Rel. 4. (2)

APR 20 1999

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 626592

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Distribution	TWRS Environmental	N/A
5. Proj./Prog./Dept./Div.:	6. Design Authority/Design Agent/Cog. Engr.:	7. Purchase Order No.:
TWRS Environmental	D. E. Clark	N/A
		9. Equip./Component No.: N/A
8. Originator Remarks: Control of Airborne Radioactive emission for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)		10. System/Bldg./Facility: TWRS
		12. Major Assm. Dwg. No.: N/A
11. Receiver Remarks: For Release	11A. Design Baseline Document? ◯ Yes ◉ No	13. Permit/Permit Application No.: N/A
		14. Required Response Date: 4/30/99

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	HNF-4327	N/A	0	Control of Airborne Emis.	E	1	1	1

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D OR N/A (See WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority N/A									
		Design Agent N/A									
1	1	Cog. Eng. D. E. Clark	D E Clark	4/20/99							
1	1	Cog. Mgr. D. J. Carrell	D J Carrell	4/20/99							
		QA N/A									
		Safety N/A									
1	1	Env. B. G. Erlandson	B G Erlandson	4/20/99							

18.	19.	20.	21. DOE APPROVAL (if required)
D. E. Clark Signature of EDT Originator — 4/20/99 Date	N/A Authorized Representative for Receiving Organization — Date	N/A D J Carrell Design Authority/ Cognizant Manager — 4/20/99 Date	Ctrl No. ◯ Approved ◯ Approved w/comments ◯ Disapproved w/comments

Control of Airborne Radioactive Emissions for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)

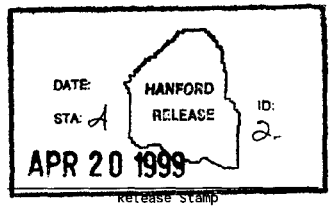
David E. Clark
Lockheed Martin Hanford Corporation, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 626592 UC: 2030
Org Code: 7B200 Charge Code: 101785/CA30
B&R Code: EW3120071 Total Pages: 62

Key Words: ALARACT, Radioactive Emissions, Environmental, Washington State Department of Health

Abstract: This document contains ALARACT Demonstrations identifying agreements made between LMHC, FDH, DOE-RL, and the Washington State Department of Health for frequently performed work activities in TWRS. These ALARACTs do not cover new activities, modifications, construction, or decontamination and decommissioning activities.

4/20/99
Release Approval Date



Release Stamp

Approved for Public Release

Control of Airborne Radioactive Emissions for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)

D. E. Clark
Lockheed Martin Hanford Corp.

Date Published
April 1999

Prepared for the U.S. Department of Energy

FLUOR DANIEL HANFORD, INC.
P.O. Box 1000
Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Control of Airborne Radioactive Emissions for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)

1.0 PURPOSE AND SCOPE

This document describes the requirements, responsibilities, and actions for ensuring compliance with As Low As Reasonably Achievable Control Technology (ALARACT) requirements in TWRS.

The purpose of these ALARACT demonstrations are to document those activities that are conducted by Department of Energy contractors within tank farm facilities and are not to be used for new activities, modifications, construction, or D&D as defined in WAC 246-247. ALARACT demonstrations may be used to cover "SIMILAR WORK" in a Notice of Construction by attaching a copy of the applicable ALARACT. The applicable sections of an ALARACT are the methods of radiological control, monitoring, and records/documentation that will be followed when conducting a portion of a new activity. These sections must be adhered to. Any potential emissions associated with the use of an ALARACT demonstration must be captured in the potential emissions estimate.

The Washington State Department of Health requested that these frequently performed activities be described and formalized into specific ALARACT Demonstrations for individual activities, thus describing the operations (including the necessary controls and periodic confirmatory measurements required). Attachment A contains each approved ALARACT Demonstration that shall be used for frequently performed TWRS work activities.

Many activities in the Tank Farms have been performed over the past several years through an approved Routine, Exempt and Approved Tank Farms Activities (Routine List) list (dated 1/9/96). The activities described in the Routine List were grouped as follows:

1. Routine activities that occurred at registered sources, or that do not create a potential new pathway for air emissions from unregistered sources.

2. Activities providing a new pathway for potential emissions to the air.

3. Use of containment tents.

4. Pit Decontamination within Tank Farms & Ancillary Facilities.

5. Size Reduction of Waste Equipment for Disposal.

6. Removal of contaminated equipment from Tank Farms and Ancillary Facilities.

7. Characterization Activities.

Each activity provided examples of routine operations and environmental controls associated with the operation. These activities will now be covered under the following distinct ALARACT demonstrations.

Some of the ALARACT Demonstrations reference the Containment Selection Guide. This is contained in Attachment B for ease of operations use.

2.0 SOURCES

The following is a list of the Washington State Department of Health approved ALARACT Demonstrations:

1. ALARACT 1, "TWRS ALARACT Demonstration for Riser Preparation/Opening."
2. ALARACT 2, "TWRS ALARACT Demonstration for Installation/Operation/Removal of Push Mode Core Sampling Equipment."
3. ALARACT 3, "TWRS ALARACT Demonstration for Installation/Operation/Removal of Auger Sampling Equipment."
4. ALARACT 4, "TWRS ALARACT Demonstration for Packaging and Transportation of Waste."
5. ALARACT 5, "TWRS ALARACT Demonstration for Soil Excavation (using hand tools)."
6. ALARACT 6, "TWRS ALARACT Demonstration for Pit Access."
7. ALARACT 7, "TWRS ALARACT Demonstration for Tank Waste Grab Sampling."
8. ALARACT 8, "TWRS ALARACT Demonstration for Vapor Sampling."
9. ALARACT 9, "TWRS ALARACT Demonstration for Light Duty Utility Arm (LDUA) (Passive)."
10. ALARACT 10, "TWRS ALARACT Demonstration for Water Lancing."
11. ALARACT 11, "TWRS ALARACT Demonstration for Waste Transfers."
12. ALARACT 12, "TWRS ALARACT Demonstration for Packaging and Transportation of Equipment and Vehicles."
13. ALARACT 13, "TWRS ALARACT Demonstration for Installation, Operation, and Removal of Tank Equipment."
14. ALARACT 14, "TWRS ALARACT Demonstration for Pit Work."

3.0 DEFINITIONS

The following definitions have been agreed upon for use in the ALARACT Demonstrations:

Contained. "Containing" an item or area is not limited to the concept of total enclosure but also includes engineered barriers, which may be applied in varying degrees, to prevent the spread of contamination.

Continuous HPT Coverage. This is sufficient to immediately influence or stop work based on observed radiological conditions and/or work practices.

Decontamination. Includes draining of Liquids in a system if applicable.

Existing. Any system, component, riser, inlet port etc that currently is in the farms and may act as an emission source.

Intermittent Coverage. This should be sufficient to monitor and verify radiological conditions and frequent enough to exclude any reasonable potential for unmonitored change.

Periodic Confirmatory Measurement. Requirement that the Washington State Department of Health accepts as monitoring data to ensure that the ALARACT demonstrations are being met.

Post-Job. HPT to perform post-job survey of work area to verify radiological conditions are at pre-job levels or better.

Radiological Surveys. The ALARACT demonstrations were developed for WDOH for the purpose of air emissions. The radiological surveys indicated for the demonstrations are swipes for removable contamination. These demonstrations do not exempt dose rate and direct contamination surveys from being performed in the assessment of radiological work conditions.

Swipes/Smears. These items are interchangeable. The term swipe is used in the ALARACT demonstrations.

