the spill at its source, Warn others of the spill, Isolate the area, Minimize personal exposure to the radiological and chemical hazards of the spilled material, and Secure ventilation to the affected plant area.

## 5.3 Plant Operator Training

For staffing and training, all plant operations at WVDP are divided into organizational areas. These operational areas and the scope of training within each are revised as the scope of operations change.

To operate in one of these areas, an operator must be trained and certified. This certification requires completion of a comprehensive written examination (and attainment of a grade of at least 80 percent) on each relevant process or operation. In addition, plant systems operators and senior plant operators must complete a plant walk-through examination, including hands-on testing and demonstration and discussion of the operator's responsibilities.

## 5.4 Safety Training

The Training Department provides ongoing safety awareness training, worker right-to-know training, and selected safety equipment training. In addition, training programs are developed and conducted as new equipment is identified as requiring specific safety training. Only individuals who have received appropriate training and demonstrated the ability (by written test or otherwise) to operate equipment are allowed to do so.

## 5.5 Emergency Spill Response Training

Specific training is provided to the WVDP Fire Brigade on emergency response. This includes the use of videotaped training modules on spill response. General training for spill response is included in the Radiation Worker Training Program.

## 5.6 Hazardous Waste Management Training

Specific training programs are provided on procedures for the management of hazardous waste. Topics included are identification of hazardous wastes, proper labeling and marking of containers, safety concerns, recordkeeping, use of manifest documents, and overall management of the wastes. Specific training is also provided to the WVDP Fire Brigade for emergency response. This training includes modules addressing hazardous wastes concerns.

## 5.7 Retraining Program

All nonradiation workers receive annual refresher training on safety and security topics, emergency signal response, and Project organizational responsibilities.

All plant systems operators are required to participate in an annual regualification program consisting of required reading (procedures and Unusual Occurrence Reports), completion of a comprehensive written examination, walkthrough, and oral examination, as applicable.

## 5.8 Administration and Records

The Training Department maintains a course file in accordance with West Valley Procedure WV-730 for all approved training material and a central documentation file for employee/subcontractor records of implementation of training programs. The file is also used to schedule refresher or upgrading training for all WVDP personnel.

Before releasing training materials for use, the Training Department reviews all the material for content to assure that it satisfies established training objectives. The material is then reviewed for technical accuracy and approved by the cognizant operations managers.

## 5.9 Inspections and Recordkeeping

All outdoor aboveground tanks and their associated spill containments are in frequented areas where leaks would be obvious to the normal traffic of operators. In addition, Tanks 14D-1, 14D-2, 14D-2A and 31D-2 are checked each shift. Levels are recorded on a form entitled "Chemical Process Data Sheet." This sheet is signed and dated by the operator taking the readings and is reviewed and initialed by the shift supervisor. These chemical process data sheets (run sheets) are placed in the operations file by the shift supervisor.



In addition to shift readings, the diesel fuel oil storage tank (31D-2) level is recorded once a week on Operations tickle file card 10051P. If the boiler is operating on diesel fuel, a reading is required every four hours. The 10051P card is filed with the Plant Operations Support Document Control Clerk.

Operational Safety Requirement OSR/TR-GP-5 states that the quantity of diesel fuel in the oil storage tank (31D-2) shall be maintained at 30,300 liters or more during normal operations. If used during abnormal conditions, operations may continue as long as a volume of 15,000 liters or greater is maintained. A volume less than this will require the commencement of plant shutdown, which shall continue unless the primary fuel (natural gas) service is restored or the fuel oil supply is replenished.

As a result of leaks in underground transfer lines, operating procedure (SOP 7-08) has been changed to require pressure testing prior to use of transfer lines that have not been used within the preceding three months.

The gasoline and diesel fuel storage tanks and pumps are under the control of the Warehouse. The Warehouse maintains an inventory log sheet for each tank, showing tank starting volume and amounts withdrawn at each use. Refills are ordered when the tank inventory falls below 3,400 liters.

The gasoline storage tanks were installed in January 1985 in accordance with the requirements of 6 NYCRR 613 for Category C tanks. These tanks were tightness tested in February and March 1991. The testing revealed there was no loss of product.

Most on-site tanks and vessels are contained within buildings or other structures. Many of these vessels are equipped with level indicator instrumentation. The operation of all these vessels is covered in SOPs, run plans, etc. Monitoring and inspection of this equipment is part of the procedures.

Monitoring and inspection of the SAAs, hazardous waste storage lockers (HWSLs), and the IWSF are covered in SOPs addressing these specific matters. In addition, daily and weekly inventory logs and inspection logs are maintained for areas served by the SAAs. These logs allow for a continuous monitoring of the types and quantities of hazardous wastes generated and stored on-site and provide documentation of the physical integrity of containers in the SAAs.

Also, the site security force performs routine inspections of all areas of the site. These personnel are directed to report any unusual occurrences such as strange odors, leaking tanks or containers, etc., to the shift supervisors for follow-up investigation.

#### 5.10 Site Security

The entire 1,335-hectare WNYNSC is fenced, posted, and subject to routine patrols by the WVDP security force. In addition, the 64-hectare plant site is a controlled-access facility surrounded by an 8 ft high chainlink fence topped with three strands of barbed wire. The HLW, STS, PVS areas, where most of the tanks discussed in this plan are located, are well-lighted and are patrolled by officers on foot and in vehicles 24 hours a day.

The controls and valves for the various tanks (14D-1, 14D-2A, and 31D-2) are operated under authorization of the Shift Supervisor in accordance with SOPs or run plans.

The operations files, tickle cards, and warehouse inventory logs are all Project records that are archived in the Project's Master Record Center in accordance with DOE orders.

Control switches for the gasoline and diesel fuel pumps are located in the Warehouse and are locked except during fuel pumping. The keys are maintained by Warehouse personnel. The security force is authorized to dispense fuel on off-shifts.

## 6.0 CONTINGENCY PLAN

### 6.1 Spill Response Equipment

The warehouse maintains several types of spill recovery equipment as well as an inventory of general supplies useful in recovering spilled material. General supplies include rubber gloves, boots, and chemical-resistant disposable suits, as well as respiratory protection equipment, goggles, and other personnel protective equipment. Lumber, plastic, and Herculite are available to construct temporary berms. Specific spill response equipment includes clay sorbent material (speedy dry) and absorbent socks and pillows. Several sizes and types of overpack and salvage drums are also maintained in inventory.

In the event of a large spill or release to the environment, the on-site excavation contractor can be directed to deploy his earth moving equipment to cut off drainage ditches and culverts to contain spilled material.

The Project also has several different types of pumps and a variety of surplus tanks, including a 5,000-gal stainless steel tanker trailer, available for recovery of large quantity spills.

The Project also maintains an on-site emergency response vehicle stocked with sufficient personnel protective equipment and initial spill response materials to initiate a response to a large scale spill.

### 6.2 Spill Prevention and Emergency Preparedness

The WVNS Plant Operations Manager is responsible for all spill prevention. Reporting to the Plant Operations Manager are: the Main Plant Operations Manager, who is responsible for operation and maintenance of the storage tanks, and the Site Engineering Manager, who is responsible for the design and engineering of the storage and containment facilities described in this Plan. The Training and Communications Manager is responsible for developing and implementing oil spill prevention and control training programs. The Plant Operations Manager reports directly to the WVNS President (also identified below as the WVNS Emergency Director).

If a spill of oil or hazardous substance or waste is identified at the WVDP, the initial response will be to contain the material on-site, identify the source, and isolate or eliminate the source. Notification of the spill will be provided to the DOE-WVPO using the "Substance Release Report Form" (see Section 6.3).

If the source of a spill is from a vendor tank truck, the DOT label will identify the material. The various DOT labels are shown in Figure 6-1. Appendix A provides DOT safety guide

# PLACARDS AND APPLICABLE



GUIDE 11



GUIDE 46



GUIDE 46



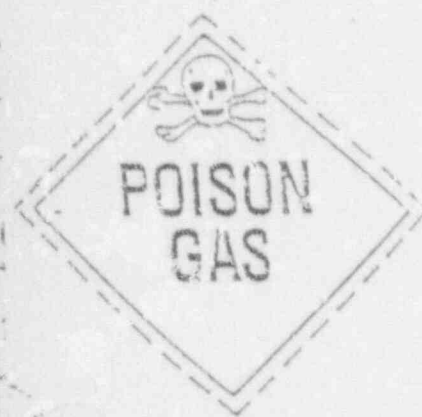
GUIDE 46



GUIDE 16



GUIDE 19



GUIDE 15



GUIDE 26



GUIDE 26



# EMERGENCY RESPONSE GUIDE

WVDP-043  
Rev. 4



GUIDE 38



GUIDE 41



GUIDE 47



GUIDE 52



GUIDE 55

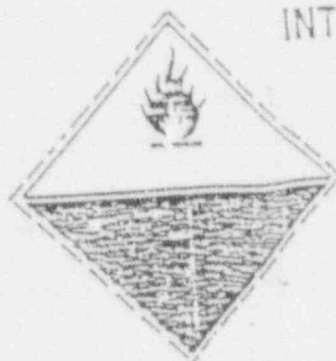


GUIDE 63

SI  
APERTURE  
CARD

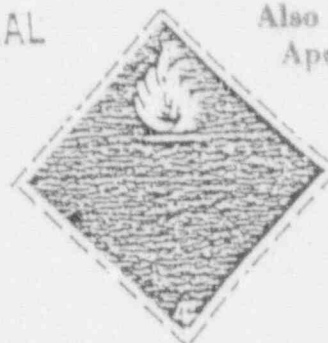


GUIDE 59



GUIDE 37

INTERNATIONAL  
SHIPPING  
ONLY



GUIDE 41

Also Available On  
Aperture Card

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numbers for such substances. A Chem-tox computer database is available on-site. This database provides more detailed information regarding hazardous substances. Multiple sources of information regarding chemical substances should be utilized in the event of a spill.

If the container or tank has a DOT hazardous material number (indicated by a "UN" or "NA" followed by four digits), the identity can be determined by the Chem-Tox data base available on the WVDP S&EA Local Area Network. This information can be accessed by calling either the S&EA manager or the Environmental Laboratory.

If containment around a given source were to fail, the spill can still be contained within the site boundaries by cutting off surface drainage from the area. This can be done by placing earthen dams across drainage ditches or utilizing alternative spill containment devices.

Eliminating the source of the spill may be performed by closing a valve on a transfer line or removing the material from the leaking tank. Material removed from a tank would be transferred into a suitably equipped spare tank or tank truck. The Project has several spare tanks and a 5,000-gallon stainless steel tanker trailer. This would also be the method for recovering spilled material retained in a spill pad or containment basin.

Responsibility for recovery from nonemergency spills (i.e., where there is no potential for off-site release or a threat to the safety of on-site personnel) resides with the WVNS Plant Service Manager. The manager will call upon the expertise of other WVNS management and staff as necessary to remediate the situation, and will also notify the WVNS Environmental Control Officer, who will determine if subsequent off-site notifications are required.

