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Quarterly Environmental Radiological Survey Summary

First Quarter 1991

100, 200, 300, and 600 Areas

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Date Published

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

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EXECUTIVE SUMMARY

This report provides a summary of the radiological surveys performed on environmental waste sites near facilities located in the 100, 200, 300 and 600 areas. The First Quarter 1991 survey results and the status of actions required from current and past reports are summarized below:

- There were 117 routine environmental radiological surveys completed during January, February and March 1991.
- Five Surveillance and Compliance Inspection Reports (SCIR) were issued for sites found out of compliance with standards identified in the Environmental Compliance Manual, WHC-CM-7-5. They are summarized in Section 5.1 of this report.
- Four SCIRs were closed as a result of corrective actions taken during the first quarter of 1991 and are summarized in Section 5.2 of this report.
- Forty-three SCIRs, summarized in Table 5.4, had not been resolved. Landlord responsibilities for the unresolved SCIRs are as follows:

<u>LANDLORD</u>	<u>OPEN INSPECTION REPORTS</u>
Hanford Restoration Operations (HRO)	29
B Plant	2
PUREX	1
Tank Farm Operations (TFO)	11

TOP TEN PRIORITY RANKING

An explanation of the prioritization system is on page 5 of this report. Priority rankings for all open SCIRs are listed in Table 5.4. The ten sites with the highest numerical ranking for contamination control include:

<u>SITE</u>	<u>CUSTODIAN</u>
1. Cross Country Transfer Line	TF0
2. UN-216-E-17 Contamination Migration	HRO
3. 241-B Tank Farm Perimeters	TF0
4. 241-BX-BY Farm Perimeters	TF0
5. 241-C Farm Perimeters	TF0
6. 216-U-14 Active Ditch	TF0
7. UN-216-E-36 Migration	B-Plant
8. UN-216-E-43 (near 244-A Lift Station)	TF0
9. UN-216-E-16 (TC-4 SPUR)	Purex
10. UN-216-W-31 Contamination Migration	HRO

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INTRODUCTION

Routine radiological surveys to monitor conditions of outdoor sites are performed by Westinghouse Hanford Company's Health and Safety Group. Areas surveyed include the road surfaces, radioactive waste sites (cribs, trenches, burial grounds, stabilized ponds and ditches), and unplanned release sites. (see fig.1-9)

A site-wide survey schedule is developed by Environmental Assurance. Environmental Review and Integration reviews the radiological survey reports and files a copy for historical purposes and reference. Radiological conditions are tracked and trends noted. All sites are surveyed at least once each year. The survey frequencies for particular sites are based on site history, radiological conditions, and general maintenance. Special surveys may be requested at irregular frequencies if conditions warrant. Radiological surveys are conducted on sites to detect surface contamination and document changes in vegetation growth, biological intrusion, erosion, and general site maintenance conditions. Survey data are compared with standards identified in WHC-CM-7-5, Environmental Compliance Manual, as well as previous surveys to recognize possible trends, assess environmental impacts, and help determine where corrective actions are needed.

Landlords of sites found out of compliance may be issued a Radiological Problem Report (RPR) from the Health and Safety Group. Should the landlord fail to respond to the identified problem in a timely manner, or if it will require a long-term corrective action, Environmental Assurance will issue a Surveillance and Compliance Inspection Report (SCIR). Environmental Review and Integration tracks the compliance violation to completion and enters the SCIR on the Quality, Environmental, Safety Tracking System (QUEST) database. Open SCIRs are listed in Section 5.4 of this report.

It should be noted that the surveys scheduled for this program consist of environmentally impacted areas only and do not include active facilities or inside tank farms. Surveillance of these areas is the responsibility of the facility. Also, a survey to determine surface radiological conditions does not equate to a release survey. Therefore, a radiological survey that detects no contamination within a radiation control area does not release the site from control, but may result in a posting status change. Sites with known surface contamination and/or migrating contamination are shown on figures 1 through 9.

