

# Handbook 200 Areas Waste Sites

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Prepared for the United States  
Department of Energy  
Under Contract EY-77-C-06-1030

**APPROVED FOR  
PUBLIC RELEASE**



## Rockwell International

Rockwell Hanford Operations  
Energy Systems Group  
Richland, WA 99352

Volume II

RHO-CD-673

HANDBOOK

200 AREAS WASTE SITES

Compiled by

H. L. Maxfield  
Under Contract W7C-SBB-31873

April 1, 1979

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APPROVED FOR  
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ROCKWELL HANFORD OPERATIONS  
RICHLAND, WASHINGTON 99352

Operated for the Department of Energy  
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Issue Approval:

J Vincent Pansik  
Issuing Manager

April 26, 1979  
Date

G C Owens  
Concurring Approval

5/1/79  
Date

M A Lewis  
Concurring Approval

5/1/79  
Date

J M [unclear]  
Program Office Representative

5-1-79  
Date



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INTRODUCTION

Document RHO-CD-673 has been written as a handbook of radioactive waste sites and associated radiation areas within the 200 Areas and related environs. It does not include those sites within the confines of the Tank Farms.

It is primarily an updating and extension of the 200 Areas section of Document BNW-MA-88 (Resource Book - Disposition [Decontamination and Decommissioning] of Retired Contaminated Facilities at Hanford).

The document consists of three volumes:

- Volume I - Contains information about those sites within the 200 East Area.
- Volume II - Contains information about those sites within the 200 West Area.
- Volume III - Contains information about those sites East of 200 East Area, south of 200 East Area, south of 200 West Area, within the 200 North Area, and the Gable Mountain Storage Vaults.

Volumes I and II are each divided into four sections called Quadrants: the northeast quadrant is indexed NE, the southeast quadrant - SE, the southwest quadrant - SW, and the northwest quadrant - NW.

Volume III is divided into quadrants containing those sites east of 200 East Area, indexed E-200 E; those south of 200 East Area, indexed S-200 E; those south of 200 West Area, indexed S-200 W; those in the 200 North Area, indexed 200 N; and the Gable Mountain Vaults, indexed Gable Mountain.

Each of the three volumes contain a master numerical index listing all of the sites by number and quadrant. In the front of each quadrant is an index of those sites within that quadrant.

Each volume contains indexes of Burial Grounds, Unplanned Release Sites, Ditches, Ponds, and Retention Basins.

All information concerning a site, such as maps, illustrations and photos, have been grouped with that site.

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## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
216-B-1	Crib (not built)	
216-B-2-1	Ditch	I. NE
216-B-2-2	Ditch	I. NE
216-B-2-3	Ditch	I. NE
216-B-3	Pond	III. E-200 E
216-B-3-1	Ditch	III. E-200 E
216-B-3-2	Ditch	III. E-200 E
216-B-3-3	Ditch	III. E-200 E
216-B-4	Reverse Well	I. SW
216-B-5	Reverse Well	I. NE
216-B-6	Reverse Well	I. SW
216-B-7A	Crib	I. NE
216-B-7B	Crib	I. NE
216-B-8	Crib and Tile Field	I. NE
216-B-9	Crib and Tile Field	I. NE
216-B-10A	Crib	I. SW
216-B-10B	Crib	I. SW
216-B-11A	Reverse Well	I. NE
216-B-11B	Reverse Well	I. NE
216-B-12	Crib	I. NW
216-B-13	French Drain	I. SW
216-B-14	Crib	III. S-200 E
216-B-15	Crib	III. S-200 E
216-B-16	Crib	III. S-200 E
216-B-17	Crib	III. S-200 E
216-B-18	Crib	III. S-200 E
216-B-19	Crib	III. S-200 E
216-B-20	Trench	III. S-200 E
216-B-21	Trench	III. S-200 E
216-B-22	Trench	III. S-200 E
216-B-23	Trench	III. S-200 E
216-B-24	Trench	III. S-200 E
216-B-25	Trench	III. S-200 E
216-B-26	Trench	III. S-200 E
216-B-27	Trench	III. S-200 E
216-B-28	Trench	III. S-200 E
216-B-29	Trench	III. S-200 E
216-B-30	Trench	III. S-200 E
216-B-31	Trench	III. S-200 E
216-B-32	Trench	III. S-200 E
216-B-33	Trench	III. S-200 E
216-B-34	Trench	III. S-200 E
216-B-35	Trench	I. NW
216-B-36	Trench	I. NW
216-B-37	Trench	I. NW
216-B-38	Trench	I. NW
216-B-39	Trench	I. NW

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## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
216-B-40	Trench	I. NW
216-B-41	Trench	I. NW
216-B-42	Trench	I. NW
216-B-43	Crib	I. NW
216-B-44	Crib	I. NW
216-B-45	Crib	I. NW
216-B-46	Crib	I. NW
216-B-47	Crib	I. NW
216-B-48	Crib	I. NW
216-B-49	Crib	I. NW
216-B-50	Crib	I. NW
216-B-51	French Drain	I. NW
216-B-52	Trench	III. S-200 E
216-B-53A	Trench	III. S-200 E
216-B-53B	Trench	III. S-200 E
216-B-54	Trench	III. S-200 E
216-B-55	Crib	I. NW
216-B-56	Crib	I. NE
216-B-57	Crib	I. NW
216-B-58	Trench	III. S-200 E
216-B-59	Trench	I. NE
216-B-60	Crib	I. NW
216-B-61	Crib	I. NW
216-B-62	Crib	I. NW
216-B-63	Trench	I. NE
216-C-1	Crib	I. SE
216-C-2	Reverse Well	I. SE
216-C-3	Crib	I. SE
216-C-4	Crib	I. SE
216-C-5	Crib	I. SE
216-C-6	Crib	I. SE
216-C-7	Crib	I. SE
216-C-8	French Drain	I. NE
216-C-9	Pond	I. NE
216-C-10	Crib	I. SE
216-S-1 & 2	Cribs	II. SE
216-S-3	Crib	II. SE
216-S-4	French Drain	II. SW
216-S-5	Crib	III. S-200 W
216-S-6	Crib	III. S-200 W
216-S-7	Crib	II. SE

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## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
216-S-8	Trench	II. SE
216-S-9	Crib	II. SE
216-S-10	Ditch and Pond	III. S-200 W
216-S-11	Pond	III. S-200 W
216-S-12	Trench	II. SE
216-S-13	Crib	II. SE
216-S-14	Trench (released)	III. S-200 W
216-S-15	Pond	II. SE
216-S-16	Pond	III. S-200 W
216-S-17	Pond	III. S-200 W
216-S-18	Crib	II. SE
216-S-19	Pond	III. S-200 W
216-S-20	Crib	II. SE
216-S-21	Crib	II. SW
216-S-22	Crib	II. SE
216-S-23	Crib	II. SE
216-S-24	Crib (not built)	II. SE
216-S-25	Crib	III. S-200 W
216-T-1	Ditch	II. NE
216-T-2	Reverse Well	II. NE
216-T-3	Reverse Well	II. NE
216-T-4-1	Ditch	II. NW
216-T-4-1	Pond	II. NW
216-T-4-2	Ditch	II. NW
216-T-4-2	Pond	II. NW
216-T-5	Crib	II. NW
216-T-6	Crib	II. NE
216-T-7	Crib	II. NW
216-T-8	Crib	II. NE
216-T-9	Trench	II. NE
216-T-10	Trench	II. NE
216-T-11	Trench	II. NE
216-T-12	Pit	II. NE
216-T-13	Trench (exhumed)	II. NW
216-T-14	Trench	II. NE
216-T-15	Trench	II. NE
216-T-16	Trench	II. NE
216-T-17	Trench	II. NE
216-T-18	Crib	II. NE
216-T-19	Crib and Tile Field	II. NW

## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
216-T-20	Crib	II. NE
216-T-21	Trench	II. NW
216-T-22	Trench	II. NW
216-T-23	Trench	II. NW
216-T-24	Trench	II. NW
216-T-25	Trench	II. NW
216-T-26	Crib	II. NE
216-T-27	Crib	II. NE
216-T-28	Crib	II. NE
216-T-29	French Drain	II. NE
216-T-30	Unplanned Release Site	II. NE
216-T-31	French Drain (exhumed)	II. NW
216-T-32	Crib	II. NW
216-T-33	Crib	II. NE
216-T-34	Crib	II. NE
216-T-35	Crib	II. NE
216-T-36	Crib	II. NW
216-U-1	Crib	II. SE
216-U-2	Crib	II. SE
216-U-3	French Drain	II. SE
216-U-4	Reverse Well	II. SE
216-U-4A	Dry Well	II. SE
216-U-4B	Dry Well	II. SE
216-U-5	Trench	II. SE
216-U-6	Trench	II. SE
216-U-7	French Drain	II. SE
216-U-8	Crib	II. SE
216-U-9	Ditch	III. S-200 W
216-U-10	Pond	II. SW
216-U-11	Old Trench	III. S-200 W
216-U-11	New Trench	III. S-200 W
216-U-12	Crib	II. SE
216-U-13	Crib	II. SW
216-U-14	Ditch	II. SE
216-U-15	Crib	II. SE
216-Z-1	Ditch	II. SW
216-Z-1 & Z-2	Cribs	II. SW
216-Z-1A	Tile Field	II. SW
216-Z-1AA	Tile Field	II. SW
216-Z-1AB	Tile Field	II. SW
216-Z-1AC	Tile Field	II. SW

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## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
216-Z-3	Crib	II. SW
216-Z-4	Crib	II. NW
216-Z-5	Crib	II. NW
216-Z-6	Crib	II. NW
216-Z-7	Crib	II. NW
216-Z-8	French Drain	II. SW
216-Z-9	Crib	II. SW
216-Z-10	Reverse Well	II. NW
216-Z-11	Ditch	II. SW
216-Z-12	Crib	II. SW
216-Z-13	French Drain	II. SW
216-Z-14	French Drain	II. SW
216-Z-15	French Drain	II. SW
216-Z-16	Crib	II. NW
216-Z-17	Trench	II. NW
216-Z-18	Crib	II. SW
216-Z-19	Ditch	II. SW

BURIAL GROUNDS

218-E-1	Burial Ground	I. SE
218-E-2	Burial Ground	I. NW
218-E-2A	Burial Ground	I. NW
218-E-3	Exhumed	
218-E-4	Burial Ground	I. NW
218-E-5	Burial Ground	I. NW
218-E-5A	Burial Ground	I. NW
218-E-6	Exhumed	
218-E-7	Vault	I. SW
218-E-8	Burial Ground	I. NE
218-E-9	Equipment Storage	I. NW
218-E-10	Burial Ground	I. NW
218-E-12A	Burial Ground	I. NE
218-E-12B	Burial Ground	I. NE
218-E-13	Burial Site	I. SE
218-E-14	Burial Tunnel	I. SE
218-E-15	Burial Tunnel	I. SE

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## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
218-W-1	Burial Ground	II. NW
218-W-1A	Burial Ground	II. NE
218-W-2	Burial Ground	II. NW
218-W-2A	Burial Ground	II. NW
218-W-3	Burial Ground	II. NW
218-W-3A	Burial Ground	II. NW
218-W-4A	Burial Ground	II. NW
218-W-4B	Burial Ground	II. NW
218-W-4C	Burial Ground	II. SW
218-W-7	Vault	II. SE
218-W-8	Vault	II. NE
218-W-9	Burial Site	II. SE
218-W-11	Burial Ground	II. NW

UNPLANNED RELEASE SITES - 200 EAST AREA

UN-216-E-1	Ground Contam. Div. Box	241-B-151	I. NE
UN-216-E-2	Ground Contam. Div. Box	241-B-152	I. NW
UN-216-E-3	Ground Contam. Div. Box	241-B-153	I. NE
UN-216-E-4	Line Break	241-B-153	I. NE
UN-216-E-5	Ground Contam. Div. Box	241-B-154	I. NE
UN-216-E-6	Ground Contam. Div. Box	241-BX-155	I. NW
UN-216-E-7	Line Break	242-B to 207-B	I. NE
UN-216-E-8	Line Break	221-B, R-3	I. NW
UN-216-E-9	Line Break	241-CR-151	I. NE
UN-216-E-10	Line Break	211-C-152	I. NE
UN-216-E-11	Ground Contam. B-C Cribs	Controlled Area	III. S-200 E
UN-216-E-12	Catch Tank Leak	241-ER-151	I. SW
UN-216-E-13	Line Break	221-B, R-13	I. NW
UN-216-E-14	Line Break	241-C, SW corner	I. NE
UN-216-E-15	Line Leak	224-B, Backside	I. SW

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## INDEX - MASTER NUMERICAL

Number	Type	Volume and Quadrant
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UNPLANNED RELEASE SITES - 200 WEST AREA

UN-216-W-2	207-S Retention Basin Contamination	II. SE
UN-216-W-4	Ground Contam. North of 233-S	II. SE
UN-216-W-5	Line Break 23rd & Camden	II. NE
UN-216-W-6	Line Break 221-T, R-19	II. NE
UN-216-W-7	Ground Contam. East of 241-TX	II. NE
UN-216-W-9	Ground Contam. 221-U, R-3 - R-5	II. SE
UN-216-W-11	221-U Vessel Vent Blower Pit Contam.	II. SE
UN-216-W-12	Line Leak Backside 224-T	II. NE
UN-216-W-13	Line Break 216-Z-18 Crib Line	II. SW
UN-216-W-14	Leach Trench NE 216-U-10 Pond	II. SW
UN-216-W-15	Leach Trench E. 216-U-10 Pond-N.	II. SW
UN-216-W-16	Leach Trench E. 216-U-10 Pond-S.	II. SW
UN-216-W-17	Overflow Plain Southside 216-U-10 Pond	II. SW
UN-216-W-18	Line Break South end 216-S-9 Crib	II. SE
UN-216-W-19	Line Break East side 218-W-9	II. SE
UN-216-W-20	Pu Spoil Trench near 216-Z-1 Ditch	II. SW
UN-216-W-21	Sludge Pits South side 207-U	II. SE
UN-216-W-22	Sludge Pits North side 207-U	II. SE
UN-216-W-23	Ground Contam. Hillside West of 241-TX-155	II. NE

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## INDEX - DITCHES

Number	Type	Volume and Quadrant
216-A-29	Purex Chem. Sewer	III. E-200 E
216-B-2-1	B Covered Ditch	I. NE
216-B-2-2	B Covered Ditch	I. NE
216-B-2-3	B Ditch Presently in Use	I. NE
216-B-3-1	B Covered Ditch - E. of 200 East	III. E-200 E
216-B-3-2	B Covered Ditch - E. of 200 East	III. E-200 E
216-B-3-3	B Ditch, E. of 200 East, Pres. in Use	III. E-200 E
216-S-10	Redox Chemical Sewer	III. S-200 W
216-T-1	221-T Head End	II. NE
216-T-4-1	T-Plant Old Covered Ditch	II. NW
216-T-4-2	T-Plant Ditch - Presently in Use	II. NW
216-U-9	Overflow Ditch to 216-S-16 & 17 Partially Covered - Not in Use	III. S-200 W
216-U-11	Overflow from U-10 Pond	III. S-200 W
216-U-14	Laundry Ditch	II. SE
216-Z-1	Z-Plant Buried Ditch	II. SW
216-Z-11	Z-Plant Buried Ditch	II. SW
216-Z-19	Z Plant Ditch, Presently in Use	II. SW

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## INDEX - PONDS

Number	Type	Volume and Quadrant
216-A-25	Pond, Gable Mountain	III. E-200 E
216-B-3	Pond, B Plant	III. E-200 E
216-C-9	Pond, Bottom of 221-C excavation	I. NE
N-1	200 N Area - Released from Rad. Zone	III. 200 N
N-4	200 N Area - (Covered)	III. 200 N
N-6	200 N Area - (Covered)	III. 200 N
216-S-10	Old Redox Leach Pond	III. S-200 W
216-S-11	Old Redox Leach Pond (East of S-10)	III. S-200 W
216-S-15	Covered Small Pond - East of 241-S	II. SE
216-S-16	Redox Covered Ponds	III. S-200 W
216-S-17	Redox Covered Pond	III. S-200 W
216-S-19	222-S Lab Pond	III. S-200 W
216-T-4-1	T-Plant Pond - Released from Rad. Zone	II. NW
216-T-4-2	T-Plant New Pond - Not Contaminated	II. NW
216-U-10	U-Pond	II. SW

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## INDEX - RETENTION BASINS

Number	Type	Volume and Quadrant
207-A	242-A Evaporator	III. E-200 E
207-B	B-Plant	I. NE
207-S	Redox (covered)	II. SE
207-SL	Redox Laboratory	II. SE
207-T	T-Plant	II. NE
207-U	U-Plant	II. SE

