WHC-SP-0472
Revision 1

Implementation Plan for Title 40 Code of Federal Regulations Parts 280 and 281; Final Rules for Underground Storage Tanks

Prepared for the U.S. Department of Energy
Assistant Secretary for Environment, Safety and Health

Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Printed in the United States of America

DISCLM-2.CHP (2-89)

WHC-SP--0472-Rev.1

DE90 004791

Implementation Plan for Title 40 Code of Federal Regulations Parts 280 and 281; Final Rules for Underground Storage Tanks

M. R. Morton

Date Published
November 1989

Prepared for the U.S. Department of Energy
Assistant Secretary for Environment, Safety and Health

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

This page intentionally left blank.

EXECUTIVE SUMMARY

This report presents the timetables, responsible organizations, and methods required to comply with the newly promulgated Underground Storage Tank (UST) Regulations Title 40 Code of Federal Regulations (CFR) 280 and 281. These rules were promulgated by the U.S. Environmental Protection Agency (EPA) on September 23, 1988, and became effective December 22, 1988.

These regulations are required by Subtitle I of the Resource Conservation and Recovery Act of 1976. Their purpose is to protect the groundwater supplies of the United States in the following ways:

- Closing old tanks
- Detecting and remediating tank leaks and spills
- Establishing stringent standards for new tanks
- Upgrade of existing tanks to new-tank standards.

Sixty-nine tanks at the Hanford Site are currently regulated under the law. Twenty tanks are permanently out of service, and most must be closed before December 22, 1989 (Category A). Three tanks are temporarily closed and must either be closed or upgraded to new-tank standards by December 22, 1989 (Category B). Twelve tanks are in service and are over 25 years old (Category C). These tanks must be tested for tightness and operated with an effective means of leak detection by December 22, 1989, or removed from service. Five more categories of tanks exist based on the age and service status of the tanks, each having a succeeding annual compliance date for installed leak detection capability of December 22. All regulated Hanford Site tanks and associated piping must meet new-tank standards by December 1998. Westinghouse Hanford Company (Westinghouse Hanford) has responsibility for implementing the tank removal program and managing the release detection program.

The majority of the USTs at the Hanford Site are operated by Westinghouse Hanford. Kaiser Engineers Hanford and Battelle Pacific Northwest Laboratory also operate underground storage tanks. Specific plans to remove the 20 Category A and B tanks are discussed, as well as annual tightness testing for the remaining tanks. Estimated costs for tank removal and tightness testing are provided as a reference to assist in budget planning. Alternatives to achieve regulatory compliance are discussed, and actions necessary for cleanup in the event of a leak or spill are stated.

Total costs for removal of the initial 19 tanks in categories A and B will be borne in fiscal years (FY) 1989 and 1990, and are estimated at approximately $765,000. The permanent closure of four subsequently discovered Category A USTs will be funded as necessary. The total cost for testing the 46 active tanks through FY 1995 could be as high as $510,000. However, early action by Hanford contractors to address consolidation, removal, upgrade, or replacement of active tanks under these regulations could significantly lower the $510,000 figure.

This page intentionally left blank.

List of Acronyms/Abbreviations

ALE	Arid Land Ecology Reservation
API	American Petroleum Institute
ARD	Advanced Reactor Development Division
CERCLA	Comprehensive Environmental Response, Compensation,and Liability Act of 1980
CFR	Code of Federal Regulations
CPD	Chemical Process Division
DEO	Decommissioning and Environmental Operations
DOE-RL	U.S. Department of Energy-Richland Operations Office
DRD	Defense Reactor Division
DWM	Defense Waste Management Division
EPA	U.S. Environmental Protection Agency
FDC	functional design criteria
FY	fiscal year
IRM	Information Resource Management
KEH	Kaiser Engineers Hanford
OSS	Operations Support Services
PNL	Battelle Pacific Northwest Laboratory
RAM	Resource Allocations Management
RCRA	Resource Conservation and Recovery Act of 1976
SARA	Superfund Amendments and Reauthorization Act of 1986
SQASD	Safety Quality Assurance and Security Division
UST	underground storage tank
WAC	Washington Administrative Code
WDOE	State of Washington Department of Ecology
Westinghouse Hanford	Westinghouse Hanford Company

This page intentionally left blank.

CONTENTS

This page intentionally left blank.

List of Figures

This page intentionally left blank.

List of Tables

This page intentionally left blank.

IMPLEMENTATION PLAN FOR TITLE 40 CFR PARTS 280 AND 281: FINAL RULES FOR UNDERGROUND STORAGE TANKS

1.0 INTRODUCTION AND TANK CATEGORY DEVELOPMENT

1.1 INTRODUCTION

The purpose of this implementation plan is fourfold: (1) It will describe the underground storage tanks at the Hanford Site currently regulated by the law; (2) it will define the programs currently planned and/or underway by the affected Hanford Site contractors; (3) it will provide estimated costs of compliance for fiscal year (FY) 1989 and, in the out years, to FY 1995; and (4) it will, through dissemination of information, provide a common understanding of compliance issues by all landlords as well as provide the opportunity for landlord cooperation to achieve efficiency and minimize the costs of compliance.

Section 2.0 of this report describes the responsibilities and efforts which are underway or planned to comply with the regulations on a site-wide basis.

Section 3.0 discusses estimated costs, including activities planned for this year and a basis for estimating out-year costs. Estimates for tank testing and removal at the Hanford Site are presented to assist in planning adjustments necessary to accomplish work required by the regulations.

Section 4.0 discusses actions to be undertaken in the event a leak or spill is discovered.

Section 5.0 contains the references.

Appendix A contains a summary of provisions of 40 CFR 280 and 281.

1.2 TANK CATEGORY DEVELOPMENT

The Hanford Site has over 350 storage tanks constructed wholly or partially underground and used for a variety of purposes. Two kinds of underground storage tanks (USTs) exist at the Hanford Site as defined by current regulations (see Appendix A). Petroleum USTs comprise the majority of active and out-of-service tanks, and most of the regulations are geared toward them. Chemical USTs also exist at the Hanford site and special requirements for them are addressed.

Sixty-nine of these USTs on the Hanford Site are currently regulated by Title 40 Code of Federal Regulations (CFR) 280 and 281 [U.S. Environmental Protection Agency (EPA) 1988(a)]. Fifty-three (53) tanks are operated by Westinghouse Hanford Company (Westinghouse Hanford), thirteen (13) are operated by Kaiser Engineers Hanford (KEH), and three (3) are controlled by

Battelle Pacific Northwest Laboratory (PNL). Table 1-1 lists the tank name and alias, if applicable, the tank's general location, its closure and/or upgrade category, and the landlord (responsible contractor or Westinghouse Hanford division). The categories (A-H) are based on age and service status. Table 1-2 explains the closure requirements for Categories A and B and the upgrade requirements for Categories C through H. These requirements are applicable to all Hanford Site contractors. All regulated active tanks must be either closed or upgraded to new-tank standards by 1998.

The regulations allow some latitude with regard to tank closures and upgrades. Table 1-2 summarizes these requirements for tanks which have been permanently or temporarily closed. Table 1-3 summarizes the upgrade requirements for active tanks in the three major areas covered by the regulations, which are leak detection, corrosion protection, and spill/overfill prevention. Tables 1-2 and 1-3 were modified from the USEPA 1988(b). Table 1-1 lists the USTs at the Hanford Site by category. All but 14 of the tanks are operated by Westinghouse Hanford.

It is possible the State of Washington will promulgate regulations that are more restrictive than those of the EPA, in particular the current exemptions dealing with fuel oil storage, emergency generators, and certain chemical tanks. This action could result in the regulation of more USTs if tank types at the Hanford Site are affected.

Table 1-1. Hanford Site Underground Storage Tanks Listed By Category. (sheet 1 of 5)

Tank identification number	Alias	Location	Category[a]	Landlord
•130-D-1		100 Area	A	Westinghouse Hanford-DRD
•130-K-1	1717K-LG	100 Area	A	Westinghouse Hanford-DRD
•130-K-2	1717K-DF	100 Area	A	Westinghouse Hanford-DRD
311-1 Methanol	311-W	300 Area	A	Westinghouse Hanford-DRD
311-2 Menthanol	311-E	300 Area	A	Westinghouse Hanford-DRD
313 Methanol Tank	313 Building	300 Area	A	Westinghouse Hanford-DRD
•703-1		700 Area	A	Westinghouse Hanford-IRM
3000-7[b]	7-3000	3000 Area	A (5/90)	KEH
3000-8	8-3000	3000 Area	A	KEH
3000-9	9-3000	3000 Area	A	KEH
3000-10	10-3000	3000 Area	A	KEH
3000-11	11-3000	3000 Area	A	KEH
3000-13[b]	13-3000	3000 Area	A (5/90)	KEH
600-1	1-600	600 Area	A	Westinghouse Hanford-RAM
600-2	2-600	600 Area	A	Westinghouse Hanford-RAM
600-3	3-600	600 Area	A	Westinghouse Hanford-RAM
622R	PNL	600 Area	B	PNL
325-1[b]		300 Area	A (5/90)	PNL
TK-SQ-151	B Plant	200 East	B	Westinghouse Hanford-DWM

Table 1-1. Hanford Site Underground Storage Tanks Listed By Category. (sheet 2 of 5)