4.0 PROCESS FOR UPDATING APPROVED ALARACT DEMONSTRATIONS

The purpose of these ALARACT demonstrations are to document those activities that are conducted by Department of Energy contractors within tank farm facilities and are not to be used for new activities, modifications, construction, or D&D as defined in WAC 246-247. ALARACT demonstrations may be used to cover "SIMILAR WORK" in a Notice of Construction by attaching a copy of the applicable ALARACT. The applicable sections of an ALARACT are the methods of radiological control, monitoring, and records/documentation that will be followed when conducting a portion of a new activity. These sections must be adhered to. Any potential emissions associated with the use of an ALARACT demonstration must be captured in the potential emissions estimate.

If it is determined by LMHC, FDH, DOE-RL, or WDOH that an approved TWRS ALARACT Demonstration needs to be updated, corrected, or amended, the following change process shall be followed:

1) The party that identifies the need for a change(s) shall send an electronic mail message to the other signing parties identifying that a change is needed to ALARACT #.

2) A conference call shall be arranged with on-site representatives of LMHC, FDH, DOE-RL, and WDOH to discuss the issue and determine if a change is necessary. If it is agreed that no change to the ALARACT Demonstration is required, no further action is needed and a telecon memo will be generated.

3) If a change to the text of an ALARACT Demonstration form is necessary, the agreed upon text changes will be made by the LMHC representative and provided to FDH, DOE-RL, and WDOH for review/concurrence. An electronic mail message from each of the four parties will be sufficient to signify agreement with the final wording. If necessary, a conference call shall be arranged with all parties involved for any final adjustments to the wording of the agreed changes.

4) Upon receipt of an electronic mail message from all parties that the revised or added wording to the ALARACT Demonstration is acceptable, the new ALARACT Demonstration will be initialed by all required signatories, with copies provided to each, and issued for implementation.

5.0 ALARACT DEMONSTRATION SIGNATURES

Attachment C lists the ALARACT Demonstration approval signatures.

ATTACHMENT A

TWRS ALARACT DEMONSTRATIONS

TWRS ALARACT DEMONSTRATION FOR RISER PREPARATION/OPENING

P John Martell FOR AWC Washington State Department of Health	10-29-98 Date
R D Bryson U.S. Department of Energy - Richland Operations	9/1/98 Date
William D Adair Fluor Daniel Hanford	8/27/98 Date
Charles D Kane Lockheed Martin Hanford Corporation	8/25/98 Date

TWRS ALARACT DEMONSTRATION FOR RISER PREPARATION/OPENING

1. Description of Activity:

Risers may have screw caps, blind flanges, shield plugs, or equipment installed in them. Preparation may include the following:

Screw caps: A pre-work survey is completed of the riser and the area around the riser. Soil covering is installed around the riser. If the riser or screw cap is highly contaminated, a glove bag may be installed to control contamination spread. Slight contamination is wiped off the riser with damp rags.

Blind flanges: A pre-work survey is completed of the riser and the immediate work area around the riser, a glove bag may be used to contain the blind flange during removal. Slight contamination is removed with damp rags.

Shield plugs and other equipment to be removed from risers: Risers may have various types of equipment installed. The equipment will be installed and removed per ALARACT 13. To open the riser, it will be necessary to remove the equipment. A pre-work survey is completed of the riser, installed equipment, and the area around the riser. Soil covering is installed around the risers. If necessary, glove bags or sleeving may be used on smaller pieces of equipment to be removed. Larger items may require the need for a windbreak or containment tent.

When the riser is opened, Industrial Hygiene samples may be taken.

All containments used are in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

Soil covering may be of a material such as, plastic sheeting, rubber matting, foil backed paper, griflon, or any material which will prevent possible contamination from reaching the soil.

The riser will be closed after all riser activities are completed.

- Emission Pathway - Existing active and passive point sources
- TWRS Facility Description - All TWRS facilities

2. Radiological Controls:

   - Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
   - Follow TWRS ALARACT demonstration for "Installation, Operation, and Removal of Equipment (ALARACT 13)
   - Pre-job survey is performed
   - Use approved containment guideline matrix from HNF-IP-0842, latest revision
   - Do not open risers if sustained winds are >25 mph
   - Open riser time will be minimized
   - HPT coverage will be performed as specified in the Radiological Work Permit

3. Monitoring:

   - Radiological surveys (swipes for removable contamination) of work area
   - Post job survey

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

ALARACT 2

TWRS ALARACT DEMONSTRATION FOR INSTALLATION/OPERATION/REMOVAL OF PUSH MODE CORE SAMPLING EQUIPMENT

Washington State Department of Health	9-2-98 Date
U.S. Department of Energy - Richland Operations	9/1/98 Date
Fluor Daniel Hanford	8/27/98 Date
Lockheed Martin Hanford Corporation	7/20/98 Date

TWRS ALARACT DEMONSTRATION FOR INSTALLATION/OPERATION/REMOVAL OF PUSH MODE CORE SAMPLING EQUIPMENT

1. Description of Activity:

Push Mode Core Sampling (PMCS) is conducted with the Rotary Mode Core Sampling (RMCS) System. The RMCS System can operate in either push mode or rotary mode. The preferred mode of RMCS sampling is push mode, which does not involve rotation of the drill string or significant purge gas flow, and is the subject of this ALARACT demonstration. Each RMCS System consists of the sample truck, an optional diesel powered electric generator, an optional in-tank video camera, a pressurized nitrogen supply, and other support equipment. In addition to the three RMCS Systems, there is one PMCS System that operates only in push mode.

Core Sampling system set up and sampling are controlled by operating procedures. Prior to moving the RMCS truck and equipment onto a tank, a walk down is performed. The walk down identifies any physical obstructions/barriers to truck placement and verifies the riser locations. The Core Sampling truck and equipment are then moved to the tank farm for system set up. System set up includes installation of the riser sleeve and riser equipment. This requires that the riser flange cover be removed. Following removal of the riser flange cover, the riser sleeve and riser adapter equipment are installed. This equipment seals against the riser flange, protecting the air pathway. The time between the removal of the flange cover and installation of the riser adapter equipment is kept to the minimum necessary to safely complete the task. HPT coverage is provided the entire time the riser is open.

The operation of core sampling begins by inserting a drill string made up of drill rod sections, into the waste. The first section to be installed is the core barrel in which the core sampler itself is seated. The rotary mode core samplers contain a seal against the bottom of the core barrel. The seal is designed to prevent back flow of tank waste into the drill string. This protects the air pathway out of the tank. The remaining drill rod sections are screwed on to the drill string and inserted into the tank until the starting point for the first core sample segment is reached.

After the first core sample segment has been taken, additional drill string sections and samplers may be added as needed. During push mode sampling, nitrogen gas (or other fluid such as water) is used only in amounts sufficient to maintain the hydrostatic head and prevent or minimize movement of tank waste into the core barrel.

When the segment is complete, the drill string is disconnected from the core sample truck and is capped. The core sampler truck platform is rotated to align and connect the shielded receiving vessel ("shielded receiver") with the drill string. During the connection the air pathway is protected by closed valves on the shielded receiver and on the adapter on the end of the drill string.

When the sampler is removed from the tank, it is placed directly into the shielded receiver without disturbing the air tight seal between the shielded receiver and the drill string. The isolation valves on the shielded receiver and the drill string adapter are closed before disconnecting the shielded receiver from the drill string. The truck platform then rotates to place the shielded receiver either directly over a shipping cask, or the shielded receiver may be positioned over an x-ray machine to allow the sampler to be x-rayed. In either case, the sealed drill string remains in place at the tank riser to maintain the seal to the atmosphere. From the shielded receiver, the sampler is mechanically lowered into a transport cask. Once the sampler is in the transport cask and the shielded receiver has been disconnected, the cask is immediately sealed.