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REFERENCE DOCUMENTS

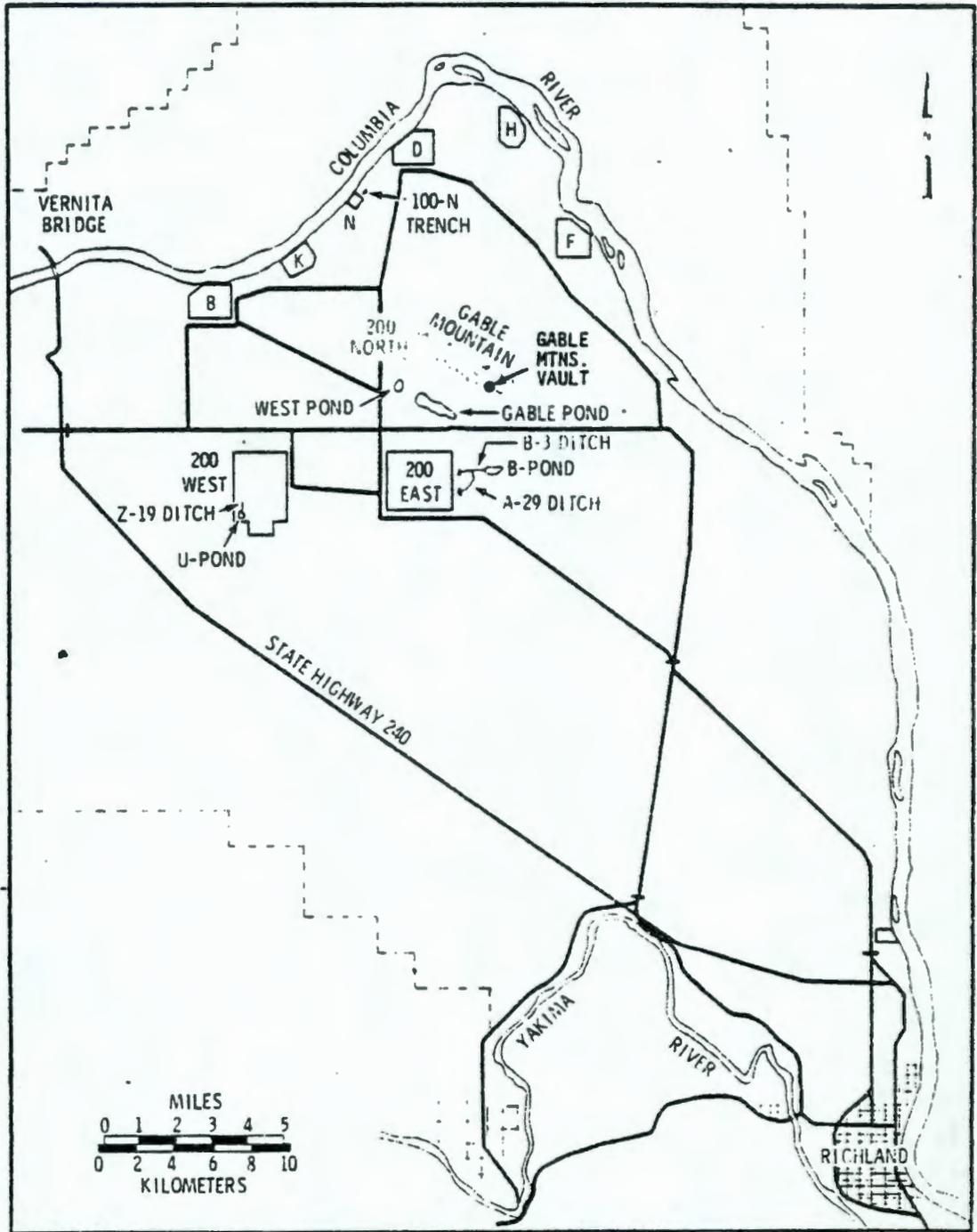
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  2. RHO-CD-78-34 2Qtr. Radioactive Liquid Wastes Discharged to Ground in the 200 Areas During the First Half of 1978.  
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  3. RHO-LD-78-24 3Qtr. Summary of Radioactive Solid Waste Burials in the 200 Areas During the First Three Quarters of 1978.  
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H. L. Maxfield

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R. C. Tabasinske

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HANFORD SITE MAP

VOLUME II 200 WEST AREA - Northeast Quadrant (NE)

## Waste Disposal Sites and Associated Radiation Zones

## Quadrant Boundaries

- East Boundary - Albany Avenue (East Fenceline Road)
- South Boundary - 19th Street from Camden Avenue to Albany Avenue.
- West Boundary - Camden Avenue from 19th Street to 27th Street (North Fenceline Road).
- North Boundary - 27th Street (North Fenceline Road) from Camden Avenue to Albany Avenue.

See Area and Quadrant maps at the end of this section.

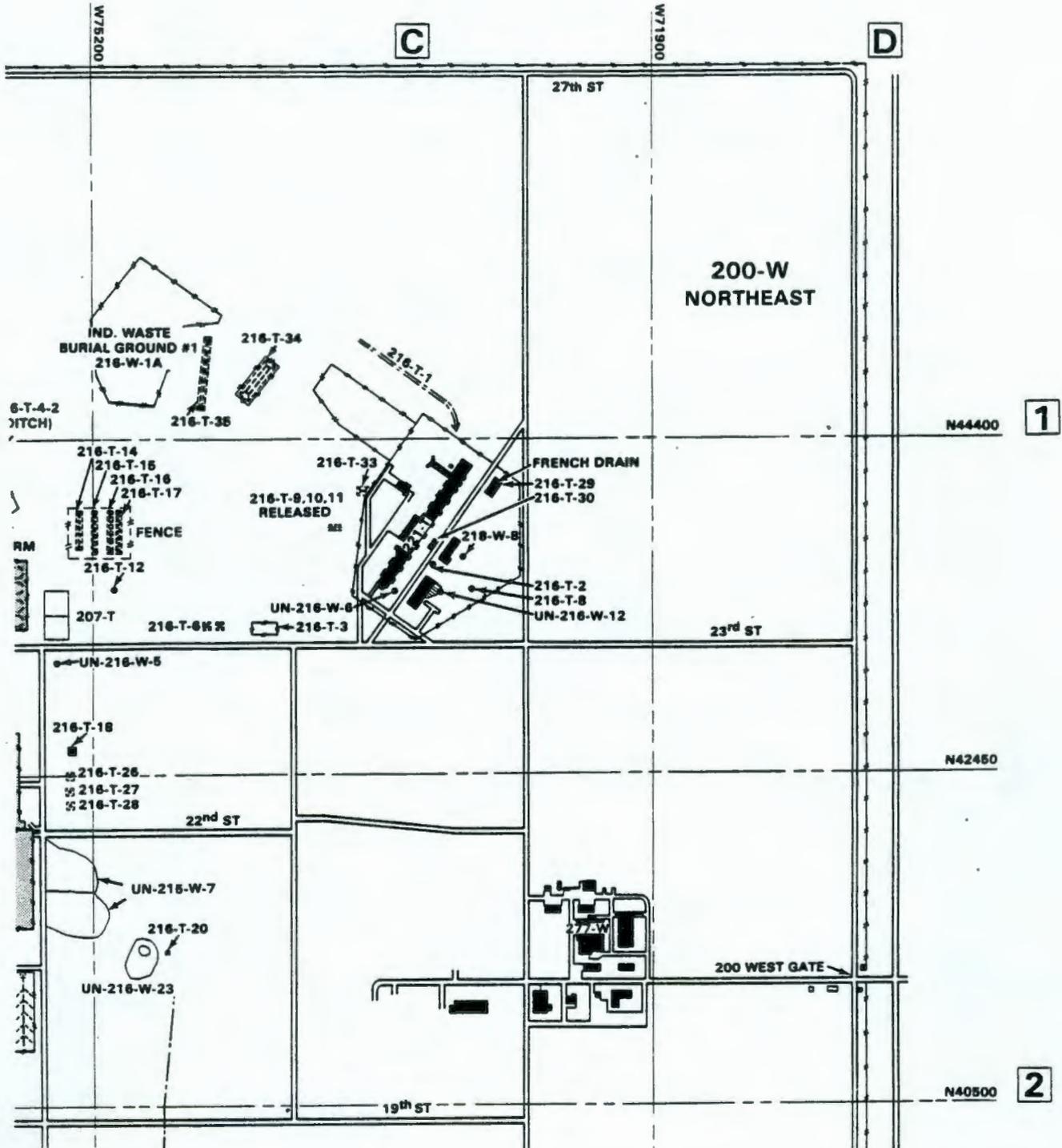
How to read the Index and locate a site:

Example - 216-T-1 Ditch

<u>Site Number</u>	<u>Volume</u>	<u>Quadrant</u>
216-T-1 Ditch	II.	NE (Northeast)

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INDEX - VOLUME II 200 WEST AREA  
Northeast Quadrant

216-T-1 Ditch	II. NE
216-T-2 Reverse Well	II. NE
216-T-3 Well	II. NE
216-T-6 Crib	II. NE
216-T-8 Crib	II. NE
216-T-9 Crib	II. NE
216-T-10 Crib	II. NE
216-T-11 Crib	II. NE
216-T-12 Crib	II. NE
216-T-14 Crib	II. NE
216-T-15 Crib	II. NE
216-T-16 Crib	II. NE
216-T-17 Crib	II. NE
216-T-18 Crib	II. NE
216-T-20 Crib	II. NE
216-T-26 Crib	II. NE
216-T-27 Crib	II. NE
216-T-28 Crib	II. NE
216-T-29 Crib	II. NE
216-T-30 Crib (Unplanned Release)	II. NE
216-T-33 Crib	II. NE
216-T-34 Crib	II. NE
216-T-35 Crib	II. NE
218-W-1A Burial Ground	II. NE
218-W-8 Burial Vault	II. NE
207-T Retention Basin	II. NE
UN-216-W-5 Unplanned Release	II. NE
UN-216-W-6 Unplanned Release	II. NE
UN-216-W-7 Unplanned Release	II. NE
UN-216-W-12 Unplanned Release	II. NE
UN-216-W-23 Unplanned Release	II. NE

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u> Ditch	<u>Past Designation</u> 221-T Trench	<u>Number</u> 216-T-1
<u>Location</u> 200 West, N.E. Quadrant.  200 ft north of 221-T 380 ft west of Beloit Avenue	<u>Service Dates</u>  11/44- To Present	<u>Status</u>  Active
<u>Site Coordinates</u> N-44455, W-73050 to N-44570, W-73050 N-44955, W-73600 (terminus).	<u>Reference Drawings</u> H-2-5101 M-2904 Sheet 11	<u>Elevations</u> Ground 720 ft Water Table 456 ft (1973) <u>Site Depth</u> 10 ft

Source and Description of Waste

1.78 x 10<sup>8</sup> liters. 1/44-1/64: Received miscellaneous waste from pilot plant experimental work, intermittent decontamination waste and waste from head end of 221-T. Bldg.  
1/64-6/70: Received the cooling water from the blow down vessel in the 277-T Bldg. (PNL head end operations 221-T Bldg.)  
6/70-Present: Receives the condensate from steam heated radiators at head end of the 221-T Bldg., also receives sodium Hydroxide wash water waste solution (<1000 gal./mo.) from the Sodium-Air-Water Reaction Emergency Air Cleaning Development-HEDL. This waste water is nonradioactive. It wets the bottom of the ditch to a distance of approximately 150 feet from the outfall.

Description of Facility

Ditch, 1800 ft x 25 ft bottom dimension.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 06/30/77</u>
Pu, g	<0.10	<0.10
Beta, Ci	5.0	<0.20
<sup>90</sup> Sr, Ci	<0.10	< .05
<sup>106</sup> Ru, Ci	1.00	< .01
<sup>137</sup> Cs, Ci	<0.10	< .05
<sup>60</sup> Co, Ci	None	None
U, kg	4.5	4.5

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216-T-1 Ditch cont.

The surface of the bottom of the 216-T-1 Ditch is contaminated with very low-level radioactivity resulting from the miscellaneous liquid wastes sent into the ditch during the years of operation. Activity at the head of the ditch reads 1500 c/m with a GM type survey meter. The activity gradually decreases until it reaches normal background levels at approximately 3/4 the length of the ditch.

In September of 1977, HEDL, in conjunction with their Sodium-Air-Water Reaction Emergency Air Cleaning Development Program, started releasing sodium hydroxide wash water waste solution into the ditch at a rate of less than 1000 gallons per month. This waste is nonradioactive. The stream sinks into the ground before running 150 ft. from the outfall.

Heavy ground surface vegetation in the ditch prevents the little remaining radioactivity from becoming airborne. It would be relatively easy to decontaminate and release all of the ditch back to within a few feet of the fallout pipe.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Reverse Well		222-T-110 Dry Well	216-T-2
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
within 15 ft. of the S. W. corner of the 222-T Bldg.		1/45-5/50	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43682, W-73173	H-2-353 HW-69870 #1	Ground	718 ft
		Water Table	456 ft (1973)
		Site Depth	75 ft

Source and Description of Waste

Volume unknown. Decontamination and sample waste from 222-T. Acidic.

Description of Facility

Reverse Well 6 in. diameter.

Deactivation: Pipeline blanked at the well.

Radionuclide Content (calculated from discharge data)

Unknown. Class II assumed due to moderate level of activity in these wastes, and small area of infiltration.

History:

Document HW-60807 - Baldrige - 1959 states: "This well consists of a three-inch diameter pipe sunk approximately 75 feet in the ground. The bottom 20 feet of the pipe is perforated to allow liquid waste to seep out into the soil. The well is located approximately 12 feet south and three feet west of the northwest\* corner of the 222-T Bldg. It was used to receive waste from the 222-T decontamination sink and sample "slurper" from start-up until the spring of 1950, after which time the wastes were routed to the 222-T cribs."

Radioactivity has been contained from the initial use until present without incident. The ground surface of the 4 x 4 ft. radiation zone is free from contamination.

\* should read "southwest"

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CONTAMINATED LIQUID DISPOSAL SITES

II. NE

RHO-CD-673

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Well		241-T-361-A Dry Well or Reverse Well	216-T-3
<u>Location</u> 200 West, N.E. Quadrant 150 ft North of 23rd Street and between 241-T-361 and 216-T-6 sites		<u>Service Dates</u> 6/45-8/46	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-43335, W-74250	<u>Reference Drawings</u> H-2-353 H-2-951	<u>Elevations</u>	
		Ground	707 ft
		Water Table	458 ft
		Site Depth	206 ft

Source and Description of Waste

1.13 x 10<sup>7</sup> liters. Cell drainage from Tank 5-6 in 221-T; waste from 224-T via overflow from the 241-T-361 Settling Tank. Low-salt, neutral/basic.

Description of Facility

One well, 8 in. diameter. Deactivation: Pipeline blanked when the effluent flow rate exceeded the infiltration rate.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 12/31/75</u>
Pu, g	3.35 x 10 <sup>3</sup>	3.35 x 10 <sup>3</sup>
Beta, Ci	2.8 x 10 <sup>3</sup>	1.07 x 10 <sup>2</sup>
<sup>90</sup> Sr, Ci	55.7	25.7
<sup>106</sup> Ru, Ci	1.2 x 10 <sup>2</sup>	4.87 x 10 <sup>-8</sup>
<sup>137</sup> Cs, Ci	59.5	28.9
<sup>60</sup> Co, Ci	None	None
U, kg	None	None

History:

Above ground piping was removed, all sink holes filled, and the ground surface decontaminated and leveled during the month of August 1975.

9 2 1 2 5 8 1 4 5 8

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		241-T-361 No. 1 and 2 Cribs 216-T-5 361-T No. 1 and 2 Cribs	216-T-6
<u>Location</u> 200 West, N. E. Quadrant		<u>Service Dates</u>	<u>Status</u>
150 ft North of 23rd Street and 1250 ft West of 224-T Bldg. Just West of 216-T-3.		8/46-10/47	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43315, W-74442	H-2-353 H-2-951	Ground	707 ft
		Water Table	458 ft(1973)
		<u>Site Depth</u>	25 ft
<u>Source and Description of Waste</u>			
4.5 x 10 <sup>7</sup> liters. Cell drainage from Tank 5-6 in 221-T and waste from 224-T via overflow from the 241-T-361 Settling Tank. Low-salt, neutral/basic.			
<u>Description of Facility</u>			
Two cribs, wooden structure 14 ft x 14 ft bottom surface. Cribs located 62 ft apart. No. 1 Crib overflows into No. 2. Most of the activity is believed to be in No. 1. Deactivation: Pipeline blanked South of 241-T-361 Settling Tank.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	3.9 x 10 <sup>2</sup>	3.9 x 10 <sup>2</sup>
	Beta, Ci	1.8 x 10 <sup>4</sup>	<6.35 x 10 <sup>2</sup>
	<sup>90</sup> Sr, Ci	3.6 x 10 <sup>2</sup>	1.72 x 10 <sup>2</sup>
	<sup>106</sup> Ru, Ci	6.0 x 10 <sup>2</sup>	5.67 x 10 <sup>-7</sup>
	<sup>137</sup> Cs, Ci	3.0 x 10 <sup>2</sup>	1.50 x 10 <sup>2</sup>
	<sup>60</sup> Co, Ci	5.0	9.34 x 10 <sup>-2</sup>
	U, kg	23	22.7
<u>Other Potential Hazards</u>			
Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			

9 2 1 2 5 8 1 4 5 9

216-T-8 continued

Site Characterization Status

Well W11-55 is a typical shallow well that monitors the 216-T-6 cribs. A thin band of subsurface contamination is noted at 20 ft below ground. Wells toward the East side of the cribs show higher radioactivity and a thicker zone of ground contamination, indicating preferential eastward waste movement (1963).