Tank identification number	Alias	Location	Category[a]	Landlord
TK-SQ-152	B Plant	200 East	B	Westinghouse Hanford-DWM
1172-11	11-1172	1100 Area	F	Westinghouse Hanford-OSS
3000-1	1-3000	3000 Area	C	KEH
3000-2	2-3000	3000 Area	C	KEH
3000-3	3-3000	3000 Area	C	KEH
3000-4	4-3000	3000 Area	C	KEH
3000-5	5-3000	3000 Area	A	KEH
3000-6	6-3000	3000 Area	A	KEH
1171-4	4-1171	1100 Area	C	Westinghouse Hanford-OSS
1171-5	5-1171	1100 Area	C	Westinghouse Hanford-OSS
1171-6	6-1171	1100 Area	C	Westinghouse Hanford-OSS
2713W-21	21-2713W	200 West	C	Westinghouse Hanford-OSS
2713W-25	25-2713W	200 West	C	Westinghouse Hanford-OSS
6652-P[b]		600 Area (ALE)	A (5/90)	Westinghouse Hanford
382-1	382 Gas 1	300 Area	C	Westinghouse Hanford-OSS
382-2	382 Gas 2	300 Area	C	Westinghouse Hanford-OSS
382-3	382 Gas 3	300 Area	C	Westinghouse Hanford-OSS
400-FFTF-T-24	400 T-24	400 Area	E	Westinghouse Hanford-ARD
182-N-1-DT	182 Do Day Tank	100 Area	D	Westinghouse Hanford-DRD

Table 1-1. Hanford Site Underground Storage Tanks Listed By Category. (sheet 3 of 5)

Tank identification number	Alias	Location	Category[a]	Landlord
• 182-N-2-DT	182 Do Day Tank	100 Area	D	Westinghouse Hanford-DRD
• 182-N-3-DT	182 Do Day Tank	100 Area	D	Westinghouse Hanford-DRD
2713W-23	23-2713W	200 West	D	Westinghouse Hanford-OSS
6652-C	PNL-1-6652P-38	600 Area (ALE)	D[c]	PNL
• 105-N-LFT	105-N Lift Station Tank	100 Area	E	Westinghouse Hanford-DRD
• 100N-SS-27	27-100N-Service Station	100 Area	E	Westinghouse Hanford-OSS
• 100N-SS-28	28-100N-Service Station	100 Area	E	Westinghouse Hanford-OSS
2713E-20	20-2713E	200 East	E	Westinghouse Hanford-OSS
3621-D		300 Area	E	Westinghouse Hanford-OSS
222S-1		200 West	F	Westinghouse Hanford-CPD
• 100-B-1		100 Area	F	Westinghouse Hanford-OSS
1172-10	10-1172	1100 Area	F	Westinghouse Hanford-OSS
1172-8	8-1172	1100 Area	F	Westinghouse Hanford-OSS
1172-9	9-1172	1100 Area	F	Westinghouse Hanford-OSS
2713W-22	22-2713W	200 West	F	Westinghouse Hanford-OSS
273W-24	24-2713W	200 West	F	Westinghouse Hanford-OSS

Table 1-1. Hanford Site Underground Storage Tanks Listed By Category. (sheet 4 of 5)

Tank identification number	Alias	Location	Category[a]	Landlord
100N-FS-30	30-100N-UG	100 Area	F	Westinghouse Hanford-SQASD
100N-FS-31	31-100N-D	100 Area	F	Westinghouse Hanford-SQASD
200W-FS-34	34-200-FS-UG	200 West	F	Westinghouse Hanford-SQASD
200W-FS-35	35-200-FS-D	200 West	F	Westinghouse Hanford-SQASD
300-FS-15	15-300	300 Area	G	Westinghouse Hanford-SQASD
300-FS-16	16-300	300 Area	G	Westinghouse Hanford-SQASD
1171-2	2-1171	1100 Area	G	Westinghouse Hanford-OSS
1171-3	3-1171	1100 Area	G	Westinghouse Hanford-OSS
2711E-26		200 East	G	Westinghouse Hanford-OSS
2713E-19	19-2713E	200 East	G	Westinghouse Hanford-OSS
200E-HSF-17	17-200E-HSF	200 East	G	Westinghouse Hanford-SQASD
2721E-HP-18	18-200E-Patrol	200 East	G	Westinghouse Hanford-SQASD
3000-12	12-3000	3000 Area	H	KEH
400-FS-40	4704-S-1	400 Area	H	Westinghouse Hanford-SQASD
400-FS-41	4704-S-1	400 Area	H	Westinghouse Hanford-SQASD

Table 1-1. Hanford Site Underground Storage Tanks Listed by Category. (sheet 5 of 5)

[a]**Key to Category**

Category A	Permanently closed--Remove by December 22, 1989, or as indicated
Category B	Temporarily closed--Activate and upgrade or remove by December 22, 1989
Category C	Tightness test and leak detection by December 22, 1989
Category D	Tightness test and leak detection by December 22, 1990
Category E	Tightness test and leak detection by December 22, 1991
Category F	Tightness test and leak detection by December 22, 1992
Category G	Tightness test and leak detection by December 22, 1993
Category H	Tightness test and leak detection by December 22, 1993

[b]These tanks are additions to the original list added by Revision 1.

[c]These tanks, although place in their respective categories due to their chronological age, are deferred from the leak detection upgrade requirements because they fuel emergency generators.

Table 1-2. Closure or Upgrade Schedules for Underground Storage Tanks.

Schedule For Required Temporary / Permanent Closure

TYPE OF TANK & PIPING	REQUIRED ACTION	DEADLINE DATE
Category A - Permanently Closed	Empty and Clean Remove From Ground or Fill With Inert Solid Material Perform Site Assessment and Corrective Action as Necessary Provide Notification Proir to Action	December 22, 1989 Or 12 Months After Temporary Closure
Category B - Temporarily Closed	Operate and Maintain Corrosion Protection Operate and Maintain Release Detection if Not Empty	Immediately
	Cap and Secure All Lines, Pumps, Manways & Ancillary Equipment Leave Vent Lines Open & Functional	March 22, 1989 Or 3 Months After Temporary Closure
	Permanently Close	December 22, 1989 Or 12 Months After Temporary Closure

Schedule For Implementation of Required Upgrades

TYPE OF TANK & PIPING	LEAK DETECTION	CORROSIVE PROTECTION	SPILL / OVERFILL PREVENTION
New Tanks and Piping*	At Installation	At Installation	At Installation
Existing Tanks** Installed Category C Tanks Category D Tanks Category E Tanks Category F Tanks Category G Tanks Category H Tanks	By No Later Than: December 1989 December 1990 December 1991 December 1992 December 1993 December 1993	December 1998	December 1998
Existing Piping** Pressurized Suction	December 1990 Same As Existing Tanks	December 1998 December 1998	Does Not Apply Does Not Apply

*New tanks and piping are those installed after December 1988
**Existing tanks and piping are those installed before December 1988
Tanks which cannot meet this schedule for upgrade must be closed permanently by the scheduled upgrade deadline date

Table 1-3. Upgrade Requirements for Active Underground Storage Tanks.

LEAK DETECTION Implementation of One Method Required	
NEW TANKS	Monthly Monitoring* Monthly Inventory Control and Tank Tightness Testing Every 5 Years For 10 Years After Installation Only
EXISTING TANKS	Monthly Monitoring Monthly Inventory Control and Annual Tank Tightness Testing Until December 1998 Only Monthly Inventory Control and Tank Tightness Testing Evcery 5 Years Until December 1998 or For 10 Years After Installation of Corrosion/Spill and Overfill Equipment Only
NEW & EXISTING PRESSURIZED PIPING	One Method From Each Set Automatic Flow Restrictor — Annual Line Testing Automatic Shutoff Device — Monthly Monitoring* Continuous Alarm System — Except Automatic Tank Gauging
NEW & EXISTING SUCTION PIPING	Monthly Monitoring* Line Testing Every 3 Years No Requirements For SystemsDesigned to Specific Criteria
CORROSION PROTECTION Implementation of One Method Required	
NEW TANKS	Coated and Cathodically Protected Steel Fiberglass Steel Tank Clad With Fiberglass
EXISTING TANKS	Same Options as For New Tanks Add Cathodic Protection System Interior Lining Interior Lining and Cathodic Protection
NEW PIPING	Coated and Cathodically Protected Steel Fiberglass
EXISTING PIPING	Same Options as For New Piping Cathodically Protected Steel
SPILL / OVERFILL PREVENTION Implementation of One Method Required	
ALL TANKS	Catchment Basins -And- Automatic Shutoff Devices -or- Overfill Alarms -or- Ball Float Valves
*Monthly Monitoring Includes:	Automatic Tak Gauging — Ground-Water Monitoring Vapor Monitoring — Other Approved Methods Interstitial Monitoring

2.0 CONTRACTOR ROLES AND RESPONSIBILITIES

2.1 PROJECT MANAGEMENT

Westinghouse Hanford has been assigned Project Management responsibility at Hanford by the Department of Energy-Richland Operations Office (DOE-RL) for the implementation of the Title 40 Code of Federal Regulations Part 280 and 281: Final Rules for Underground Storage Tanks.

2.1.1 Project Manager Responsibilities

The lead in Westinghouse Hanford for the compliance effort is the Environmental Division (Decommissioning and Environmental Operations). They are responsible to:

- Request funding to perform tasks associated with compliance (either from the owner/operator or from DOE-RL as discussed in Section 3.2).
- Direct the preparation of offsite bids to perform work.
- Coordinate with other contractors in compliance efforts, and provide interface with DOE-RL.
- Request, as necessary, DOE-RL to notify the State of Washington Department of Ecology (WDOE) of changes in tank status.
- Develop procedures and direct the field operations for tank removal, site assessment, final cleaning, and disposal of tanks.
- Develop and manage the Release Detection Program for Category C through H Tanks (this effort will increase annually as subsequent categories come under regulations each year).
- Review new regulations (state or federal) that may impact this plan and provide updates as necessary.
- Provide a soil sample plan and supervision of soil sampling for site assessment. Perform site assessment based on sample results.
- In the event that a UST is found to have leaked, provide immediate and subsequent notifications and reports to DOE-RL for submission to WDOE.
- Environmental Restorations shall develop and implement site remediation of UST sites as necessary.
- Assure completion date of December 22 is met for tanks in each respective category.