The Project Emergency Plan will be implemented if a spill of oil or hazardous material is of sufficient magnitude to threaten the safety of on-site personnel; or an off-site release of reportable quantities of hazardous materials (per 40 CFR 117); or harmful quantities of oil per (40 CFR 110). For the hazardous substances nitric acid, sulfuric acid, and sodium hydroxide, the reportable quantity (RQ) is 1,000 pounds. Other hazardous substances which are components of the slurry feed used by the VF are potassium hydroxide and nickel hydroxide, each with RQs of 1,000 pounds; and sodium phosphate, zirconium nitrate, sodium fluoride, and formic acid, each with RQs of 5,000 pounds. The petroleum product spill reporting procedures agreed to by the DEC and the West Valley Project Office as of February 21, 1990, include the following provisions:

1. Spills of petroleum products less than five gallons that occur on pavement or other impervious material and do not enter any surface drainage must be entered into a monthly log.
2. Spills of petroleum products of any size that are fully contained within an enclosed structure must be entered into the monthly log.
3. Spills of petroleum products of any size that impact any environmental medium (e.g., soil, groundwater, air) or enter a drainage system must be immediately reported using the DEC Hotline 1-800-457-736 (if calling from outside New York State, 1-518-457-7362). During normal business hours, spills can be reported to DEC Region 9 at 716-847-4590.

The monthly log must be submitted to DEC Region 9 by the 15th of the following month. The log must be available for inspection during normal business hours.

If a release is imminent, the WVNS Environmental Control Officer (ECO) will notify the DOE-WVPO. The DOE Project Office will notify the Warning Communications Center (WCC) at DOE-ID, and the EPA, if necessary. The ECO will also notify Westinghouse Electric Corporation Environmental Affairs.

The Project Emergency Plan (PEP) provides an organized plan of action that identifies authorities and responsibilities of emergency response personnel and organizations and identifies the manpower and equipment resources available to cope with emergencies at the WVDP. The PEP applies to emergency actions relative to radiological, hazardous, industrial, safeguards and security (theft of Special Nuclear Materials, threats or acts of violence, etc.), and natural phenomena emergencies at the WVDP. The primary purpose of the PEP is to minimize the impact of any emergency upon the health and safety of plant personnel and the general public. Appendix B provides a list of on-site individuals in possession of a controlled copy of WVDP-022, the PEP.

The WVNS President has the ultimate responsibility for all WVNS activities. The WVNS President interacts with the DOE Project Director and off-site resources as appropriate for the mitigation of emergency conditions. The President will designate qualified Emergency Directors and associated Emergency Operations Center personnel. This list will be periodically updated and will be maintained in the Emergency Procedures Manual contained in the PEP. The WVNS President will retain responsibility and authority for assessment and mitigation of emergency conditions at WVDP unless relieved by higher authority.

With regard to emergencies, the President or his alternate shall:

1. Maintain executive control of all emergency situations affecting WVDP operations;
2. Activate the WVDP Emergency Operations Center and WVDP emergency response personnel, as needed;
3. Direct emergency response actions utilizing personnel and resources to mitigate consequences of the emergency;
4. Authorize site-wide evacuation of personnel, if needed;
5. Activate WVNS personnel, as needed;
6. Maintain WVNS succession of authority;
7. Authorize obtaining assistance from off-site organizations such as hospitals, health departments, highway departments, law enforcement agencies, fire departments, ambulance services, etc., as needed;
8. Authorize mutual aid or other emergency assistance from off-site agencies or organizations, as needed; and
9. Recommend to the DOE-WVPO Director notification of off-site local, county, and state officials when WVDP-originated hazardous material releases to the environment may affect persons or property outside the site boundary. The WVPO will notify DOE-ID and DOE-HQ, and DOE-ID assistance will be requested, as needed. The DOE-WVPO will determine if the situation warrants notification of the EPA or National Response Center for spills of oil or hazardous materials.

Whenever a major WVDP emergency occurs, the Emergency Director shall activate Emergency Operations Center personnel or their designated alternates. This group provides administrative and technical assistance to the Emergency Director, as needed, and consists of the Emergency Operations Center staff Technical Support Center Staff, Operational Support Group, and On-Scene Commander Group. The composition and functions of these groups are described in the WVDP Emergency Plan and Procedures Manual.

On off-shifts, the responsibility for emergency direction for the WVDP rests with the Main Plant Operations Supervisor until relieved by higher authority. The Main Plant Operations Supervisor is the Emergency Director during emergency events where fire and health concerns are paramount, i.e., radiological, chemical, toxic releases, etc.; when natural emergencies, e.g., high winds,

blizzards, flooding, earthquakes, tornados, etc., present actual or imminent threats; or during security emergencies.

Regardless of the size or severity of a spill, once the situation has been stabilized, recovery measures will be implemented. Equipment will be repaired or replaced and contaminated areas will be cleaned up. Contaminated wastes generated during these operations will be disposed of in accordance with applicable state and federal regulations.

### 6.3 Notifications

In the event of a spill or other release of oil, hazardous substances, or hazardous wastes, the following notifications will be made:

- o The individual discovering the release will notify the Shift Supervisor in charge of the affected area. The Shift Supervisor of the affected area will notify the Main Plant Shift Supervisor (MPSO). The MPSO will notify the Environmental Control Officer (ECO) as soon as possible.
- o If the release constitutes an emergency as determined by the ECO, notification of the situation will be made via the 812 emergency all-page system.
- o For any spills resulting in a release to the environment, the DOE-PO will be notified as soon as possible by means of the Substance Release Report Form shown in Figure 6-2.
- o The Plant Operations Manager will initiate spill containment measures.
- o The Emergency Director will determine if the situation warrants activation of the Emergency Operations Center.
- o In a non-emergency, the ECO will notify the respective DOE-WVPO representatives and Westinghouse Environmental Affairs (412-642-3444).
- o The DOE-WVPO will notify the DOE-ID WCC (FTS-7-583-1515 [1-208-526-1515]).
- o The DOE-WVPO will notify EPA and appropriate New York State agencies if needed. The notifications will include but necessarily be limited to the following:
  - DOE Emergency Operations Center (EOC) (FTS-896-8100)
  - EPA National Response Center (NRC) (1-800-424-8802)



Figure 6-2



West Valley Nuclear Services  
Substance Release Report Form

Reported By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Department: \_\_\_\_\_ Supervisor: \_\_\_\_\_

The following has been reported to Environmental Compliance:

Substance Released (Be specific): \_\_\_\_\_

Date and time release occurred or was discovered: \_\_\_\_\_

Environmental Compliance person contacted: \_\_\_\_\_

Probable source of discharge: \_\_\_\_\_

Location of discharge: \_\_\_\_\_

Amount released (Be as accurate as possible): \_\_\_\_\_

Nearest location of water to discharge: \_\_\_\_\_

Responsible person/work group: \_\_\_\_\_

If subcontractor is responsible, complete the following:

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Agent/Contact: \_\_\_\_\_ Tel. # \_\_\_\_\_

If Equipment, I.D. number: \_\_\_\_\_

Actions taken and date responded to contain/clean-up release:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Possible health or fire hazards resulting from discharge?

☐ NO ☐ YES (explain) \_\_\_\_\_

Substance Regulated by: ☐ Navigation Law/6NYCRR 613.8 (Petroleum)

☐ SARA ☐ CERCLA ☐ RCRA

Reportable quantity: ☐ Petroleum All others: \_\_\_\_\_

Reported to DOE-PO:

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Reported to NYSED:

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Report Completed by: \_\_\_\_\_ Date: \_\_\_\_\_



- DOE-ID (WCC) (FTS-583-1515)
- Region II EPA Emergency Response Team (ERT)  
(1-201-548-8730)
- State Emergency Response Commission (SEMO) State  
Warning Point, Albany (1-518-457-2000)
- Local Emergency Planning Coordinator, Cattaraugus  
County (716-938-6631), and Erie County (716-846-  
8270)

#### 6.4 Storage and Handling

In addition to the oil and hazardous material or hazardous waste storage tanks or containers discussed in the previous sections, a large number of containers and large amount of these materials are stored in various locations at the project.

Storage in these cases will be according to the following guidelines and specifications:

Materials shall be stored in such a manner as to prevent the occurrence of an extremely hazardous situation (fire, explosion, release of toxic fumes, etc.) in the event of a spill or a leak. Storage of hazardous materials must be in a designated area which meets requirements specified by the Radiation and Environmental Safety manager. These requirements will be determined based on the magnitude and severity of the chemical hazards for the proposed facility. The following general requirements will also apply for separation of incompatible chemicals.

Flammables. Appendix A lists under Fire Hazards the degree of flammability of many of the chemicals stored at the WVDP. Highly flammable materials must be kept separated from explosives, powerful oxidizing agents, materials susceptible to spontaneous heating, or materials that react with moisture to evolve heat.

Oxidizing Agents. The following classes of chemicals are known for their ability to supply oxygen, or in other words are strong oxidizing agents: organic and inorganic peroxides, permanganates, perhenates, chlorates, perchlorates, persulfates, organic and inorganic nitrites, organic and inorganic nitrates, iodates, periodates, bromates, perselenates, perbromates, chromates, dichromates, ozone, and perborates. In addition to storing these materials separate from flammable/combustible materials, they should be kept separate from strong reducing agents.

Water Sensitive Materials. Some materials react with water, water solutions, or steam to evolve heat or flammable/explosive gases. Examples include lithium, sodium, potassium, calcium, rubidium, cesium, alloys and amalgams of

the above, hydrides, nitrides, sulfides, carbides, borides, silicides, and concentrated acids and alkalies. This should be taken into consideration in fighting fires involving these chemicals.

Acid Sensitive Materials. Fire and explosive hazards exist from materials which react with acids and acid fumes to evolve heat, hydrogen, and flammable or explosive gases. These include lithium, sodium, potassium, calcium, rubidium, cesium, alloys and amalgams of the above, hydrides, nitrides, sulfides, carbides, borides, silicides, tellurides, selenides, arsenides, phosphides, concentrated alkalies, cyanides, and metals.

Corrosives. Corrosive materials include acids, acid anhydrides, and alkalies. These have the ability to destroy their containers (if inappropriate containment vessels are used) and escape to the atmosphere. Some of these materials are volatile. Others may react violently with moisture. Corrosives should be isolated from sulfides, sulfites, cyanides, arsenides, tellurides, phosphides, borides, silicides, carbides, fluorides, and selenides. Reactions with these chemicals can produce toxic fumes.

In addition to storing incompatible chemicals separately, other general safety practices are to be followed. For example, adequate ventilation shall exist in all areas where chemicals are stored in appreciable quantities. Smoking shall be prohibited in areas where flammable and/or combustible materials are stored. In addition, storage areas should be equipped with adequate firefighting and spill response equipment. In all instances, storage of hazardous materials will be in accordance with procedure WV-993, Storage and Usage of Chemicals.