Thirteen wells were drilled around the 216-T-6 cribs in 1947 to determine the distribution of fission products and plutonium beneath this disposal site. Plutonium contamination ( $>0.04 \mu\text{g}/\text{kg}$  of soil) was detected as far as 20 ft below the bottom of the cribs and had spread laterally about 45 ft. Fission product contamination ( $>0.05 \mu\text{Ci}/\text{kg}$  of soil) had penetrated to a depth of 107 ft below the bottom of the crib and had spread laterally to a distance of 95 ft. Most of the contamination was found in the No. 1 crib which overflowed into the No. 2 crib.

Sink holes were filled and the ground surface leveled at this site in August 1975.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

9 2 1 2 5 8 1 4 6 1

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		222-T-1 and 2 Crib	216-T-8
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
50 ft East of 222-T and 500 ft North of 23rd St. 65 yards SSE of the S.E. Corner of 222-T Bldg.		5/50-9/51	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43545, W-72950	H-2-353	Ground 719 ft	
		Water Table 464 ft (1973)	
		<u>Site Depth</u> 25 ft	

Source and Description of Waste

5.0 x 10<sup>5</sup> liters of neutral-basic waste from 222-T: decontamination sink waste and "slupper" waste.

Description of Facility

Two wooden-structure cribs, each 12 x 12 ft in bottom area. Pipelines in building were blanked in 9/1951.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	5.0	5.0
Beta, Ci	1.0 x 10 <sup>2</sup>	2.11
<sup>90</sup> Sr, Ci	1.0	0.521
<sup>106</sup> Ru, Ci	5.0	6.19 x 10 <sup>-8</sup>
<sup>137</sup> Cs, Ci	<1.0	.543
<sup>60</sup> Co, Ci	<0.1	<3.04 x 10 <sup>-3</sup>
U, kg	4.5	4.5

"Two standard type cribs cascading in series were built in spring of 1950 to receive waste from the 222-T building previously sent to the 222-T drywell." Reference Document #HW 60807 - July 1959, Baldrige.

Other Potential Hazards

Wooden structure of crib may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u> Trench	<u>Past Designation</u> Decontamination Trenches Equipment Decontamination Area	<u>Number</u> 216-T-9
<u>Location</u> 200 West, N.E. Quadrant  610 ft west of 221-T, 630 ft north of 23rd St.	<u>Service Dates</u>  7/65-1/69 Exhumed 5/72	<u>Status</u>  Released from Radiation Zone Status
<u>Site Coordinates</u> N-43895, W-73750 to N-43895, W-73800	<u>Reference Drawings</u> H-2-44511 #140	<u>Elevations</u> Ground 710 ft Water Table 467 ft (1973) <u>Site Depth</u> 6 ft

EXHUMED AND RELEASED - MAY 1972

9 2 1 2 5 8 1 4 6 2

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Trench	Decontamination Trenches Equipment Decontamination Area	216-T-10
<u>Location</u> 200 West, N.E. Quadrant  610 ft west of 221-T; 630 ft north of 23rd Street	<u>Service Dates</u>  6/51-3/57  Exhumed 5/72	<u>Status</u>  Released from Radiation Zone Status

EXHUMED AND RELEASED MAY 1972

9 2 1 2 1 1 4 3 3

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u> Trench	<u>Past Designation</u> Decontamination Trenches Equipment Decontamination Area	<u>Number</u> 216-T-11
<u>Location</u> 200 West, N.E. Quadrant 610 ft west of 221-T, 630 ft north of 23rd Street	<u>Service Dates</u> 6/51-3/57 Exhumed 5/72	<u>Status</u> Released from Radiation Zone Status

EXHUMED AND RELEASED MAY 1972

9 2 1 2 3 4 1 4 5 4

CONTAMINATED LIQUID DISPOSAL SITES

II. NE

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Crib	207-T Sludge Grove or Pit 216-T-11	216-T-12
<u>Location</u> 200 West, N.E. Quadrant	<u>Service Dates</u>	<u>Status</u>
300 ft North of 23rd Street and 1800 ft West of 224-T Bldg. N.E. corner of 207-T Retention basin	11/54-11/54	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-43560, W-75140	H-2-44510 No. 3 H-2-2430	Ground 669 ft Water Table 468 ft (1973) Site Depth 8 ft

Source and Description of Waste

5.0 x 10<sup>6</sup> liters. Contaminated sludge from 207-T Retention Basin.  
Low-salt, neutral/basic.

Description of Facility

One pit, 15 ft x 10 ft. Deactivation: Backfilled.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	1.0	1.0
Beta, Ci	55	17.1
<sup>90</sup> Sr, Ci	5.0	2.84
<sup>106</sup> Ru, Ci	10.0	1.29 x 10 <sup>-6</sup>
<sup>137</sup> Cs, Ci	10.0	5.89
<sup>60</sup> Co, Ci	2.0	0.096
U, kg	45	45

Site Characterization

This site is a small trench that was dug in Nov. of 1954 with a backhoe at the Northeast corner of the 207-T Retention Basin. Sludge dredged from the 207-T Retention Basin was put into the trench and covered. Activity on the sludge read a maximum of 15 mrads/hr at the time of the burial. The majority of the surface readings taken were in the range of 2 to 5 mrads/hr.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

9212511466

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		241-T-1 Trench 216-T-1 Grave 216-T-13	216-T-14
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.E. Quadrant  50 yards straight North of the 207-T Retention Basins		1/54-1/54	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43780, W-75275	SK-2-2409  H-2-36849	Ground 692 ft Water Table 468 ft (1973)	
		<u>Site Depth</u>	10 ft

Source and Description of Waste

1 x 10<sup>6</sup> liters. First cycle supernatant waste from 221-T via the 104, 105 and 106-T tanks in the 241-T Tank Farm. High-salt, neutral/basic.

Description of Facility

Trench structure, 220 ft x 10 ft. Deactivation: The aboveground piping was removed and the trench backfilled when the specific retention capacity was reached.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	0.88	.88
Beta, Ci	9.9 x 10 <sup>2</sup>	5.37 x 10 <sup>2</sup>
<sup>90</sup> Sr, Ci	6.0	3.41
<sup>106</sup> Ru, Ci	15.0	1.93 x 10 <sup>-6</sup>
<sup>137</sup> Cs, Ci	4.7 x 10 <sup>2</sup>	2.76 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	1.5	0.72 x 10 <sup>-1</sup>
U, kg	30	30

Site Characterization

Shallow well W-11-68 monitors the 216-T-14 through 17 trenches where specific retention disposal was made. Only a narrow band of contamination 30 feet below ground surface is noted.

(See Next Page)

216-T-14 continued

In May 1970 radioactive Russian thistle to a maximum of 15 mrads/hr were found growing on this trench and trenches 216-T-15 and 216-T-16. The weeds were removed and the entire surface of the radiation zone (including T-14, T-15, T-16, and T-17) was treated with Trisden-dimethylamine salts of Trichlorobenzoic. The herbicide treatment was completely effective until the summer of 1976 when a few non-radioactive weeds appeared.

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<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		241-T-2 Trench 216-T-2 Grave 216-T-14	216-T-15
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
500 ft North of 23rd Street and 2000 ft West of 224-T Bldg. 50 yards north of the 207-T Retention Basins.		1/54-2/54	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43760, W-75185 to N-44000, W-75185	SK-2-2409 H-2-36849	Ground 692 ft Water Table 468 ft (1973) <u>Site Depth</u> 10 ft	
<u>Source and Description of Waste</u>			
1.0 x 10 <sup>6</sup> liters. First cycle supernatant waste from 221-T via the 104, 105 and 106-T tanks in the 241-T Tank Farm. High-salt, neutral/basic.			
<u>Description of Facility</u>			
Trench structure, 240 ft x 10 ft bottom area. Deactivation: The aboveground piping was removed and the trench backfilled when the specific retention capacity was reached.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	0.94	0.94
	Beta, Ci	2.1 x 10 <sup>3</sup>	1.20 x 10 <sup>3</sup>
	<sup>90</sup> Sr, Ci	21.0	11.9
	<sup>106</sup> Ru, Ci	12.0	1.55 x 10 <sup>-6</sup>
	<sup>137</sup> Cs, Ci	1.0 x 10 <sup>3</sup>	6.10 x 10 <sup>-2</sup>
	<sup>60</sup> Co, Ci	1.2	5.78 x 10 <sup>-2</sup>
	U, kg	27	27.2
<u>Site Characterization</u>			
Shallow well W-11-68 monitors the 216-T-14 through 17 trenches where specific retention disposal was made. Only a narrow band of contamination 30 feet below ground surface is noted.			

(See Next Page)

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216-T-15 continued

In May 1970 radioactive Russian thistle to a maximum of 15 mrads/hr were found growing on trenches T-14, T-15 and T-16. The weeds were removed and the entire surface of the radiation zone (including T-14, T-15, T-16, and T-17) was treated with Trisden-dimethylamine salts of Trichlorobenzoic. The herbicide treatment was completely effective until the summer of 1976 when a few non-radioactive weeds appeared.

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<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		241-T-3 Trench 216-T-15 216-T-3 Grave	216-T-16
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
200 West Area, 500 ft North of 23rd Street and 2000 ft West of 224-T Bldg. 50 yards north of the 207-T Retention Basins.		2/54-2/54	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43760, W-75095 to N-44000, W-75095	SK-2-2409 H-2-36849	Ground	692 ft
		Water Table	648 ft (1973)
		Site Depth	10 ft
<u>Source and Description of Waste</u>			
1.0 x 10 <sup>6</sup> liters. First cycle supernatant waste from 221-B via the 104, 105 and 106-T tanks in the 241-T Tank Farm. High-salt, neutral/basic.			
<u>Description of Facility</u>			
Trench structure, 240 ft x 10 ft bottom surface. Deactivation: The aboveground piping was removed and the trench backfilled when the specific retention capacity was reached.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	0.65	0.65
	Beta, Ci	1.05 x 10 <sup>3</sup>	<5.99 x 10 <sup>2</sup>
	<sup>90</sup> Sr, Ci	8.0	4.95
	<sup>106</sup> Ru, Ci	13.0	1.67 x 10 <sup>-6</sup>
	<sup>137</sup> Cs, Ci	5.22 x 10 <sup>2</sup>	3.07 x 10 <sup>2</sup>
	<sup>60</sup> Co, Ci	1.3	6.27 x 10 <sup>-2</sup>
	U, kg	22.2	22.2
<u>Site Characterization Status</u>			
Shallow well W-11-68 monitors the 216-T-14 through 17 trenches where specific retention disposal was made. Only a narrow band of contamination 30 feet below ground surface is noted.			

9 2 1 2 5 8 1 4 7 0

(See Next Page)

216-T-16 continued

In May 1970 radioactive Russian thistle to a maximum of 15 mrads/hr were found growing on trenches T-14, T-15 and T-16. The weeds were removed and the entire surface of the radiation zone (including T-14, T-15, T-16, and T-17) was treated with Trisden-dimethylamine salts of Trichlorobenzoic. The herbicide treatment was completely effective until the summer of 1976 when a few nonradioactive weeds appeared.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 241-T-4 Trench 216-T-4 Grave 216-T-16	<u>Number</u> 216-T-17
<u>Location</u> 200 West, N.E. Quadrant  200 West Area, 500 ft north of 23rd Street and 2000 ft west of 224-T Bldg.		<u>Service Dates</u>  2/54-6/54	<u>Status</u>  Inactive
<u>Site Coordinates</u> (Approximate)  N-43760, W-75045 N-44000, W-75045	<u>Reference Drawings</u>  SK-2-2409 H-2-36849	<u>Elevations</u>  Ground 692 ft Water Table 468 ft (1973) Site Depth 10 ft	
<u>Source and Description of Waste</u> 7.85 x 10 <sup>5</sup> liters. First cycle supernatant waste from 221-T via the 104, 105 and 106-T tanks in the 241-T Tank Farm. High-salt, neutral/basic.			
<u>Description of Facility</u> Trench structure, 275 ft x 10 ft bottom surface. Deactivation: The aboveground piping was removed and the trench backfilled when the specific retention capacity was reached.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
	Pu, g	0.53	0.53
	Beta, Ci	7.7 x 10 <sup>2</sup>	<416.0
	<sup>90</sup> Sr, Ci	3.0	1.66
	<sup>106</sup> Ru, Ci	10.0	6.46 x 10 <sup>-7</sup>
	<sup>137</sup> Cs, Ci	3.7 x 10 <sup>2</sup>	215.0
	<sup>60</sup> Co, Ci	1.0	4.22 x 10 <sup>-2</sup>
	U, kg	20	20.0
<u>Site Characterization Status</u> Shallow well W-11-68 monitors the 216-T-14 through 17 Trenches where specific retention disposal was made. Only a narrow band of contamination 30 feet below ground surface is noted.			

9 2 1 2 5 1 1 4 7 2

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-T-17;216-U-10; Test crib for 221-T; scavenged TBP waste	216-T-18
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.E. Quadrant  500 ft South of 23rd Street and 250 ft East of Camden Ave. Due North of cribs 216-T-26, 27, 28		12/53-12/53	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-42790, W-75300	H-2-235 H-2-2733	Ground 671 ft Water Table 468 ft (1973) Site Depth 10 ft	
<u>Source and Description of Waste</u>			
1.0 x 10 <sup>6</sup> liters. Scavenged first cycle wate from 221-T. High-salt, neutral/basic.			
<u>Description of Facility</u>			
One crib, 10 ft x 10 ft bottom surface, concrete structure. Deactivation: Above-ground piping was removed and the pit backfilled.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	1.8 x 10 <sup>3</sup>	1.80 x 10 <sup>3</sup>
	Beta, Ci	8.4 x 10 <sup>2</sup>	<7.13 x 10 <sup>1</sup>
	<sup>90</sup> Sr, Ci	7.0	3.88
	<sup>106</sup> Ru, Ci	2.0 x 10 <sup>2</sup>	1.29 x 10 <sup>-5</sup>
	<sup>137</sup> Cs, Ci	57.0	32.8
	<sup>60</sup> Co, Ci	10.0	0.42
	U, kg	27.2	27.2
<u>Site Characterization Status</u>			
Well W11-11 monitors the 216-T-18 crib site. A band of gross subsurface contamination is indicated from about 7 ft to 85 ft beneath ground surface. Little downward waste migration has been noted.			

9 2 1 2 5 8 1 4 7 3

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		155-TX 216-TX-2	216-T-20
<u>Location</u> 200 West, N. E. Quadrant		<u>Service Dates</u>	<u>Status</u>
750 ft South of 22nd Street and 750 ft East of Camden Ave.		11/52-11/52	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-41380, W-74720	H-2-44510 No. 3	Ground	690 ft
		Water Table	468 ft (1973)
		<u>Site Depth</u>	4 ft

Source and Description of Waste

1.89 x 10<sup>4</sup> liters. Contaminated nitric acid from 241-TX-155 Diversion Box catch tank. Acidic.

Description of Facility

One pit, 10 ft x 10 ft. Deactivation: Aboveground piping removed and the pit backfilled.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	None	None
Beta, Ci	50	<2.24
<sup>90</sup> Sr, Ci	0.99	0.54
<sup>106</sup> Ru, Ci	2.1	6.9 x 10 <sup>-8</sup>
<sup>137</sup> Cs, Ci	1.1	.60
<sup>60</sup> Co, Ci	None	None
U, kg	5.0	5.0

(See Next Page)

9 2 1 2 5 8 1 4 7 4

216-T-20 continued

History: Reference - HW-60807, K. F. Baldrige (155-TX Diversion Box)

155-TX DIVERSION BOX

Contamination has been spread from this diversion box to the surrounding ground at various times during the past few years. An area on three sides of the box has been black-topped to fix the contamination and is delimited by a combination of wood, chain, and rope fence and signs. In November 1952, a contaminated nitric acid solution was pumped from the 155-TX catch tank to an excavation nearby. This waste was covered with about three feet of clean earth and the area aboveground delimited by a wooden fence and posted with radiation zone signs. Again in the spring of 1954 a leak occurred from one of the jumpers in the diversion box causing the area 30 feet by 100 feet to the west of the diversion box to become contaminated. This area was covered with clean soil and temporarily posted a radiation zone; however, the fence and signs have since disappeared.

Note:

The pit dug to receive the nitric acid was later designated 216-T-20 crib.