2.1.2 Westinghouse Hanford Company Divisional Responsibilities

Other Westinghouse Hanford Divisions shall support these compliance efforts as follows:

- Defense Waste Management - responsible for the designation of each tank contents as to waste classification, manage the contract to empty and rinse each tank prior to removal (including waste disposal), manage the contract to clean and certify tanks after removal or dispose of tanks that cannot be certified clean.

- Operational Support Services (OSS) - provide labor, equipment, and supervision to physically excavate, remove, and transport USTs.

- Chemical Processing Division - provide labor and equipment to collect liquid and soil samples for waste designation and site assessment.

- Landlord Programs Management/Projects Division - prepare an Engineering Study, Functional Design Criteria, and Conceptual Design Report to match anticipated needs of OSS and Safety Quality Assurance and Security Division (SQASD) with tanks that meet new tank standards.

- All Divisions - provide information and routine data collection to the Hanford Surplus Facilities Program Office for the Release Detection Program.

2.2 OTHER HANFORD CONTRACTORS RESPONSIBILITIES/INTERFACES

Interfaces and shared liabilities are numerous in the UST closure and testing areas. Kaiser Engineers Hanford and Battelle Pacific Northwest Laboratories have contractual responsibilities to DOE-RL and as well as liabilities as operators of UST systems under 40 CFR 280 and 281. In order to assure that these responsibilities are met and liabilities minimized, it is imperative that a close, well understood interface exist between Westinghouse Hanford, as Project Manager, and both KEH and PNL as operators.

Each contractor shall be responsible to notify Westinghouse Hanford Environmental Division (Hanford Surplus Facilities Program Office) of its designated representative for all UST related matters. This designated representative shall then be responsible for proper dissemination of information within the contractor organization.

Table 2.1. Contractor Interface Actions.

Westinghouse Hanford Company Environmental Division Action	Battelle Pacific Northwest Laboratory or Kaiser Engineers Hanford Action	
	Approval of Action	Notification of Action Completion
1. Prepare Liquid Sample Plan.	X	
2. Subcontractor Laboratory Analysis. (Note 1)		X (Copy of Results)
3. Designate waste.	X	
4. Pump contents/Rinse tank.		X
5. Prepare waste manifests and ship wastes.		X (Copy of Documents)
6. Subcontractor disposes of waste and provides certification.		X (Copy of Certification)
7. Prepare Implementation Plan.	X	
8. Prepare Detailed Work Plan including Soil Sampling.	X	
9. Obtain Excavation Permit.	X	
10. Obtain Cultural Resource Review.		X
11. Prepare Job Control Documentation.		X
12. Inert, excavate, and remove UST.		X
13. Transport UST to Central Landfill for storage.		X
14. Obtain soil samples of UST impression in excavation.		X
15. Provide immediate notification if a leak is evident.		X
16. Subcontractor Laboratory Analysis. (Note 1)		X (Copy of Results)
17. Backfill excavation.		X
18. Subcontractor cleans and certifies clean USTs at Central Landfill.		X (Copy of Certificate)
19. Provide follow-up reports if UST was found to have leaked.		X
20. Site remediation (if necessary).		X

NOTE 1: Duplicate samples for independent analysis may be obtained if desired for the contractor who has operator responsibilities for a particular UST.

2.2.1 Interface Requirements

Table 2-1 lists a step-by-step methodology from start of project to site remediation (if necessary) for a typical UST in category A or B. Included in the Table are the interface points and the approval/ notifications that the Project Manager will provide for the operators (KEH or PNL). In addition to the interfaces listed in Table 2-1, Westinghouse Hanford shall provide KEH and PNL designated representatives with appropriate Project status on a biweekly basis.

2.3 COMPLIANCE ACTIONS

Actions and due dates, itemized below, shall be performed for each UST as listed on Table 1-1.

2.3.1 Category A--Permanently Closed

Petroleum or chemical tanks which are to be permanently closed may be either filled with inert material or removed from the ground. A site assessment and corrective action for leaks and/or spills discovered during closure is required. These actions must be completed by December 22, 1989. Because of the difficulty of sampling beneath an in-place UST to assure that no leak has occurred and to preclude any future liability, removal of all tanks is the selected option, unless cost or safety issues significantly impact this decision. A written removal plan is in place for these tanks. It includes descriptions the preparation of the tank for removal, tank cleaning and disposal, specific method of sampling, and spill survey plans. The sample results, when they become available, shall be appended to the plan, and the plan shall be considered a permanent record. Standards for removal and disposal should follow those described by the American Petroleum Institute (API, 1987).

2.3.2 Category B--Temporarily Closed

Each of these three tanks must be permanently closed, similar to the steps outlined in Section 2.3.1, or reactivated by December 22, 1989. If they are reactivated before December 22, 1989, they will meet the standards for new tanks.

2.3.3 Category C--Active Tanks Installed 1965 or Earlier

Monthly inventory control and annual tank tightness testing (see Appendix A, Section 8.0) must be implemented for these tanks. The first tightness test will occur before December 22, 1989.

2.3.4 Category D--Active Tanks 20 - 25 Years Old

Monthly inventory control and annual testing (see Appendix A, Section 8.0) will be instituted prior to December 22, 1990. The three 182N-DT tanks will implement a separately approved monitoring technique by December 22, 1990.

2.3.5 Category E--Active Tanks 15 - 20 Years Old

Monthly inventory control and annual testing (see Appendix A, Section 8.0) will be instituted prior to December 22, 1991.

2.3.6 Category F--Active Tanks 10 - 15 Years Old

Monthly inventory control and annual testing (see Appendix A, Section 8.0) will be instituted prior to December 22, 1992.

2.3.7 Category G--Active Tanks 5 - 10 Years Old and Category H--Active Tanks Less Than 5 Years Old

Monthly inventory control and annual testing (see Appendix A, Section 8.0) will be installed prior to December 22, 1993.

2.3.8 Underground Storage Tank Piping Requirements

All active USTs which have pressurized piping will meet the leak detection and corrosion protection requirements for new pressurized piping by December 1990. This includes automatic shutoff, automatic flow restrictions, or continuous alarm in the event of a leak. Annual tightness testing or monthly monitoring will be required.

Active tanks, with suction piping which leaves the line full, will meet the requirements for new-suction piping; however, this will be accomplished according to the same schedule as the leak-detection upgrades on the tanks themselves (Section 2.3.3 through 2.3.7). This upgrade will involve corrosion protection and tightness testing every three (3) years or monthly monitoring. The initial tightness test will be performed at the same time the tank meets the leak detection schedule (Section 2.3.3 through 2.3.7). Suction piping designed to have the line empty in the absence of demand is exempt from this requirement.

2.3.9 New Tank Standards

All organizations must establish plans by which their tanks may be upgraded or replaced to meet new tank standards. These standards are summarized in Section 5.0, 6.0, and 7.0 of Appendix A and become mandatory for all UST systems on December 22, 1998.

Most requirements in 40 CFR 280 and 281 apply specifically to petroleum USTs. For chemical USTs, special upgrade requirements apply. By December 1998, all chemical USTs will feature secondary containment and interstitial monitoring as their primary method of leak detection, and meet standards in the areas of corrosion protection and spill/overfill prevention.

2.4 RELEASE DETECTION PROGRAM REQUIREMENTS

2.4.1 Tightness Testing

Tank tightness testing shall be performed by a Westinghouse Hanford subcontractor and be available to Westinghouse Hanford Operating Divisions, KEH, and PNL as a service provided by Westinghouse Hanford Decommissioning and Environmental Operations, or by separate certified testing subcontract administered by each tank operator. Necessary tank preparations shall be specified by the subcontractor and be prepared for testing by the operating unit. Schedules for Decommissioning and Environmental Operations administered tank testing will be developed with normally two week notification prior to testing. This lead time is necessary due to the anticipated tank conditions for the tests, i.e. completely filled and out of service for 12 to 24 hours prior to test and out of service until after the test completion.

Each UST operator, and Westinghouse Hanford Decommissioning and Environmental Operations, shall be informed in writing of the test results as soon as available. In the event that a tank fails to meet tightness requirements as discussed in Section 8.0 of Appendix A, Westinghouse Hanford Decommissioning and Environmental Operations shall be notified and start the notification process in accordance with Section 4.0.

2.4.2 Monitoring Program

The Monitoring Program shall provide for routine data collection and monthly evaluations to ensure that tank leaks that may develop between annual tightness testing are identified and stopped as early as possible. Westinghouse Hanford Decommissioning and Environmental Operations shall provide an administrative control procedure to specify data requirements for each participating UST operator. Although each UST operator may opt to use individually developed procedures and methods, all Hanford Site UST Release Detection data shall meet the requirements of 40 CFR 280 and 281 as outlined in Appendix A.

All data, regardless of operator or method of monitoring, shall be submitted to Westinghouse Hanford Decommissioning and Environmental Operations for monthly evaluation, trend analysis, and release reporting as outlined in Section 4.0.

2.5 TANK CLOSURE

2.5.1 Notifications and Tank Preparations

The initial steps for permanent tank closure shall proceed as follows once the decision has been made to permanently close a particular UST.

- Westinghouse Hanford Company Environmental Division will notify WDOE through DOE-RL concerning the change in tank status within 30 days of change of status.
- Obtain tank liquid samples for analysis and waste designation per approved procedures.
- Remove and dispose of tank contents per State and Federal Regulations.
- Rinse and flush tank, remove rinsate, and dispose of as waste per State and Federal regulations.