Appendix A lists many of the chemicals which are used by the WVDP. This listing shall be used in emergency situations to determine the degree of flammability of the material in question, health hazards, what to do in case of a spill or leak, extinguishing media to use in case of a fire, and general first aid in case of personnel exposure.

APPENDIX A

EMERGENCY GUIDES FOR SUBSTANCES USED AT THE WVDP

<u>Name of Material</u>	<u>Guide No.</u>	<u>Name of Material</u>	<u>Guide No.</u>
Acetic Acid:	60	Barium Chloride:	42
Acetone:	26	Barium Hydroxide:	42
Acetylene:	17	Barium Nitrate:	42
Alcohol:	26	Batteries:	60
Alkyl Polyether Alcohol:	26	Borax (Fused):	53
Aluminum Hydroxide:	60	Boric Acid:	59
Aluminum Nitrate:	35	Bromthymol Blue:	31
Aluminum Powder, Coated:	32	Buffer, 2.0 pH:	31
Aluminum Powder, Uncoated:	40	Buffer, 4.0 pH:	31
Aluminum Sulfate Solution:	60	Buffer, 10.0 pH:	31
Aluminum Sulfate Solid:	31	Buffer, 12.0 pH:	31
Amercoat Cleaner:	26	Cadmium, Shot:	57
Ammonia Solution w/>44% Ammonia:	15	Calcium Carbonate:	31
Ammonia Solution w/Between		Calcium Chloride:	53
12 & 44% Ammonia:	60	Calcium Fluoride:	53
Ammonium Acetate:	31	Calcium Hydroxide:	31
Ammonium Chloride:	31	Calcium Hypochlorite Dry, 10-39%	
Ammonium Hydroxide:	60	Available Chlorine:	35
Ammonium Meta-vanadate:	53	Calcium Nitrate:	35
Ammonium Molybdate 4-Hydrate:	53	Carbtrol (Model LI) (Activated	
Ammonium Oxalate:	54	Charcoal):	32
Ammonium Persulfate:	35	Caustic Beads:	60
Ammonium Sulfate:	35	Caustic Potash (KOH):	60
Antifreeze:	26	Caustic Soda Flakes:	60
Argon, Compressed:	12	Cerium Hydroxide:	60
Argon, Compressed Liquid:	21	Cesium Carbonate:	54
Ascarite II:	60	Cesium Chloride:	54
Barium:	40	Cesium Hydroxide:	60

Guide		Guide	
Name of Material	No.	Name of Material	No.
Cesium Nitrate:	35	Hydrazine, <64% by Weight:	59
Chlorine:	20	Hydrazine Sulfate:	28
Chloroform:	55	Hydrobromic Acid:	60
Chromium:	31	Hydrochloric Acid, Anhydrous:	15
Chromium, Powder:	31	Hydrochloric Acid, Solution:	60
Chromium Nitrate:	35	Hydrofluoric Acid, Anhydrous:	15
Chromium Oxide:	42	Hydrofluoric Acid, Solution:	59
Citric Acid:	31	Hydrogen Peroxide, 35%:	45
Cobalt Nitrate:	35	Hydroxylamine Hydrochloride:	53
Copper Hydroxide:	60	Insolhote ET:	28
Copper:	35	Iron Oxide:	37
Cupric Sulfate:	31	Iron Powder:	44
Cyclohexane:	26	Isopropyl Alcohol:	26
Dearborn Hardness Buffer:	31	Kodak Dektol Developer:	53
Diatomaceous Earth:	35	Kodak Indicator Stop Bath:	60
Diesel Fuel:	27	Lanthanum Nitrate, 6-Hydrate:	35
EDTA:	31	Lanthanum Oxide:	31
Ethyl Alcohol:	26	Lead:	42
Ferric Chloride:	31	Lead Oxide:	42
Ferric Hydroxide Slurry:	60	Lime (Hydrate):	31
Ferric Nitrate:	35	Lithium Carbonate:	55
Ferric Phosphate:	31	Lithium Nitrate:	35
Ferrous Ammonium Sulfate:	31	Ludox Colloidal Silica:	35
Ferrous Chloride:	60	Magnesium Carbonate:	31
Ferrous Sulfate:	31	Magnesium Chromate:	31
Formic Acid:	60	Magnesium Hydroxide:	31
Fuel Oil No. 2:	27	Magnesium Sulfate:	31
Gasoline:	27	Manganese Dioxide:	35
Glycerine:	26	Mercuric Iodide:	53
Hardness Buffer Code 521:	31	Mercurous Nitrate:	42
Heptane:	27	Mercury:	60
Hydrazine, Anhydrous:	28	Methanol:	28

Guide		Guide	
Name of Material	No.	Name of Material	No.
Methylene Blue:	54	Potassium Hydroxide, Solution:	60
Methyl Isobutyl Ketone:	26	Potassium Hydroxide, Dry:	60
Methyl Orange:	54	Potassium Iodate:	56
Methyl Red:	31	Potassium Iodide:	60
Morton Pellets (NaCl):	35	Potassium Nitrate:	35
Naphalene:	32	Potassium Permanganate:	35
Nickel Hydroxide:	31	Potassium Phosphate:	31
Nickelous Nitrate, 6-Hydrate:	35	Povdine - Iodine:	42
Nickel Powder:	42	Praseodymium Oxide:	31
Nitric Acid, Fuming:	44	Propane (LPG):	22
Nitric Acid, >40% Acid:	44	Pyridine:	26
Nitric Acid, <40% Acid:	60	RTV Protective Sealer 1890:	27
Nitrogen, Compressed:	12	Samarium Oxide:	40
Nitrogen, Liquid:	21	Silica Gel:	35
Oakite Clearcoat:	26	Silicon Dioxide:	35
Oil:	27	Silver Nitrate:	45
Oxalic Acid:	53	Silver Oxide:	35
Perchloric Acid, <50% Acid, by weight:	45	Soda Ash:	25
Perchloric Acid, >50%, but not more than 72% acid by weight:	47	Sodium Acetate:	35
1, 10 Phenanthroline:	31	Sodium Arsenate:	53
Phosphoric Acid:	60	Sodium Bicarbonate:	60
Phosphorus Pentoxide:	39	Sodium Bisulfite:	60
Polyelph 975:	60	Sodium Borate:	53
Potassium Bisulfate:	60	Sodium Carbonate, Anhydrous:	35
Potassium Borate:	31	Sodium Chloride:	35
Potassium Bromate:	35	Sodium Fluoride:	54
Potassium Carbonate, Anhydrous:	31	Sodium Hydroxide:	60
Potassium Chloride:	31	Sodium Meta-Bisulfite:	60
Potassium Chromate:	31	Sodium Nitrate:	35
Potassium Cyanide:	55	Sodium Nitrite:	35
		Sodium Phosphate:	31
		Sodium Sulfate:	35



Name of Material	Guide No.	Name of Material	Guide No.
Sodium Sulfide, Anhydrous:	34	Tannic Acid (Powder):	31
Sodium Sulfide, Hydrated:	60	Titanium Dioxide:	37
Sodium Sulfite:	31	Tributyl Phosphate:	60
Sodium Tetraborate:	53	Turco T-4368:	60
Sodium Thiosulfate:	42	Zinc Bromide:	31
Strontium:	40	Zinc Nitrate:	35
Strontium Carbonate:	31	Zinc Powder, Nonpyrophoric:	32
Strontium Hydroxide:	60	Zinc Powder, Pyrophoric:	37
Strontium Nitrate:	35	Zip Strip:	68
Sulfamic Acid:	60	Zirconium Dioxide:	37
Sulfuric Acid:	39	Zirconyl Nitrate:	35

## Guide 11

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
May ignite other combustible materials (wood, paper, oil, etc.).  
Container may explode in heat of fire.  
Reaction with fuels may be violent.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

May be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flames, smoking or flames in hazard area.  
Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Do not touch spilled material.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.

## Guide 12

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.  
Container may explode in heat of fire.

#### HEALTH HAZARDS

Vapors may cause dizziness or suffocation.  
Contact with liquid may cause frostbite.  
Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire.

#### SPILL OR LEAK

Stop leak if you can do it without risk.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.

## Guide 13

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poison; extremely hazardous.  
May be fatal if inhaled or absorbed through skin.  
Vapors non-irritating but deaden sense of smell.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials are extremely flammable.  
May be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Small Fires: Let burn unless leak can be stopped immediately.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.  
Cool container with water using unmanned device until well after fire is out.  
Isolate area until gas has dispersed.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Shut off ignition sources: no flares, smoking or flames in hazard area.  
Use water spray to reduce vapors.  
Isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.



## Guide 14

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Mixture with fuels may explode.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.

#### HEALTH HAZARDS

Contact with liquid may cause frostbite.  
Vapors may cause dizziness or suffocation.  
Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Stop leak if you can do it without risk.  
Isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Keep victim quiet and maintain normal body temperature.



## Guide 15

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled.  
Contact may cause burns to skin and eyes.  
Contact with liquid may cause frostbite.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.  
Container may explode in heat of fire.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and full protective clothing.  
Evacuate area and change by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Do not get water inside container.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Isolate area until gas has dispersed.

#### SPILL OR LEAK

Stop leak if you can do it without risk.  
Use water spray to reduce vapor but do not put water on leak or spill area.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike far ahead of spill for later disposal.  
Do not get water inside container.  
Isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 16

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

If inhaled, may be harmful.  
Vapor extremely irritating.  
Contact may cause burns to skin and eyes.  
Contact with liquid may cause frostbite.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but do not ignite readily.  
Container may explode in heat of fire.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Isolate area until gas has dispersed.

#### SPILL OR LEAK

Stop leak if you can do it without risk.  
Use water spray to reduce vapor but do not put water on leak or spill area.  
Isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.

## Guide 17 POTENTIAL HAZARDS

### FIRE OR EXPLOSION

Extremely flammable.  
May be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode violently in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.

### HEALTH HAZARDS

If inhaled, may be harmful; contact may cause burns to skin and eyes.  
Vapors may cause dizziness or suffocation.  
Contact with liquid may cause frostbite.  
Fire may produce irritating or poisonous gases.

### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

### FIRE

Let tank car, tank truck or storage tank burn unless leak can be stopped; with smaller tanks or cylinders, extinguish/isolate from other flammables.  
Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.  
Cool container with water using unmanned device until well after fire is out.

### SPILL OR LEAK

Shut off ignition sources; no flames, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Isolate area until gas has dispersed.

### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of frostbite, thaw frosted parts with water.  
Keep victim quiet and maintain normal body temperature.

## Guide 18

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Contact with liquid may cause frostbite.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Extremely flammable; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and full protective clothing.  
Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Let burn unless leak can be stopped immediately.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors; isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 19

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Extremely flammable; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.