While the sampler is being replaced after each segment, with the RMCS System, nitrogen is injected into the drill string at approximately 0.03 cubic meter per minute. This maintains the hydrostatic head in the drill string, minimizing waste from entering the drill string. This also allows for pressurization and depressurization of the shielded receiver, as necessary, for sampler change out. For the PMCS System, water is used to maintain the hydrostatic head.

Once a complete core has been obtained, the RMCS truck can be repositioned on the same riser or moved to a different riser on the same tank to obtain additional cores. During RMCS breakdown, the drill string is sleeved as it is removed from the tank and placed into a waste container. When sampling is complete at one tank, the RMCS system will be disconnected and moved to the next tank.

- Emission pathway - Existing active and passive point sources (Displacement gas used in drill string which is a closed system and has minimal/no emission impact)

- TWRS facility description - All SST's, DST's and IMUST's

2. Radiological Controls:

- When opening riser, use TWRS ALARACT demonstration controls for "Riser Preparation/Opening" (ALARACT 1)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- HPT coverage will be performed as specified in the Radiological Work Permit
- Do not initiate sampling activities if sustained winds are >25 mph
- Valves, caps, plugs, used to minimize open riser time
- Core sampler seal in place
- Threaded connections and/or cam-locks
- Verify passive or active HEPA filtration on tanks

3. Monitoring:

- Radiological surveys (swipes for removable contamination) of work area
- Post job survey(s)

4. Records/Documentation:

- Work package
- Radiological work permit
- Radiological survey report(s)

TWRS ALARACT DEMONSTRATION FOR INSTALLATION/OPERATION/REMOVAL OF AUGER SAMPLING EQUIPMENT

Washington State Department of Health	9-2-98 Date
U.S. Department of Energy - Richland Operations	9/1/98 Date
Fluor Daniel Hanford	8/27/98 Date
Lockheed Martin Hanford Corporation	7/20/98 Date

TWRS ALARACT DEMONSTRATION FOR INSTALLATION/OPERATION/REMOVAL OF AUGER SAMPLING EQUIPMENT

1. Description of Activity:

Auger sampling represents one technique to remove a sample from tanks which have less than 25 vertical inches of hardened waste material. The auger sampling assembly uses the auger "bit" to obtain a sample of tank waste. Auger sampling equipment consists of an auger "bit", auger rod, auger sleeving assembly, receiving cask, and an on-site transfer cask (OTC).

To begin, a tank riser is opened and the auger adapter sleeving assembly is installed into the tank headspace. The installation of the auger sleeving assembly reduces open riser time. The auger sleeving assembly provides lateral strength to the auger bit and auger rod, and extends from the riser to the top of the waste surface. The receiver cask is then mounted on top of the auger adapter sleeving assembly via a camlock fitting. This camlock fitting seals the receiver cask to the auger adapter assembly which is sealed to the riser, thereby minimizing the open riser time.
The auger rod and auger bit assembly are lowered through the top of the receiver cask assembly, through the interior of the auger sleeving assembly, down to the surface of the tank waste. The portion of the auger rod extending above the riser is then hand rotated forcing the auger bit to penetrate the tank waste. The tank waste material fills the grooves (flutes) of the auger bit and this constitutes the waste sample.

The auger bit (now containing the sample) and auger rod are pulled up from the tank waste surface, through auger sleeving, and into the receiver cask on top of the riser. During this sample removal step, the auger rod exits the top of the receiver cask into the ambient environment. The auger rod is surveyed for contamination as it is extracted and contained if found to be contaminated. When the auger bit (sample) is within the receiver cask, a ball valve, mounted on the bottom of the receiver cask is closed. The receiver cask is then isolated by placing a temporary cover over the auger rod port.

The receiver cask is moved via crane to the OTC. Once the receiver cask has been connected by a cam lock to the OTC, a handle is connected to the auger bit through the top of the receiver cask and the sample is lowered into the cask. The OTC is sealed and then provides a shipping container for the auger sample.

- Emission pathway - Existing active and passive point sources
- TWRS facility description - All TWRS SST's, DST's and IMUST's

2. Radiological Controls:

   - Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
   - Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
   - HPT coverage will be performed as specified in the Radiological Work Permit
   - Do not initiate auger sampling if sustained winds are >25 mph
   - Use valves, caps, and plugs to minimize open riser time
   - Cam locks used to secure receiving cask to riser and shipping cask
   - Verify passive or active HEPA filtration on tanks
   - Contain contaminated equipment
   - Temporary cover placed on top of receiving cask
   - Sample contained when in shipping cask

3. Monitoring:

   - Radiological surveys (swipes for removable contamination) of work area
   - Post job survey(s)

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

ALARACT 4

TWRS ALARACT DEMONSTRATION FOR PACKAGING AND TRANSPORTATION OF WASTE

Washington State Department of Health	10/22/98 Date
U.S. Department of Energy - Richland Operations	10/5/98 Date
Fluor Daniel Hanford	9/30/98 Date
Lockheed Martin Hanford Corporation	9/16/98 Date

TWRS ALARACT DEMONSTRATION FOR PACKAGING AND TRANSPORTATION OF WASTE

1. Description of Activity:

Some materials become contaminated during work conducted within all TWRS facilities. Such contaminated materials, which are not released or otherwise controlled, are handled as radioactive waste. Radioactive waste generated from Tank Farms operations activities such as pit work, excavations, surveillances, housekeeping, maintenance and tank sampling, will be double contained at a minimum. A radiological survey is conducted prior to storage or transportation of the outer-most container to verify that removable contamination meets the requirements under the Radiological Controls section.

- Emission pathway - Existing passive point sources
- TWRS facility description - All TWRS facilities (Except special nuclear material in 2718-E)

2. Radiological Controls:

- Double contained and closed (At a minimum)
- <1,000 dpm/100cm^2 beta/gamma on the outer-most container
- <20 dpm/100cm^2 alpha on the outer-most container (Unless exempted by the latest revision of the "Justification for Dual Survey Exemption in Tank Farm Facilities," HNF-3391)

3. Monitoring:

- Radiological surveys (swipes for removable contamination) of work area
- Post job survey(s)

4. Records/Documentation:

- Radiological survey report(s)
- Radiological work permit

ALARACT 5

TWRS ALARACT DEMONSTRATION FOR SOIL EXCAVATION (USING HAND TOOLS)

Washington State Department of Health	4-5-99 Date
U.S. Department of Energy - Richland Operations	3/15/99 Date
Fluor Daniel Hanford	3/1/99 Date
Lockheed Martin Hanford Corporation	2/20/99 Date

Rev. 0
2/18/99

TWRS ALARACT DEMONSTRATION FOR SOIL EXCAVATION (USING HAND TOOLS)

1. Description of Activity/Requirements:

Soil is routinely excavated in the TWRS facilities to support riser preparation, repair and maintenance activities, soil sampling, cleanup of contamination, removal of vegetation and biological hazards, and operational activities (laying conduit or cables for power). An initial survey is performed of the area to be excavated. Surveys are performed throughout the excavation to assure that worker safety and environmental protection is maintained. Once the excavation begins, water is used, as necessary, to prevent the spread of dust. To the extent practicable using hand held instrument field survey techniques, the clean soil is separated from the soil identified as contaminated. The contaminated soil has a fixative applied or is covered by plastic at the end of the shift, and as necessary, to stabilize the contaminated soil. The activities covered by this ALARACT demonstration do not include D&D. All radioactively contaminated soil excavation is conducted using hand tools.