2.5.2 Actual Tank Removal

Actual tank removal shall be performed by a Westinghouse Hanford approved procedure to ensure a safe and technically correct approach. Although the procedure may be modified as the project progresses, to include refinements, the basic process is as follows:

- Add absorbent to eliminate minor liquid that may remain in tank.
- Inert potentially explosive atmospheres in the UST by adding dry ice prior to excavation. Normally, excavation will not proceed until UST oxygen level is below 10 percent.
- Excavate and remove UST piping. Normally, piping is handled and disposed of as a hazardous material since most cannot be cleaned.
- Excavate and remove UST, and transport to a central location for storage.
- Obtain soil samples in the tank impression per an approved sample plan approved by Environmental Engineering.
- Westinghouse Hanford Company Environmental Division shall provide immediate (24 hour) notification as discussed in Section 4.0 for any tank determined to have leaked.

2.5.3 Follow-up Actions

Following soil sample collection, the excavation shall normally be backfilled, compacted to approximate pre-excavation density, and sloped to match the pre-excavation site appearance. If a leak was determined to have occurred, the site will be adequately marked to allow the exact leak location to be determined in future remediation activities.

All USTs removed and stored at the central location as part of this project shall be cleaned and certified clean by Westinghouse Hanford using an approved subcontractor. This work will be performed by experienced personnel working to industry standards and copies of the certification will be provided to KEH and PNL for their respective tanks.

A Tank Closure Report shall be written by Westinghouse Hanford Company Environmental Division to document all pertinent aspects of the entire removal project.

Site remediation/cleanup necessary due to UST leakage shall be planned, scheduled and performed in accordance with Resource Conservation and Recovery Act (RCRA) requirements on an individual case basis. Remediation plans shall be reviewed by and co-ordinated with area landlord(s) prior to submission to the regulatory agency. It should be noted that the December 22 compliance dates do not include actual site remediation/cleanup.

2.6 ORPHAN TANKS

At this time it is possible that undiscovered USTs may exist at the Hanford Site. These are most likely in areas of old town sites, 1940s central construction areas or abandoned farmsteads. A detailed historical research effort is being conducted of these areas. As the status of USTs changes, a 30-day notice to the State of Washington will be submitted as required by regulations. As tanks are discovered, investigated, and confirmed to meet the UST regulations, they will be reported by Westinghouse Hanford Company Environmental Division to the State of Washington through DOE-RL.

3.0 COST ESTIMATES, FUNDING, AND SCHEDULING

3.1 COST ESTIMATES

While cost estimates have been prepared for each UST covered by current regulations, the most detailed effort has been logically placed on near term requirements. The removal of the initial 19 Category A and B USTs has been estimated at approximately $765,000 (average $40,000 per tank). Table 3.1 is a Task Listing used to determine this estimate. Category C cost estimates for tightness testing and release detection implementation are approximately $2500 to $3500 annually per tank. Whether Westinghouse Hanford Decommissioning and Environmental Operations or the operating organization performs the testing and manages the program, similar costs should be expected. The asterisked items on Table 3.1 were used to determine the $2500 to $3500 estimates. It should be noted that both the removal and testing are estimates only, the actual per tank costs will be included in the Tank Closure Report for this phase of the project.

Cost estimates for planning purposes, for Categories D through H tightness testing, may be determined from the $3500 per tank rate. While the necessity of tank removal will not be known until after testing, an estimate to remove 25% of the tanks tested (at $40,000 per tank) may be expected. The 25% value is based on industry averages for 15 year old UST systems. (See Reference 5.3.)

3.2 FUNDING

Current funding and funding expectations are as follows:

- Necessary funds for the initial 19 Category A and B UST permanent closures, including tank disposal, have been allocated to Westinghouse Hanford Decommissioning and Environmental Operations. Additional funding for the permanent closure of the 4 newly discovered Category A tanks will be provided to the Decommissioning and Environmental Operations group if necessary.

- Funding for tightness testing and data collection for the Release Detection Program (Categories C through H) shall be the owner/operators responsibility.

- The owner/operator shall also be responsible for funding tank removal and site assessment of Category C through H tanks that leak or that are otherwise removed from service.

- Remedial actions necessary due to UST leakage are not currently funded but are expected to be included in the overall Decommissioning and Environmental Operations Remedial Actions Program.

TABLE 3.1. TASK LISTING FOR UNDERGROUND STORAGE TANKS

* 1. Engineering support for procedure and documentation preparation.

2. Radar penetration to locate tank at each tank location.

3. Additional tank removal work (Tank Numbers 3000-7 and 3000-13).

4. Obtain samples of contents of each tank.

5. Analyze samples from each tank to confirm contents and designate waste classification.

6. Removal of tank contents by offsite vendor, included is certification of tank contents disposal from vendors.

7. Each tank will be pumped and rinsed by vendor prior to excavation (excluding dry tanks).

* 8. Tank tightness determination.

9. Introduce dry ice into each tank in order to inert a combustible/ explosive atmosphere.

10. Introduce absorbent into each tank.

11. Remove concrete or asphalt prior to excavation where concrete or asphalt exists.

12. Excavate for tank removal and segregate any contaminated soils.

13. Install shoring as necessary.

14. Remove tank and associated piping.

15. Obtain soil samples from the bottom of each tank excavation. Package and ship samples to lab to be analyzed.

16. Transport tanks to central storage location.

17. Final cleaning and certification of tanks at central storage location.

18. Crush those tanks not designated to be scrapped or sandfilled at the central landfill disposal site.

19. Sandfill the remaining tanks at the disposal site.

*20. Project management cost.

*21. Final Engineering documentation and reports.

22. Remove shoring prior to backfilling (if required).

23. Backfill all tank sites.

24. Replace concrete/asphalt slabs in designated areas where concrete slabs existed.

25. Dispose of any contaminated soil removed during tank excavation.

26. Piping packaging and disposal costs.

NOTE: 1. All items pertain to Category A and B UST Removal.
2. Only items marked (*) pertain to Category C UST tightness testing.

- A proposed line item in FY 1992 or 1993 will include funds for upgrade or replacement of Westinghouse Hanford OSS and SQASD USTs in Categories C through H and will meet the 1998 deadline for active tanks to be closed or meet new tank standards.

- Funding for tank upgrade, removal, replacement, or certification to meet new tank standards by December 1998 shall be the responsibility of the owner/operator. Funding for piping upgrades shall also be the owner/operators responsibility.

3.3 SCHEDULES

Figure 3.1 is the Project schedule for Category A and B UST Removal and Category C Testing currently in place. Similar schedules shall be prepared annually for future UST removal and tightness testing, as necessary.

Routine tightness testing is a relatively short duration operation that will normally be performed in the first quarter of each fiscal year. Those organizations using the Westinghouse Hanford Decommissioning and Environmental Operations service for tightness testing will be notified a minimum of two weeks prior to the test date.

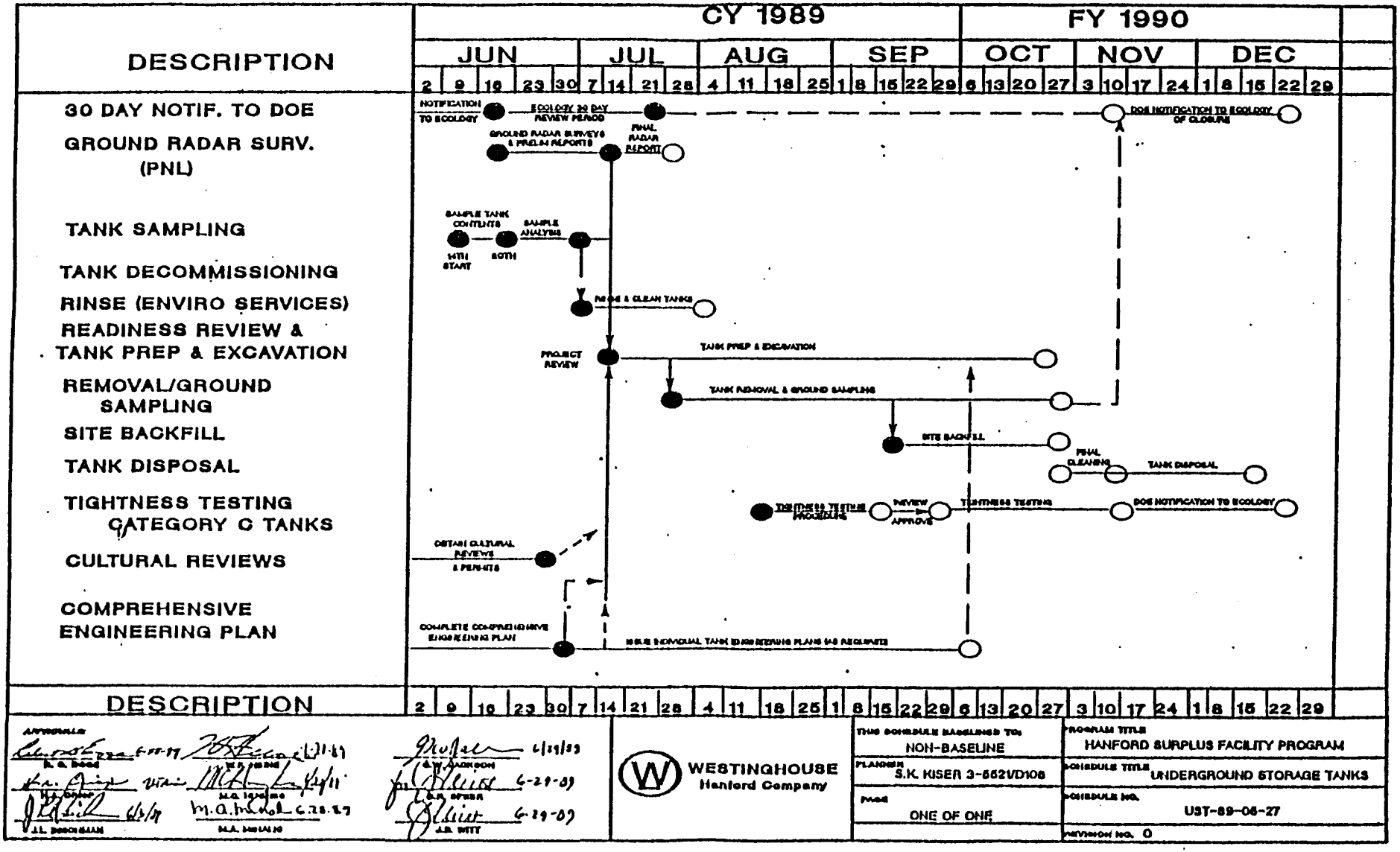

Figure 3.1. UST Removal and Testing Schedule for CY 1989.