#### HEALTH HAZARDS

If inhaled, may be harmful; contact may cause burns to skin and eyes.  
Vapor extremely irritating.  
Contact with liquid may cause frostbite.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Let tank car, tank truck or storage tank burn unless leak can be stopped; with smaller tanks or cylinders, extinguish/isolate from other flammables.  
Small Fires: Dry chemical or  $\text{CO}_2$ .  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors; isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.



## Guide 20

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled.  
Contact may cause burns to skin and eyes.  
Contact with liquid may cause frostbite.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Mixture with fuels may explode.  
Container may explode in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and full protective clothing.  
Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapor but do not put water on leak or spill area.  
Isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 21

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Cannot catch fire.  
Container may explode in heat of fire.

#### HEALTH HAZARDS

Vapors may cause dizziness or suffocation.  
Contact with liquid may cause frostbite.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Ventilate closed spaces before entering them.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300

#### FIRE

Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.

#### SPILL OR LEAK

Do not touch spilled material.  
Stop leak if you can do it without risk.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of frostbite, thaw frosted parts with water.  
Keep victim quiet and maintain normal body temperature.

## Guide 22

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Extremely flammable; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.

#### HEALTH HAZARDS

Vapors may cause dizziness or suffocation.  
Contact will cause severe frostbite.  
Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Let tank car, tank truck or storage tank burn unless leak can be stopped; with smaller tanks or cylinders, extinguish/isolate from other flammables.  
Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

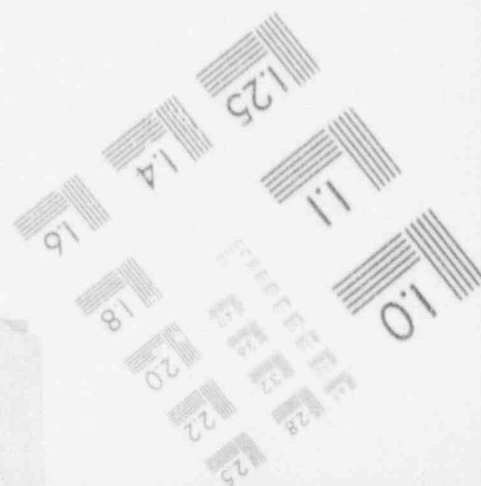
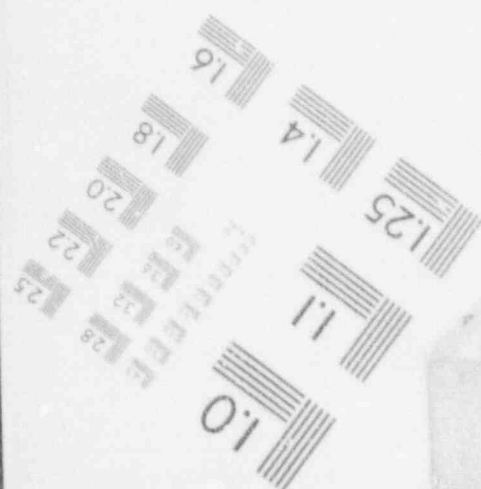
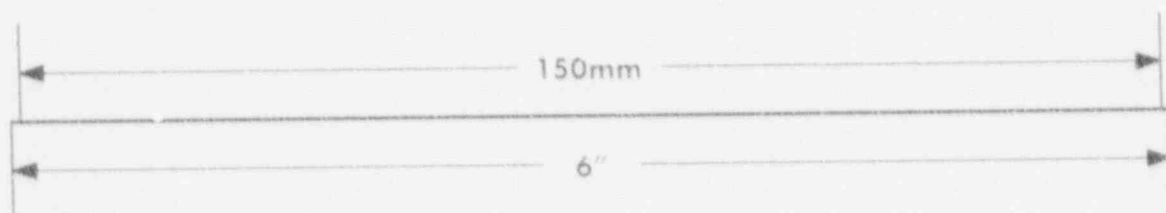
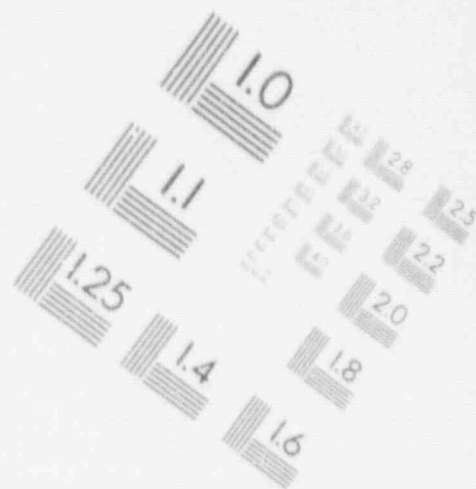
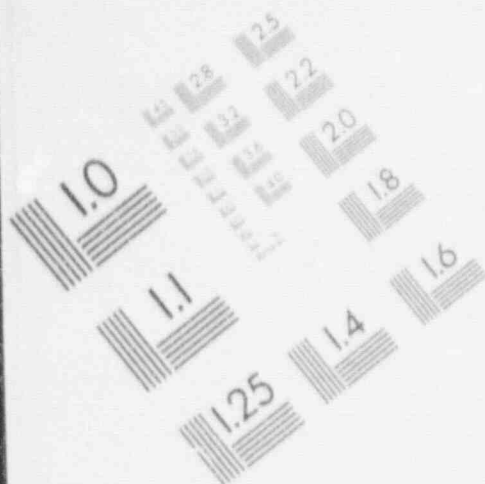
Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors; isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of frostbite, thaw frosted parts with water.  
Keep victim quiet and maintain normal body temperature.

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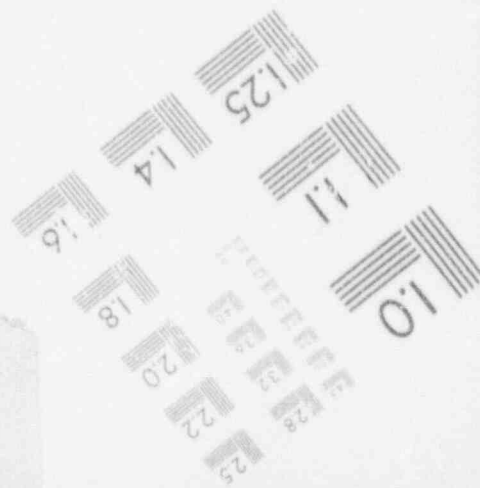
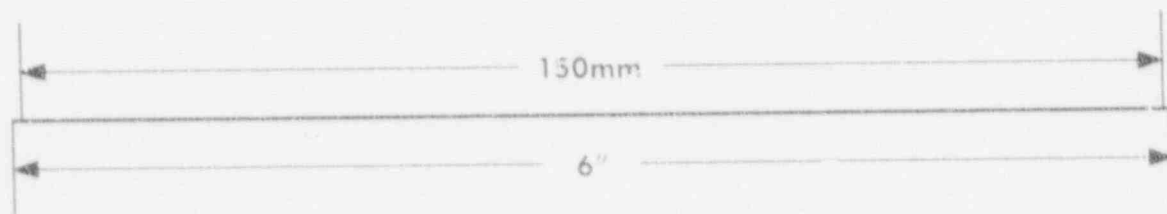
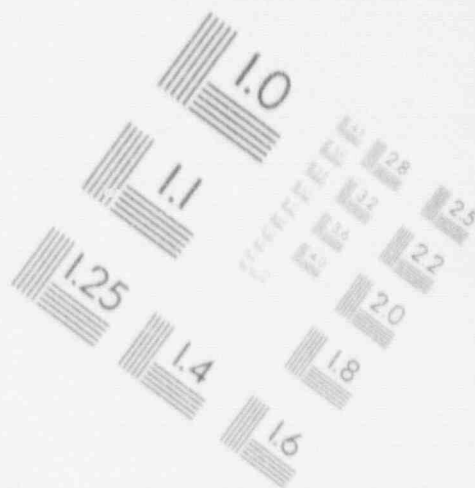
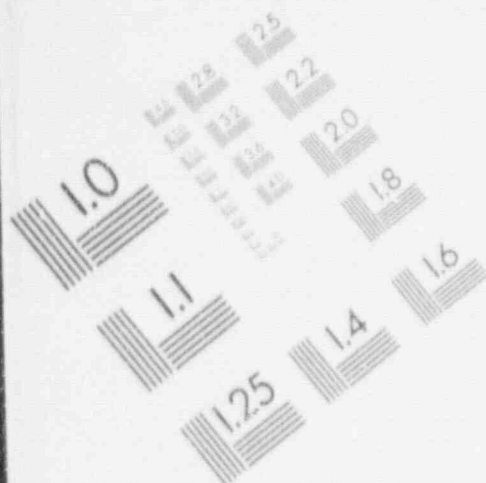
IMAGE EVALUATION  
TEST TARGET (MT-3)





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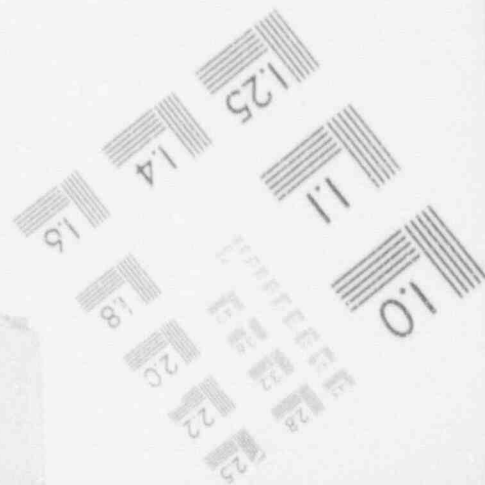
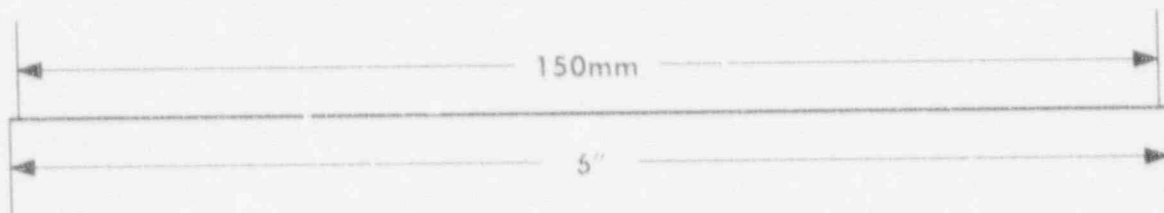
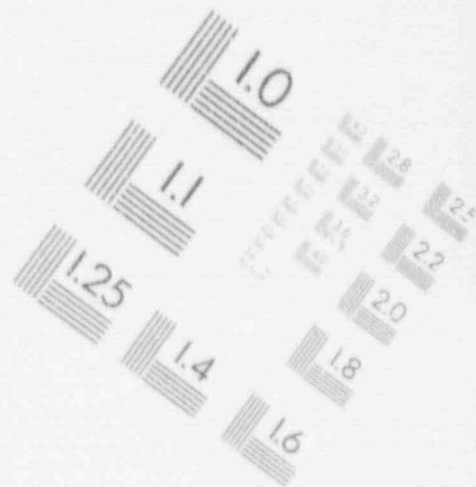
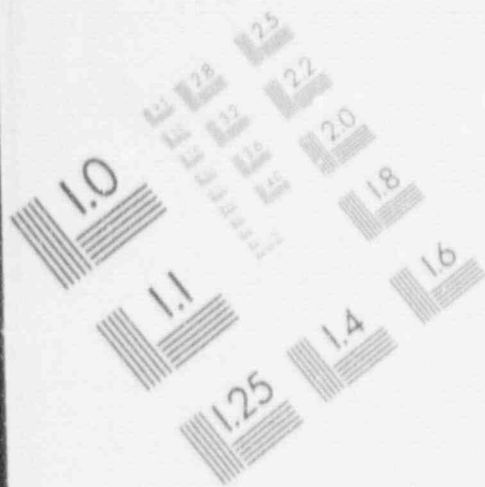
IMAGE EVALUATION  
TEST TARGET (MT-3)





1

IMAGE EVALUATION  
TEST TARGET (MT-3)



## Guide 23

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Mixture with fuels may explode.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.