2. Radiological Controls:

- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- HPT coverage will be performed as specified in the radiological work permit.
- A beta-gamma survey of the ground surface is required prior to excavation in Contamination Areas (CA's), High Contamination Areas (HCA's), Soil Contamination Areas (SCA's), and Underground Radioactive Material Areas (URMA's). An alpha survey may be required prior to excavation per the "Justification for Dual Survey Exemption in Tank Farm Facilities" HNF-3391.
- For excavation in CA's, HCA's, SCA's, and URMA's, if beta-gamma activity greater than 1000 dpm/probe area (5000 dpm/100cm^2) is identified, alpha surveys will also be performed.
- Suppressants such as water, fixatives, covers, or windscreens will be used as necessary, including at the end of each shift or when sustained or predicted winds are >20mph.
- If the net alpha for the general area is greater than 140 dpm/probe area, OR if the net beta-gamma activity for the general area is greater than 500,000 dpm/probe area, work will be suspended and worker safety evaluated by TWRS Radiological Control. Direct contact will also be made to WDOH. After it is determined that there is no threat to worker safety, WDOH has been

contacted, and the proper controls (e.g., water fixatives, covers, windscreens) have been put in place, excavation may continue. A contact of WDOH will not be needed if the contamination consists of a hot speck. If hot specks are detected during the radiological surveys, the specks will be removed and contained before the activity is allowed to continue unless located in the bottom of the trench after excavation has been completed. Specks found in the bottom of the completed trench may be covered with clean fill. A hot speck will be defined as a very small amount (i.e. less than or equal to 100 cm^2) of contamination reading greater than or equal to 1,000,000 dpm/probe size beta-gamma and/or greater than or equal to 490 dpm/probe size alpha.

3. Monitoring:

   - Radiological surveys (direct surveys of soil)
   - Post job survey(s)

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

5. Emission Pathway:

   - Existing passive (fugitive/diffuse)

6. TWRS Facility Description:

   - All TWRS facilities

ALARACT 6

TWRS ALARACT DEMONSTRATION FOR PIT ACCESS

P John Martell for AWC Washington State Department of Health	4-5-99 Date
U.S. Department of Energy - Richland Operations	3/15/99 Date
2-26-99 Fluor Daniel Hanford	3/1/99 Date
2-18-99 Lockheed Martin Hanford Corporation	2/20/99 Date

Rev. 0
2/18/99

TWRS ALARACT DEMONSTRATION FOR PIT ACCESS

This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

1. Description of Activity/Requirements:

PREPARATION WORK: A pre-job survey is performed on the exterior surface of the pit and the surrounding area. A fall protection handrail is installed around the pit. The fall protection is draped in plastic sheeting that extends to the top of the pit. This establishes a splash guard around the pit. Before the cover blocks are removed, an approved fixative may be applied inside the pit or the pit may be decontaminated as described below. These processes are generally performed through an access port. If there is no access port(s), the cover blocks are raised and suspended, a radiological survey is performed, and/or a fixative may be applied inside the pit as described in Section 2, Radiological Control. The cover blocks are removed.

DECONTAMINATION: Uniformly distributed removable contamination levels in the pit are decontaminated/fixed to less than 100,000 dpm/100cm^2 beta/gamma and 2,000 dpm/100cm^2 alpha by washing and/or an approved fixative is applied to pit surfaces. Fixative will matrix the contamination to ensure minimization of potential airborne contamination. If a high pressure (up to 3,000 psi) or low pressure (approximately 125 psi) whirly is installed, it is done through an opening (if one exists) in the cover blocks and the pit is washed down. The cover blocks are lifted and contained if the removable level is greater than 50,000 dpm/100 cm^2 beta/gamma and 20 dpm/100 cm^2 alpha. The cover blocks are then moved to a storage area. With the cover blocks off, additional decontamination activities may include the use of chemicals, peel and strip paints, water, or manual scrub brushes. When decontamination activities are complete, other work may begin or a temporary cover is installed over the pit.

CLOSURE: After all activities in the pit are completed, the cover blocks are reinstalled and the splash guard is removed.

2. Radiological Controls:

- Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- Use of a splash guard extending to the edge of the pit

- Uniformly distributed removable contamination levels within the pit are decontaminated or fixed so that a swipe reads less than 100,000 dpm/100 cm^2 beta/gamma and 2,000 dpm/100 cm^2 alpha. An approved fixative will be applied to pit surfaces if contamination levels exceed the limits stated above or as needed. Note: The fixative will matrix the contamination to ensure minimization of potential airborne contamination.
- Splash guard will be taped or sealed to the edge of the pit
- Pit work will not be performed if sustained winds are >25 mph
- HPT coverage will be performed as specified in the Radiological Work Permit

3. Monitoring:

- Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.
- Swipes will be taken to determine that splash guards are to be maintained below 50,000 dpm/100 cm^2 beta/gamma and 20 dpm/100 cm^2 alpha
- Post job survey(s)

4. Records/Documentation:

- Work package
- Radiological work permit
- Radiological survey report(s)

5. Emission Pathway:

- Existing passive non-point sources

6. TWRS Facility Description:

- Pits at all TWRS facilities
- This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

ALARACT 7

TWRS ALARACT DEMONSTRATION FOR TANK WASTE GRAB SAMPLING

John Martell FOR ALWE Washington State Department of Health	10-29-98 Date
For D. Bryson U.S. Department of Energy - Richland Operations	10/22/98 Date
William D. Adair Fluor Daniel Hanford	10/12/98 Date
Lockheed Martin Hanford Corporation	9/24/98 Date

TWRS ALARACT DEMONSTRATION FOR TANK WASTE GRAB SAMPLING

1. Description of Activity:

Grab sampling is used to obtain small volume samples of tank waste materials. Individual samples are typically <1 liter, but multiple samples can be taken from the tank. The sampled material consists of liquid, sludges, and solids. Grab sampling techniques are suitable for relatively soft waste. If the waste material is too thick or hard, other sampling techniques (such as core sampling) may be required.

Grab samples are acquired through tank risers. A riser is prepared for grab sampling by first installing a riser adapter called a 'top hat'. The top hat acts as a temporary seal for the open riser to minimize open riser time. The next step is to install a glove bag over the tank riser.

The sampling assembly consists of a sample device suspended on a wire cable. The most commonly used sample devices are a bottle in a weighted bottle holder, and a finger sampler. The bottle is used when the waste material is primarily liquid, while the finger sampler is used to sample relatively solid material.

The sample assembly is placed into the glovebag, the glovebag is closed and the riser is opened. The sample device is lowered with a hand operated winch, the waste sample collected, and retrieved from the tank. If the collected sample is a bottle, the bottled is capped, bagged and placed into a shielded container. If the sample is collected in a finger sampler, the waste is transferred to a secondary container, bagged and placed into the shielded container. The shielded container with the waste sample is then transferred outside the glovebag through an ante-chamber. The glovebag ante-chamber isolates the open riser during sample transfer.

When sampling is finished, the glove bag is collapsed, venting air through a small HEPA type filter, and all contaminated sampling equipment contained inside is disposed as waste.

A small percentage of grab sampling jobs are performed on top of a tank riser without a glovebag. An example would be raising a saltwell pump (accessed from within a pit) and sampling between the pump legs and the saltwell screen. Such sample jobs are controlled through work planning utilizing the Radiological Control Containment Guide Matrix (contained in HNF-IP-0842, latest revision).

- Emission pathway - Existing active and passive point sources
- TWRS facility description - All TWRS SST's, DST's and IMUST's

2. Radiological Controls:

   - Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
   - Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
   - Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6), if applicable
   - HPT coverage will be performed as specified in the Radiological Work Permit
   - Do not initiate sampling if sustained winds are >25 mph
   - Use riser adapter to minimize open riser time
   - Samples contained prior to placement in a shielded container
   - Sample contained when in shipping cask
   - Contain contaminated equipment
   - Use approved containment guideline matrix from HNF-IP-0842, latest revision

3. Monitoring:

   - Radiological surveys (swipes for removable contamination) of work area
   - Post job survey(s)

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

ALARACT 8

TWRS ALARACT DEMONSTRATION FOR VAPOR SAMPLING

Washington State Department of Health	10-29-98 Date
U.S. Department of Energy - Richland Operations	10/22/98 Date
Fluor Daniel Hanford	10/12/98 Date
Lockheed Martin Hanford Corporation	9/24/98 Date

TWRS ALARACT DEMONSTRATION FOR VAPOR SAMPLING

1. Description of Activity:

There are two methods to collect vapor samples from waste tanks: grab sampling (with SUMMA canisters), and In-Situ Vapor Sampling (ISVS or Type IV) equipment. SUMMA is an evacuated container. Other equivalent evacuated containers may be used in its place.