9212 1475

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-TY-1 Cavern or Crib	216-T-26
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.E. Quadrant 200 ft North of 22nd Street and 200 ft East of Camdon Ave. Cribs 216-T-26, 216-T-27, and 216-T-28 are all included within one radiation zone		8/55-11/56	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-42275, W-75330	H-2-2735 H-2-2733 H-2-2913	Ground	666 ft
		Water Table	468 ft (1973)
		Site Depth	15 ft

Source and Description of Waste

1.2 x 10<sup>7</sup> liters. Scavenged first-cycle waste from 221-T. High-salt, neutral/basic.

Description of Facility

One crib, concrete structure, 30 ft x 30 ft. Deactivation: Pipeline to crib blanked between the east perimeter fence of the 241-TY Tank Farm and the roadway.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	59.0	59.0
Beta, Ci	2.9 x 10 <sup>4</sup>	<9.89 x 10 <sup>2</sup>
<sup>90</sup> Sr, Ci	6.7 x 10 <sup>2</sup>	3.90 x 10 <sup>2</sup>
<sup>106</sup> Ru, Ci	2.6 x 10 <sup>3</sup>	7.48 x 10 <sup>-4</sup>
<sup>137</sup> Cs, Ci	1.7 x 10 <sup>2</sup>	1.03 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	1.0	5.81 x 10 <sup>-2</sup>
U, kg	1.5 x 10 <sup>2</sup>	1.5 x 10 <sup>2</sup>

Site Characterization Status

Well W14-2 monitors the 216-T-26 through 28 cribs. The scintillation log shows gross subsurface contamination to 120 ft belowground surface. Some downward migration is noted since 1959. Significant lateral spread of waste was noted at this crib site several years ago. When contaminants were detected in the ground beneath the southernmost (T-28), unused crib, this spread was attributed to the presence of a thin, relatively impermeable caliche layer at a depth of about 120 ft.

(See Next Page)

9 2 1 2 5 8 1 4 7 6

216-T-26 continued

Site Characterization continued

A few scattered Russian thistle containing Strontium and Cesium radioactivity were found growing each year for the past ten years or more on the surface of this site. Most of the thistles were removed when found, but some escaped detection and subsequently deteriorated releasing contamination to the ground surface. A radiation survey in May 1975 revealed spotty surface contamination to a maximum of 30,000 c/m. Remedial action in June and July of 1975 included blading six inches of soil from the affected areas and disposing of the spoil in the 200 West Dry Waste Burial Grounds. The ground surface was then covered with clean fill dirt back to its original level.

921211477

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-TY-2 Cavern or Crib	216-T-27
<u>Location</u> 200 West, N.E. Quadrant 250 ft North of 22nd Street and 200 ft East of Camden Ave. Cribs 216-T-26, 216-T-27, and 216-T-28 are all included within one radiation zone		<u>Service Dates</u> 9/65-11/65	<u>Status</u> Inactive
<u>Site Coordinates</u> N-42360, W-75330	<u>Reference Drawings</u> H-2-2735 H-2-2733	<u>Elevations</u> Ground 666 ft Water Table 468 ft Site Depth 15 ft	
<u>Source and Description of Waste</u> 7.19 x 10 <sup>6</sup> liters. 300 Area laboratory waste from 340 Bldg. Low-salt, neutral/basic.			
<u>Description of Facility</u> One crib, concrete structure, 30 ft x 30 ft bottom surface. Deactivation: Pipeline to 216-T-26/28 cribs blanked when the radionuclide disposal limit was reached.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	13	13.0	
Beta, Ci	3.6 x 10 <sup>3</sup>	<3.56 x 10 <sup>2</sup>	
<sup>90</sup> Sr, Ci	1.4 x 10 <sup>2</sup>	1.04 x 10 <sup>2</sup>	
<sup>106</sup> Ru, Ci	1.5 x 10 <sup>3</sup>	.38	
<sup>137</sup> Cs, Ci	1.0 x 10 <sup>2</sup>	75.9	
<sup>60</sup> Co, Ci	1.0	.206	
U, kg	7.3	7.26	

(See Next Page)

9212-11473

216-T-27 continuedSite Characterization Status

Well W14-2 monitors the 216-T-26 through 28 cribs. The scintillation log shows gross subsurface contamination to 120 ft below ground surface. Some downward migration is noted since 1959. Significant lateral spread of waste was noted at this crib site several years ago when contaminants were detected in the ground beneath the southernmost (T-28), unused crib. This spread was attributed to the presence of a thin, relatively impermeable caliche layer at a depth of about 120 ft (1963).

A few scattered Russian thistle containing Strontium and Cesium radioactivity were found growing each year for the past ten years or more on the surface of this site. Most of the thistles were removed when found, but some escaped detection and subsequently deteriorated releasing contamination to the ground surface. A radiation survey in May 1975 revealed spotty surface contamination to a maximum of 30,000 c/m. Remedial action in June and July of 1975 included blading six inches of soil from the affected areas and disposing of the spoil in the 200 West Dry Waste Burial Grounds. The ground surface was then covered with clean fill dirt to its original level.

92121470

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Crib	216-TY-3 Cavern or Crib	216-T-28
<u>Location</u> 200 West, N.E. Quadrant 300 ft North of 22nd Street and 200 ft East of Camden Ave. Cribs 216-T-26, 216-T-27, and 216-T-28	<u>Service Dates</u>	<u>Status</u>
	2/60-12/66	Inactive

<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-42445, W-75330	H-2-2735 H-2-2733	Ground 666 ft Water Table 468 ft (1973) Site Depth 15 ft

Source and Description of Waste

4.23 x 10<sup>7</sup> liters. Steam condensate, decontamination waste and misc. effluents from 221-T; 300 Area laboratory waste from 340 Bldg. Low-salt, neutral/basic.

Description of Facility

One concrete crib, 30 ft x 30 ft bottom surface. Deactivation: Pipeline blanked when the crib reached the prescribed radionuclide disposal limits.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	70	70
Beta, Ci	5.9 x 10 <sup>4</sup>	<9.89 x 10 <sup>2</sup>
<sup>90</sup> Sr, Ci	2.0 x 10 <sup>2</sup>	1.47 x 10 <sup>2</sup>
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>3</sup>	.182
<sup>137</sup> Cs, Ci	3.5 x 10 <sup>2</sup>	2.61 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	5.0	.98
U, kg	3.9 x 10 <sup>2</sup>	3.91 x 10 <sup>2</sup>

(See Next Page)

921211433

216-T-28 continuedSite Characterization Status

Well W14-2 monitors the 216-T-26 through 28 cribs. The scintillation log shows gross subsurface contamination to 120 ft below ground surface. Some downward migration is noted since 1959. Significant lateral spread of waste was noted at this crib site several years ago when contaminants were detected in the ground beneath the southernmost (T-28), unused crib. This spread was attributed to the presence of a thin, relatively impermeable caliche layer at a depth of about 120 ft (1963).

A few scattered Russian thistle containing Strontium and Cesium radioactivity were found growing each year for the past ten years or more on the surface of this site. Most of the thistles were removed when found, but some escaped detection and subsequently deteriorated releasing contamination to the ground surface. A radiation survey in May 1975 revealed spotty surface contamination to a maximum of 30,000 c/m. Remedial action in June and July of 1975 included blading six inches of soil from the affected areas and disposing of the spoil in the 200 West Dry Waste Burial Grounds. The ground surface was then covered with clean fill dirt to its original level.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

9 2 1 2 5 1 1 4 8 2

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
French Drain		291-T Sand Filter Sewer	216-T-29
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
190 ft east of 221-T, 95 ft west of Beloit Ave..		3/49-3/64	Inactive
Map 1			
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-44064, W-72850 to	H-2-34762	Ground	729 ft
N-44154, W-74789	H-2-1345	Water Table	456 ft(1973)
N-44182, W-72825 to	H-2-1348		
N-44091, W-72891	H-2-1351	<u>Site Depth</u>	3.5 ft
<u>Source and Description of Waste</u>			
Volume unknown. Sand filter condensate runoff. Potentially acidic.			
<u>Description of Facility</u>			
60 vitrified soil pipes, 6 in. diameter, in an area 100 ft x 48 ft.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 12/31/73</u>	
Beta, Ci	<10	<8	
<u>Note:</u>			
The 291-T sand filter inlet trenches drain to a french drain pipe extending into the ground at the north corner of the sand filter. Any moisture condensed from the canyon air on the filter bed will escape to the ground at this location. The amount and activity are both very low.			

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib (Unplanned Release Site)			216-T-30
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
Between 221-T Bldg. and 222-T Bldg. at section R-11, 221-T		<u>Spill Dates:</u> July 1953 Dec. 30, 1955	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43880, W-73200	SK-2-1773	Ground	718 ft
		Water Table	460 ft (1968)
		<u>Site Depth</u>	15 ft
<u>Source and Description of Waste</u>			
1.9 x 10 <sup>4</sup> liters. Waste from 221-T. High-salt, neutral/basic.			
<u>Description of Facility</u>			
Jumper leak in 241-TX-154 Diversion Box caused 241-TX-302C Catch Tank to overflow. Contaminated liquid spread over area 160 ft x 90 ft, contamination covered with earth.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	1.0	1.0
	Beta, Ci	5.0 x 10 <sup>2</sup>	88.7
	<sup>90</sup> Sr, Ci	40	22.2
	<sup>106</sup> Ru, Ci	50.0	3.23 x 10 <sup>-6</sup>
	<sup>137</sup> Cs, Ci	40.0	23.0
	<sup>60</sup> Co, Ci	1.0	4.22 x 10 <sup>-2</sup>
	U, kg	4.5	4.54
<u>History:</u>			
Two incidents, one in July 1953 and the other December 30, 1955, contributed to the contamination remaining in this unplanned release site. (See Attachments 1 and 2)			
(See Next Page)			

92125 11483

216-T-30 continuedHistory continued

During the months of April and May 1968, the east side of the 216-T-30 radiation zone was cut back a distance of 10 feet at road level to straighten the road and give better access to the 222-T Building entrance. Dose rates to a maximum of 500 MR/hr were encountered shining through the overfill at the face of the new cut. No radioactive contamination was detected in the soil removed.

Thin concrete cell cover blocks were leaned at a 60° angle against the side of the cut to shield the dose rates to acceptable levels at the east perimeter of the zone.

A radiation survey of the zone, Radiation Monitoring Monthly Report- January 28, 1971, reported road surface contamination to 90,000 c/m at the east edge of the zone. It appeared that winter moisture had leached out beta contamination from the zone subsoils and deposited it along the side of the road.

A few radioactive weeds grow each year through the tar covering on top of the zone.

Dose rates at the east perimeter of the zone are presently 12 mrads/hr which does not meet zone standards of less than 2 mrads/hr.

Recommendations are to remove the overfill from the site, remove soil contamination to a depth of at least 4 feet, then fill the cavity with coarse gravel to create a shallow french drain. Treat the gravel with herbicides, cover with 10 mil plastic sheeting, cover with sand, and stabilize with fine gravel against wind and water erosion.

9212 11484

GROUND CONTAMINATION - 241-TX-154 DIVERSION BOX

A cave-in of the ground occurred early in July 1953 over a process line near the 241-TX diversion box causing an extended area on both sides of the road between 221-T and 222-T buildings to become contaminated and was reported as a dose rate of 25 rads/hour at eight inches. This area has been covered with blacktop and posted with underground contamination signs.

Reference HW-60807 K. F. Baldrige - July 15, 1959

921211435

MANUFACTURING DEPARTMENT  
RADIATION INCIDENT INVESTIGATION\*

Class: 1

Incident Number: 553-C

Incident:

Area: 200-W

Date: December 30, 1955

Section: Separations

Time: Approximately 5:00 AM

Nature of Incident: Highly radioactive liquid waste spread to ground around the 302 catch tank in back of the 221-T Building.

Investigation

Committee

Date: January 3, 1956

CB Foster, T Plant, Chairman

RG Zumhoff, T Plant

Time: 1:30 PM

PEL Nussbaum, T Plant

HW Murray, T Plant

JW Vanderbeek, Radiological Sciences

GE Backman, Radiation Monitoring, Secretary

In Attendance

JF Nesbitt

Interviewed

None

\* Taken from HW-40765

921211436

Description of Incident

Because of an accumulation of liquid waste in the 302 catch tank which collects drainage from the 154-T Diversion Box, it was necessary to transfer this waste to a storage tank to prevent possible waste backup in the 154-TX box. A jumper was installed in the diversion box which allowed the catch tank waste to be jetted into the presently used metal waste line and hence into the 101-U metal waste storage tank. Some difficulty was encountered in getting the jet to transfer the solution but this was not considered unusual since the jet is used infrequently; however, at about 11:00 PM on 12-29-55, the jet began to operate and liquid level measurements indicated that about 2,000 gallons an hour were being transferred.

Routine liquid level measurements were made at the catch tank at 1:00 and 2:00 AM on 12-30-55 and at these times the transfer seemed to be progressing satisfactorily. However, when a process operator started to make a routine measurement at approximately 5:30 AM, he noticed that he was getting a high reading on his radiation dose rate meter. He also noticed that there was a pool of liquid in the immediate area where he would normally take the catch tank measurement. His findings were reported to his supervisor immediately who in turn notified Radiation Monitoring.

It was first assumed that it was waste from the 5-6 tank that was being transferred at that time and was somehow escaping and flooding this area, so this transfer was stopped. Members of the Operations and Radiation Monitoring Units went up to the 221-T Building roof which was an excellent vantage point for observing the area. It appeared to them that either the catch tank transfer line had ruptured or a gasket failed and that the liquid from the catch tank was being forced to the surface. The steam to the transfer jet was then turned off.

High radiation levels were noted throughout the area and these levels increased until the steam to the jet was turned off. Dose rates of interest at that time were as follows:

221-T building roof above spill (approx. 80')	1.5 r/hr
224-T building F-10 entrance	15 mr/hr
224-T building roof door	150 mr/hr
222-T building main entrance	1.0 r/hr
Eight feet from edge of the pool (partially shielded)	5.0 r/hr
One foot above pool	100 rads/hr
T Plant badgehouse	4 mr/hr

9212 11917

### Discussion of Incident

The 302 catch tank has a capacity of approximately 17,000 gallons and before any of the solution was transferred out, the catch tank was estimated to contain 14,000 gallons. It was not possible to estimate closely the number of gallons that escaped to the ground, but it appeared to be of the magnitude of several thousand gallons. The content of the catch tank was assumed to be primarily metal waste and rain water. The high radiation level of the solution tends to confirm this assumption.

It was not definitely determined how the liquid escaped but it appeared that either the transfer line ruptured or a gasket in one of the flanges failed. The liquid was forced through several feet of earth and onto the surface of the ground. This area had been covered with asphalt because of a previous contamination spread and tended to hold the liquid on the surface rather than allow it to seep in the ground. When the area was being backfilled, it was necessary to backfill around the pool to prevent further contamination spread. This complicated the work since dose rates to the heavy equipment operators varied between 1 and 5 r/hr.

After the pool of liquid was covered, low-level contamination was found from the pool of liquid over in front of 222-T (two vehicles there were found contaminated) and between 222-T and 224-T. It was apparently caused from steam blowing through the radioactive liquid and then drifting in that direction and condensing. This area will be covered with asphalt.

When the steam was turned off to the jet, the line was not broken and as the steam condensed, liquid was pulled back into the steam hose. The dose rate at two inches from the hose was 33 r/hr. The hose was placed in the dirt used to cover the contamination spread and buried.

The committee was of the opinion that the action of the process operator was exceptional. He was alert and detected the high radiation level before he entered the area where he would be expected to monitor. This unquestionably saved him and possibly others from receiving high exposure.

### Dosimetry

No one exceeded the daily working exposure limit when the incident occurred.

### Cause of Incident

The underground transfer line failed in some manner and because of poor design of equipment, the liquid was forced to the surface. Had this line been encased, the liquid would have drained back into the catch tank.

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NE

9 2 1 2 5 1 1 4 8 9

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-T-33	216-T-33
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
250 ft West of 2706-T Bldg. and 900 ft North of 23rd Street		1/63-2/63	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-44100, W-73600	H-2-32097 H-2-32096	Ground	715 ft
		Water Table	462 ft(1973)
		<u>Site Depth</u>	11 ft
<u>Source and Description of Waste</u>			
1.9 x 10 <sup>6</sup> liters. Decontamination waste from 2706-T. Low-salt, neutral/basic.			
<u>Description of Facility</u>			
One gravel crib, 30 ft x 5 ft bottom surface. Deactivation: Perforations in the tile line plugged at the discharge point to the crib; sections of pipeline removed.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	5.0	5.0	
Beta, Ci	50	1.63	
<sup>90</sup> Sr, Ci	0.5	.354	
<sup>106</sup> Ru, Ci	10	6.40 x 10 <sup>-4</sup>	
<sup>137</sup> Cs, Ci	0.5	.36	
<sup>60</sup> Co, Ci	1.0	.158	
U, kg	4.5	4.54	
<u>History:</u>			
The crib was used the first two months of 1963 before the line to the crib plugged. There is some question as to the amount of liquid that actually reached the crib. Operating management believed the line to the crib retained all of the waste. The crib should be exhumed.			