#### HEALTH HAZARDS

Vapors may cause dizziness or suffocation.  
Contact will cause severe frostbite.  
Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Do not touch spilled material.  
Stop leak if you can do it without risk.  
Isolate area until gas has dispersed.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of frostbite, thaw frosted parts with water.  
Keep victim quiet and maintain normal body temperature.

**Guide 24****POTENTIAL HAZARDS****FIRE OR EXPLOSION**

May be ignited if carrier liquid is flammable.

**HEALTH HAZARDS**

Contact with material may cause infection and disease.  
Runoff from fire control or dilution water may cause pollution.

**EMERGENCY ACTION**

Keep unnecessary people away.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

**FIRE**

Small Fires: Dry chemical, soda ash or lime.  
Move container from fire area if you can do it without risk.

**SPILL OR LEAK**

Do not touch damaged containers or spilled material.  
Damage to outer container may not affect primary inner container.  
If inner container damaged or leaking, cover with damp towel or rag and keep wet with liquid bleach (Clorox®, etc.)  
Spills: Dike for later disposal.  
Cleanup only under supervision of an expert.

**FIRST AID**

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Remove and isolate contaminated clothing and shoes at the site.

## Guide 25

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled.  
Vapor extremely irritating.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Mixture with fuels may explode.  
Container may explode in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and special protective clothing.  
Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, soda ash or lime.  
Large Fires: Water spray, fog (flooding amounts).  
Do not get solid stream of water on liquid pool.  
Do not get water inside container.  
Move container from fire area if you can do it without risk.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

If you have not donned special protective clothing approved for this material, do not expose yourself to any risk of this material touching you.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors but do not put water on leak or spill area.  
Isolate area until gas has dispersed.  
A fine water spray applied to the edge of the spill or leak will start a hot flare fire which will burn the spilled material. (Use extreme caution.)

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 26

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

May be poisonous if inhaled or absorbed through skin.  
Vapors may cause dizziness or suffocation.  
Contact may irritate or burn skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fire: Dry chemical, CO<sub>2</sub>, water spray or alcohol foam.  
Large Fire: Water spray, fog or alcohol foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flames, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Remove and isolate contaminated clothing and shoes at the site.



## Guide 27

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

May be poisonous if inhaled or absorbed through skin.  
Vapors may cause dizziness or suffocation.  
Contact may irritate or burn skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flames, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Remove and isolate contaminated clothing and shoes at the site.

## Guide 28

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.  
Runoff to sewer may create fire or explosion hazard.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and special protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray and foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Dike fire control water for later disposal; do not scatter the material.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 29

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

If inhaled, may be harmful; contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Some of these materials may react violently with water.  
Small Fires: Dry chemical,  $\text{CO}_2$ , water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Do not get water inside container.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors; do not get water inside container.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.

## Guide 30

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Extremely flammable; may be ignited by heat, sparks, or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode violently in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.  
Runoff to sewer may create fire or explosion hazard.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and special protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Stay away from ends of tanks.  
Do not get water inside container.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors; do not get water inside container.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 31

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.

Fire may produce irritating or poisonous gases.

Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away.

Isolate hazard area and deny entry.

Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.

FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.

Large Fires: Water spray, fog or foam.

Move container from fire area if you can do it without risk.

Do not scatter spilled material with more water than needed for fire control.

Dike fire control water for later disposal.

#### SPILL OR LEAK

Stop leak if you can do it without risk.

Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.

Remove and isolate contaminated clothing and shoes at the site.



## Guide 32

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
May burn rapidly with flare-burning effect.

#### HEALTH HAZARDS

Fire may produce irritating or poisonous gases.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

**Small Fires:** Dry chemical, sand, water spray or foam.  
**Large Fires:** Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
**Magnesium Fires:** Use dry sand, Met-L-X powder or G-1 graphite powder; do not use water.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material.  
**Small Dry Spills:** With clean shovel, place material into clean, dry container and cover; move containers from spill area.  
**Large Spills:** Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call for emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.

**Guide 33****POTENTIAL HAZARDS****FIRE OR EXPLOSION**

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Dried out material may explode if exposed to heat, flame or shock.  
Runoff to sewer may create fire or explosion hazard.

**HEALTH HAZARDS**

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

**EMERGENCY ACTION**

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

**FIRE**

Tire Fires: Flood with water; if no water is available, use dry chemical or dirt.  
CAUTION: Tire fires may start again.  
Do not move cargo or vehicle if cargo has been exposed to heat.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**SPILL OR LEAK**

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Wet down with water and dike for later disposal.

**FIRST AID**

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.

## Guide 34

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
May burn rapidly with flare-burning effect.

#### HEALTH HAZARDS

Poisonous if swallowed.  
Skin contact poisonous.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material.  
Small Dry Spill: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spill: Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.

## Guide 35

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.)  
Reaction with fuels may be violent.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Vapors or dust may be irritating.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, or water spray.  
Large Fires: Water spray or fog.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material.  
Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.

## Guide 36

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Dried out material may explode if exposed to heat, flame or shock.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Tire Fires: Flood with water; if no water is available, use dry chemical or dirt. CAUTION: Tire fires may start again.  
Do not move cargo or vehicle if cargo has been exposed to heat.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.



## Guide 37A

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material.  
May ignite itself if exposed to air.  
May re-ignite after fire is extinguished.  
May burn rapidly with flare-burning effect.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

If inhaled, may be harmful.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Some of these materials may react violently with water.  
Small Fires: Dry chemical, soda ash or lime.  
Large Fires: Flood fire area with water from a distance.  
Do not get water inside container.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Do not get water inside container.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.

## Guide 38

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable material; will ignite itself if exposed to air.  
Will re-ignite itself after fire is extinguished.  
Burns rapidly, releasing dense white fumes.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Poisonous if swallowed or if fumes are inhaled.  
Fire will produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9303.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Cover with sand, earth or water spray and keep it wet.  
Large Fires: Water spray, or fog.  
Do not scatter spilled material with more water than needed for fire control.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Cover with water, sand or earth; shovel into metal container and keep material under water.  
Large Spills: Dike for later disposal and cover with wet sand or water.  
Cleanup only under supervision of an expert.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, keep exposed skin areas immersed in water or covered with wet bandages until medical attention is received.  
Remove and isolate contaminated clothing and shoes at the site and place in metal container filled with water - Fire hazard if allowed to dry.

**Guide 39****POTENTIAL HAZARDS****HEALTH HAZARDS**

Poisonous if inhaled or swallowed.  
Contact causes severe burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

**FIRE OR EXPLOSION**

Some of these materials may burn but none of them ignite readily.  
May ignite other combustible materials (wood, paper, oil, etc.).  
Violent reaction with water.  
Flammable poisonous gases may accumulate in tanks and hopper cars.  
Runoff to sewer may create fire or explosion hazard.

**EMERGENCY ACTION**

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

**FIRE**

Do not get water inside container.  
Small Fires: Dry chemical or CO<sub>2</sub>.  
Large Fires: Flood fire area with water from a distance.  
Do not get solid stream of water on spilled material.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.

**SPILL OR LEAK**

Do not get water inside container; stop leak if you can do it without risk.  
Do not touch spilled material.  
Use water spray to reduce vapors but do not put water on leak or spill area.  
Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Spills: Dike spill for later disposal; do not apply water unless directed to do so.  
Clean up only under supervision of an expert.

**FIRST AID**

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
Speed in removing material from skin is of extreme importance.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.

## Guide 40

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite itself if exposed to air.  
May re-ignite after fire is extinguished.  
May ignite in presence of moisture.  
Violent reaction with water produces flammable gas.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

If inhaled, may be harmful.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Do not use water or foam.  
Small Fires: Dry chemical, soda ash or lime.  
Large Fires: Withdraw from area and let fire burn.  
Magnesium Fires: Use dry sand, Met-L-X powder or G-1 graphite powder; do not use water.  
Move container from fire area if you can do it without risk.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
No water on spilled material; do not get water inside container.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike spill for later disposal.  
Cover powder spill with plastic sheet or tarp to minimize spreading.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
Wipe material from skin immediately; then flush skin or eyes with running water for at least 15 minutes.

## Guide 41

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite in presence of moisture.  
Contact with water produces flammable gas.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact with water produces poisonous gas.  
Skin contact poisonous.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Do not use water or foam.  
Small Fires: Dry chemical, soda ash or lime.  
Large Fires: Withdraw from area and let fire burn.  
Move container from fire area if you can do it without risk.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material.  
No water on spilled material; do not get water inside container.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spills: Dike spill for later disposal.  
Cover powder spill with plastic sheet or tarp to minimize spreading.  
Cleanup only under supervision of an expert.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin and eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.



## Guide 42

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous if swallowed.  
Inhalation of dust poisonous.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
May burn rapidly.  
Reaction with fuels may be violent.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical or CO<sub>2</sub>, water spray.  
Large Fires: Water spray or fog.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

#### SPILL OR LEAK

Do not touch spilled material.  
Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.

## POTENTIAL HAZARDS

### Guide 43

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Mixture with fuels may explode.  
Container may explode in heat of fire.  
May explode from friction, heat or contamination.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Do not move cargo or vehicle if cargo has been exposed to heat.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.

## Guide 44

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Violent reaction with water.  
Reaction with fuels may be violent.  
Flammable/poisonous gases may accumulate in tanks and hopper cars.  
Runoff to sewer may create fire or explosion hazard.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Water, dry chemical, or soda ash.  
Large Fires: Flood fire area with water.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors; do not get water inside container.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 45

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Reaction with fuels may be violent.  
Flammable poisonous gases may accumulate in tanks and hopper cars.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

If inhaled, may be harmful.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Water only; no dry chemical or  $\text{CO}_2$ .  
Large Fires: Flood fire area with water.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors; do not get water inside container.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.