SUMMA VAPOR SAMPLING

SUMMA sampling equipment consists of a riser adapter (not used for drill string vapor samples), sample tubing, and SUMMA canisters.

To begin SUMMA sampling, a tank riser is opened and the riser adapter is installed. The riser adapter contains sampling tubes that extend above the top of the riser and continue down into the tank headspace. The sampling tubes are fitted with isolation valves. An installed riser adapter with the sample tube valve closed isolates the tank vapor space from the ambient environment.

In the first step, the sampling tube is purged using portable industrial hygiene instruments and the headspace vapor is drawn into the tube. A tank headspace sample is collected by attaching a SUMMA canister to the top end of a sampling tube and opening the valve. The SUMMA canister, an evacuated container, allows the tank headspace gas to be pulled into the container. The self-contained sample canister is shipped to a laboratory for analysis.

When vapor sampling is finished, the riser adapter/tubing assembly is removed, surveyed by an HPT, and placed into containment sleeving if found contaminated. If a riser is used, a cap or flange is then installed.

TYPE IV VAPOR SAMPLING

The second method of vapor sampling is the In-Situ Vapor sampling (ISVS or Type IV sampling) method. Contrasting SUMMA grab sampling, ISVS sample media is directly exposed to tank vapor gases by placement in the tank headspace. The ISVS sampling equipment consists of a riser adapter, an air pump mounted on a handcart, a manifold for connecting sample tubing, tube bundle assembly which has a sampling head containing the sample media, and the sample media.

The sampling begins by opening a tank riser designated for sampling; installing the riser adapter; inserting the plastic sleeved sample tubes (with the sampling head/media attached) into the riser to the required sampling depth; attaching the sample tubes to the air pump handcart; sampling for a period of time; removal of the sample lines and sample media; removal of the riser adapter and closing the riser; packaging the samples for shipment to a laboratory; packaging waste for eventual disposal.

- Emission pathway - Existing active and passive point sources
- TWRS facility description - All TWRS SST's, DST's and IMUST's

2. Radiological Controls:

- Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- HPT coverage will be performed as specified in the Radiological work permit
- Use riser adapter to minimize open riser time
- Verify passive or active HEPA filtration on tanks
- HEPA-type filtration in sample line
- Contain contaminated equipment
- Sample contained when in shipping container

3. Monitoring:

- Radiological surveys (swipes for removable contamination) of work area
- Post job survey(s)

4. Records/Documentation:

- Work package
- Radiological work permit
- Radiological survey report(s)

ALARACT 9

TWRS ALARACT DEMONSTRATION FOR LIGHT DUTY UTILITY ARM (LDUA)

P John Martell for Washington State Department of Health	4-5-99 Date
U.S. Department of Energy - Richland Operations	3/4/99 Date
Fluor Daniel Hanford	2/21/99 Date
Lockheed Martin Hanford Corporation	12/28/98 Date

Rev. 0
10/23/98

TWRS ALARACT DEMONSTRATION FOR LIGHT DUTY UTILITY ARM (LDUA)

1. Description of Activity/Requirements:

The Light Duty Utility Arm is a long robotic manipulator arm that is installed, operated, and removed in waste tanks through existing tank risers. A variety of tools (called 'end effectors') can be installed on the end of the arm to perform activities such as: sampling waste materials, tank surveillance and inspections, manipulating in-tank equipment, and performing in-tank analysis of waste properties. The end effectors may be locally waste disturbing near the waste surface (up to 12 inches deep) by probing, scraping, grabbing or sampling tank waste at various locations within the tank. In addition, the end effectors may be used to place monitoring equipment onto or into tank waste.

The manipulator arm is maintained in a housing on a truck that transports the equipment. The truck contains equipment for vertical and horizontal positioning of the arm and housing. The manipulator arm, housing, and positioning equipment is collectively called the Vertical Positioning Mast (VPM).

The riser is opened per ALARACT 1 and a riser isolation valve is installed. The VPM is connected to the riser isolation valve with the Tank Riser Interface and Confinement (TRIC) system. The TRIC provides radiological confinement when the riser isolation valve is open. The TRIC contains gloved ports for hands-on activities, access to change end effectors, and to allow vapor sampling. The TRIC is equipped with a HEPA-type filter.

A decontamination system provides for gross removal of external contamination from the mast, arm, and end effector. The decontamination system is attached to the bottom of the confinement enclosure. The decontamination system sprays a ring of water through which the mast, arm, and end effector are withdrawn from the tank and into the housing of the VPM.

When the LDUA is operated in a waste tank, a purge system provides a constant low volume flow of instrument grade air into the LDUA, VPM, and any end effectors. The purge air creates a positive pressure inside the system. This is required for operation in flammable gas environments and also minimizes radioactive contamination from entering the in-tank components. The purge gas exits through the TRIC HEPA-type filter or the tank ventilation system.

2. Radiological Controls:

   - Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
   - Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
   - HPT coverage will be performed as specified in the Radiological Work Permit
   - Verify passive or active HEPA filtration on tanks
   - The LDUA TRIC will not be set up or removed if sustained winds are >25 mph
   - Riser isolation valve minimizes open riser time
   - HEPA-type filter equipped TRIC. The HEPA-type filter is tested by the manufacturer and used once per tank evolution.
   - VPM Housing

3. Monitoring:

   - Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.
   - Post job survey(s)

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

5. Emission Pathway:

   - Existing active and passive point sources

6. TWRS Facility Description:

   - All TWRS SST's, DST's, and IMUSTs

ALARACT 10

TWRS ALARACT DEMONSTRATION FOR WATER LANCING

Washington State Department of Health	11-18-98 Date
U.S. Department of Energy - Richland Operations	11/12/98 Date
Fluor Daniel Hanford	10/27/98 Date
Lockheed Martin Hanford Corporation	10/8/98 Date

Rev. 0
9/30/98

TWRS ALARACT DEMONSTRATION FOR WATER LANCING

1. Description of Activity:

Water lancing the waste in an underground storage tank is performed to determine the depth of the tank from the riser location and to prepare for equipment installation, such as salt well screens, jet pump assemblies and liquid observation wells. There are two types of water lances:

a) A long pipe approximately 7.62 cm in diameter with a single nozzle at the end. This design uses hot water (supplied by a truck) at low pressure, approximately 1034 kilopascals (150 psi). Use of this design may require the lance to be raised and lowered into the waste multiple times so that a large enough hole can be formed in the waste to accommodate the equipment to be installed in the hole.

b) A newer design lance has a 28 cm diameter pipe and multiple nozzles on the bottom to facilitate waste penetration. It is designed to create a large hole with one insertion of the lance into the waste. This design requires less (hot) water volume and operates at higher pressure, 20685 kilopascals (3000 psi).