4.0 LEAKS AND SPILLS

The EPA estimates that nationwide as many as 25 percent of the five million USTs currently operating in the country are leaking (See Reference 5.3.). Even if a much lower failure rate at the Hanford Site is assumed because of low soil moisture and corrosivity, removal, testing, and upgrade of USTs may reveal a significant leakage problem at one or more tank sites.

The first years of testing and tank removal involve tanks with the greatest chronological age and therefore the greatest potential to discover a leaking tank. If a leak is found, remediation is not tied to the December 22 compliance date. Prompt cleanup is assumed, and there are several actions which must be taken to comply with the law, regardless of the extent of the environmental damage or the pace of the cleanup. These actions include the following.

- For active tanks, the owner shall take immediate actions to stop and contain the leak or spill; such as emptying the tank as soon as possible.

- Notify the regulatory authority and the owner/operator within 24 hours. Operational Westinghouse Hanford organizations should also prepare an Event Fact Sheet.

- Report progress of cleanup/assessment to the regulatory authority within 20 days after cleanup commences.

- If significant leakage has occurred, a site investigation must be undertaken and a corrective action plan prepared. The results of this complete investigation must be presented to the regulatory authority within 45 days of the discovery. For this case "significant leakage" shall be determined by field investigations and sampling that indicates greater than 20 gallons of product has leaked to the surrounding soils.

- Long-term actions will involve compliance with requirements established for the site by the regulatory authority. Corrective action plans developed for the cleanup must be approved by the regulatory authority.

  With the exception of emptying active tanks determined to be leaking, Westinghouse Hanford Environmental Division shall perform these actions for USTs removed or tested by Westinghouse Hanford. Interfaces for these reports shall be as illustrated in Table 2.1.

Additional information on extensive cleanup can be obtained from the publication "Cleanup of Releases from Petroleum USTs, Selected Technologies" Stock No. 055-000-00272-0, available from the U.S. Government Printing Office, Washington, D. C.

5.0 REFERENCES

5.1 EPA, 1988a, "Underground Storage Tanks; Technical Requirements" Final Rule, Federal Register, U.S. Environmental Protection Agency, Washington, D.C.

5.2 EPA, 1988b, "Musts for USTs. A Summary of the New Regulations for Underground Storage Tank Systems," U.S. Environmental Protection Agency, Washington, D.C.

5.3 American Petroleum Institute (API), December 1987, "Removal and Disposal of Underground Storage Tanks, API Recommended Practice 1604. Marketing Department, Second Edition.

APPENDIX A

SUMMARY OF PROVISIONS HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984 SUBTITLE I

1.0 INTRODUCTION

The Hazardous and Solid Waste Amendments of 1984 extend and strengthen the provisions of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (RCRA). Subtitle I of RCRA, as amended, provides for the development and implementation of a comprehensive regulatory program for underground storage tank (UST) systems containing regulated substances and unplanned releases of these substances to the environment. This appendix describes the provision of this regulation.

2.0 OVERVIEW

The UST regulations final ruling, promulgated September 22, 1988, outlines technical and operating standards for UST systems containing regulated substances, including product materials defined as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and petroleum products.

Until the promulgation of the final ruling, an interim prohibition was established that restricted installation of UST systems after May 8, 1986. Any system installed under the interim prohibition is required to be protected from corrosion, prevent releases due to corrosion or structural failure for the operational life of the tank, and be constructed of material compatible with the substance to be stored.

The UST regulations are organized into five major sections. The first section outlines performance standards for new UST systems, including requirements for corrosion protection, spill and overfill prevention equipment, installation, and notification.

The second section addresses the upgrading of existing active UST systems. Cathodic protection, interior linings, piping, and spill and overfill prevention equipment must be upgraded by December 22, 1998, to meet the performance standards for new UST systems.

The third major section, contained in Subparts C and D, describes general operating requirements for UST systems. Spill and overfill control, operation and maintenance of corrosion protection, compatibility, repair, reporting and recordkeeping requirements are addressed in Subpart C. Subpart D contains detailed requirements for release detection systems, including a list of acceptable options in release detection methods.

Subparts E and F constitute the fourth major section of concern. Requirements for release reporting, investigation, confirmation, and corrective action are listed in these sections.

The fifth and final major section deals with requirements for out-of-service UST systems and closure. Permanent closure, temporary closure, and changes in service are addressed.

3.0 PROGRAM SCOPE AND NOTIFICATION

The term Underground Storage Tank or UST is defined to include any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10% or more beneath the surface of the ground. The following systems are either <u>not</u> considered USTs or are specifically excluded by the regulation:

1. Farm or residential tank of 1,100 gal or less capacity used for storing motor fuel for noncommercial purposes

2. Tanks used for storing heating oil for consumptive use on the premises where stored

3. Septic tank

4. Pipeline facility (including gathering lines) regulated under

   a. The Natural Gas Pipeline Safety Act of 1968 or

   b. The Hazardous Liquid Pipeline Safety Act of 1979 or

   c. Which is an intrastate pipeline facility regulated under State laws comparable to the provisions of the law referred to in paragraph (1)(a) or (1)(b) of this definition

5. Surface impoundment, pit, pond, or lagoon

6. Storm water or waste water collection system

7. Flow-through process tank

8. Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations or

9. Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated on or above the surface of the floor

10. Any UST system holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and any other regulated substance

11. Any waste water treatment tank system that is part of a waste water treatment facility regulated under Section 402 or 307(b) of the Clean Water Act

12. Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks

13. Any private or commercial underground tank system whose capacity is 110 gal or less

14. Any underground tank system that contains a de minimis (below minimum standard) concentration of regulated substances

15. Any emergency spill or overflow containment underground tank or system that is expeditiously emptied after use.

These systems are deferred under the following subparts. Subpart B, Design, Construction, Installation, and Notification; Subpart C, General Operating Requirements; Subpart D, Release Detection; Subpart E, Release Reporting, Investigation, and Confirmation; and Subpart G, Out of Service UST Systems and Closure, are deferred for the following types of UST systems:

16. Waste water treatment tank systems

17. Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 USC 2011 and following)

18. Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR 50 Appendix A

19. Airport hydrant fuel distribution systems

20. UST systems with field-constructed tanks.

Subpart D, Release Detection, is deferred until FY 1998 for any UST system that stores fuel solely for use by emergency power generators.

Any owner who brings an underground storage tank system into use after May 8, 1986, is given 30 d from the date the system is put in use to submit a notice of existence of the tank system to the State or local agency or department designated. This notification must be provided on either the Federally mandated form provided in the legislation, or a State form if required by State law, regulations, or procedure, provided that the State form meets Federal requirements. Notification for several tanks may be

provided on one notification form, but notification for tanks located at more than one place of operation must be filed on separate forms. All the required information must be completed for each tank reported.

All owners and operators of new UST systems must certify on the notification form. The owner and operator must also ensure that the tank system installer certifies in the notification form that the methods used to install the tank and piping comply with installation requirements.

Beginning October 24, 1988, any person who sells a tank intended to be used as an UST must notify the purchaser of such tank of the owner's notification obligations.

4.0 INTERIM PROHIBITION

An interim prohibition section was included in the proposed rulings to provide control over installation of UST systems during the period of time prior to promulgation of the regulations. This prohibition states that no person may install a UST system for the purpose of storing regulated substances unless the UST system (whether of single- or double-wall construction) meets the following conditions:

- Will prevent releases due to corrosion or structural failure for the operational life of the UST system
- Is cathodically protected against corrosion, constructed of non-corrodible material, steel clad with a non-corrodible material, or designed in a manner to prevent the release or threatened release of any stored substance
- Is constructed or lined with material that is compatible with the stored substance.

A UST system without corrosion protection may be installed at a site which has been determined by a corrosion expert to be sufficiently non-corrosive to prevent releases due to corrosion throughout the operating life of the system. Documentation of this assessment of corrosivity must be maintained by the owner and operator for the life of the tank.

5.0 PERFORMANCE STANDARDS FOR NEW UNDERGROUND STORAGE TANK SYSTEMS

5.1 INSTALLATION

All tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer's instructions.

All owners and operators must ensure that one or more of the following methods of certification, testing, or inspection is used to provide a certification of compliance on the UST notification form:

- The installer has been certified by the tank and piping manufacturers; or
- The installer has been certified or licensed by the implementing agency; or
- The installation has been inspected and certified by a registered professional engineer with education and experience in UST system installation; or
- The installation has been inspected and approved by the implementing agency; or
- All work listed in the manufacturer's installation checklists has been completed; or
- The owner and operator have complied with another method for ensuring compliance that is determined by the implementing agency to be no less protective of human health and the environment.