## Guide 46

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May explode if fire reaches cargo area.

#### HEALTH HAZARDS

Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Stop all traffic and clear area for 2500 feet (1/2 mile) in all directions.

Keep unnecessary people away.

Do not fight fire in cargo. Try to prevent a fire from reaching the explosive cargo compartment.

Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.

FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

##### Truck and Equipment

Fires: Flood with water, if no water available use dry chemical or dirt.  
CAUTION: Tire fires may start again.

Unhook and separate tractor from trailer if possible.

Cargo Fires: Do not move cargo or vehicle if cargo has been exposed to heat.

Do not fight fire when it reaches cargo.

Withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.

Do not touch spilled material.

#### FIRST AID

Call emergency medical care.

Use first aid treatment according to the nature of the injury.





### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Mixture with fuels may explode.  
Flammable poisonous gases may accumulate in tanks and hopper cars.  
Container may explode in heat of fire.  
May explode from friction, heat or contamination.  
Runoff to sewer may create fire or explosion hazard.

### HEALTH HAZARDS

If inhaled, may be harmful.  
Contact causes severe burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

### FIRE

**Small Fires:** Water only; no dry chemical or  $\text{CO}_2$ .  
**Large Fires:** Flood fire area with water.  
Do not move cargo or vehicle if cargo has been exposed to heat.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
**Small Spills:** Flush area with flooding amounts of water.  
**Large Spills:** Dike spill for later disposal.

### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.

## Guide 48

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May be ignited by heat, sparks or flames.  
Container may explode in heat of fire.  
May explode from heat or contamination.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Flood fire area with water.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Small Spills: Take up with inert, damp noncombustible material; move containers from spill area.  
Large Spills: Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Keep victim quiet and maintain normal body temperature.

## Guide 49

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May be ignited by heat, sparks or flames.  
May burn rapidly with flare-burning effect.  
Container may explode in heat of fire.  
May explode from friction, heat or contamination.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Flood fire area with water.  
Do not move cargo or vehicle if cargo has been exposed to heat.  
If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out.  
If this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Small Spills: Take up with inert, damp noncombustible material; move containers from spill area.  
Large Spills: Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Keep victim quiet and maintain normal body temperature.

## Guide 50

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May explode if fire reaches cargo area.

#### HEALTH HAZARDS

Fire may produce irritating or poisonous gases.

#### EMERGENCY ACTION

Stop all traffic and clear area for 1500 feet (1/3 mile) in all directions.

Keep unnecessary people away.

Do not fight fire in cargo. Try to prevent a fire from reaching the explosive cargo compartment.

Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.

FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

##### Truck and Equipment

Fire: Flood with water. If no water is available, use dry chemical or dirt. CAUTION: Tire fires may start again.

Unhook and separate tractor from trailer if possible.

Cargo Fire: Do not move cargo or vehicle if cargo has been exposed to heat.

Do not fight fire when it reaches cargo.

Withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.

Do not touch spilled material.

#### FIRST AID

Call emergency medical care.

Use first aid treatment according to the nature of the injury.

## Guide 51

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May be ignited by heat, sparks or flames.  
Container may explode in heat of fire.  
May explode from heat or contamination.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Vapor extremely irritating.  
Contact of material or its vapor with eyes may cause blindness.  
Poisonous if swallowed.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Flood fire area with water.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.  
If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out.  
If this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material.  
Shut off ignition sources; no flares, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Small Spills: Take up with inert, damp noncombustible material, move containers from spill area.  
Large Spills: Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.



## Guide 52

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite itself if exposed to air.  
May be ignited by heat, sparks or flames.  
May burn rapidly with flare-burning effect.  
May explode from heat, contamination or loss of temperature control.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### LOSS OF COOLING

Specified control temperature of material must be maintained. Obtain liquid nitrogen, dry ice or ice for cooling. If none can be obtained, evacuate area.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Flood fire area with water.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.  
If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out.  
If this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Shut off ignition sources; no flares, smoking or flames in hazard area.  
Small Spills: Take up with sand, or other noncombustible material; move containers from spill area.  
Large Spills: Dike spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Keep victim quiet and maintain normal body temperature.

**Guide 53****POTENTIAL HAZARDS****HEALTH HAZARDS**

Poisonous if swallowed.  
 Inhalation of dust particles.  
 Fire may produce irritating or poisonous gases.  
 Runoff from fire control or dilution water may cause pollution.

**FIRE OR EXPLOSION**

Some of these materials may burn but none of them ignite readily.

**EMERGENCY ACTION**

Keep unnecessary people away; isolate hazard area and deny entry.  
 Stay upwind; keep out of low areas.  
 Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
 FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
 If water pollution occurs, notify appropriate authorities.

**FIRE**

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
 Large Fires: Water spray, fog or foam.  
 Move container from fire area if you can do it without risk.

**SPILL OR LEAK**

Do not touch spilled material; stop leak if you can do it without risk.  
 Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
 Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
 Large Spills: Dike far ahead of spill for later disposal.

**FIRST AID**

Move victim to fresh air; call emergency medical care.  
 Remove and isolate contaminated clothing and shoes at the site.  
 In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.

## Guide 54

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous if swallowed.  
If inhaled, may be harmful.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Small Spills: Take up with sand, or other noncombustible absorbent material and place into containers for later disposal.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.

## Guide 55

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control water may give off poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.  
Cylinder may explode in heat of fire.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
Remove and isolate contaminated clothing at the site.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Fight fire from maximum distance.  
Dike fire control water for later disposal; do not scatter the material.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Speed in removing material from skin is of extreme importance.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 56

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.  
May explode from friction, heat or contamination.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Speed in removing material from skin is of extreme importance.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.



## Guide 57

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous; may be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

May be ignited by heat, sparks or flames.  
Container may explode in heat of fire.  
Vapor explosion and poison hazard indoors, outdoors or in sewers.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Fight fire from maximum distance.  
Dike fire control water for later disposal; do not scatter the material.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
Large Spills: Dike for an area of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Speed in removing material from skin is of extreme importance.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed, keep victim under observation.

## Guide 58

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Inhalation of vapor or dust is extremely irritating.  
May cause burning of eyes and flow of tears.  
May cause coughing, difficult breathing and nausea.  
Brief exposure effects last only a few minutes.  
Exposure in an enclosed area may be very harmful.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Small Spills: Take up with sand or other noncombustible absorbent material  
and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running  
water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Effects should disappear after individual has been exposed to fresh air for ap-  
proximately 10 minutes.

## Guide 59

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Poisonous if inhaled or swallowed.  
Skin contact poisonous.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.  
Some of these materials may ignite combustibles (wood, paper, oil, etc.).

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Some of these materials may react violently with water.  
Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other non-combustible absorbent material and place into containers for later disposal.  
Large Spills: Dike spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

**Guide 60****POTENTIAL HAZARDS****HEALTH HAZARDS**

Contact causes burns to skin and eyes.

If inhaled, may be harmful.

Fire may produce irritating or poisonous gases.

Runoff from fire control or dilution water may cause pollution.

**FIRE OR EXPLOSION**

Some of these materials may burn but none of them ignite readily.

Flammable/poisonous gases may accumulate in tanks and hopper cars.

Some of these materials may ignite combustibles (wood, paper, oil, etc.).

**EMERGENCY ACTION**

Keep unnecessary people away; isolate hazard area and deny entry.

Stay upwind; keep out of low areas.

Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.

FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

If water pollution occurs, notify appropriate authorities.

**FIRE**

Some of these materials may react violently with water.

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.

Large Fires: Water spray, fog or foam.

Move container from fire area if you can do it without risk.

Cool containers that are exposed to flames with water from the side until well after fire is out.

**SPILL OR LEAK**

Do not touch spilled material; stop leak if you can do it without risk.

Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.

Large Spills: Dike far ahead of spill for later disposal.

**FIRST AID**

Move victim to fresh air; call emergency medical care.

Remove and isolate contaminated clothing and shoes at the site.

In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.

Keep victim quiet and maintain normal body temperature.

## **Guide 61**

### **POTENTIAL HAZARDS**

#### **HEALTH HAZARDS**

Fire may produce irritating or poisonous gases.  
Radioactive material; little radiation hazard.

#### **FIRE OR EXPLOSION**

Some of these materials may burn but none of them ignite readily.

#### **EMERGENCY ACTION**

Keep unnecessary people away.  
Isolate hazard area and deny entry.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Delay cleanup until arrival or instruction of qualified Radiation Authority.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### **FIRE**

Move container from fire area if you can do it without risk.

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.

Large Fires: Water spray or fog (flooding amounts).

#### **SPILL OR LEAK**

Do not touch damaged containers or spilled material.

Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.

#### **FIRST AID**

Use first aid treatment according to the nature of the injury.

Advise medical care personnel that injured persons may be contaminated with radioactive material.



## Guide 62

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Fire may produce irritating or poisonous gases.  
Radioactive material; degree of hazard will vary from little to moderate, depending on type and quantity of radioactive material.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.

#### EMERGENCY ACTION

Keep unnecessary people at least 150 feet upwind of spill.  
Isolate hazard area and deny entry.  
Limit entry to shortest possible time.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Delay cleanup until arrival or instruction of qualified Radiation Authority.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Do not move damaged containers; move undamaged containers out of fire zone.  
Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.

#### SPILL OR LEAK

Do not touch damaged containers or spilled material.  
Large Spills: Dike far ahead of spill for later disposal.  
Cover powder spill with plastic sheet or tarp to minimize spreading.

#### FIRST AID

Use first aid treatment according to the nature of the injury.  
If not affecting injury, remove and isolate contaminated clothing and shoes; wrap victim in blanket before transporting.  
If not injured, remove and isolate contaminated clothing and shoes; shower victim with soap and water.  
Advise medical care personnel that injured persons may be contaminated with radioactive material.

## Guide 63

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

External radiation from unshielded radioactive material.  
Internal radiation from inhalation, ingestion or skin absorption.  
Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.

#### EMERGENCY ACTION

Keep unnecessary people at least 150 feet upwind; greater distances may be necessary if advised by qualified Radiation Authority.  
Isolate hazard area and deny entry.  
Enter spill area only to save life; limit entry to shortest possible time.  
Wear positive pressure breathing apparatus and full protective clothing.  
Detain uninjured persons and equipment exposed to radioactive material until arrival or instruction of qualified Radiation Authority.  
Delay cleanup until arrival or instruction of qualified Radiation Authority.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Do not move damaged containers; move undamaged containers out of fire zone.  
Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, or fog (flooding amounts).  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.  
Fight fire from maximum distance.

#### SPILL OR LEAK

Do not touch damaged containers or spilled material.  
Damage to outer container may not affect primary inner container.  
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Call emergency medical care.  
If not affecting injury, remove and isolate contaminated clothing and shoes; wrap victim in blanket before transporting.  
If not injured, remove and isolate contaminated clothing and shoes; shower victim with soap and water.  
Except for the injured, detain persons and equipment exposed to radioactive material until arrival or instruction of Radiation Authority.  
Advise medical care personnel that injured persons may be contaminated with radioactive material.