ENVIRONMENTAL RADIOLOGICAL SURVEY PROGRAM OBJECTIVES

- Identify environmental priorities for cleanup of surface contamination.
- Determine compliance with Department of Energy requirements and Westinghouse policy and standards regarding operational control, and environmental and radiological protection.
- Identify trends in radioactive contamination levels and radioactive migration at waste sites and other radiation areas in the Hanford area environment.
- Assess the surface integrity of solid and liquid waste disposal sites.
- Monitor for unplanned releases of radioactivity to the operations area environment.

PRIORITY RANKING SYSTEM

A numerical system is used for sorting open SCIRs in reference to environmental radiological concerns and provides a priority guide to responsible landlords for clean-up efforts of surface contaminated areas.

A numerical value is assigned for level of contamination, site accessibility, and contamination mobility. Site histories are examined by reviewing past and present radiological surveys. Contamination levels from 1000 cpm to greater than 10 mR/hr are considered and assigned a numerical value of 1 (lowest value) to 5 (greatest value). Any removable alpha contamination will be considered a high priority and will receive a contamination value of 5. Location is evaluated for accessibility. A restricted area would receive the lowest point value of 1 progressing up to a value of 5 where the public could have access. Mobility refers to contamination that can be or has a history of being transported from where it was originally identified to places outside of the radiologically posted area. Fixed contamination would receive a value of 1 progressing to contamination that is blown by the wind or the result of biological uptake receiving a value of 5. The rankings, with a maximum of 15 points, are noted on Table 5.4.

It should be noted that this system is not intended to be a total risk assessment, but rather a way of communicating environmental significance to the landlords and their program offices. Other elements of the site clean-up process are considered such as costs, location, political emphasis and engineering strategies before a site is actually remediated.

200 West Area 1991

Figure 1

200 East Area 1991

29103008.7

Figure 2

Figure 3

100-D and DR Area

Figure 5

Figure 6

100-H Area

29103008.1

Figure 7

100-K Area

Surface Contamination

Underground Radioactive Material

29103008.3

Figure 8

300 Area 1991

29103069.1

Figure 9

1.1 SURVEY RESULTS FORMAT

This report provides a list of environmental radiological surveys conducted during January, February and March of 1991. It includes brief descriptions of noteworthy survey results, cites SCIRs issued (Section 5.1), SCIRs which were closed (Section 5.2) and the status of previously issued SCIRs including priority ranking points (Table 5.4).

1991 1st QUARTER SURVEY SCHEDULE

100 Area Surveys

M	105 B/C, D/DR, F, H, KE/KW Reactor Exclusion Areas
Q	100 B/C Surface Contamination Area
Q	100 B/C Underground Radioactive Material Area
SA	118-B-2,3,5,6,7 Burial Grounds
A	118-B-1 Burial Ground
Q	100 D/DR Surface Contamination Area
SA	100 D/DR Underground Radioactive Material Area
SA	118-D-3 & 4 Burial Grounds
A	118-D-1 & 2 Burial Grounds
Q	Lewis Canal
Q	100 F Underground Radioactive Material Area
Q	100 F Surface Contamination Area (107-F)
A	118-F-1, 2, 3 Burial Grounds
Q	100 H Underground Radioactive Material Area
Q	100 H Surface Contamination Area (107-H)

200 Area Surveys

BM	Road Surveys - Inside 200 East Area
BM	Road Surveys - Inside 200 West Area
SA	Road Survey - Outside Perimeters of 200 East Area
SA	Road Survey - Outside Perimeters of 200 West Area
SA	UN-216-W-5
SA	UN-216-W-7
SA	216-S-17 Covered Pond
A	216-B-3-3 Ditch Survey Plots
Q	Road Survey - Rt. 4S from 200 W Gate to 200 E Hill
A	West Lake Survey Plots
A	216-T-4 Ditch and 216-T-4-2 Pond
SP	Special Survey - U Farm Perimeters (include zone to North)
A	A/AN/AP/AX/AY/AZ Tank Farm Perimeters (6 surveys)
A	Inactive Diversion Boxes not located inside the "A" Tank Farms
A	C Cribs and Trenches (3 surveys)
SA	216-U-11 Covered Trenches
SA	218-W-1,2,4A&B,11 Burial Grounds
SA	Z Stabilized Area
A	216-S-19 Covered Pond
A	216-S-16 Covered Pond
Q	216-A-37-1 Crib
Q	216-A-37-2 Crib
SA	216-B-10A & B Cribs
BM	Road Survey - Inside 200 East Area
BM	Road Survey - Inside 200 West Area
SA	216-U-12 Crib
SA	216-U-16 Crib