5.2 CORROSION PROTECTION

Any portion of the system underground that routinely contains product must be protected from corrosion in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory. Cathodic protection is not required for tanks constructed of fiberglass-reinforced plastic or a metal-fiberglass-reinforced-plastic composite or for tanks installed at a site which has been determined by a corrosion expert to be sufficiently noncorrosive to prevent releases due to corrosion for the life of the system. In the latter case records must be maintained by the owner and operator documenting this assessment of corrosivity throughout the remaining life of the tank.

For all other tanks, cathodic protection is required. Protection for steel tanks may be provided as follows:

- The tank may be coated with a suitable dielectric material
- Field-installed cathodic protection systems must be designed by a corrosion expert
- Impressed current systems must be designed to allow determination of current operating status
- Cathodic protection systems must be operated and maintained in accordance with regulatory guidelines.

Corrosion protection must also be provided for piping that routinely contains regulated substances and is in contact with the ground in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory. Standards for piping are identical to the above standards for tank systems.

5.3 SPILL AND OVERFILL PREVENTION

Equipment must be provided to prevent spilling and overfilling associated with product transfer to the UST system. Standards for spill and overfill equipment are as follows:

- Spill prevention equipment must prevent the release of the product to the environment when the transfer hose is detached from the fill pipe (for example, a spill catchment basin)

- Overfill protection equipment must automatically shut off flow into the tank when the tank is no more than 95% full or alert the transfer operator when the tank is no more than 90% full by restricting the flow into the tank or triggering a high-level alarm.

Spill and overfill prevention equipment as specified is not required if alternative equipment is used that is determined by the implementing agency to be no less protective of human health and the environment than the equipment specified above, or if the UST system is filled by transfers of no more than 25 gal at one time.

6.0 UPGRADE OF EXISTING UNDERGROUND STORAGE TANK SYSTEMS

6.1 GENERAL

No later than December 22, 1998, all existing UST systems must comply with either the standards as set for new UST system performance, standards for system upgrade as defined below, or requirements for closure, site assessment, and corrective action as required.

6.2 INTERIOR LINING

Steel tanks may be upgraded by installation of interior lining or cathodic protection, according to a code of practice developed by a nationally recognized association or independent testing laboratory. Tank linings must be properly installed according to regulatory requirements, and the lined tank must be internally inspected for structural soundness and lining performance within 10 yr after lining and every 5 yr thereafter.

6.3 CATHODIC PROTECTION

Steel tanks may also be upgraded by cathodic protection. The cathodic protection system must meet regulatory requirements, and the integrity of the tank must be ensured prior to system installation. Tank integrity may be ensured by internal inspection for tanks greater than 10 yr old. For tanks less than 10 yr old, integrity may be assumed on the basis of monthly release monitoring over the life of the tank or determined through tightness testing, conducted both prior to installation of the cathodic protection system and between 3 and 6 mo following the system installation. Another method of corrosion-hole detection may be used if the method is determined by the implementing agency to be no less protective of human health and the environment than the methods specified.

A tank may be upgraded by both internal lining and cathodic protection by compliance with all the criteria outlined for both upgrades. A tank so upgraded is exempt from periodic internal inspections.

6.4 PROTECTION OF PIPING

Metal piping that routinely contains regulated substances and is in contact with the ground must be cathodically protected in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory. Cathodic protection systems for piping must meet the regulatory requirements outlined here for cathodic protection of tank systems.

6.5 SPILL AND OVERFILL PROTECTION

To prevent spilling and overfilling associated with product transfer, all existing UST systems must be upgraded to comply with spill and overfill prevention equipment requirements as specified for new UST systems.

7.0 GENERAL OPERATING REQUIREMENTS

7.1 RELEASE PREVENTION

The owner and operator must prevent releases in product transfer. The volume available in the tank must be ascertained to be greater than the volume of product to be transferred to the tank before the transfer is made. Each transfer operation must be monitored constantly to prevent overfilling and spilling.

Any spills and overfills must be reported, investigated, and corrective action taken in accordance with regulatory requirements.

7.2 CORROSION PROTECTION

Corrosion protection systems for steel tank systems must be operated and maintained to ensure that releases due to corrosion are prevented for as long as the UST system is used to store regulated substances. Corrosion protection must be continuously provided to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.

Cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester. All systems must be tested within 6 mo of installation and at least every 3 yr thereafter. Criteria used to determine the adequacy of cathodic protection must be set in accordance with a code of practice developed by a nationally recognized association. Impressed current cathodic protection systems must also be inspected every 60 d to ensure the equipment is running properly.

Records of the operation of cathodic protection must be maintained to demonstrate compliance with the performance standards specified above. These records must provide the results of the last three annual inspections and the last two 60-d inspections if required.

7.3 COMPATIBILITY

Tanks and piping must be lined with materials that are compatible with the substance stored in the system.

7.4 REPAIR OF TANK SYSTEMS

Repairs must be sufficient to prevent releases due to structural failure or corrosion for as long as the system is used to store regulated substances. All repairs must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

Repairs to fiberglass-reinforced plastic tanks may be made by the manufacturer's authorized representatives. Metal pipe sections and fittings which have released product as a result of corrosion or other damage must be replaced. Fiberglass pipes and fittings may be repaired in accordance with the manufacturer's specifications.

Repaired tanks and piping must be tightness tested within 30 d following the date of the completion of the repair. Tightness testing must be conducted in accordance with regulatory requirements. Tightness testing is not required if an internal inspection is conducted or if the repaired portion of the system is monitored monthly for releases using a Federal or State approved method.

Within 6 mo following the repair of any cathodically protected system, cathodic protection must be tested to ensure proper operation.

Records of each repair must be maintained for the remaining operating life of the UST system to demonstrate compliance with these regulatory requirements.

7.5 INSPECTION AND MAINTENANCE OF RECORDS FOR TANK SYSTEMS

Inspections, monitoring and testing conducted by the implementing agency, as well as requests for document submission, testing, and monitoring by the owner or operator, must be met with full cooperation. Notification must be provided for all UST systems, including certification of proper installation for new systems. Reports must be filed for all releases including suspected releases, spills and overfills, and confirmed releases. In the case of a release, a write-up of corrective actions planned or taken including initial abatements measures, initial site characterization, free product removal, investigation of soil and groundwater cleanup, and a corrective action plan must be provided to the implementing agencies. A notification must also be provided prior to permanent closure or change-in-service of a system.

Owners and operators must maintain on file a corrosion expert's analysis of site corrosion potential when corrosion protection equipment is not used. Documentation of the following must also be maintained: operation of corrosion protection equipment, repairs to UST systems, recent compliance with release detection requirements, and results of the site investigation conducted at permanent closure. Records must be maintained at the UST site either immediately available for inspection by the implementing agency or at a readily available alternative site to be provided to the implementing agency upon request.

8.0 RELEASE DETECTION

8.1 GENERAL REQUIREMENTS

Owners and operators of new and existing UST systems must provide release detection that is capable of detection of a release from any portion of the tank and connected underground piping which routinely contains product. Release detection systems must be installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition. All systems must meet regulatory requirements for performance, and any performance claims and their manner of determination must be described in writing by the equipment manufacturer or installer. In addition, methods used after December 22, 1990, (excepting methods permanently installed prior to that date) must be capable of detecting the leak rate or quantity as regulated for that method with a probability of detection of 0.95 and a probability of false alarm of 0.05.

When a release detection method operated in accordance with regulated performance standards indicates that a release may have occurred, owners and operators must provide notification to the implementing agency as required.

All UST systems must be in compliance with these release detection requirements by December 22 as follows:

- 1989 for systems installed before 1965 or for systems for which the installation date is unknown
- 1990 for systems installed between 1965 and 1969, and for all systems with pressurized piping
- 1991 for systems installed between 1970 and 1974
- 1992 for systems installed between 1975 and 1979
- 1993 for systems installed between 1980 and 1988.

Where a method of release detection in compliance with these requirements cannot be implemented, closure procedures must be completed by the date on which release detection would be required for that tank system.

8.2 PETROLEUM STORAGE TANKS

Petroleum UST systems must be monitored at least every 30 d for releases using a method approved for UST systems. Tank systems that meet legislated performance standards and monthly inventory control requirements for new UST systems may satisfy release detection requirements by the use of tank tightness testing at least every 5 yr until December 22, 1998. After this date the tank must be upgraded according to meet new tank standards, or it must be permanently closed. Tanks with a capacity of 550 gal or less may satisfy the release detection requirement through the use of weekly tank gauging.

Underground piping that routinely contains regulated substances must be monitored for releases. Underground piping that conveys regulated substances under pressure must be equipped with an automatic line-leak detector and have an annual line tightness test or monthly monitoring conducted in accordance with regulatory requirements. Underground piping that conveys regulated substances under suction must have either a line tightness test conducted at least every 3 yr or use a monthly monitoring method conducted in accordance with regulatory requirements. No release detection is required for suction piping that meets the following conditions:

- Is designed and constructed to operate at less than atmospheric pressure
- Is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released
- Includes only one check valve each suction line which is located directly below and as close as practical to the suction pump, provided that a method exists that allows compliance to be readily determined.

8.3 HAZARDOUS SUBSTANCES

Release detection for UST systems containing hazardous substance must meet requirements as outlined for petroleum UST systems. By December 22, 1998, all existing hazardous substance UST systems must be in compliance with release detection requirements for new systems described below.

Release detection for new hazardous substance UST systems must have secondary containment systems designed, constructed, and installed to contain regulated substances released from the tank system until they are detected and removed. To prevent the release of regulated substances to the environment at any time during the operational life of the UST system. Secondary containment systems must be checked for evidence of a release at least every 30 d.

Double-walled tanks must be designed, constructed, and installed to contain a release from any portion of the inner tank within the outer wall and to detect the failure of the inner wall.