## Guide 64

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Radioactive material; little radiation hazard.  
Contact may cause burns to skin and eyes.  
If inhaled, may be harmful.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may ignite combustibles (wood, paper, oil, etc.).

Keep unnecessary people away; isolate hazard area and deny entry.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Delay cleanup until arrival of instruction of qualified Radiation Authority.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Move container from fire area if you can do it without risk.  
Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, or fog (flooding amounts).

#### SPILL OR LEAK

Stop leak if you can do it without risk.  
Move undamaged packages from spill area.  
Do not touch damaged containers or spilled material.  
Damage to outer container may not affect primary inner container.  
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
If not affecting injury, remove and isolate contaminated clothing and shoes; wrap victim in blanket before transporting.  
If not injured, remove and isolate contaminated clothing and shoes; shower victim with soap and water.  
Advise medical personnel that victim may be contaminated with radioactive material and may have chemical burns.

## Guide 65

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite itself if exposed to air.  
May burn rapidly with flare-burning effect.  
May re-ignite after fire is extinguished.

#### HEALTH HAZARDS

Radioactive material; little radiation hazard.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away.  
Isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Delay cleanup until arrival or instruction of qualified Radiation Authority.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

#### FIRE

Move container from fire area if you can do it without risk.  
Small Fires: Dry chemical, soda ash or lime.  
Large Fires: Flood fire area with water.  
Cool containers that are exposed to flames with water from the side until well after fire is out.

#### SPILL OR LEAK

Do not touch damaged containers or spilled material.  
Move undamaged packages from spill area.  
Small Spills: Sweep into metal containers and keep under water or mineral oil.  
Large Spills: Wet down with water and dike for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes; shower victim with soap and water.  
Advise medical care personnel that injured persons may be contaminated with radioactive material.

## Guide 66

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Radioactive material; little radiation hazard.  
If inhaled, may be fatal.  
Vapors or white dust cloud may be extremely irritating.  
Contact causes burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Container may explode in heat of fire.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and special protective clothing.  
Delay cleanup until arrival or instruction of qualified Radiation Authority.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Move container from fire area if you can do it without risk.  
Small Fire: Dry chemical or CO<sub>2</sub>.  
Large Fire: Water spray, fog or foam.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
If this is impossible, withdraw from area and let fire burn.  
Do not get water inside container.

#### SPILL OR LEAK

Do not touch spilled material.  
Try to freeze leakage by cooling at point of opening with carbon dioxide (dry ice).  
Use water spray to reduce vapor but do not put water on leak or spill area.  
Small Spill: Flush area with flooding amounts of water on a small part of the spill at a time.  
Large Spill: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes; shower victim with soap and water.  
Keep victim quiet and maintain normal body temperature.  
Advise medical personnel that victim may be contaminated with radioactive material and may have chemical burns.



**Guide 67****POTENTIAL HAZARDS****HEALTH HAZARDS**

Poison; extremely hazardous.  
 Inhalation extremely dangerous; may be fatal.  
 Contact with liquid may cause frostbite.  
 Vapors non-irritating; but deaden sense of smell.

**FIRE OR EXPLOSION**

Extremely flammable; may be ignited by heat, sparks or flames.  
 Flame may be invisible.  
 Vapors may travel to a source of ignition and flash back.  
 Container may explode in heat of fire.  
 Vapor explosion and poison hazard indoors, outdoors or in sewers.

**EMERGENCY ACTION**

Keep unnecessary people away; isolate hazard area and deny entry.  
 Stay upwind; keep out of low areas.  
 Wear positive pressure breathing apparatus and full protective clothing.  
 Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
 Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
 FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.

**FIRE**

Let burn unless leak can be stopped immediately.  
 Small Fires: Dry chemical, CO<sub>2</sub>, or water spray.  
 Large Fires: Water spray, fog or foam.  
 Move container from fire area if you can do it without risk.  
 Stay away from ends of tanks.  
 Cool containers that are exposed to flames with water from the side until well after fire is out.  
 For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
 Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

**SPILL OR LEAK**

Shut off ignition sources; no flares, smoking or flames in hazard area.  
 Stop leak if you can do it without risk.  
 Isolate area until gas has dispersed.

**FIRST AID**

Move victim to fresh air; call emergency medical care.  
 If not breathing, give artificial respiration.  
 If breathing is difficult, give oxygen.  
 In case of frostbite, thaw frosted parts with water.  
 Keep victim quiet and maintain normal body temperature.  
 Effects may be delayed; keep victim under observation.

## Guide 68

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.  
Vapor explosion hazard indoors, outdoors or in sewers.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Poisonous if inhaled or swallowed.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Water spray, fog or foam.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Do not touch spilled material; stop leak if you can do it without risk.  
Use water spray to reduce vapors.  
Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Keep victim quiet and maintain normal body temperature.

## POTENTIAL HAZARDS

### Guide 69

#### FIRE OR EXPLOSION

Extremely flammable; may be ignited by heat, sparks or flames.  
Vapors may travel to a source of ignition and flash back.  
Container may explode in heat of fire.

#### HEALTH HAZARDS

If inhaled, may be fatal.  
Vapor extremely irritating; contact may cause burns to skin and eyes.  
Contact with liquid may cause frostbite.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear positive pressure breathing apparatus and full protective clothing.  
Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)  
Isolate for 1 mile in all directions if tank car or truck is involved in fire.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or alcohol foam.  
Large Fires: Water spray, fog or alcohol foam.  
Let burn unless leak can be stopped immediately.  
Move container from fire area if you can do it without risk.  
Stay away from ends of tanks.  
Fight fire from maximum distance.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.  
Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

#### SPILL OR LEAK

Shut off ignition sources; no flares, smoking or flames in hazard area.  
Stop leak if you can do it without risk.  
Use water spray to reduce vapors; do not get water inside container.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed; keep victim under observation.

## Guide 70

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Extremely flammable.  
May ignite itself if control temperature is exceeded.  
May explode from heat or loss of temperature control.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### LOSS OF COOLING

Specified control temperature of material must be maintained. Obtain liquid nitrogen, dry ice or ice for cooling. If none can be obtained, evacuate area.

#### FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.

Large Fires: Flood fire area with water.

For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out.

If this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material.

Shut off ignition sources; no flares, smoking or flames in hazard area.

Spills: Moisten material with water and place it into loosely-covered plastic or fiberboard containers for later disposal.

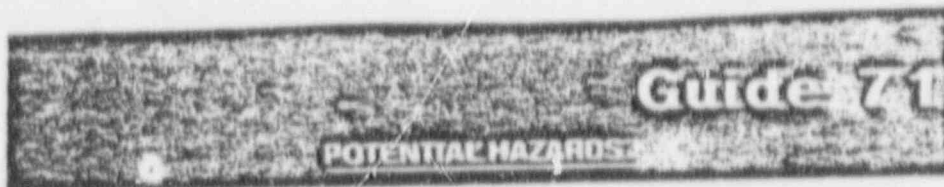
#### FIRST AID

Move victim to fresh air.

Remove and isolate contaminated clothing and shoes at the site.

In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.

Keep victim quiet and maintain normal body temperature.



## FIRE OR EXPLOSION

May be ignited by heat, sparks or flames.  
May burn rapidly.  
Container may explode violently in heat of fire.  
May explode from friction, heat or contamination.

## HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

## EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.

FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

## FIRE

Small Fires: Dry chemical, CO<sub>2</sub>, water spray or foam.  
Large Fires: Flood fire area with water.  
Fight fire from maximum distance.  
If fire can be controlled, cool container with water from unmanned hose holder or monitor nozzles until well after fire is out.  
If this is impossible, withdraw from area and let fire burn.

## SPILL OR LEAK

Do not touch spilled material.  
Shut off ignition sources; no flames, smoking or flames in hazard area.  
Spills: Moisten material with water and place it into loosely-covered plastic or fiberboard containers for later disposal.

## FIRST AID

Move victim to fresh air.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Keep victim quiet and maintain normal body temperature.



## Guide 72

### POTENTIAL HAZARD

#### FIRE OR EXPLOSION

May be ignited by heat, sparks or flames.  
Container may explode in heat of fire.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

**Small Fire:** Dry chemical, CO<sub>2</sub>, water spray or foam.  
**Large Fire:** Flood fire area with water.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Shut off ignition sources; no flames, smoking or flames in hazard area.  
Do not touch spilled material.  
**Spills:** Moisten material with water and place in loosely-covered plastic or fiberboard containers for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Keep victim quiet and maintain normal body temperature.

## Guide 73

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).  
Reaction with fuels may be violent.  
Flammable/poisonous gases may accumulate in tanks and hopper cars.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and special protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Some of these materials may react violently with water.  
Do not get water inside container.  
Small Fires: Water only; no dry chemical or CO<sub>2</sub>.  
Large Fires: Flood fire area with water.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Keep combustibles (wood, paper, oil, etc.) away from spilled material.  
If you have not donned special protective clothing approved for this material, do not expose yourself to any risk of this material touching you.  
Use water spray to reduce vapors; do not get water inside container.  
Small Spills: Flush area with flooding amounts of water.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.  
Effects may be delayed, keep victim under observation.

## Guide 74

### POTENTIAL HAZARDS

#### HEALTH HAZARDS

Vapors may cause dizziness or suffocation.  
Exposure in an enclosed area may be very harmful.  
Contact may irritate or burn skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### FIRE OR EXPLOSION

Some of these materials may burn but none of them ignite readily.  
Most vapors are heavier than air.  
Container may explode in heat of fire.

#### EMERGENCY ACTION

Keep unnecessary people away.  
Stay upwind; keep out of low areas.  
Wear self-contained (positive pressure if available) breathing apparatus and full protective clothing.  
Isolate for 1/2 mile in all directions if tank car or truck is involved in fire.  
Remove and isolate contaminated clothing at the site.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Dry chemical or  $\text{CO}_2$ .  
Large Fires: Water spray, fog or foam.  
Stay away from ends of tanks.  
Cool containers that are exposed to flames with water from the side until well after fire is out.

#### SPILL OR LEAK

Stop leak if you can do it without risk.  
Shut off ignition sources; no flames, smoking or flames in hazard area.  
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.  
Large Spills: Dike far ahead of spill for later disposal.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
Remove and isolate contaminated clothing and shoes at the site.  
In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water.  
Use first aid treatment according to the nature of the injury.

## Guide 75

### POTENTIAL HAZARDS

#### FIRE OR EXPLOSION

Extremely flammable; will ignite itself if exposed to air.  
May burn rapidly with flare-burning effect.  
Runoff to sewer may create fire or explosion hazard.