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

9 2 1 2 5 1 1 4 9 0

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-T-34	216-T-34
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.E. Quadrant  Approximately 100 yards down the railroad track, west of the 221-T railroad cut		5/66-3/67	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-44200, W-73900	H-2-32649 H-2-32650	Ground 703 ft Water Table 459 ft (1973) Site Depth 16 ft	

Source and Description of Waste

1.73 x 10<sup>7</sup> liters. 300 Area laboratory waste from 340 Bldg.  
Low-salt, neutral/basic.

Description of Facility

One gravel crib, 200 ft x 30 ft bottom surface. Deactivation: Pipelines capped Northeast of crib when the radionuclide limit was reached.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	1.1 x 10 <sup>2</sup>	1.07 x 10 <sup>2</sup>
Beta, Ci	2.6 x 10 <sup>4</sup>	<1.04 x 10 <sup>3</sup>
<sup>90</sup> Sr, Ci	3.2 x 10 <sup>2</sup>	2.47 x 10 <sup>2</sup>
<sup>106</sup> Ru, Ci	1.1 x 10 <sup>2</sup>	5.58 x 10 <sup>-2</sup>
<sup>137</sup> Cs, Ci	2.8 x 10 <sup>2</sup>	2.14 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	7.3	1.80
U, kg	4.1	4.12

History: The tanker unloading station, with underground piping still remains at the northwest corner of this crib. During the construction and tie in of the 216-T-35 companion crib in February 1967 low-level beta-gamma soil contamination to 30,000 c/m was found around the 216-T-34 unloading station piping. Forty yards of contaminated soil were removed and buried in the 200 West dry waste burial ground. Residue contamination still remains near the ground surface at the unloading station.

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib			216-T-35
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West Area, N.E. Quadrant  Down the railroad tracks approximately 200 yards west of the 221-T railroad cut		3/67-12/67	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-44558, W-74575 to N-45015, W-74520	H-2-33446 H-2-33447	Ground 700 ft Water Table 460 ft (1973) Site Depth 15 ft	
<u>Source and Description of Waste</u>			
5.72 x 10 <sup>6</sup> liters. 300 Area lab wastes (from 340 Bldg.)			
<u>Description of Facility</u>			
Crib, rock-filled; 450 ft x 10 ft bottom dimension			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	66	66.2
	Beta, Ci	930	<67.3
	<sup>90</sup> Sr, Ci	<20	<15.8
	<sup>106</sup> Ru, Ci	130	.134
	<sup>137</sup> Cs, Ci	20	15.8
	<sup>60</sup> Co, Ci	3.4	.914
	U, kg	49	48.9
<u>History:</u>			
A small area at the unloading station has low-level underground contamination. (See History of 216-T-34 crib). There has never been any radioactive surface contamination above the 216-T-35 crib.			

921211491

CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

II. NE

<u>Name/Type of Facility</u> Burial Ground		<u>Past Designation</u> Industrial Waste No. 001	<u>Number</u> 218-W-1A
<u>Location</u> 200 West, N.E. Quadrant  200-West Area, approximately 2000 ft northwest of 221-T Bldg. The railroad track turnaround splits in two this burial ground.		<u>Service Dates</u>  1944-3/54	<u>Status</u>  Inactive
<u>Site Coordinates</u> N-45466, W-74435 N-45119, W-74847 N-44602, W-74177 N-44784, W-74932	<u>Reference Drawings</u>  H-2-2516 (Survey Notes)	<u>Elevations</u> Ground ~700 ft Water Table. ~460 ft(1973) Site Depth ~15-25 ft	
<u>Source and Description of Waste</u>  Failed equipment and industrial waste (approximately $4.8 \times 10^5 \times 10^5 \text{ ft}^3$ ).			
<u>Description of Facility</u>  Backfilled trenches. Surface area is $4.13 \times 10^5 \times \text{ft}^2$ .			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time</u>	
		<u>of Burial</u>	
	U, g	$9.0 \times 10^5$	
	Pu, g	$2.0 \times 10^3$	
	Total Beta, Ci	$4.8 \times 10^4$	
	$^{90}\text{Sr}$ , Ci	$9.6 \times 10^2$	
	$^{106}\text{Ru}$ , Ci	$2.1 \times 10^3$	
	$^{137}\text{Cs}$ , Ci	$1.0 \times 10^3$	

(See next page)

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218-W-1A continuedHistory:

The 218-W-1A Burial Ground is the first large equipment burial site that was used in the 200 West Area. Most of the equipment was buried in wooden boxes which eventually rotted and caused settling of the ground surface. Most of the sink holes were filled with dirt in 1975, but there still remains a number of deep sink holes north of the railroad tracks. The ground surface is free of contamination.

A large number of 6-foot thick concrete cell blocks were stored above ground south of the railroad tracks. Nearly all of the surface radioactive contamination that was on the blocks when they were stored in the burial ground has since decayed. There remains only about 1000 c/m on the underside of two of the blocks.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Vault	222-T Vault	218-W-8
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>
30 yards Southeast of the 222-T Building		1944-1952
<u>Status</u>		
Inactive		
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-43675, W-73015	H-2-4451 Sht. 132 H-2-2322	Ground 718 ft Water Table 456 ft (1973) Site Depth 28 ft
<u>Source and Description of Waste</u>		
Lab and sample wastes from 222-T Bldg. (approximately $2.4 \times 10^3$ ft <sup>3</sup> ).		
<u>Description of Facility</u>		
Underground compartment. $2.50 \times 10^2$ ft <sup>2</sup> of surface area.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Burial</u>	<u>As of 9/30/78</u>
U, g	$3.0 \times 10^2$	300.
Pu, g	0.30	0.3
Total Beta, Ci	$7.7 \times 10^2$	31.7
<sup>90</sup> Sr, Ci	15	7.6
<sup>106</sup> Ru, Ci	33	$1.69 \times 10^{-7}$
<sup>137</sup> Cs, Ci	16	8.49
<u>History:</u> The vault contains miscellaneous lab. waste and 222-T lab. process samples In 1975 approximately 15 yards of fill dirt were spread over the surface of this radiation zone to fill the sink hole that had settled around the vault opening.		
<u>Recommendations:</u> It is recommended that this facility be capped over with a dome of concrete to preclude future cave-ins.		

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## 200 AREA RETENTION BASIN

RHO-CD-673

II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
T Plant Retention Basin			207-T
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.E. Quadrant. ~1500 ft West of 221-T Bldg., ~200 ft North of 23rd Street.		11/44 to present	Active
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43600, W-75200	W-73646	Ground	680 ft
		Water Table	466 ft
		Site Depth	6.5 ft
<u>Source and Description of Waste</u>			
<p>Received process cooling water from process equipment jackets in the 221-T and 224-T Buildings during fuels reprocessing era (1944 to 1957). Activity levels were normally low and the water was discharged to the 216-T-4 Pond via the 216-T-4 Ditch. Also received cooling water from the 242-T Evaporator. Currently receives nonradioactive waste water from 221-T air conditioning filter units and floor drains.</p>			
<u>Description of Facility</u>			
<p>Divided concrete basin, approximately 1 million gal capacity. Dimensions 123 ft. by 246 ft. x 6.5 ft. deep.</p> <p>System also includes about 6000 ft of 24 in. diam. vitrified pipe used to convey the waste water to and from the basin.</p>			
<u>Radionuclide Content</u> (calculated from discharge data)			
Unknown. Basin is still being used.			
<u>History:</u>			
<p>The two concrete basins of this site are contaminated with very low level mixed fission activities to a maximum of 2000 c/m. Most of the activity is in the sludge and in the blow sand buildup on the floors of the basins.</p> <p>The ground surface surrounding the basins is generally contaminated with low level beta-gamma activity resulting from particulate fall-out from early day waste unloading incidents in the nearby 241-T Tank Farm. A significant portion of the ground contamination is beyond the confines of the radiation zone boundary. Action should be taken to remove the radiation zone outside the retention basins.</p>			

(See next page)

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207-T continuedHistory: continued

During the 1950's and early 1960's, cleanout of the 207-T basins was accomplished by removing the blown-in sand and decayed vegetation sludge from each basin and burying it in scooped out holes eight to ten feet deep along the east side of the basins. These burial holes were within 15 feet of the basin walls. The buried sludge was covered with approximately three or four feet of clean soil. Activities on the sludge read approximately 15 mrad/hr or less at the time of burial. There may be three or four such holes in addition to the listed 216-T-12 site. All fall within the posted radiation zone.

Ground surface contamination around the 207-T Basins is the result of particulate matter being blown from the nearby 241-T Tank Farm when the farm was receiving trucked-in liquid wastes from the 100 and 300 Areas. Some ground surface decontamination was accomplished in 1975 and again in 1978, but there remains scattered specks, particularly to the south and to the northwest of the basins.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-073

II. NE

<u>Name/Type of Facility</u> Unplanned Release		<u>Past Designation</u> 23rd and Camden Roadside Line Break	<u>Number</u> UN-216-W-5
<u>Location</u> 200 West, N.E. Quadrant Corner at 23rd and Camden		<u>Service Dates</u> May 1966	<u>Status</u>
<u>Site Coordinates</u> N-43163, W-75348 to N-43163, W-75468 N-43023, W-75468 to N-43023, W-75348	<u>Reference Drawings</u> H-2-44510 Sheet 4	<u>Elevations</u> Ground 679 ft Water Table 468 ft(1973) <u>Site Depth</u> 3 ft	
<u>Source and Description of Waste</u> Liquid waste solution. High-salt, neutral/basic.			
<u>Description of Facility</u> Broken underground line. Liquid surfaced and ran across the road. All surface contamination was removed to depth of 3 ft and taken to the burial ground. Backfilled with clean soil.			
<u>Radionuclide Content</u> (at time of discharge) Approximately 10 Ci Fission Products.			
<u>History:</u> Two similar incidents contributed to the contaminated radioactivity at this site: 1. November 15, 1954 as reported in Document HW-33979 - attached. 2. May 1966, which was a repeat of the first incident except of a lesser magnitude. The same broken waste transfer line was involved. It was mistakenly used. Liquid waste ran from the site and across the road to the West, but did not run down the side of the road, as did the 1954 incident. The surface spill site was excavated to a depth of 3 feet. Surface dose rates in the bottom of the 3 foot excavation read 9 rads/hr and had increased with each scoop of the shovel. The digging was stopped and the hole filled with 3 feet of clean dirt. The radioactive spoil pile was buried in the 200 West Area Dry Waste Burial Grounds.			

(See Next Page)

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UN-216-W-5 continued

History continued:

Note: Whenever there is a prolonged period of heavy moisture at the site (following a rain period or melting snow), radioactive contamination leaches out of the ground on the lower edge of the zone adjacent to Camden Ave. Readings up to a maximum of 60,000 c/m have been found on the ground at the side of the road. Russian thistle growth brings strontium and cesium radioactivity to the ground surface each year. The zone requires frequent surveillance and repeated maintenance.

During May 1978 further work was done to remove contamination from the surface of the zone and to minimize future control problems:

1. All contaminated soil adjacent to the zone, on the south and west sides, was removed. This required excavations to a depth of four feet on the south side and three feet on the west side of the zone. The excavations were filled with clean soil to ground level.
2. Soil was removed from the surface of the zone area to a depth of one feet. The new surface was then treated with a heavy coating of fiberfilm to seal against moisture penetration. It was then covered with four inches of sand and treated with ureabore herbicide.
3. All surfaces were topped with four inches of crushed rock to stabilize against wind erosion.

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MANUFACTURING DEPARTMENT  
RADIATION INCIDENT INVESTIGATION

Class: I

Incident Number: 393Severity: 2Incident:

Date: 11-15-54

Area: 200-West

Time: 4-12 shift

Sub-Section: TBP Plant

Location: Southeast of 241-T

Nature of Incident: Cave-in and ground contamination from a failed process waste line.

23rd and Camden

Description of Incident

About 10:00 AM, 11-16-54, a Radiation Monitor assigned to survey vehicles at the 269-W garage discovered a background reading of 5,000 c/m on his GM meter. Attempting to find the source of this, he quickly discovered a small cave-in and run-off of contaminated liquid in an area about 75 feet by 100 feet on the far (east) side of Camden Street. Dose rates up to 11.5 rads/hr at two inches including 3.5 r/hr were measured over the run-off, and fields up to 4.5 r/hr at three feet near the cave-in. A field of 50 mr/hr existed on Camden Street.

Discussion

About 2:45 PM on 11-15-54, the transfer of first cycle waste from 105-T to 118-TX for 242-T evaporator processing was begun. The routing between the 152-T and 153-TX diversion boxes was via an unencased underground line. As usual, electrode readings were scheduled hourly during the operation as well as checks at diversion box catch tank risers. At 11:00 PM, liquid was heard running into the 302-T catch tank (draining 153-T, 152-T and other diversion boxes). A leaking jumper thus being indicated, supervision was notified and the transfer discontinued about 11:30 PM. Had there been no indication of a leaking jumper, the transfer would have continued until the next morning and possibly greatly increased the exposure problem.

The cave-in occurred approximately 75 feet east of Camden Street and 75 feet south of 23rd Street, with the run-off extending southwest to Camden. There is fortunately no traffic in this area except when cranes occasionally run off the roadway here while turning the corner. No evidence of any exposure was found other than flash exposures to the field of 50 mr/hr to passengers in vehicles using Camden Street during the 4-12 and 12-8 shifts. No high pencil meter results were reported for these shifts.

Inventory readings at 105-T and 118-TX indicated a total discrepancy of 3450 gallons. The 302-T catch tank showed an increase of about 3300 gallons overnight, a few gallons of which was undoubtedly due to rain water, but practically all to a leaking connector. At the most, less than 1000 gallons of waste actually escaped from the line.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Unplanned Release		221-T, R-19 Transfer Line Break	UN-216-W-6
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.E. Quadrant Southeast corner of 221-T		Spring 1947	
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43550, W-73430	H-2-44510 Sheet 4	Ground	718 ft
		Water Table	458 ft (1973)
		Site Depth	Several Feet
<u>Source and Description of Waste</u>			
Contaminated waste from 221-T. High-salt, neutral/basic.			
<u>Description of Facility</u>			
<u>Radionuclide Content</u> (calculated from discharge data)			
<p>In the spring of 1945 radioactive waste from a broken process waste transfer line surfaced at Section R-19, 221-T Building, and spread mixed fission contamination over a small surface of the ground. The affected area was later overfilled with approximately 4 feet of clean dirt.</p> <p>In 1968 Russian thistle containing strontium and cesium radioactivity were found to be growing over the spill site. Each subsequent year the radioactivity in the new crop of Russian thistles became less until no activity was detected after 1975.</p> <p>In the spring of 1977 a number of test holes were cut to a depth of 4 feet across the site. No radioactivity was detected. A blacktop road has since been constructed over the top of the site. The road is in daily use.</p>			

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<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Unplanned Release Site			UN-216-W-7
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
Adjacent to Camden Ave. East of 241-TX Tank Farm.			Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-40750, W-75400 N-41500, W-75200			
<u>Source and Description of Waste</u>			
<p>September 21, 1966 - Ground and road contamination along Camden Avenue and adjacent ground surfaces resulted from two plumes of airborne contamination that floated northeast and southeast from 153-TX diversion box depositing <sup>90</sup>Sr particles at a frequency of 1 particle per sq. yard over an area running 250-yards north and south along Camden and extending from 75 to 100-yards east of Camden. Particles up to 700 mrad/hr were found. Road contamination was covered with a new tar mat, sides of roads were "fixed" with tar, and the field to the east of Camden Avenue was turned under to cover the particulate material.</p>			
<u>Description of Facility</u>			
<p><u>Radionuclide Content</u> (calculated from discharge data)</p> <p align="center">Original Deposition - Approximately 1 Ci <sup>90</sup>Sr.</p> <p>History:</p> <p>All of the contamination is within 6 inches of the ground surface. A road grader was used to push the top of the soil into low windrows. Test plots dug into the soil in the fall of 1976 disclosed strontium 90 particulate matter thinly scattered, but still present. The windrows need to be picked up and taken to the burial ground.</p>			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u> Unplanned Release		<u>Past Designation</u> 224-T SE Side Pu	<u>Number</u> UN-216-W-12
<u>Location</u> 200 West, N.E. Quadrant South East side of 224-T (touching the building) Map 1		<u>Service Dates</u> 2/72	<u>Status</u>
<u>Site Coordinates</u> N-43565, W-73180 to N-43430, W-73275	<u>Reference Drawings</u> H-2-44510 Sheet 4	<u>Elevations</u> Ground: 718 ft Water Table: 458 ft Site Depth: 12 ft	
<u>Source and Description of Waste</u>  Alpha laden moisture from process tank vent lines believed to have seeped through pipe joints during operating years (1945-1957).			
<u>Description of Facility</u>  An underground tile pipe header which received moisture from tank vent lines. Soil contamination was in an area 50' x 12' x 12'. 139 drums of soil were removed for burial.			
<u>Radionuclide Content</u> (calculated from discharge data)  Approximately 10g <sup>239</sup> Pu.  <u>History:</u> February 1972  During remodeling of 224-T Building for Pu storage, gross alpha contamination was found in the soil on the back side of the building. The 224-T Building was originally constructed with vent lines from process tanks entering tile piping at ground level to rear of building. The jointed tile piping went to a common tile header which fed into 221-T Building cells. During the years of process operation, alpha-laden moisture seeped through pipe joints and grossly contaminated the subsoil. Excavations of area showed soil contamination below the surface of an area 50-feet long by 12-feet wide by 12-feet deep. A total of 139 drums of soil were removed from the zone containing approximately 72 grams of plutonium. The zone is marked for underground contamination which remains below the header pipe. (It is believed a similar contaminated condition exists behind 224-B Building in 200-East Area.)			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NE

<u>Name/Type of Facility</u> Unplanned Release Site		<u>Past Designation</u>	<u>Number</u> UN-216-W-23
<u>Location</u> 200 West, N.E. Quadrant		<u>Service Dates</u> Not Known (probably 1950's)	<u>Status</u> Inactive
<u>Site Coordinates</u> N-41450, W-74900	<u>Reference Drawings</u> H-2-34762	<u>Elevations</u>	
<u>Source and Description of Waste</u> Unknown			
<u>Description of Facility</u> Unplanned Salt Waste line leak site. Contamination and radioactivity increases from soil surface downward.			
<u>Radionuclide Content</u> (calculated from discharge data) Radioactive rabbit droppings found near the 241-TX-155 Diversion Box during the spring and summer months of 1977 prompted an extensive radiation survey to determine the source of radioactive rabbit food. It was during this survey that low-level beta-gamma ground surface contamination was found on the hillside below and to the west of the 241-TX-155 Diversion Box. As soil was removed from the ground surface in an attempt to decontaminate the site, radioactivity increased until it was evident that the source of the contamination was sub-surface - possibly an old leak from a nearby waste transfer pipeline. The contaminated area was covered with clean gravel and identified with radiation zone markings around its perimeter.			