External liners (including vaults) must be designed, constructed, and installed to contain 100% of the capacity of the largest tank within the liner boundary, prevent the interference of precipitation or groundwater intrusion with the ability to contain or detect a release of regulated substances, and be capable of preventing lateral as well as vertical migration of regulated substances.

Underground piping must be equipped with secondary containment that satisfies the requirements for tank containment systems. In addition, underground piping that conveys regulated substances under pressure must be equipped with an automatic line-leak detector.

Other methods of release detection may be used if owners and operators can demonstrate to the implementing agency that an alternative method can detect a release of the stored substance as effectively as any of the methods allowed for petroleum tank systems. Information must also be provided to the implementing agency on effective corrective action technologies, health risks, chemical and physical properties of the stored substance and the characteristics of the UST site. Approval from the implementing agency must be obtained prior to installation and operation of the new UST system.

Facilities will be informed of the requirements for new systems and required to meet these requirements in the design, installation, and operation of new systems.

8.4 METHODS OF RELEASE DETECTION

8.4.1 Inventory Control

Product inventory control (or another test of equivalent performance) must be conducted monthly. Detection capability must be at least one percent of flow-through plus 130 gal on a monthly basis. Inventory volume measurements for regulated substance inputs, withdrawals, and the amount

still remaining in the tank must be recorded each operating day. Equipment used must be capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch. The regulated substance inputs must be reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery. Deliveries must be made through a drop tube that extends to within 1 ft of the tank bottom. Product dispensing must be metered and recorded within the local standards for meter calibration or an accuracy of 6 in^3 for every 5 gal of product withdrawn. The measurement of any water level in the bottom of the tank must be made to the nearest one-eighth of an inch at least once a month.

8.4.2 Manual Tank Gauging

Manual tank gauging must be conducted as follows. The tank liquid level measurements must be taken at the beginning and ending of a period of at least 36 h during which no liquid is added to or removed from the tank. Level measurements must be based on an average of two consecutive stick readings at both the beginning and ending of the period. The equipment used must be capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch. A leak must be suspected if the variation between beginning and ending measurements exceeds the weekly or monthly standards. For a nominal tank capacity of 550 gal or less a weekly standard of 10 gal must be used (one test) and 5 gal for a monthly standard (average of four tests). For a nominal tank capacity of 551 to 1,000 gal, 13 gal must be used for a weekly standard and 7 gal for a monthly standard. For a nominal tank capacity of 1,001 to 2,000 gal, 26 gal must be used for a weekly standard and 13 gal for a monthly standard. Only tanks of 550 gal or less nominal capacity may use this as the sole method of release detection. Tanks of 550 to 2,000 gal may use this method in place of manual inventory control. Tanks of greater than 2,000 gal nominal capacity may not use this method to meet these requirements.

8.4.3 Tank Tightness Testing

Tank tightness testing must be capable of detecting a 0.1 gal/h leak rate from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

8.4.4 Automatic Tank Gauging

Equipment for automatic tank gauging that tests for the loss of product and conducts inventory control must have a detection capability of 0.2 gal/h leak rate from any portion of the tank that routinely contains product. Inventory control must be conducted in accordance with the requirements for inventory control as outlined above.

8.4.5 Vapor Monitoring

Testing or monitoring for vapors within the soil gas of the excavation zone may be used provided that the materials used as backfill are sufficiently porous to readily allow diffusion of vapors from releases into the excavation area. The stored regulated substance, or a tracer compound placed in the tank system, must be sufficiently volatile to result in a vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank. The measurement of vapors by the monitoring device must not be rendered inoperative by the groundwater rainfall, soil moisture, or other known interferences so that a release could go undetected for more than 30 d. The level of background contamination in the excavation zone must not interfere with the method used to detect releases from the tank. The vapor monitors must be designed and operated to detect any significant increase in concentration above background of the regulated substance stored in the tank system, a component or components of that substance, or a tracer compound placed in the tank system. In the UST excavation zone, the site must be assessed to establish the number and position of monitoring wells that will detect releases within the excavation zone from any portion of the tank that routinely contains product. Monitoring wells must be clearly marked and secured to avoid unauthorized access and tampering.

8.4.6 Groundwater Monitoring

For groundwater monitoring to be a valid method of release detection, the substance stored in the UST system must be immiscible with water and have a specific gravity of less than one. The groundwater must never be more than 20 ft from the ground surface and the hydraulic conductivity of the soils between the UST system and the monitoring wells must not be less than 0.01 cm/sec. The soils should consist of gravel, coarse to medium sand, coarse silts, or other permeable materials.

The slotted portion of the monitoring well casing must be designed to prevent migration of natural soils or filter pack into the well and to allow entry of regulated substance on the water table into the well under both high and low groundwater conditions. Monitoring wells shall be sealed from the ground surface to the top of the filter pack. Wells shall intercept the excavation zone or be placed as close to the zone as is technically feasible. Continuous monitoring devices used must have a detection capability of at least one-eighth of an inch of free product on top of the groundwater in the wells.

Within and immediately below the UST system excavation zone, the site must be assessed to ensure the validity of the use of this method and to establish the number and positioning of monitoring wells that will detect releases from any portion of the tank that routinely contains product.

Monitoring wells must be clearly marked and secured to avoid unauthorized access and tampering.

8.4.7 Interstitial Monitoring

Interstitial monitoring between the UST system and a secondary barrier immediately around or beneath it may be used but only if the system is designed, constructed, and installed to detect a leak from any portion of the tank that routinely contains product.

For double-walled UST systems, the sampling or testing method must be capable of detecting a release through the inner wall in any portion of the tank that routinely contains product.

For UST systems with a secondary barrier within the excavation zone, the sampling or testing method used must be capable of detecting a release between the UST system and the secondary barrier. The secondary barrier around or beneath the UST system must consist of artificially constructed material that is sufficiently thick and impermeable (at least 10E-06 cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection. The barrier must be compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier allowing a release to pass through undetected.

For cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system. The groundwater, soil moisture, or rainfall must not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 d. The site must be assessed to ensure that the secondary barrier is always above the groundwater and not in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions. Monitoring wells must be clearly marked and secured to avoid unauthorized access and tampering.

For tanks with an internally fitter liner, an automated device must be capable of detecting a release between the inner wall of the tank and the liner, and the liner must be compatible with the substance stored.

8.4.8 Other Methods

Any other type of release detection method, or combination of methods, can be used if it has detection capability of 0.2-gal/h leak rate or a release of 150 gal within a month with a probability of detection of 0.95 and a probability of false alarm of 0.5. The implementing agency may approve another method if the owner and operator can demonstrate that the method can detect a release as effectively as any of the methods described above. In comparing methods, the implementing agency shall consider the size of release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner and operator must comply with any conditions imposed by the implementing agency on its use to ensure the protection of human health and the environment.

8.5 METHODS OF RELEASE DETECTION FOR PIPING

Pressure piping used for product delivery on regulated tanks must be upgraded to current standards by December 1990. This includes cathodic protection and leak detection. Suction piping upgrades may or may not be required, depending on the placement of the backflow preventer. If the backflow preventer allows the liquid to drain from the pipe to the tank, no additional upgrades are required by the regulations. If the placement of the backflow preventer leaves the piping full at all time, then the upgrades described below are required. The installation schedule is the same as for the tanks themselves.

Release detection methods for piping which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering an audible or visual alarm may be used only if the detection capability of the method is at least 3 gal/h at 10 lbf/in^2 line pressure within 1 h. An annual test of the operation of the leak detector must be conducted in accordance with the manufacturer's requirements.

Periodic piping testing may be conducted only with a detection capability of 0.1 gal/h leak rate at one and one-half times the operating pressure.

Any of the methods as outlined for release detection for tank systems may be used if they are designed to detect a release from any portion of the underground piping that routinely contains regulated substances.

8.6 RELEASE DETECTION RECORDKEEPING

All written performance claims pertaining to any release detection system used and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be maintained for 5 yr from the date of installation. The results of any sampling, testing, or monitoring must be maintained for at least 1 yr, except that the results of tank tightness testing must be retained until the next test is conducted. Written documentation of all calibration, maintenance, and repair of release detection equipment permanently located onsite must be maintained for at least 1 yr after servicing work is completed. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for 5 yr from the date of installation.

9.0 RELEASE REPORTING, INVESTIGATION, AND CONFIRMATION

9.1 Reporting Requirements

Reporting a release or suspected release must take place within 24 h. The following constitute reportable situations:

- The discovery by owners and operators or others of released regulated substances at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface water)

- Unusual operating conditions observed by owners and operators (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST system, or an unexplained presence of water in the tank), unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced

- Monitoring results that indicate a release may have occurred, unless the monitoring device is found to be defective. Additional monitoring must confirm that no release has occurred. If inventory control is the method of release detection chosen, a second month of data must confirm the leak.

When required by the implementing agency, owners and operators of UST systems must determine if the UST system is the source of offsite impacts. These impacts include the discovery of regulated substances (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface and drinking waters) that has been observed by the agency or brought to its attention by another party.

Unless corrective action is initiated, owners and operators must immediately investigate and confirm all suspected releases of regulated substances requiring reporting within 7 d. Tests must be conducted to determine whether a leak exists in that portion of the tank that routinely contains product, or the attached delivery piping, or both. If the test results for the system, tank, or delivery piping indicate that a leak exists the system must be repaired, replaced or upgraded, and corrective action must be implemented as required.

Further investigation is not required if the test results for the system, tank, and delivery piping do not indicate that a leak exists and if environmental contamination is not the basis for suspecting a release. A site check must be conducted if the test results for the system, tank, and delivery piping do not indicate that a leak exists but environmental contamination is the basis for suspecting a release. Measurements for the presence of contamination must be taken at the location most likely to be contaminated at the UST site. In selecting sample types, sample locations, and measurement methods, the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth of ground water, and other factors appropriate for identifying the presence and source of the release must be considered.