In each case, a hose from a water truck is connected to the top end of the water lance. The water lance is inserted into a tank riser which has a water spray ring mounted within the riser. Additionally, a plastic sleeve is staged and tied off at the top of the lance for deployment during lance retrieval. During insertion of the water lance, air emissions are controlled by the use of the water spray ring. The water spray ring sprays water in the annulus between the outside diameter of the water lance and the inside diameter of the riser. The water lance is lowered until it penetrates the solid portions of the waste which need to be broken up to allow insertion of the saltwell screen or other equipment. The water lance withdrawal steps are the reverse of the insertion sequence. The water spray ring is used to wash radioactive tank waste from the outside of the water lance. Hand wiping of the lance may also take place immediately above the riser and below the plastic sleeving. Washing is repeated until radiation readings are <100 mrem/hr. If the lance cannot be decontaminated below 100 mrem/hr, the lance will be sleeved in plastic, removed from the tank, and stored. The pit or riser will be closed.

Contingency plans within the scope of this ALARACT demonstration are:

a) Removing the lance from the tank for further decontamination by washing, wiping or brushing. The activities will be conducted in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

b) Replacement of contaminated parts if they cannot be adequately decontaminated as noted in (a) above. This activity will be conducted in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

c) Packaging, storing and transporting the lance "as is" if the external dose rates exceed 100 mrem/hr.

As the water lance is withdrawn from the tank, it is placed inside a plastic sleeve (during the withdrawal process), surveyed, and stored until its next use.

The actual water lancing time (residence time in waste) usually ranges from 10 minutes to 4 hours with an average time of about 30 minutes. Riser open time is minimized.

- Emission pathway - Existing active and passive point sources
- TWRS facility description - All TWRS SST's, DST's, and IMUSTs

2. Radiological Controls:

- Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6), if applicable
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment" (ALARACT 12)
- During insertion and removal, radionuclide control is achieved by spraying the annulus between the lance outside diameter and riser inside diameter with water.
- Verify passive or active HEPA filtration on tanks
- Use approved containment guideline matrix from HNF-IP-0842, latest revision
- HPT coverage will be performed as specified in the Radiological Work Permit

3. Monitoring:

   - Radiological surveys (swipes for removable contamination) of work area
   - Post job survey(s)

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

ALARACT 11

TWRS ALARACT DEMONSTRATION FOR WASTE TRANSFERS

Washington State Department of Health	4-5-99 Date
U.S. Department of Energy - Richland Operations	3/15/99 Date
Fluor Daniel Hanford	3/1/99 Date
Lockheed Martin Hanford Corporation	2/20/99 Date

Rev. 0
2/18/99

TWRS ALARACT DEMONSTRATION FOR WASTE TRANSFERS

1. Description of Activity/Requirements:

Wastes are transferred to, from, and within actively ventilated tank farm storage facilities (i.e. double-shell tanks), chemical processing facilities, receiver vaults, mobile tanks, and evaporators. Wastes are also transferred from single-shell tanks during (and due to) salt well pumping. Transfers are made through a network of existing or to be installed above or below ground pipelines, operating equipment. Transfers also utilize the existing network of controls or transfer structures (currently in use, or constructed under a Notice of Construction) such as diversion boxes, valve pits, double contained receiver tanks, and diverter stations.

Jet, submersible, or transfer pumps are used to transfer waste at flow rates up to 300 gallons (1,132 liters) per minute. The cover blocks are reinstalled on the pits before starting any waste transfer operation.

Occasionally, water is added to a tank or transfer system to prevent or remove plugs. Other techniques to free blockages include chemical flushing, pressurization, temporary jumpers, hydraulic scouring, and the use of heat tracing. Flow rates and pressures used are determined by engineering evaluations. Flow into the sending/receiving tank is exhausted using a HEPA filtered vent.

2. Radiological Controls:

- Verify HEPA filtration on receiving tanks
- Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)
- Follow TWRS ALARACT demonstration for "Installation and Removal of Equipment from Tanks" (ALARACT 13)
- Follow TWRS ALARACT demonstration for "Pit Work" (ALARACT 14)

3. Monitoring:

   - Process parameters monitored include tank pressure alarms and annulus and primary tank exhaust CAMs.
   - Record samplers
   - Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.
   - Post job survey(s)

4. Records/Documentation:

   - Flow rate and pressure engineering evaluations
   - Work package
   - Radiological work permit
   - Radiological survey report(s)

5. Emission Pathway:

   - Existing active and passive point sources and fugitive non-point sources

6. TWRS Facility Description:

   - All TWRS facilities

ALARACT 12

TWRS ALARACT DEMONSTRATION FOR PACKAGING AND TRANSPORTATION OF EQUIPMENT AND VEHICLES

P John McCarthy FOR AWC Washington State Department of Health	1-5-99 Date
U.S. Department of Energy - Richland Operations	12/29/98 Date
William D. Adair Fluor Daniel Hanford	12/18/98 Date
Lockheed Martin Hanford Corporation	12/10/98 Date

Rev. 0
11/19/98

TWRS ALARACT DEMONSTRATION FOR PACKAGING AND TRANSPORTATION OF EQUIPMENT & VEHICLES

1. Description of Activity:

   Equipment and vehicles that become contaminated during work activities are reused when possible. If the equipment or vehicle is to be reused or stored in a contamination area, the removable activity levels on the surface of the item, or the outer-most container, must be in accordance with HSRCM-1, Table 2-4 (or latest revision). If the equipment or vehicle is to be transported to another facility, the surface of the item, or the outermost container, must meet the requirements under the Radiological Controls section listed below.

   - Emission pathway - Fugitive/diffuse sources
   - TWRS Facility Description - All TWRS facilities

2. Radiological Controls:

   Removable contamination on the surface of the item, or the outer-most container, must be <1,000 dpm/100cm^2 beta/gamma and/or <20 dpm/100cm^2 alpha if the equipment or vehicle is leaving the contamination area

3. Monitoring:

   - Radiological surveys (swipes for removable contamination) of work area
   - Post job survey

4. Records/Documentation:

   - Radiological work permit
   - Radiological survey report(s)

ALARACT 13

TWRS ALARACT DEMONSTRATION FOR INSTALLATION, OPERATION, AND REMOVAL OF TANK EQUIPMENT

Washington State Department of Health	Date 4-5-99
U.S. Department of Energy - Richland Operations	Date 3/15/99
Fluor Daniel Hanford	Date 3/1/99
Lockheed Martin Hanford Corporation	Date 2/20/99

Rev. 0
2/18/99

TWRS ALARACT DEMONSTRATION FOR INSTALLATION, OPERATION, AND REMOVAL OF TANK EQUIPMENT

1. Description on Activity/Requirements:

This ALARACT demonstration does not provide approval for the following activities: waste sampling, sluicing, lancing, operations of mixer pumps, and use of the LDUA. While operating under these activities, the applicable ALARACT demonstrations must be complied with.

A multitude of equipment may be installed, operated, and removed from tanks (actively and passively ventilated).

When installing and removing equipment from tanks, risers and pits are opened. ALARACT 1 (Riser Preparation/Opening) and ALARACT 6 (Pit Access) describe the activities necessary to prepare the risers and pits.

If water lancing is performed to assist in the installation of equipment, it will be done in accordance with ALARACT 10 (Water Lancing).

Equipment is lowered into and removed from tanks either manually or remotely (e.g. using a crane). Once the equipment is installed, mating surfaces of the equipment and riser are sealed.

All equipment removed from tanks is contained using glovebags, sleeving, or other containment devices in accordance with the latest revision of the containment matrix guide from HNF-IP-0842.

The riser is closed under ALARACT 1 (Riser Preparation/Opening) and the pit is closed under ALARACT 6 (Pit Access) following installation or removal of equipment.

Waste is packaged and transported per ALARACT 4 (Packaging and Transportation of Waste). Equipment is packaged and transported per ALARACT 12 (Packaging and Transportation of Equipment and Vehicles).