#### HEALTH HAZARDS

May be fatal if inhaled, swallowed or absorbed through skin.  
Contact may cause burns to skin and eyes.  
Fire may produce irritating or poisonous gases.  
Runoff from fire control or dilution water may cause pollution.

#### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Ventilate closed spaces before entering them.  
Wear positive pressure breathing apparatus and full protective clothing.  
FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300.  
If water pollution occurs, notify appropriate authorities.

#### FIRE

Small Fires: Let burn unless leak can be stopped immediately.  
Large Fires: Withdraw and let fire burn.  
Move container from fire area if you can do it without risk.  
Cool containers that are exposed to flames with water from the side until well after fire is out.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

#### SPILL OR LEAK

Do not touch spilled material; stop leak if you can do it without risk.  
Spills: Dike for later disposal; do not apply water unless directed to do so.  
Cleanup only under supervision of an expert.

#### FIRST AID

Move victim to fresh air; call emergency medical care.  
If not breathing, give artificial respiration.  
If breathing is difficult, give oxygen.  
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.

# GUIDE 76

## POTENTIAL HAZARDS

### FIRE OR EXPLOSION

Flammable/combustible material; may be ignited by heat, sparks or flames.  
May burn rapidly with flare-up effect.  
May ignite in presence of moisture.  
Violent reaction with water.

### HEALTH HAZARDS

Fire may produce irritating or poisonous gases.  
Contact may cause burns to skin and eyes.  
Runoff from fire control or dilution water may cause pollution.

### EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.  
Stay upwind; keep out of low areas.  
Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.  
CALL CHEMTREC AT 1-800-424-9300 AS SOON AS POSSIBLE, especially if there is no local hazardous materials team available.

### FIRE

Some of these materials may react violently with water.  
Do not use water or foam.  
Do not get water inside container.  
Small Fires: Dry chemical, soda ash, lime or sand.  
Magnesium Fires: Use dry sand, Met-X® powder or G-1 graphite powder.  
Move container from fire area if you can do it without risk.  
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

### SPILL OR LEAK

Do not touch spilled material.  
Shut off ignition sources; no flares, smoking or flames in hazard area.  
Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area.  
No water on spilled material; do not get water inside container.  
Spills: Dike for later disposal; do not apply water unless directed to do so.  
Magnesium Spills: Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.  
Cleanup only under supervision of an expert.  
Move undamaged packages from spill area.

### FIRST AID

Move victim to fresh air and call emergency medical care; if not breathing, give artificial respiration; if breathing is difficult, give oxygen.  
Wipe material from skin immediately; flush skin or eyes with running water for at least 15 minutes.  
Remove and isolate contaminated clothing and shoes at the site.  
Keep victim quiet and maintain normal body temperature.



APPENDIX B  
Distribution Sheet

CONTROLLED DISTRIBUTION RECEIPT ACKNOWLEDGEMENT  
OIL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTES SPILL PREVENTION,  
CONTROL, AND COUNTERMEASURES PLAN

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COPY NUMBER	MAIL STOP	RECIPIENT	DEPARTMENT	DATE OF RECEIPT
1.	07	J. J. Buggy, Jr.	WVNS President and General Manager	/ / 90
3.	07	R. E. Lawrence	Vitrification Project	/ / 90
4.	D	E. D. Picazo	Safety & Environmental Assessment	/ / 90
5.	D	C. J. Roberts	Safety & Environmental Assessment	/ / 90
6.	Z-26	R. B. Keel	Site Support	/ / 90
7.	K	T. M. Conlin	Radiation & Safety Training	/ / 90
8.	R&S	D. Beila	Radiological Controls	/ / 90
9.	R&S	D. Tharnish	Radiological Controls	/ / 90
10.	I	P. S. Klanian	Vitrification Test Group	/ / 90
11.	PSO	P. S. Church	Control Room	/ / 90
12.	PSO	P. S. Church	PRO - S/S Office	/ / 90
13.	A	M. W. Damerow	Community Relations	/ / 90
14.	35A	J. R. Greenquist	Human Resources	/ / 90
15.	04	M. H. Sgroi	Contractor	/ / 90
16.	41B	L. L. Howard	Administrative Services	/ / 90
17.	N	W. J. Czyz	Plant Security	/ / 90
18.	N	W. J. Czyz	Security - Gatehouse	/ / 90
19.	C	S. P. Kenzie	Training and Development	/ / 90
20.	B	D. J. Shugars	Quality Assurance	/ / 90
21.	DOE	J. A. Yeazel	DOE - WVPO	/ / 90
23.	41A	J. L. Knabenshien	Radiological & Environmental Safety	/ / 90
24.	201	R. F. Gese	Plant Operations	/ / 90
25.	I	J. Paul	Vitrification Test Engineering	/ / 90
26.	K	D. J. Howard	Radiation and Safety	/ / 90
27.	52	L. E. Domes	Records Management	/ / 90
28.	K	R. A. Gonzalez	Radiation & Safety	/ / 90
29.	205	D. J. Sawyer	Main Plant Operations	/ / 90
30.	45	T. M. Gentner	Emergency Operations Center	/ / 90
31.	NJRSE	M. V. Barrett	Nurse	/ / 90
32.	W	R. J. Fussner	LWTS/CSS Control Room	/ / 90
33.	R	D. G. Feldman	Waste Management Operations	/ / 90
34.	D	C. J. Roberts	Safety & Environmental Assessment	/ / 90
35.	61A	J. R. Fox	Safety & Environmental Assessment	/ / 90
36.	K	G. H. Metzler	Radiological Engineering	/ / 90
38.	WHSE	M. L. Ciaramella	Warehouse	/ / 90

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

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39.	R	A. F. Russillo	Drum Cell Operation	___/___/90
40.	W	P. J. Valenti	IRTS Operations	___/___/90
41.	---	M. Gentner	West Valley Volunteer Fire Co.	___/___/90
42.	---	Frank Noeson	Springville Volunteer Fire Co.	___/___/90
43.	---	J. Johnston	Catt. County Office of Emerg. Mgmt.	___/___/90
44.	---	L. J. Gallo	Erie County Office of Disaster Preparedness	___/___/90
45.	---	W. J. Clark	State Emergency Management Office	___/___/90
46.	---	T. Germano	State Emergency Management Office State Warning Point	___/___/90
47.	---	J. Roth	NRC Region I	___/___/90
48.	---	R. D. Hurt	NRC Headquarters	___/___/90
49.	---	W. D. Jensen	DOE - Idaho	___/___/90
50.	DOE	W. S. Ketola	DOE - WV	___/___/90
52.	W	H. J. Shaffner	STS Control Room	___/___/90
53.	---	T. W. McIntosh	DOE Headquarters	___/___/90
54.	DOE	T. J. Rowland	DOE - WVPO	___/___/90
55.	Z-23	G. G. Baker	Environmental Compliance	___/___/90
56.	NYSERDA	T. Sonntag	NYSERDA	___/___/90
57.	NYSERDA	T. K. Deboer	NYSERDA	___/___/90
58.	56	A. C. Feuz	Radiochemical Laboratory Operations	___/___/90
59.	DOE	E. Matthews	DOE - WVPO	___/___/90
60.	DOE	C. Leek	DOE - WVPO	___/___/90
61.	37	M. J. Ryan	Components and Services Purchasing	___/___/90
62.	305	D. K. Ploetz	Plant Engineering	___/___/90
63.	R	D. H. Garland	Waste Management Operations	___/___/90
64.	N	W. J. Czyz	Plant Security	___/___/90
65.	A	J. D. Chamberlain	Community Relations	___/___/90
66.	305	T. Hughes	Site Engineering	___/___/90
67.	W	J. C. Cwynar	Process Control Engineering	___/___/90
68.	Z-26	J. F. Miller	Site Support	___/___/90
69.	57	R. L. Schairf	Vitrification Operations	___/___/90
70.	T	N. J. Armknecht	FRS Operations	___/___/90
71.	41A	M. N. Haas	Process Chemistry Laboratory	___/___/90
72.	50	L. E. Domes	Records Management Audit File	___/___/90
73.	DOE	R. B. Provencher	DOE - WVPO	___/___/90

FOR LATEST REVISION  
SEE RECORDS MANAGEMENT

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Date: \_\_\_\_\_

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<u>COPY NUMBER</u>	<u>MAIL STOP</u>	<u>RECIPIENT</u>	<u>DEPARTMENT</u>	<u>DATE OF RECEIPT</u>
74.	R	P. M. Vlad	Radiological Projects	___/___/90
75.	45	T. M. Gentner	Emergency Operations Center	___/___/90
76.	45	T. M. Gentner	Emergency Operations Center	___/___/90
77.	45	T. M. Gentner	Emergency Operations Center	___/___/90
78.	45	T. M. Gentner	Emergency Operations Center	___/___/90
79.	45	T. M. Gentner	Emergency Operations Center	___/___/90
80.	45	T. M. Gentner	Emergency Operations Center	___/___/90
81.	DOE	P. Van Loan	DOE - WVPO	___/___/90
82.	41A	D. J. Fauth	Analytical Environmental Lab.	___/___/90
83.	Z-24	R. Estep	Radiological Engineering	___/___/90
84.	M	V. S. Arakali	Vitrification Process Development	___/___/90
85.	M	S. M. Barnes	Vitrification Process Development	___/___/90
86.	51	P. Burn	Systems Engineering and Support	___/___/90
87.	54	D. C. Burns	Vitrification In-Cell Engineering	___/___/90
88.	I	D. E. Carl	Vitrification Test Engineering	___/___/90
90.	Z-18	J. E. Crumlish	Engineering	___/___/90
91.	48	V. A. DesCamp	Vitrif. Facility Project Eng.	___/___/90
92.	51	R. W. Devlin	Systems Engineering and Support	___/___/90
93.	Z-08	C. C. Gerwitz	Drafting	___/___/90
94.	BLPRT	J. K. Lexer	Drafting	___/___/90
95.	58	R. M. Mahany	Vitrification Test Engineering	___/___/90
96.	57	W. E. Mateer	Vitrification Test Engineering	___/___/90
98.	M	K. A. O-Ahoofe	Vitrification Process Development	___/___/90
99.	305	P. E. O'Brien	Site Engineering	___/___/90
100.	305	W. J. Potts	Site Engineering	___/___/90
101.	48	D. J. Rickettson	Vitrif. Facility Project Eng.	___/___/90
102.	M	K. R. Routt	Vitrification Process Development	___/___/90
103.	54	M. A. Schiffhauer	Vitrification In-Cell Engineering	___/___/90
104.	MNT	R. E. Vandervort	Maintenance	___/___/90
105.	MNT	L. J. Wiedemann	Maintenance	___/___/90
106.	Z-18	D. C. Meess	IRTS Engineering	___/___/90
107.	L	A. J. Huot	Project Appraisals	___/___/90
108.	Z-08	J. R. Horton	Drafting	___/___/90
109.	C	B. C. Blakeley	Training and Development	___/___/90
110.	NYSERDA	P. J. Bembia	NYSERDA	___/___/90

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