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VOLUME II 200 WEST AREA - Southeast Quadrant (SE)

Waste Disposal Sites and Associated Radiation Zones

Quadrant Boundaries

- East Boundary - Albany Avenue, known as the "East Fenceline Road".
- South Boundary - 10th Street, known as the "South Fenceline Road".
- West Boundary - Camden Avenue from 10th Street to 19th Street.
- North Boundary - 19th Street from Camden Avenue to Albany Avenue.

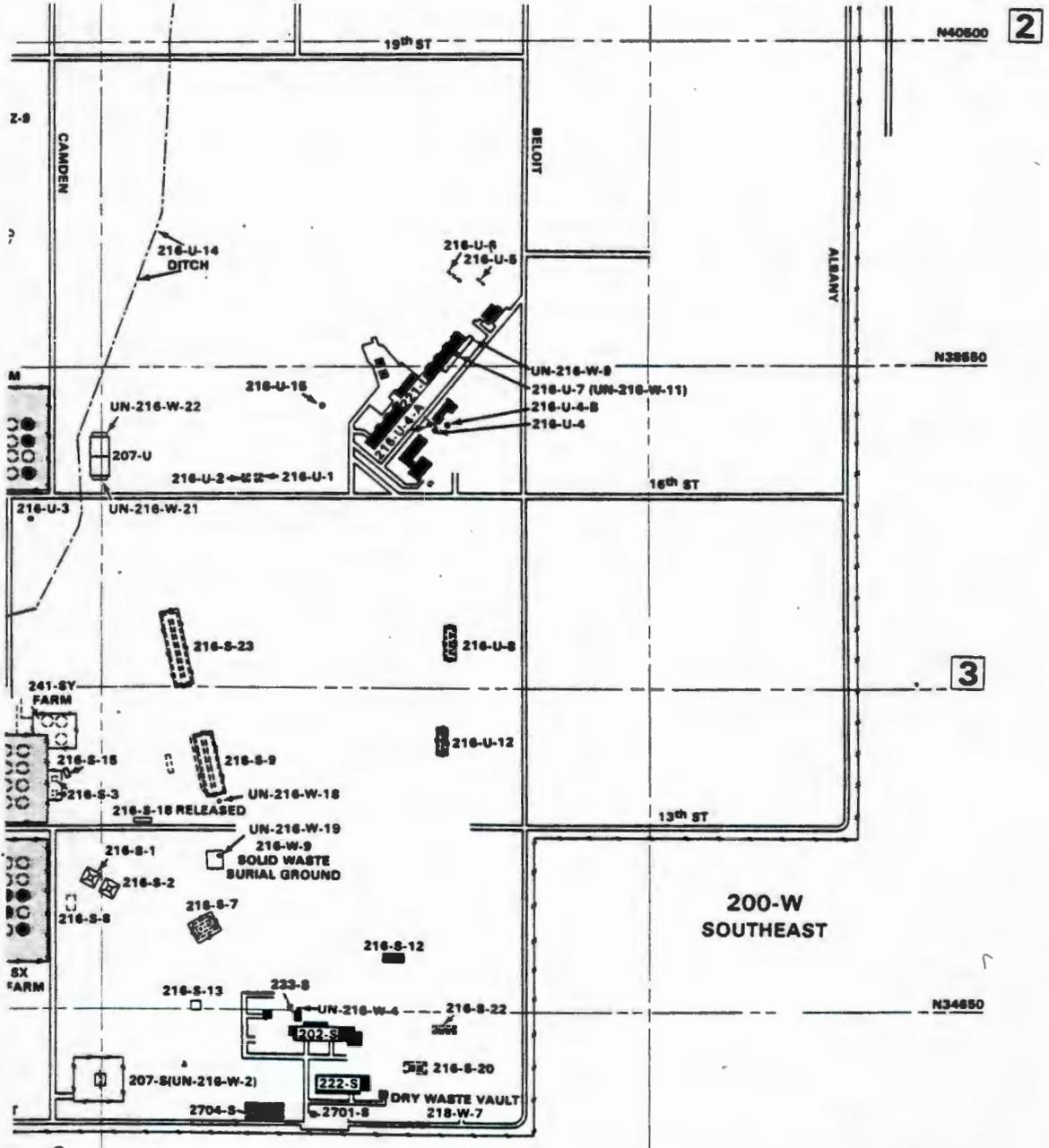
See Area and Quadrant maps at the end of this section.

How to read the Index and locate a site:

Example - 216-U-1 Crib	II. NE	
<u>Site Number</u>	<u>Volume</u>	<u>Quadrant</u>
216-U-1 Crib	II.	SE (Southeast)

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**LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITES - JULY 1978**

**LEGEND**

- 216 SITES - SOLID WASTE BURIAL OR DISPOSAL SITE
- 216 SITES - LIQUID WASTE DISPOSAL SITES
- UN-216 - UNPLANNED RELEASES
- - UNDERGROUND, HIGH LEVEL LIQUID WASTE TANK WITH LEAK TO THE GROUND
- 241 - TANK FARM

216-S-14  
 DECONTAMINATED AND RELEASED



2

3

4

INDEX - VOLUME II    200 WEST AREA  
Southeast Quadrant

216-S-1 and 2 Crib	II. SE	UN-216-W-2 Unplanned Release	II. SE
216-S-3 French Drain	II. SE	UN-216-W-4 Unplanned Release	II. SE
216-S-7 Crib	II. SE	UN-216-W-9 Unplanned Release	II. SE
216-S-8 Crib	II. SE	UN-216-W-11 Unplanned Release	II. SE
216-S-9 Crib	II. SE	UN-216-W-18 Unplanned Release	II. SE
216-S-12 Trench	II. SE	UN-216-W-19 Unplanned Release	II. SE
216-S-13 Crib	II. SE	UN-216-W-21 Unplanned Release	II. SE
216-S-15 Pond	II. SE	UN-216-W-22 Unplanned Release	II. SE
216-S-18 Crib	II. SE	207-SL Retention Basin	II. SE
216-S-20 Crib	II. SE	207-S Retention Basin	II. SE
216-S-22 Crib	II. SE		
216-S-23 Crib	II. SE		
216-S-24 Crib (Not Built)	II. SE		
216-U-1 Crib	II. SE		
216-U-2 Crib	II. SE		
216-U-3 French Drain	II. SE		
216-U-4 Reverse Well	II. SE		
216-U-4A Dry Well	II. SE		
216-U-4B Dry Well	II. SE		
216-U-5 Trench	II. SE		
216-U-6 Trench	II. SE		
216-U-7 French Drain	II. SE		
216-U-8 Crib	II. SE		
216-U-12 Crib	II. SE		
216-U-14 Ditch	II. SE		
216-U-15 Crib	II. SE		
207-U Retention Basin	II. SE		
218-W-7 Burial Vault	II. SE		
218-W-9 Burial Ground	II. SE		

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u>  Crib	<u>Past Designation</u>  216-S-5	<u>Number</u>  216-S-1 and 2																								
<u>Location</u> 200 West, S.E. Quadrant  About 1600 ft NW of 202-S Southeast of the 241-S-151 Diversion Box	<u>Service Dates</u>  1/52-1/56	<u>Status</u>  Inactive																								
<u>Site Coordinates (Approximate)</u>  N-35410, W-75153 N-35453, W-75230	<u>Reference Drawings</u>  H-2-1774	<u>Elevations</u> Ground 667 ft Water Table 471 ft(1971) Site Depth 34 ft																								
<u>Source and Description of Waste</u>  1.6 x 10 <sup>8</sup> liters. Cell drainage from D-1 receiver tank and process candidate from D-2 receiver tank in 202-S.																										
<u>Description of Facility</u>  Two cribs, 12 x 12 ft wooden structure, 40 ft apart; total bottom dimensions, 90 x 40 ft. Deactivation: In January 1956, when acid waste corroded monitoring well casings and penetrated sediments near the water table, pipeline capped at the 241-S-151 Diversion Box.  <u>Radionuclide Content (calculated from discharge data)</u> <table border="1" data-bbox="535 1239 1331 1554"> <thead> <tr> <th>Radionuclide</th> <th>At Time of Discharge</th> <th>As of 6/30/78</th> </tr> </thead> <tbody> <tr> <td>Pu, g</td> <td>1.2 x 10<sup>3</sup></td> <td>1.2 x 10<sup>3</sup></td> </tr> <tr> <td>Beta, Ci</td> <td>7.5 x 10<sup>5</sup></td> <td>6.46 x 10<sup>3</sup></td> </tr> <tr> <td><sup>90</sup>Sr, Ci</td> <td>3.0 x 10<sup>3</sup></td> <td>1.68 x 10<sup>3</sup></td> </tr> <tr> <td><sup>106</sup>Ru, Ci</td> <td>3.0 x 10<sup>3</sup></td> <td>2.90 x 10<sup>-4</sup></td> </tr> <tr> <td><sup>137</sup>Cs, Ci</td> <td>2.5 x 10<sup>3</sup></td> <td>1.45 x 10<sup>3</sup></td> </tr> <tr> <td><sup>60</sup>Co, Ci</td> <td>10</td> <td>0.45</td> </tr> <tr> <td>U, kg</td> <td>2.2 x 10<sup>3</sup></td> <td>2.27 x 10<sup>3</sup></td> </tr> </tbody> </table> <u>Other Potential Hazards</u>  Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.  <u>Site Characterization and History:</u>  Core samples taken from wells drilled in the vicinity of the 216-S-1 and 2 cribs in 1966 indicated that greater than 99.9 percent of the <sup>137</sup> Cs and <sup>90</sup> Sr discharged to these cribs is contained in the 16 to 33 ft. zone below the cribs.			Radionuclide	At Time of Discharge	As of 6/30/78	Pu, g	1.2 x 10 <sup>3</sup>	1.2 x 10 <sup>3</sup>	Beta, Ci	7.5 x 10 <sup>5</sup>	6.46 x 10 <sup>3</sup>	<sup>90</sup> Sr, Ci	3.0 x 10 <sup>3</sup>	1.68 x 10 <sup>3</sup>	<sup>106</sup> Ru, Ci	3.0 x 10 <sup>3</sup>	2.90 x 10 <sup>-4</sup>	<sup>137</sup> Cs, Ci	2.5 x 10 <sup>3</sup>	1.45 x 10 <sup>3</sup>	<sup>60</sup> Co, Ci	10	0.45	U, kg	2.2 x 10 <sup>3</sup>	2.27 x 10 <sup>3</sup>
Radionuclide	At Time of Discharge	As of 6/30/78																								
Pu, g	1.2 x 10 <sup>3</sup>	1.2 x 10 <sup>3</sup>																								
Beta, Ci	7.5 x 10 <sup>5</sup>	6.46 x 10 <sup>3</sup>																								
<sup>90</sup> Sr, Ci	3.0 x 10 <sup>3</sup>	1.68 x 10 <sup>3</sup>																								
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<sup>60</sup> Co, Ci	10	0.45																								
U, kg	2.2 x 10 <sup>3</sup>	2.27 x 10 <sup>3</sup>																								

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216-S-1 and 2 continuedSite Characterization and History:

However, small but measurable amounts of these long-lived isotopes have penetrated the soil column to greater depths into lenticular shaped zones directly beneath the cribs. Strontium-90 mobility through the soil is greater than that for  $^{137}\text{Cs}$  due to acidic nature of the waste water. Soil samples near the water table contained up to  $1.2 \times 10^{-3}$   $\mu\text{Ci}$  of  $^{90}\text{Sr/g}$ . Ground water samples showed an average of  $5 \times 10^{-5}$   $\mu\text{Ci}$  of  $^{90}\text{Sr/cc}$  at the time of the well drilling. For further details on this site refer to discussion in Volume 1, Section 1.

Radiological Science Department Report 495-C reported a failure of test well casing on August 2, 1955 as follows:

Waste Disposal

A test well to the water table adjacent to the 216-S-2 crib failed and permitted an unknown quantity of Hexone stripped aqueous solution to discharge essentially to the underground water table. The condition was discovered on an investigative survey where dose rates up to 100 rads/hr were observed on the cap of the well. The well was last sampled on June 9, and found to be in good condition. An employee of the Earth Sciences Group, RS Department sampled the well on the morning the condition of the well was established, and received localized exposure due to skin and glove contamination in excess of the permissible limits. The well was backfilled and abandoned, and the incident was investigated by the RS Department. (Class I#495-C for well failure; Class II No 94-R for overexposure).

See following map of distribution of radionuclides beneath the 216-S-1 and 2 crib site.

92131518

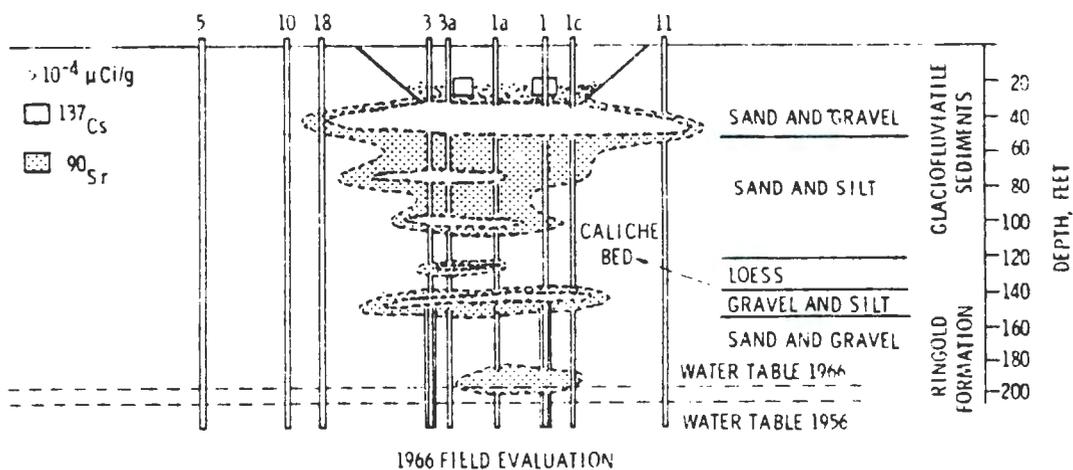
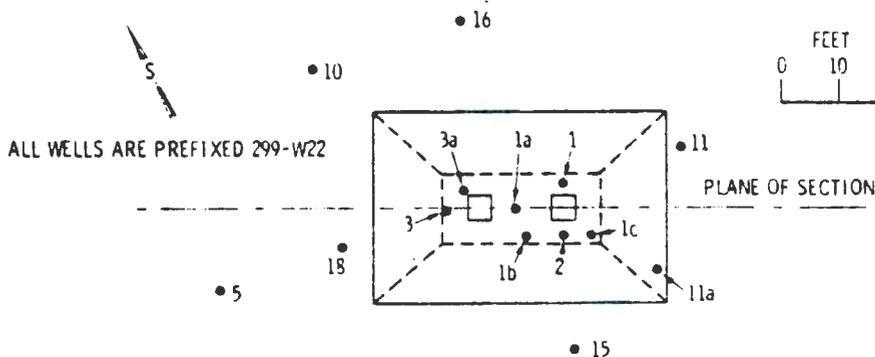
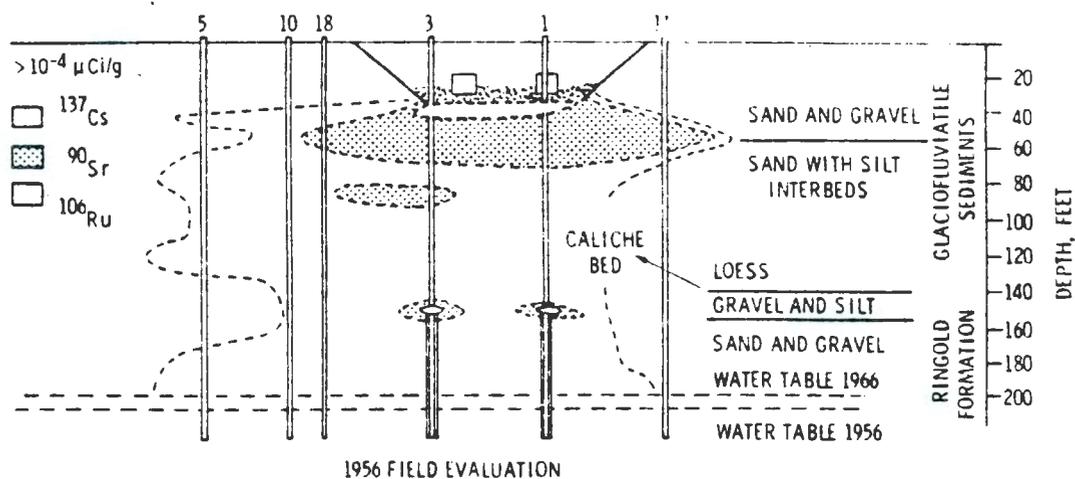