2. Radiological Controls:

- Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
- Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)
- Follow TWRS ALARACT demonstration for "Water Lancing" (ALARACT 10)

- Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)
- Equipment is decontaminated or contained when removed from tanks
- Swipes will be taken to determine that the surface of the item or the outermost surface of the container are maintained <50,000 dpm/100cm^2 beta/gama and/or <20 dpm/ 100cm^2 alpha
- HPT coverage will be performed as specified in the Radiological Work Permit
- Do not install or remove equipment if sustained winds are >25 mi/hr
- When containment is used, it will be in accordance with the latest revision of the containment matrix guide from HNF-IP-0842.

3. Monitoring:
   - Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.
   - Post job survey(s)
4. Records/Documentation:
   - Work package
   - Radiological work permit
   - Radiological survey report(s)
5. Emission Pathway:
   - Existing passive or active point & non-point sources
6. TWRS Facility Description:
   - All TWRS facilities

ALARACT 14

TWRS ALARACT DEMONSTRATION FOR PIT WORK

Washington State Department of Health	4-5-99 Date
U.S. Department of Energy - Richland Operations	3/15/99 Date
Fluor Daniel Hanford	3/1/99 Date
Lockheed Martin Hanford Corporation	2/20/99 Date

Rev. 0
2/18/99

TWRS ALARACT DEMONSTRATION FOR PIT WORK

This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

1. Description of Activity/Requirements:

When entering or exiting the pit, ALARACT 6 "Pit Access" must be complied with.

All equipment removed from the pit is decontaminated or contained. A temporary or permanent cover is placed over the pit if ever left unattended.

Installing pit leak detectors, unplugging drains, and housekeeping/waste removal activities are performed following the above description.

Specific activities performed in pits follows:

Jumper Work

Before any jumper work takes place, the affected lines are flushed (if possible) and an approved fixative is applied. The fixative will be applied in accordance with ALARACT 6 "Pit Access" and reapplied as necessary.

Swipes of the splash guard will be taken during the jumper work. If a used jumper is to be removed from the pit, it is drained and a fixative is applied. If removable contamination is greater than 50,000 dpm/100 cm^2 beta/gamma and/or 20 dpm/100 cm^2 alpha, the jumper will be contained and/or decontaminated.

If jumpers are cut, they are cut by hydraulic shears or a portable band saw within the pit. The pieces are contained before they are removed from the pit.

Pressure Testing Lines

A pressure test assembly is installed on the line to be tested in one pit. A blank with a drain is installed on the other end of the line in a separate pit. Temporary and/or permanent covers are placed over the pits during the pressure test.

2. Radiological Controls:

   - Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)
   - Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)
   - Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)
   - Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)
   - A splash guard will extend to the edge of the pit were it is taped or sealed.
   - Uniformly distributed removable contamination levels within the pit are decontaminated or fixed so that a swipe reads less than 100,000 dpm/100 cm^2 beta/gamma and 2,000 dpm/100 cm^2 alpha. An approved fixative will be applied to pit surfaces if contamination levels exceed the limits stated above or as needed. Note: The fixative will matrix the contamination to ensure minimization of potential airborne contamination.
   - If a used jumper is to be removed from the pit, it is drained and a fixative is applied. If removable contamination is greater than 50,000 dpm/100 cm^2 beta/gamma and/or 20 dpm/100 cm^2 alpha, the jumper will be contained and/or decontaminated.
   - A temporary or permanent cover is placed over the pit if the pit is ever left unattended
   - Pit work will not be performed if sustained winds are >25 mph
   - HPT coverage will be performed as specified in the Radiological Work Permit

3. Monitoring:

   - Radiological surveys of the work area as required by the work package. Swipes for removalbe contamination are required.
   - Swipes will be taken to determine that splash guards are maintained below 50,000 dpm/100 cm^2 beta/gamma and 20 dpm/100 cm^2 alpha
   - Post job survey(s)

4. Records/Documentation:

   - Work package
   - Radiological work permit
   - Radiological survey report(s)

5. Emission Pathway:

   - Existing passive non-point sources

6. Locations:

   - All TWRS facilities
   - This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

ATTACHMENT B

CONTAINMENT SELECTION GUIDE (PER HNF-IP-0842, Volume VII, Section 3.1)

Some of the ALARACT Demonstrations reference the Containment Selection Guide. This is contained in Attachment B for ease of operations use.

NOTE:

The copy of the Containment Selection Guide in Attachment B was current when HNF-4327, Revision 0 was issued. Since the ALARACTs require use of the "latest revision" of the matrix, check HNF-IP-0842, Volume VII, Section 3.1 to ensure that the most recent version is use to implement the ALARACTs.

Attachment B

Containment Selection Guide
(Attachment A of HNF-IP-0842, Volume VII, Section 3.1)

1.0 BASIS

The appropriate containment for a given task should be selected based on the fundamental concepts of contamination control and personnel safety. Table A-1, "Recommended Containments for Specific Work Activities", provides a worksheet format applying the guidance contained in this section.

The level of containment is broken down into four "risk" categories: very low, low, moderate, and high. These categories are somewhat subjective in nature and because of this, the table is a guide from which to begin the planning and evaluation process and is not intended to be the sole means of determining what level of containment should be used. Other considerations should include impact of containment failure, area dose rates, waste minimization, ventilation, etc. When all factors are considered, the final determination may vary from the matrix.

2.0 ASSESSMENT CRITERIA

Three primary criteria are used to determine the appropriate level of containment: removable contamination levels, contamination stability, and the work activity to be performed.

Secondary criteria are also considered as a second check of the result to allow for common sense adjustments. These other considerations should include impact of containment failure, area dose rates, waste minimization, ventilation, etc. When all factors are considered, the final determination may vary from the matrix.

In essence, the primary criteria are independent of the area the job takes place in, the secondary criteria customize the selection to the work area, ensuring the decision is appropriate.

2.1 Removable Contamination Levels

Removable contamination is defined as radioactive material that can be removed from surfaces by nondestructive means, such as casual contact, wiping, brushing, or washing. The table breaks the criteria down into three distinct categories: 1) less than 10 times Table 2-2 (<10,000 dpm $\beta\tau$, 200 dpm α); 2) 10 to 100 times Table 2-2 (10,000 to 100,000 dpm β-τ or 200 to 2000 dpm α); or 3) greater than 100 times Table 2-2 (>100,000 dpm β-τ, 2000 dpm α).

NOTE: IF the likely contamination levels cannot be obtained from survey or historical data, THEN the most limiting category should be used.

2.2 Contamination Stability

As noted above, removable contamination is defined as radioactive material that can be removed from surfaces by casual contact. Stability is a qualitative assessment of how easily this transfer occurs and how easily the contamination may be transported from surface to surface or surface to air. Contamination stability is broken into three categories: high, medium, and low. For example, contamination that, if disturbed, readily resuspends into the air would be categorized as low stability, while contamination suspended in liquid, or on a moist or oily surface, would generally be considered high stability; other contaminated surfaces would generally fall between these criteria based on surface texture, weathering, and a variety of other factors to be considered.

Table A-1: Recommended Containments for Specific Work Activities

Removable Contamination Level	Contamination Stability	Operation	Containment Category
<10 times Table 2-2 6	Very Stable 4	Simple material movement 5	Very Low Risk Total = 15-20
<100 times Table 2-2 12	Moderately Stable 8	Vigorous material movement 10	Low Risk Total = 21-31
>100 times Table 2-2 18	Low Stability 12	Use of power tools in area or manual cutting, shaping or abrading of material 15	Moderate Risk Total = 32-45
		Use of low velocity power tools to cut, shape or abrade material 20	High Risk Total >45
		Use of high velocity power tools to cut, shape or abrade material 25	
___	+ ___	+ ___	= ___

Instructions: Select the appropriate block from each of the first three columns. Add the numbers from the appropriate block in each column and select the appropriate containment class.