If the test results for the excavation zone or the UST site indicate that a release has occurred, corrective action must be implemented. If the test results for the excavation zone or the UST site do not indicate that a release has occurred, further investigation is not required.

A spill or overfill must be contained and immediately cleaned up and reported to the implementing agency within 24 h. Corrective action must be implemented within the same 24-h time period. The following spills and overfills are reportable:

- Spills or overfills of petroleum that result in a release to the environment that exceeds 25 gal or that cause a sheen on nearby surface water.
- Spills or overfills of a hazardous substance that result in a release to the environment that equals or exceeds the reportable quantity under CERCLA (40 CFR 302).

A spill or overfill of petroleum that is less than 25 gal or of hazardous substance that is less than the reportable quantity must be immediately contained and cleaned up. If cleanup cannot be accomplished within 24 h, the implementing agency must be notified immediately. A release of a hazardous substance equal to or in excess of its reportable quantity must also be reported immediately (rather than within 24 h) to the National Response Center under sections 102 and 103 of CERCLA, and to the appropriate State and local authorities under Title III of SARA.

9.2 RELEASE RESPONSE AND CORRECTIVE ACTION

9.2.1 Initial Response and Abatement Measures

Upon confirmation of a release, a report must be made to the implementing agency within 24 h. Immediate action must be taken to prevent any further release of the regulated substance into the environment to identify and mitigate fire, explosion, and vapor hazards.

Unless otherwise directed by the implementing agency, as much of the regulated substance as necessary to prevent further release to the environment must be removed from the UST system. Any above-ground releases or exposed below-ground releases must be visually inspected and further migration of the released substance into surrounding soils and ground water must be prevented. Monitoring and mitigation of any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers or basements) must be continued. Hazards posed by contaminated soils that are excavated or exposed as a result of release confirmation, site investigation, abatement, or corrective action activities must be remedied. If these remedies include treatment or disposal of soils, applicable State and local requirements must be complied with. The presence of a release must be measured at the location where contamination is most likely to be present at the UST site, unless the presence and source of the release have been confirmed by conducting a site check or closure site assessment as required. In selecting sample types, sample locations, and measurement methods, the nature of the stored substance, the type of backfill, depth to groundwater and other factors as appropriate

for identifying the presence and source of the release must be considered. An investigation must be carried out to determine the possible presence of free product, and free product removal must be started as soon as practicable.

Within 20 d after release confirmation, a report must be submitted to the implementing agency summarizing the initial abatement steps taken and any resulting information or data.

9.2.2 Initial Site Characterization

Unless otherwise directed by the implementing agency, information about the site and the nature of the release must be assembled, including information gained while confirming the release or completing the initial abatement measures. This information must include data on the nature and estimated quantity of release; data from available sources and/or site investigations concerning the surrounding populations, water quality, use and approximate locations of wells potentially affected by the release, subsurface soil conditions, locations of subsurface sewers, climatological conditions, and land use; results of the site check as required; and results of the free product investigations as required to determine whether free product must be recovered.

Within 45 d of release confirmation the information collected must be submitted to the implementing agency in a manner that demonstrates its applicability and technical adequacy, or in a format and according to the schedule required by the implementing agency.

9.3 FREE PRODUCT REMOVAL

At sites where investigations indicate the presence of free product, free product must be removed to the maximum extent practicable as determined by the implementing agency while continuing, as necessary, any abatement actions initiated. Free product removal must be conducted in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site. Any recovery byproducts must be properly treated, discharged or disposed of in compliance with applicable local, State and Federal regulations. Abatement of free product migration will be used as a minimum objective for the design of the free product removal system. Any flammable products must be handled in a safe and competent manner to prevent fires or explosions.

Unless otherwise directed by the implementing agency, a free product removal report must be submitted within 45 d after confirming a release. This report must provide the name of the person(s) responsible for implementation of the free product removal measures; the estimated quantity, type, and thickness of free product observed or measured in wells, boreholes, and excavations; the type of free product recovery system used; whether any discharge will take place onsite or offsite during the recovery operation and where such discharge will be located; the type of treatment applied to,

and the effluent quantity expected from, any discharge; the steps taken to obtain necessary permits for any discharge; and the disposition of the recovered free product.

9.4 INVESTIGATIONS FOR SOIL AND GROUNDWATER CLEANUP AND CORRECTIVE ACTION PLAN

To determine the full extent and location of soils contaminated by the release and the presence and concentrations of dissolved product contamination in the groundwater, investigations must be conducted for the release, release site, and any surrounding area which may have been affected. Several factors must be considered in determining the extent of investigation required: evidence of contamination in groundwater wells, presence of free product requiring removal, and evidence of contaminated soils in contact with groundwater. Investigations must also be conducted if requested by the implementing agency, based on the potential effects of contaminated soil or groundwater on nearby surface water and groundwater resources.

Information obtained in investigation must be submitted as soon as practicable or in accordance with a schedule established by the implementing agency.

Subsequent to review of investigation findings, the implementing agency may require the submittal of additional information or the development of a corrective action plan for response to contaminated soils or groundwater. Corrective action plans must be submitted according to a schedule and format established by the implementing agency.

The corrective action plan will be approved by the agency only when the plan adequately provides for protection of human health, safety, and the environment. In making this determination, the agency will consider: the physical and chemical characteristics of the regulated substance, including toxicity, persistence, and potential for migration; the hydrogeologic characteristics of the surrounding area; the proximity, quality, and current and future uses of nearby surface and groundwater; the potential effects of residual contamination on nearby surface and groundwater; an exposure assessment; and any additional information submitted.

Upon approval the plan must be implemented, including any modifications made by the implementing agency. The results of the plan must be monitored, evaluated and reported in accordance with a schedule and format established by the implementing agency. Cleanup of soil and groundwater may be started prior to approval of the plan provided that the implementing agency is notified. Any cleanup activity must be in compliance with any conditions imposed by the implementing agency. The implementing agency may require cleanup activity to cease at any time, and may require the mitigation of any adverse consequences from cleanup activities. Any self-initiated cleanup activities must be incorporated into the corrective action plan as submitted for approval.

For each confirmed release that requires a corrective action plan, the implementing agency will provide notice to the public. This notice may include, but is not limited to, public notice in local newspapers, block advertisements, public service announcements, publication in State Register, letters to individual households, or personal contacts by field staff. Site release information and decisions concerning the corrective action plan will be made available to the public for inspection upon request. Public meetings may be held on the corrective action plan if there is sufficient public interest. Public notice must also be provided if implementation of the corrective action plan does not achieve the established cleanup levels and if termination of the plan is under consideration by the agency.

10.0 OUT OF SERVICE UNDERGROUND STORAGE TANK SYSTEMS AND CLOSURE

10.1 TEMPORARY CLOSURE

Temporary closure is defined as removal from service for a period of less than 12 mo. Operation and maintenance of corrosion protection is required throughout temporary closure. Operation and maintenance of release detection systems is required only if the tank is not empty, empty being defined as no more than 2.5 cm (1 in.) of residue, or 0.3% by weight of the total system capacity remaining.

When a system is temporarily closed for 3 mo or more, vent lines must be left open and functioning. All other lines, pumps, manways, and ancillary equipment must be capped and secured.

A system which has been temporarily closed for more than 12 mo must be permanently closed if it does not meet the performance standards for new UST systems or the upgrading requirements, with the exception of spill and overfill equipment requirements. An extension of the 12-mo period may be granted by the implementing agency. A site assessment as required for closure must be completed prior to application for extension.

10.2 PERMANENT CLOSURE OR CHANGE-IN-SERVICE

The implementing agency must be notified of permanent closure or change-in-service 30 d prior to beginning closure actions, unless such actions are in response to corrective action.

For closure, the tank must be emptied and cleaned by removing all liquids and accumulated sludges. The tank must be either removed from the ground or filled with an inert solid material.

Continued use of an UST system to store a non-regulated substance is considered a change-in-service. Prior to change-in-service, the tank must be emptied and cleaned by removal of all liquid and accumulated sludges, and a site assessment for closure must be conducted.

10.2.1 Site Assessment

Prior to completion of permanent closure or change-in-service, the site must be measured for the presence of a release where contamination is most likely to be present. In selection of sample types, sample locations, and measurement methods, the method of closure, the nature of the stored substance, the type of backfill, the depth of groundwater, and other appropriate factors must be considered. If an approved external release detection method is in operation at the time of closure or change-in-service that indicates no release has occurred, this requirement is satisfied. If contaminated soils or groundwater, or free product as a liquid or vapor, is discovered in assessment, corrective action must be implemented in accordance with corrective action requirements.

The implementing agency may direct assessment of the excavation zone and closure in compliance with these requirements for a system permanently closed prior to December 22, 1988, if releases from the UST may pose a current or potential threat to human health and the environment in the judgement of the agency.

10.2.2 Records Maintenance

Records of excavation zone assessment must be maintained for 3 yr after completion of permanent closure or change-in-service. Records demonstrating compliance with all other requirements for closure or change-in-service must also be maintained.

11.0 REFERENCES

Atomic Energy Act of 1954, as amended, Public Law 83-703, 66 Stat. 919, 42 USC 2011.

Clean Water Act of 1977, as amended, Public Law 95-217, 92 Stat. 1566, 33 USC 1251.

Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, Public Law 96-510, 94 Stat. 2767, 42 USC 9601 et seq.

Resource Conservation and Recovery Act of 1976, Public Law 94-580, 90 Stat. 2795, 42 USC 6901 et seq.

Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499, 100 Stat. 1613, 42 USC 11001 et seq.