FIGURE 1.6. Radionuclide Distribution Beneath the 216 S-1, and 2 Crib Site from 1956 and 1965 Field Evaluation Data (11)

BRUK-MA-SS

921211579

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> French Drain		<u>Past Designation</u> 216-S-5	<u>Number</u> 216-S-3
<u>Location</u> 200 West, S.E. Quadrant Along east border of 241-S Tank Farm, east 104-S tank.		<u>Service Dates</u> 9/53-8/56	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-36150, W-75500	<u>Reference Drawings</u> H-2-39574 H-2-1813	<u>Elevations</u> Ground 667 ft Water Table 477 ft Site Depth 6 ft	
<u>Source and Description of Waste</u> 4.2 x 10 <sup>6</sup> liters. Condensate from condensers on the 101-S and 104-S tanks in the 241-S Tank Farm. Low-salt, neutral/basic.			
<u>Description of Facility</u> Two cribs, French drain structure, 10 ft x 10 ft bottom surface (each), 50 ft apart. Deactivation: Above ground piping removed.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
	Pu, g	0.5	.50
	Beta, Ci	2.7 x 10 <sup>2</sup>	5.70 x 10 <sup>1</sup>
	<sup>90</sup> Sr, Ci	1.0	.56
	<sup>106</sup> Ru, Ci	0.50 x 10 <sup>2</sup>	5.90 x 10 <sup>-6</sup>
	<sup>137</sup> Cs, Ci	0.50 x 10 <sup>2</sup>	2.91 x 10 <sup>1</sup>
	<sup>60</sup> Co, Ci	1.0	4.47 x 10 <sup>-2</sup>
	U, kg	0.38	.38
<u>History:</u> Radiation Monitoring Monthly Report - Redox, August 1952 has reference to a need for a crib system to receive cooling water from the 241-S Tank Farm:  "As it is now apparent that this boiling problem will be eventually encountered in each of the cascade systems in the Redox tank farm, it is obvious that a crib system for further disposal of condenser cooling water will be required. Some means for insuring that all risers are sealed off to prevent emission of contaminated vapors will also be required."			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 216-S-15	<u>Number</u> 216-S-7
<u>Location</u> 200 West, S.E. Quadrant  About 900 ft NW of 202-S Adjacent to the NW corner of the Redox Area fence.		<u>Service Dates</u> 1/56-7/65	<u>Status</u> Inactive
<u>Site Coordinates</u> N-35132, W-74150	<u>Reference Drawings</u> H-2-30135	<u>Elevations</u> Ground 674 ft Water Table 467 ft(1973) Site Depth 29. ft	
<u>Source and Description of Waste</u>  3.9 x 10 <sup>8</sup> liters. Cell drainage from D-1 receiver tank; process condensate from D-2 receiver tank; condensate from H-6 condenser in 202-S.			
<u>Description of Facility</u>  One crib. 50 x 100 ft bottom dimensions. Wooden structure. Deactivation: Pipeline to crib blanked at the NW corner of the Redox Plant area perimeter fence.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
	Pu, g	4.4 x 10 <sup>2</sup>	4.40 x 10 <sup>2</sup>
	Beta, Ci	2.8 x 10 <sup>5</sup>	<5.73 x 10 <sup>3</sup>
	<sup>90</sup> Sr, Ci	3.1 x 10 <sup>3</sup>	1.87 x 10 <sup>3</sup>
	<sup>106</sup> Ru, Ci	1.5 x 10 <sup>3</sup>	6.11 x 10 <sup>-3</sup>
	<sup>137</sup> Cs, Ci	1.5 x 10 <sup>3</sup>	9.32 x 10 <sup>2</sup>
	<sup>60</sup> Co, Ci	25.0	1.74
	U, kg	2.6 x 10 <sup>3</sup>	2.59 x 10 <sup>3</sup>
<u>Other Potential Hazards</u>  Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			
<u>Site Characterization Status</u>  See next page.			

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216-S-7 continued

Site Characterization Status

Two wells were drilled at the 216-S-7 Crib in 1966 to determine radionuclide distribution beneath this disposal site. Well W22-13A was drilled to a depth of 212 ft at a distance of 25 ft southeast of the S-7A Crib center. Well W22-14A was also drilled to a depth of 212 ft but located 25 ft southwest of the S-7B Crib center. Ground water level was 202 ft below ground surface at the time of the drilling.

Radiochemical analyses of the core samples from well W22-13A show  $^{137}\text{Cs}$  reaching a maximum of  $13 \mu\text{Ci/g}$  at 21 ft and decreasing rapidly to  $<3 \times 10^{-4} \mu\text{Ci/g}$  at 35 ft below ground surface. Cesium-137 concentrations remain at  $<3 \times 10^{-4}$  from 35 ft to 130 ft and become  $2 \times 10^{-6} \mu\text{Ci/g}$  below 130 ft. Strontium-90 peaks at 21 ft also at a concentration of  $2.7 \mu\text{Ci/g}$  and decreases to less than detection limit ( $<2 \times 10^{-5} \mu\text{Ci/g}$  below 140 ft).

The maximum  $^{137}\text{Cs}$  concentration in well W22-14A occurs at 21 ft but is much less ( $1.5 \times 10^{-2} \mu\text{Ci/g}$  versus  $13 \mu\text{Ci/g}$ ) than that in well W22-13A. Cesium-137 concentrations in well W22-14A are at or below detection limit below 45 ft. Strontium-90 peaks at 25 ft ( $5.8 \times 10^{-2} \mu\text{Ci/g}$ ) and again at a much higher concentration ( $6.1 \mu\text{Ci/g}$ ) at 50 ft. Water samples taken from well W22-14A in 1966 contained  $7.8 \times 10^{-7} \mu\text{Ci/cc}$  of  $^{90}\text{Sr}$ , a value slightly above the detection limit.

History:

February 3, 1956 Re: Redox Monthly Report, Radiation Monitoring

Three meetings were held with representatives from the Radiological Sciences Department on liquid waste disposal problems applicable to Redox. The most serious problem needing immediate resolution involved the D-12 overhead condensates which go to D-2 and then to the 216-S-7 Crib, and the D-1 cell drainage wastes, which also go to 216-S-7. Recent samples of these streams indicated the Ph to be as low as 2.0, and the total salt content to be 0.4 g/l and 4.0 g/l for the D-2 and D-1 streams respectively. With this Ph and salt condition, soil absorption of strontium 90 and Cesium 137 is reduced sharply. This inturn could allow  $\text{Sr}^{90}$  to reach the water table in a much shorter length of time than if the Ph (especially) were in the 8 to 10 range. Immediate building plans include routing all D-1's to the D-13 salt waste receiver vessel for concentration in D-12, and investigation of the necessary equipment changes to neutralize the D-2 stream before going to 216-S-7. The 216-S-7 crib as will be called was activated recently because activity was observed in the water table below the 216-S-1, 2 cribs, the former D-1, D-2 stream terminal point.

216-S-7 continuedHistory:

1. Ref. Addendum to Document HW-41535.

The 216-S-7 Crib, located at coordinates N-35100 and W-74500, was put into service 1-12-56. A buildup of beta activity in this crib prompted the rerouting of H-6 waste material. On April 12, 1959, jumper changes were completed and H-6 liquid waste has since been routed to underground salt waste storage tanks. The crib continues to receive waste from D-1 and D-2 vessels.

2. Ref. Radiation Monitoring Monthly Report, August 1975.

"Above ground piping was removed. Remaining piping was blanked below ground level. Sink holes were fill and the ground surface leveled above the crib."

921211514

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Crib	Cold Aqueous Trench or Crib	216-S-8
<u>Location</u>	<u>Service Dates</u>	<u>Status</u>
200 West, S.E. Quadrant  600 ft south of 13th Street and 1500 ft west of railroad tracks.	11/51-2/52	Inactive
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-35350, W-75300	H-2-32525 M-2600 SA 22	Ground 663 ft Water Table 471 ft(1973) Site Depth 25 ft
<u>Source and Description of Waste</u>		
1.0 x 10 <sup>7</sup> liters. Unirradiated uranium start-up waste from 202-S.		
<u>Description of Facility</u>		
One crib (hole), 100 ft x 60 ft bottom surface. Deactivation: Above ground piping removed and hole backfilled.		
<u>Radionuclide Content (calculated from discharge data)</u>		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	2.0	2.0
Beta, Ci	1.5 x 10 <sup>3</sup>	< 1.40 x 10 <sup>1</sup>
<sup>90</sup> Sr, Ci	1.0	0.521
<sup>106</sup> Ru, Ci	50.0	6.11 x 10 <sup>-3</sup>
<sup>137</sup> Cs, Ci	12.0	6.52
<sup>60</sup> Co, Ci	<0.1	< 3.04 x 10 <sup>-3</sup>
U, kg	2.0 x 10 <sup>-2</sup>	1.95 x 10 <sup>2</sup>
<u>History:</u> Monthly Report for October 1951, "S" Facility recorded the following:		
"Approval has been given by the Radiological Sciences Department to excavate a trench at about N35,300, W75400 for disposal of the uranium test run wastes. Estimated concentration is 0.2 gm U/ml with a total volume of approximately 40,000 gallons of liquid being involved."		

9212131313

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib			216-S-9
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, SE Quadrant 250 ft north of 13th Street and 300 ft west of railroad track.		7/65-1/69	Inactive
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-36150, W-76550	H-2-32363 H-2-32362	Ground	676 ft
		Water Table	466 ft(1973)
		Site Depth	30 ft

Source and Description of Waste

5.03 x 10<sup>7</sup> liters. Process condensate from D-2 receiver tank in 202-S Bldg. Acidic.

Description of Facility

One gravel crib, 300 ft x 30 ft bottom area. Deactivation: Pipeline blanked at south end of crib.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	65.0	6.50 x 10 <sup>1</sup>
Beta, Ci	1.6 x 10 <sup>4</sup>	<1.04 x 10 <sup>-5</sup>
<sup>90</sup> Sr, Ci	<1.8 x 10 <sup>2</sup>	<1.30 x 10 <sup>2</sup>
<sup>106</sup> Ru, Ci	2.6 x 10 <sup>3</sup>	1.34
<sup>137</sup> Cs, Ci	5.1 x 10 <sup>2</sup>	3.84 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	<26.0	<5.82
U, kg	34.0	3.39 x 10 <sup>1</sup>

Site Characterization Status

Wells W22-26A and W22-27A were drilled to depths of 215 ft next to the 216-S-9 crib in 1966 to determine the radionuclide distribution below this site. Well W22-26A was drilled to the east side of the crib and well W22-27A was drilled on the west side. Only low level <sup>90</sup>Sr (~10<sup>-5</sup> μCi/g) was detected in a "perched" water zone at 140 ft in well W22-26A and no long-lived isotopes were detected in well W22-27A. (See leaking pipe UN-216-W-18.)

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. SE

<u>Name/Type of Facility</u> Trench		<u>Past Designation</u> 291-S Stack Wash Sump Redox Stack Flush Trench	<u>Number</u> 216-S-12
<u>Location</u> 200 West, SE Quadrant  1000 ft north of 13th Street and 600 ft west of Beloit Avenue. In the NE corner of the Redox Area. North of the 291-S Stack		<u>Service Dates</u>  7/54-7/54	<u>Status</u>  Inactive
<u>Site Coordinates</u> (Approximate) N-34965, W-73384	<u>Reference Drawings</u> H-2-2430 H-2-32525	<u>Elevations</u> Ground 687 ft Water Table 463 ft (1973) <u>Site Depth</u> 10 ft	

Source and Description of Waste

6.81 x 10<sup>4</sup> liters. Flush water from the 291-S Stack.

Description of Facility

One trench, 20 ft x 90 ft bottom surface. Deactivation: Above ground piping removed and trench backfilled.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	1.0	1.0
Beta, Ci	6.5	<2.27
<sup>90</sup> Sr, Ci	1.0	.568
<sup>106</sup> Ru, Ci	1.0	1.29 <sup>-7</sup>
<sup>137</sup> Cs, Ci	1.0	.589
<sup>60</sup> Co, Ci	<0.1	<4.82 <sup>-3</sup>
U, kg	5.0	4.99

History:

Recommend core drilling this trench to determine the status of the remaining radioactivity. In all probability the site can be removed from the status of a radiation zone.

92125 11517

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CU-673

II. SE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		276-S Crib 216-S-6	216-S-13
<u>Location</u> 200 West, SE Quadrant		<u>Service Dates</u>	<u>Status</u>
532 ft west of 202-S 608 ft north of 10th Street		2/51-7/72	Inactive
<u>Site Coordinates</u> (Approximate)	<u>Reference Drawings</u>	<u>Elevations</u>	
N-34610, W-74620	H-2-5385 H-2-5391	Ground	676 ft
		Water Table	467 ft
		Site Depth	33 ft
<u>Source and Description of Waste</u>			
5 x 10 <sup>6</sup> liters. 1/52-6/67 Received liquid waste from the 203-S decontaminated storage facility, the 204-S UNH Lag storage facility and the 276-S organic-solvent make-up facility.			
6/67-7/72 Received occasional sump waste from 204-S facility. Low-salt, neutral/basic.			
<u>Description of Facility</u>			
Crib, wooden structure, 40 ft x 40 ft bottom dimension.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	8.0	8.0	
Beta, Ci	6.3 x 10 <sup>2</sup>	<8.88	
<sup>90</sup> Sr, Ci	0.04	0.028	
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>2</sup>	0.022	
<sup>137</sup> Cs, Ci	5.0	3.76	
<sup>60</sup> Co, Ci	<0.10	<0.019	
U, kg	<91.0	91.0	
<u>Other Potential Hazards</u>			
Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			

921211018

<u>Name/Type of Facility</u> Pond		<u>Past Designation</u> 241-S-110 Pond 216-S-2 110-S Tank Overflow	<u>Number</u> 216-S-15
<u>Location</u> 200 West, S.E. Quadrant 316 ft North of 13th St.		<u>Service Dates</u> 12/51 to 10/52	<u>Status</u> Inactive
<u>Site Coordinates</u> N-36000, W-75450	<u>Reference Drawings</u> H-2-32525 H-2-44510 (Sheet 4)	<u>Elevations</u> Ground 667 ft Water Table 475 ft(1967)	
<u>Source and Description of Waste</u>  Volume not available. Condenser spray cooling water from 110-S Tank in 241-S Tank Farm.		<u>Site Depth</u>	Surface
<u>Description of Facility</u>  Pond, 35 ft x 5 ft, backfilled with 2 feet of clean soil.			
<u>Radionuclide Content</u> (calculated from discharge records)  Not available. Removed from service when condensed radioactive tank vapors were mixed with the normal waste discharged to this pond.  Estimated: 1 Ci Fission Products.			
(See Next Page)			

921211519

216-S-15 continued

History:

Radiation Monitoring Monthly Report-Redox, August, 1952, contained the following reference to the 216-S-15 Pond:

"The temperature of the 110-S Waste Storage Tank climbed during the month to the point where boiling action was initiated within the waste in the tank. Vapors were observed issuing from the air condensers on the tank and contamination buildup on the top and sides of the condenser was detected.