NOTES:

1. Removable contamination level refers to the DOE Radiological Control Manual Table 2-2.
2. Containment requirements may be revised up or down based on general area contamination levels, or dose rates, and personnel protection afforded (for example, respirators, ventilation, engineering controls).
3. When contamination levels cannot be verified, either by survey or historical data, the most limiting level for contamination should be used.
4. The values on the chart call for subjective analysis. The Radiological Control organization is responsible for making the final determination of the level of containment. This should be done in consultation with the line organization.

2.3 Work Activity

Work activities are those actions which will be performed in the contaminated portion of the work area. The containment selection process breaks work activities into five categories:

1. Simple material movement such as walking, lifting, carrying.

2. Vigorous material movement such as repackaging waste, HEPA filter manipulation, packing replacement, etc.

3. Using power tools in the area or manually cutting, abrading, or shaping the material.

4. Using low velocity power tools (portable band saws, electric drills operated at low speeds, etc.) on the contaminated components.

5. Using high velocity power tools (grinders, high-speed drills, etc.) on the contaminated components.

3.0 CONTAINMENT CATEGORIES

3.1 Very Low Risk

For tasks involving a very small risk of contamination spread, no specific containment beyond the administrative controls of good work practices would apply. This does not preclude using containment; experience and training of the work force would be the basis for containment selection. In this category, containment might be a damp rag, sleeving, an air curtain, or even a plastic bag.

No health physics technician certification or work package description of the containment is routinely required.

3.2 Low Risk

Tasks where the risk of contamination spread is low, but the containment device is specified. Examples of devices in this category are catch containments, drip pans, bull pens, sleeving, air curtains, etc.

No health physics technician certification of the containment is routinely required, but the work package describes the containment device/method.

3.3 Moderate Risk

Tasks where the risk of contamination spread is moderate and containment becomes total enclosure such as heavy sleeving, glovebags, or containment tents.

Health physics technician certification of the containment device is required. The work package should contain a certification checklist for the appropriate style of containment.

3.4 High Risk

Tasks where the risk of contamination spread is high and containment should be accomplished by ventilated tents or glovebags, used independently or in conjunction with each other.

Health physics technician certification of the containment device is required. The work package must contain a certification checklist (see below) for the appropriate style of containment.

Containment Tent Certification Checklist			
Location		Work Package #	
Activity			
Check if waived *	Check if adequate at installation	CRITERIA	
		1.	The tent is free of tears, loose seams, cuts or other loss of integrity.
		2.	The tent is properly oriented and supported.
		3.	Sharp objects are properly covered to prevent inadvertent penetration of the tent.
		4.	Installed services use service sleeves and are taped.
		5.	Unused service sleeves are sealed or taped closed.
		6.	Radiological postings and protective clothing removal procedures are prominently posted at the entrance/exit.
		7.	Proper lighting is provided.
		8.	Doors work properly.
		9.	The tent seal to the component is properly made.
		10.	If HEPA filtered ventilation is used, the system is properly installed, including connections, proper labeling, proper flow, and current efficiency test label.
		11.	Step-off pad(s) and clothing and waste receptacles are in place.
		12.	If welding, grinding, or burning is to be done inside or near a containment tent, the affected areas are covered with flame-resistant materials.
		13.	The inspection certification is posted on or near the containment.
		14. Other	
		15. Other	
		16. Other	

Comments: _____

_____

_____

* Checkoffs in this column must be supported by comments and/or approval signatures. If no criteria are waived or added, approval signatures are not required.

Approval: Health Physics_____

Operations_____

Glovebag Certification Checklist			
Location		Work Package #	
Activity			
Check if Waived *	Check if adequate at installation	CRITERIA	
		1.	The glovebag is free of holes, tears, or defects in materials.
		2.	Components and surfaces inside the glovebag are covered to minimize decontamination.
		3.	The containment is protected from sharp objects, internal and external.
		4.	The glovebag and installed service sleeves are properly supported.
		5.	The gloves are properly attached and free of cracks, splits, or holes.
		6.	The glovebag seal to the component is adequate and inside seals are used (if possible).
		7.	The glovebag is properly aligned to allow access to the work.
		8.	If a drain is used, it is located in the low point of the glovebag, is unobstructed, and is securely fastened to an appropriate collection system.
		9.	If a vacuum is used with the glovebag, it is HEPA filtered and has a current efficiency test label.
		10. Other	
		11. Other	
		12. Other	

Comments: _____

_____

_____

_____

* Checkoffs in this column must be supported by comments and/or approval signatures. If no criteria are waived or added, approval signatures are not required.

Approval: Health Physics_____

Operations_____

ATTACHMENT C

ALARACT DEMONSTRATION SIGNATURES

ATTACHMENT C

The individuals who signed the ALARACTs are designated in the below table.

ALARACT DEMONSTRATIONS	TERRY HISSONG (LMHC)	CHARLES RICE (LMHC)	WILLIAM ROSS (LMHC)	WILLIAM (BILL) ADAIR (FDH)	DANA BRYSON (DOE-RL)	MARK RAMSAY (DOE-RL)	MICHAEL ROYACK (DOE-RL)	JOHN MARTELL (WDOH)	JOHN SCHMIDT (WDOH)
ALARACT 1		X		X	X			X	X
ALARACT 2			X	X	X			X	X
ALARACT 3			X	X	X			X	X
ALARACT 4		X		X			X	X	X
ALARACT 5		X		X			X	X	X
ALARACT 6		X		X			X	X	X
ALARACT 7			X	X			X	X	X
ALARACT 8			X	X			X	X	X
ALARACT 9			X	X			X	X	X
ALARACT 10	X			X			X	X	X
ALARACT 11		X		X			X	X	X
ALARACT 12		X		X		X		X	X
ALARACT 13		X		X			X	X	X
ALARACT 14		X		X			X	X	X

DISTRIBUTION SHEET

To	From	Page 1 of 2
Distribution	David E. Clark	Date 4/20/99
Project Title/Work Order		EDT No. 626592
Control of Airborne Radioactive Emission for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
William (Bill) Adair	H6-21	X			
Dale I. Allen	R2-50	X			
Jerlinda D. Banks	S7-54	X			
John A. Bates	H6-23	X			
Lucinda E. Borneman	A3-03	X			
Dennis W. Bowser	A2-22	X			
Robert L. Brown	S6-14	X			
Dana C. Bryson	S7-54	X			
Donald J. Carrell	R1-51	X			
David E. Clark	R1-51	X			
James S. Conrad	T4-08	X			
Michelle L. Dexter	R1-51	X			
Thomas A. Dillhoff	S5-03	X			
Ryan A. Dodd	R3-72	X			
Shelly D. Doss	S5-02	X			
Dale L. Dyekman	S7-03	X			
Bradley G. Erlandson (25)	R1-51	X			
Carl J. Grando	H6-25	X			
John S. Hill	H6-25	X			
Terry L. Hissong	S7-20	X			
Thomas J. Kelley	R2-33	X			
Ralph Lipfert	S6-14	X			
Stephanie H. Livesey	S7-05	X			
Phillip C. Miller	R1-51	X			
R. S. Popielarczyk	R2-58	X			
Mark L. Ramsay	S7-54	X			
Richard E. Raymond	G1-54	X			
Charles J. Rice	R2-50	X			
William E. Ross	S7-84	X			
Michael J. Royack	S7-54	X			
David J. Saueressig	S7-20	X			
Royal Shupe	R2-50	X			

DISTRIBUTION SHEET

To	From	Page 2 of 2
Distribution	David E. Clark	Date 4/20/99
Project Title/Work Order		EDT No. 626592
Control of Airborne Radioactive Emission for Frequently Performed TWRS Work Activities (ALARACT Demonstrations)		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
David L. Sparks	S5-03	X			
Ronald P. Tucker	T4-07	X			
Robert T. Winward	A2-22	X			
WDOH (5)					