1st QUARTER SURVEY SCHEDULE (continued)

SA 216-S-25 Crib
 Q 216-A-45 Crib
 Q 216-A-30 Crib
 Q 216-A-36 A&B Crib
 Q 216-A-10 Crib
 Q 216-B-55 Crib
 Q 216-B-62 Crib
 Q 216-S-26 Crib
 Q 216-W-LWC Crib (REDOX)
 Q 216-U-17 Crib
 Q OUTSIDE TLD EXCHANGE 100, 200, and 300 area
 A B, BX/BY, C Tank Farm Perimeters
 A Inactive Diversion Boxes not inside "B" or "C" Tank Farms
 A B Cribs and trenches and Reverse Wells (18 surveys)
 SA 216-A-24
 SA 216-A-8
 SA 216-A-34 Crib
 SA 216-B-3-1,2 Ditch
 SA UN-216-E-33
 SA 216-A-18 Crib
 SA 216-A-19,20 Crib

300, 400, 600 Area Surveys

Q 300 Area RR Spur
 Q 400 Area RR Spur
 SA 316-5 Process Trench
 A 307 Retention Basin perimeters
 A UN-300-1 Valve Pits
 A UN-300-2 Valve Pits
 A 618-2 & 3 Burial Grounds
 A 618-5 Burial Ground
 A 618-10 Burial Ground
 A 618-11 Burial Ground

** Abbreviations

M - Monthly, Q - Quarterly, SA - Semiannual, A - Annual, BM - Bi-monthly

2.0 ENVIRONMENTAL PROTECTION STANDARDS

In this document, radiation survey data are used to determine compliance of Inactive Radioactive Waste Sites with the following WHC-CM-7-5, Environmental Compliance Manual Section L requirements:

Section L3.0 (d): Environmental Assurance shall:

- * Establish a radiological survey schedule of waste sites
- * Review radiological survey data
- * Conduct environmental inspections
- * Issue reports to appropriate managers for corrective actions

Section L4.0 (a): Facility operations management shall provide a barrier over the contamination source which inhibits radionuclide transport to the surface. The barrier design shall be based on proven techniques which are appropriate for the type of disposal, and the adequacy of the barrier shall be verified by demonstrating through periodic monitoring that surface contamination levels do not exceed the limits established in Part K4.0.

Section L4.0 (c): Surface radiation levels shall be less than 1 mrem/hr (10 μ Sv/hr). The surface shall be uncontaminated; i.e., less than the limits in Part K (Part K4.0).

Section L4.0 (d): Engineered barriers shall also limit biotransport of contamination.

Section L4.0 (f): Maintenance shall include herbicide application to reduce deep rooted vegetation that could provide transport of contamination to the surface.

These requirements apply to all inactive radioactive waste sites which include cribs, trenches, ditches, ponds, French drains, burial grounds and other areas of concern such as tank farm perimeters and radioactive contamination due to spills or releases. Interiors of tank farms and radiation areas where operations are ongoing are not included.

In order to compare standards [as established in WHC-CM-7-5, Section L4.0 (c)] and field instrument values, a conversion factor is necessary. This conversion factor has been established where 20,000 dpm (2000 c/m) are approximately equivalent to one millirem per hour or 10 microsieverts per hour for beta-emitting radionuclides. It must be understood that converting field instrument values, which included both beta and gamma energies, is approximate and does not allow for absolute precision.

3.0 SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS

When it is determined that conditions at a site are not in compliance with the standards established in WHC-CM-7-5, the appropriate area landlord will be notified. Environmental Assurance will issue a Surveillance and Compliance Inspection Report (SCIR). Resolution of a SCIR is considered initiated when a formal corrective action plan is provided to and accepted by Environmental Review and Integration. However, for tracking purposes it will remain on file and appear in subsequent Environmental Radiological Survey Reports and the QUEST data base until satisfactory completion of the plan is demonstrated. A visual inspection by Environmental Review and Integration and/or a post-corrective action radiation survey by Health Physics is required before closing a SCIR. If a compliance plan is not provided to Environmental Assurance within one month, a second notice is issued.

An SCIR may be issued for conditions which pose a probable threat of radiological contamination to uncontrolled areas. These conditions include the presence of deep-rooted vegetation, animal intrusion, or obvious migrating contamination. Once the contamination is contained on or removed from a site for which a SCIR has been issued, the report will be closed after a follow-up radiation survey has indicated that no further environmental impact is evident. For example, fixed contamination may remain and the site may be properly posted as a Surface Contamination area. The site will no longer be out of compliance, therefore, the SCIR can be closed.

4.0 SURVEY METHODS AND PROCEDURES

Surveys documented by this report include road surfaces, cribs, stabilized burial grounds, covered ponds and ditches, tank farm perimeters, unplanned release sites and other radiation areas. Methods and procedures for these surveys can be found in WHC-CM-7-4, Operational Environmental Monitoring, WHC-CM-4-10, Radiation Protection, and WHC-IP-0692, Health Physics Procedures.

4.1 ROAD SURVEYS

Road Surveys are performed with the Mobile Surface Contamination Monitor (MSCM Tractor) or a vehicle equipped with sodium iodide detectors mounted on the undercarriage. The detector height is adjustable. The average survey height is one foot.

The vehicle is driven at less than seven miles per hour. When activity is detected, the vehicle is stopped and a thorough survey is made with an Eberline Model BNW-1 portable survey instrument equipped with a P-11 probe to identify the extent of the contamination. Appropriate management is notified when road contamination is identified and corrective actions initiated.

4.2 WASTE SITES AND OTHER RADIATION AREA SURVEYS

Surveys at waste sites and other radiation areas may be conducted with vehicles equipped with radiation detection instruments or with hand-held field instruments. Field instrument survey results are reported in disintegrations per minute as detected by a P-11 mica window probe attached to an Eberline Model BNW-1 count rate meter. Alpha survey results are reported in disintegrations per minute and are measured with a portable alpha meter (PAM) or a portable alpha counter (PAC-6). Surveys include the perimeter and portions of the ground surface of radiation areas. Wherever possible, smear surveys are made on the surface of exposed equipment within a radiation area. Vegetation, animal burrows, and animal feces are also monitored to detect biological transport. Detailed survey practices and procedures are described in WHC-CM-4-10, Radiation Protection Manual, WHC-IP-0692, Health Physics Procedures, and WHC-CM-7-4, Operational Environmental Monitoring.

5.0 SURVEY RESULTS

One hundred seventeen routine environmental radiological surveys were completed during January, February and March 1991. These are surveillances of inactive waste facilities which include cribs, trenches, burial grounds, covered ponds and covered ditches. The survey schedule for environmental sites is outlined in WHC-CM-7-4, Section 12.

Landlords for areas found out of compliance with guidelines described in WHC-CM-7-5 are issued a Surveillance and Compliance Inspection Report (SCIR).

5.1 SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS ISSUED

During the first quarter of 1991 five SCIRs were issued and are as follows: (see Figures 10 through 15)

9101EP200-001	UN-216-E-44 contamination (North of 241-B Tank Farm) issued to Tank Farm Operations (TFO)	Fig. 10
9101EP200-002	UN-216-E-17 contamination (redefined boundaries) issued to Hanford Restoration Operations (HRO)	Fig. 11
9102EP200-010	216-S-7 Crib (growing contaminated vegetation) issued to Hanford Restoration Operations (HRO)	Fig. 12
9102EP200-011	216-U-10 Pond surface contamination area (Southeast) issued to Hanford Restoration Operations (HRO)	Fig. 13
9102EP200-012	218-2,5,5a,9 Burial Ground (contaminated vegetation) issued to Hanford Restoration Operations (HRO)	Fig. 14

5.2 SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS CLOSED

During the first quarter of 1991 four SCIRs were closed.

ESC-84-02-03	UN-216-E-17	Updated and Reissued as 9101EP200-002
ESC-85-016	216-B-57 Crib	Updated and Reissued as 9101EP200-002
EP-87-47	216-B-43-50 Cribs	Updated and Reissued as 9101EP200-002
EP-87-44	UN-216-E-32	Site destroyed during Burial Ground excavation

Figure 10

UN-216-E-17

Figure 11

Figure 12

Surface contamination zone - max. 900 c/m

Figure 13

218-E-2,5a,5b,9

Growing contaminated vegetation
(max. 1000 c/m)

Figure 14

5.3 STATUS OF OPEN SURVEILLANCE AND COMPLIANCE REPORTS

When sites are found to be out of compliance with the Environmental Compliance Manual, WHC-CM-7-5, appropriate landlords are issued an SCIR. Corrective actions are submitted to Environmental Review and Integration by the responsible organization. Forty-three SCIRs remain open in the first quarter of 1991. These reports are summarized on Table 5.4 to include the referenced site number, priority ranking points (maximum of 15 points based on contamination levels, location and mobility), responsible custodian, SCIR report number, and estimated completion date.

Abbreviations used on table 5.4 include:

SCIR - Surveillance and Compliance Inspection Report

ECD - Estimated Completion Date

HRO - Hanford Restoration Operations

TFO - Tank Farm Operations

PTS - Points

TBD - To Be Determined

TABLE 5.4
OPEN SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS
(maximum 15 pts.)

<u>SITE</u>	<u>RANKING PTS</u>	<u>CUSTODIAN</u>	<u>SCIR NUMBER</u>	<u>ECD</u>
UN-216-E-31	11	HRO	ESC-84-02-04	1991
UN-216-E-23	9	B-PLANT	ESC-85-019	1995
207-S BASIN	7	HRO	ECU-86-022	1995
216-Z-5 CRIB	7	HRO	ECU-86-026	1993
216-Z-7 CRIB	10	HRO	ECU-86-028	1993
218-E-12B	8	HRO	ECU-86-036	1993
UN-216-W-24	9	HRO	ECU-86-046	1991
UN-216-W-29	7	HRO	ECU-86-047	1995
UN-216-W-30	7	HRO	ECU-86-048	1992
UN-216-W-31	10	HRO	ECU-86-049	1992
216-C-8 FR. DRAIN	7	HRO	ECU-87-10	1991
216-A-6 CRIB	7	HRO	ECU-87-21	1992
216-A-7 CRIB	8	HRO	ECU-87-22	1992
204-S AREA	8	HRO	ECU-87-28	1992
218-W-9 VAULT	7	HRO	EP-87-34	1992
UN-216-W-26	8	HRO	EP-87-38	1991
216-B-7A&B Cribs	10	HRO	EP-87-45	1992
216-B-9 Crib	10	HRO	EP-87-46	1992
UN-216-E-37	11	HRO	EP-87-50	1991
276-U-Basin	8	HRO	EP-88-7	1992
WR Vault	8	HRO	EP-88-10	1995
216-U-1&2 Cribs	9	HRO	EP-88-15	1994

TABLE 5.4 (continued)
OPEN SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS

<u>SITE</u>	<u>RANKING PTS</u>	<u>CUSTODIAN</u>	<u>SCIR NUMBER</u>	<u>ECD</u>
UN-216-W-33	10	TF0	8810EP200-012	TBD
216-B-11A&B WELLS	9	HRO	8810EP200-025	TBD
UN-216-E-16 (TC-4 SPUR)	11	PUREX	8901EP200-001	1991
216-T-14-17 TRENCHES	10	HRO	8907EP200-032	1995
241-B PERIMETERS	13	TF0	8909EP200-036	TBD
UN-216-E-5	10	TF0	8910EP200-043	TBD
211-S Tank Storage	10	HRO	9001EP200-013	1992
UN-216-E-36	12	B-Plant	9002EP200-024	TBD
241-S, SX Perimeters	8	TF0	9006EP200-052	TBD
216-A-40 Basin	11	TF0	9007EP200-053	1991
216-U-14 Active Ditch	13	TF0	9007EP200-054	1991
BX-BY Farm Perimeters	13	TF0	9007EP200-056	1991
C Farm Perimeters	13	TF0	9008EP200-068	1991
100 Area Sites	7	HRO	9008EP100-137	1991
Cross Country Line (UN-216-E-41)	14	TF0	9012EP200-095	1991
UN-216-E-43	13	TF0	9012EP200-099	1991
UN-216-E-44	11	TF0	9101EP200-001	1992
UN-216-E-17	13	HRO	9101EP200-002	1991
216-S-7 Crib	10	HRO	9102EP200-010	TBD
216-U-10 Pond	8	HRO	9102EP200-011	1991
218-E-2,5,5a,9	8	HRO	9102EP200-012	1991

6.0 SUMMARY

One hundred seventeen environmental sites were surveyed during January, February and March of 1991 in the 100, 200 E&W, 300 and 600 areas.

Five SCIRs were issued (Table 5.1)

Four SCIRs were closed (Table 5.2)

Forty-three SCIRs remain open (Table 5.4). Open reports have been addressed and clean-up plans with completion dates are being developed or to be provided to Environmental Assurance.

Environmental Assurance

100,200,300,600 Areas Environmental
Review and Integration

April 30, 1991

Quarterly Environmental Radiological Survey Summary
WHC-SP-0665-0 1st Quarter 1991WESTINGHOUSE HANFORD COMPANY

M. R. Adams	L4-92	X
M. I. Armatis	T3-21	X
D. A. Berg	R1-67	X
T. D. Blankenship	S5-04	X
R. J. Bliss	B3-04	X
J. W. Bloom	S6-05	X
J. A. Brockman	S4-39	X
G. D. Carpenter	B2-16	X
L. P. Diediker	T1-30	X
J. J. Dorian	B2-16	X
G. T. Dukelow	R1-81	X
G. L. Dunford	S5-15	X
J. A. Eacker	R1-51	X
R. E. Elder	L8-16	X
D. B. Erb	R1-51	X
L. E. Eyre	T4-01	X
K. A. Gano	X0-21	X
D. L. Gardner	A1-04	X
L. A. Garner	B2-19	X
E. M. Greager	L6-60	X
M. L. Grygiel	S6-65	X
K. A. Hadley	R2-42	X
D. G. Hamrick	R1-51	X
W. F. Heine	B2-35	X
R. E. Heineman	R3-12	X
M. E. Hevland	R3-12	X
N. A. Homan	H4-52	X
C. R. Huckfeldt (2)	T1-30	X
M. C. Hughes	R1-15	X
A. R. Johnson	T1-30	X
S. R. Johnson	R3-12	X
D. H. Jones	H4-16	X
R. E. Lerch	B2-35	X
K. R. Jordan	B3-51	X
J. S. Lee	T4-01	X
J. B. Levine	X3-50	X
D. J. McCain	S0-08	X
M. A. Mihalic	L4-88	X
R. M. Mitchell	H4-55	X
L. A. Nelson	T1-25	X
W. L. Osborne	T3-21	X
R. D. Pierce	R2-80	X

Environmental Assurance

100,200,300,600 Areas Environmental
Review and Integration

April 30,1991

Quarterly Environmental Radiological Survey Summary
WHC-SP-0665-0 1st Quarter 1991WESTINGHOUSE HANFORD COMPANY
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A. E. Sampson	S0-09	X
D. R. Speer	R2-77	X
J. W. Stiffler	R3-20	X
M. K. Strankman	S5-51	X
R. R. Thompson	R1-10	X
G. E. VanSickle	R1-15	X
R. L. Watts	L6-52	X
B. F. Weaver	T3-21	X
D. E. Wegener	S5-04	X
B. W. Wyrick	T3-21	X
M. T. York	S6-65	X
Document Clearance (2)	R1-08	X

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