The initial application of externally applied cooling water to the condenser tubes was successful in reducing the vapor emission. However, recent temperature increases within the tank have again resulted in the emission of vapors from the condenser and from all the tank risers. Contamination buildup in the pond receiving the cooling water and on the ground around both risers and the condensers is such as to cause a serious potential for contamination spread to the tank farm and surrounding terrain. Dose rates up to 10.5 rep/hr including 1 r/hr have been observed at the edge of the cooling water pond, and up to 30 rep/hr at three inches from the contaminated risers."

The September, 1952 Redox Operation Radiation Monitoring Report carried this additional information:

"Cooling water is now being supplied to the four condensers serving the first tanks on each of the two cascades. The initial pond located just west of the 241-S Tank Farm fence which was receiving cooling water from the 110-S condensers has been backfilled and the area railed off and posted. A new and larger open pond located about 600 feet due west of the 241-S Tank Farm, is now receiving this cooling water. Contamination in this water appears now to be negligible."

You will note that the initial pond location is reported "just west of the 241-S Tank Farm fence". In the copy of the report that this writer saw, "west" had been crossed out and the word "east" had been written above. By whom, is unknown (?).

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. SE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		241-SX Steam Cleaning Pit 216-S-14 " " Pit	216-S-18
<u>Location</u> 200 West, SE Quadrant		<u>Service Dates</u>	<u>Status</u>
200 West. 50 ft north of 13th Street and 1000 ft west of railroad tracks.		10/54-10/54 Exhumed 10/72	Release from a Radiation Zone Status
<u>Site Coordinates</u> (Approximate)	<u>Reference Drawings</u>	<u>Elevations</u>	
N-36200, W-74800	H-2-2430 H-2-32525	Ground	674 ft
		Water Table	470 ft (1973)
		<u>Site Depth</u>	
<u>Source and Description of Waste</u>			
9.84 x 10 <sup>4</sup> liters. Vehicle decontamination pit waste.			
<u>Description of Facility</u>			
One crib, bottom surface area 125 ft x 15 ft. Deactivation: Pit backfilled.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	<0.1	None	
Beta, Ci	<0.7	"	
<sup>90</sup> Sr, Ci	<0.1	"	
<sup>106</sup> Ru, Ci	<0.1	"	
<sup>137</sup> Cs, Ci	<0.1	"	
<sup>60</sup> Co, Ci	<0.1	"	
U, kg	<4.5 x 10 <sup>-2</sup>	"	
U, g	none	none	
<u>History:</u> In October of 1972 this site was dug up and the remaining radioactive objects found (a few feet of 3/4" piping, one lab sink, and approximately two cubic yards of soil) were taken to the 200 West Dry Waste Burial Grounds for burial. The site was removed from a radiation zone status 10/72.			

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CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 216-SL-1, & 2 Cribs 216-SL-2	<u>Number</u> 216-S-20
<u>Location</u> 200 West, S.E. Quadrant 304 ft southeast 202-S 300 ft north of 10th Street	<u>Service Dates</u> 1/52-12/74	<u>Status</u> Deactivated
<u>Site Coordinates</u> N-34296, W-73337	<u>Reference Drawings</u> H-2-5229 H-2-5224	<u>Elevations</u> Ground 681 ft Water Table 462 ft(1973) Site Depth 29 ft
<u>Source and Description of Waste</u> 1.35 x 10 <sup>8</sup> liters. Waste from 222-S and 300 Area laboratories via 207-SL Retention Basin.		
<u>Description of Facility</u> Two cribs, wooden structure, 90 ft x 40 ft bottom dimension.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	1.7 x 10 <sup>2</sup>	1.71 x 10 <sup>2</sup>
Beta, Ci	7.6 x 10 <sup>3</sup>	<2.14 x 10 <sup>2</sup>
<sup>90</sup> Sr, Ci	45.	3.06 x 10 <sup>3</sup>
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>2</sup>	1.17 x 10 <sup>-3</sup>
<sup>137</sup> Cs, Ci	1.1 x 10 <sup>2</sup>	7.49 x 10 <sup>1</sup>
<sup>60</sup> Co, Ci	1.4	<0.557
U, kg	38.	<0.388
<u>Other Potential Hazards</u> Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.		

(See Next Page for History)

92125 11522

216-S-20 continuedHistory:

This crib has had a history of sinking. During the past 15 years, the sink holes have been filled on three different occasions with several cubic yards of fill dirt. It is doubtful if any cavities remain below the surface of the ground.

## Deactivation work:

1. The valve on the discharge line from the 207-SL Retention Basin to the 216-S-20 Crib was closed and the valve wheel removed.
2. The gang valve on the line from the 219-S Building to the 216-S-20 Crib was locked out, and the steam supply line to the gang valve was removed.
3. All openings into the inactive 216-S-20 Crib were closed by removing the vents and capping off all risers. Sink holes within the zone were filled to ground level. This work was completed December 13, 1974.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u>	<u>Number</u> 216-S-22
<u>Location</u> 200 West, SE Quadrant 200 West. 600 ft north of 10th Street and 500 ft east of 202-S.		<u>Service Dates</u> 10/57-6/67	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-34533, W-73080 to N-34533, W-73185	<u>Reference Drawings</u> H-2-31047	<u>Elevations</u> Ground 681 ft Water Table 461 ft (1973) Site Depth 10 ft	
<u>Source and Description of Waste</u> 9.8 x 10 <sup>4</sup> liters. Liquid waste from acid recovery facility in 293-S Bldg.			
<u>Description of Facility</u> One gravel crib, 100 ft x 3.5 ft bottom surface. Deactivation: Inlet piping blanked			
<u>Radionuclide Content (calculated from discharge data)</u>			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	<0.10	<0.10	
Beta, Ci	15.0	<2.52	
<sup>90</sup> Sr, Ci	1.0	0.63	
<sup>106</sup> Ru, Ci	5.0	1.32 x 10 <sup>-5</sup>	
<sup>137</sup> Cs, Ci	1.0	0.649	
<sup>60</sup> Co, Ci	<0.1	<9.32 x 10 <sup>-3</sup>	
U, kg	<4.5 x 10 <sup>-2</sup>	<0.045	
<u>History:</u> Used until the shutdown of the Redox Operation in June of 1967. The piping serving the crib was blanked in the 293-S Building.			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u>	<u>Number</u> 216-S-23
<u>Location</u> 200 West, S.E. Quadrant About 2400 ft north by northwest from 202-S. Near 216-S-9 Crib, slightly west and north.		<u>Service Dates</u> 1/69-7/72	<u>Status</u> Inactive
<u>Site Coordinates</u> N-36669, W-74709 to N-37020, W-74725	<u>Reference Drawings</u> SK-2-21845 H-2-46111 H-2-46112	<u>Elevations</u> Ground 674 ft Water Table 473 ft Site Depth 28 ft	
<u>Source and Description of Waste</u> 3.4 x 10 <sup>7</sup> liters. Redox process condensate (from D-2 receiver tank). Low-salt, neutral/basic.			
<u>Description of Facility</u> Crib, gravel-filled, 360 ft x 10 ft bottom dimension.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	<0.99	< 0.99	
Beta, Ci	1.9 x 10 <sup>2</sup>	<13.8	
<sup>90</sup> Sr, Ci	1.9	1.58	
<sup>106</sup> Ru, Ci	56.	.326	
<sup>137</sup> Cs, Ci	<5.4	4.71	
<sup>60</sup> Co, Ci	<1.40	< 0.636	
U, kg	<0.40	< 0.39	

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Crib. Not Built.		<u>Past Designation</u>	<u>Number</u> 216-S-24
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
<u>Source and Description of Waste</u>			
<u>Description of Facility</u>			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>NOT BUILT</u>			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u>		<u>Fast Designation</u>	<u>Number</u>
Crib		216-U-1 & U-2(361-WR) 216-U-3 216-UR No.1 & 2 Cribs	216-U-1
<u>Location</u> 200 West, S.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
200 ft north of 16th Street and 1000 ft east of 207-U Retention Basin. Shares a common radiation zone with 216-U-2.		11/51-6/67	Inactive
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-37860, W-74242 to N-37860, W-74340	H-2-32527 H-2-50061	<u>Ground</u>	695 ft
		<u>Water Table</u>	467 ft(1973)
		<u>Site Depth</u>	24 ft
<u>Source and Description of Waste</u>			
1.59 x 10 <sup>8</sup> liters. Cell drainage from Tank 5-6 in 221-U; waste from 224-U via overflow from 241-U-361 Settling Tank; contaminated solvent from 276-U Solvent Storage Area. Low-salt, neutral/basic.			
<u>Description of Facility</u>			
One crib, wooden structure, 12 ft x 12 ft bottom surface.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	43	42.6	
Beta, Ci	1.2 x 10 <sup>3</sup>	<17.3	
<sup>90</sup> Sr, Ci	5.0	2.92	
<sup>106</sup> Ru, Ci	5.0 x 10 <sup>2</sup>	0.006	
<sup>137</sup> Cs, Ci	10	5.91	
<sup>60</sup> Co, Ci	< 0.1	< 4.82 x 10 <sup>-3</sup>	
U, kg	4.0 x 10 <sup>3</sup>	4.0 x 10 <sup>3</sup>	
<u>Other Potential Hazards</u>			
Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			
<u>Site Characterization Status</u>			
Well W19-3, the only monitoring well near the 216-U-1 Crib, shows low-level contamination from 70 to 105 ft beneath ground surface. Little downward migration of contaminants has occurred from 1958 to 1963. However, low concentrations of uranium have been detected in the groundwater at this site.			

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CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> Crib		<u>Fast Designation</u> 216-U-2 (361-WR) 216-U-3 216-UR No.1 & 2 Cribs		<u>Number</u> 216-U-2	
<u>Location</u> 200 West, S.E. Quadrant  200 ft north of 16th Street and 1000 ft east of 207-U Retention Basin. Shares a common radiation zone with 216-U-1.			<u>Service Dates</u> 3/52-5/67		<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-37860, W-74242 to N-37860, W-74340		<u>Reference Drawings</u> H-2-32527 H-2-50061		<u>Elevations</u> Ground 695 ft Water Table 467 ft(1973) Site Depth 24 ft	
<u>Source and Description of Waste</u>  1.59 x 10 <sup>8</sup> liters. Cell drainage from Tank 5-6 in 221-U; waste from 224-U via overflow from 241-U-361 Settling Tank; contaminated solvent from 276-U Solvent Storage Area; equipment decontamination and reclamation wastes from 221-U Canyon. Low-salt, neutral/basic.					
<u>Description of Facility</u>  One crib, wooden structure, 12 ft x 12 ft bottom surface.					
<u>Radionuclide Content (calculated from discharge data)</u>					
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>		
	Pu, g	43	42.6		
	Beta, Ci	1.2 x 10 <sup>3</sup>	<17.3		
	<sup>90</sup> Sr, Ci	5.0	2.92		
	<sup>106</sup> Ru, Ci	5.0 x 10 <sup>2</sup>	0.006		
	<sup>137</sup> Cs, Ci	10	5.91		
	<sup>60</sup> Co, Ci	< 0.1	< 4.82 x 10 <sup>-3</sup>		
	U, kg	4.0 x 10 <sup>3</sup>	4.0 x 10 <sup>3</sup>		
<u>Other Potential Hazards</u>  Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.					
<u>Site Characterization Status</u>  Well W19-3, the only monitoring well near the 216-U-2 Crib, shows low-level contamination from 70 to 105 ft beneath ground surface. Little downward migration of contaminants has occurred from 1958 to 1963. However, low concentrations of uranium have been detected in the groundwater at this site.					

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 216-U-3 French Drain 216-U-11	<u>Number</u> 216-U-3
<u>Location</u> 200 West, S.E. Quadrant 1000 ft west of Railroad Tracks and 50 ft south of 16th Street, near Camden Ave.		<u>Service Dates</u> 5/54-8/55	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-37620, W-75630	<u>Reference Drawings</u> H-2-44004 H-2-32527	<u>Elevations</u> Ground 668 ft Water Table 471 ft(1973) Site Depth 12 ft	
<u>Source and Description of Waste</u>  7.91 x 10 <sup>5</sup> liters. Condensate from condenser as 110-U Tank in 241-U Tank Farm. Low-salt, neutral/basic.			
<u>Description of Facility</u> One French drain, 6 ft diameter. Deactivation: Condenser piping to the crib was valved out.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
Pu, g	<0.1	<0.1	
Beta, Ci	5.0	1.25	
<sup>90</sup> Sr, Ci	<0.1	<0.057	
<sup>106</sup> Ru, Ci	1.0	1.29 x 10 <sup>-7</sup>	
<sup>137</sup> Cs, Ci	1.0	0.589	
<sup>60</sup> Co, Ci	<0.1	<0.48 x 10 <sup>-2</sup>	
U, kg	1.8	18	

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Reverse Well		<u>Past Designation</u> 222-U-110 Dry Well 216-U-2;222-U Dry Well		<u>Number</u> 216-U-4	
<u>Location</u> 200 West, S.E. Quadrant  170 ft southeast of 221-U, 450 ft north of 16th Street. S. W. corner of 222-U Bldg.			<u>Service Dates</u>  3/47-8/55		<u>Status</u>  Inactive
<u>Site Coordinates (Approximate)</u>  N-38209, W-73218		<u>Reference Drawings</u> H-2-32527 H-2-50183 H-2-43081		<u>Elevations</u> Ground 695 ft Water Table 468 ft (1973) Site Depth 75 ft	
<u>Source and Description of Waste</u>  Volume unknown. Decontamination waste from 222-U Lab hood sinks. Acidic.					
<u>Description of Facility</u>  Reverse Well, 6 inches diameter.					
<u>Radionuclide Content (calculated from discharge data)</u>  <1 Ci Beta					
<p>This well consists of a pipe sunk approximately 75 feet in the ground. The bottom 20 feet of the pipe is perforated to allow liquid waste to seep out into the soil. The well is located approximately 12 feet south and three feet west of the south-west corner of 222-U. It was first used to receive liquid wastes from the 222-U Laboratory in the spring of 1947. Both plutonium and fission product wastes from the decontamination hoods used in the laboratory drain into this unit. The pipe has been sealed off above ground level but is not posted as a radiation zone.</p>					

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Dry Well		<u>Past Designation</u> 216-U-4 Dry Well	<u>Number</u> 216-U-4A
<u>Location</u> 200 West, S.E. Quadrant 200 West Area. 500 ft north of 16th Street and 500 ft west of Beloit Avenue. S.W. corner of 222-U Building.		<u>Service Dates</u> 7/55-7/70	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-38214, W-73215	<u>Reference Drawings</u> H-2-43081 SK-2-3733	<u>Elevations</u> Ground 705 ft Water Table 464 ft(1973) <u>Site Depth</u> 75 ft	
<u>Source and Description of Waste</u> 5.45 x 10 <sup>5</sup> liters. 222-U Lab wastes. Acidic.			
<u>Description of Facility</u> Dry well, 36-inch diameter.			
<u>Radionuclide Content (calculated from discharge data)</u>			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
	Pu, g	<9.0 x 10 <sup>-3</sup>	<9.0 x 10 <sup>-3</sup>
	Beta, Ci	5.3	<0.529
	<sup>90</sup> Sr, Ci	<3.3 x 10 <sup>-2</sup>	<2.21 x 10 <sup>-2</sup>
	<sup>106</sup> Ru, Ci	<1.1	<1.15 x 10 <sup>-3</sup>
	<sup>137</sup> Cs, Ci	0.37	0.251

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CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> Dry Well	<u>Past Designation</u> 216-U-4B Dry Well	<u>Number</u> 216-U-4B
<u>Location</u> 200 West, S.E. Quadrant 30 ft from back side of 222-B Building	<u>Service Dates</u> 1/60-9/68	<u>Status</u> Inactive
<u>Site Coordinates</u> N-38248, W-73100	<u>Reference Drawings</u> SK-2-3337 H-2-34762	<u>Elevations</u> Ground 705 ft Water Table 464 ft(1973) <u>Site Depth</u> 75 ft
<u>Source and Description of Waste</u> 3.3 x 10 <sup>4</sup> liters. 222-U Lab wastes. Low-salt, neutral-basic.		
<u>Description of Facility</u> Dry well, 36-inch diameter.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	4.4 x 10 <sup>-2</sup>	0.05
Beta, Ci	2.4	<0.518
<sup>90</sup> Sr, Ci	3.0 x 10 <sup>-3</sup>	2.29 x 10 <sup>-3</sup>
<sup>106</sup> Ru, Ci	None	None
<sup>137</sup> Cs, Ci	0.37	.27
<u>History and Present Status</u> Is vented through a 1-inch diameter stainless steel riser which is covered with a small hood. The zone is marked with four concrete posts and a chain. There is no identification marker.		

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Trench		<u>Past Designation</u> 221-U Cold U Trench #2 216-U-4	<u>Number</u> 216-U-5
<u>Location</u> 200 West, S.E. Quadrant  250 ft west of Beloit Ave. at N.W. corner of 241 WR Vault.		<u>Service Dates</u> 3/52-3/52	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-39027, W-72922	<u>Reference Drawings</u> H-2-32527	<u>Elevations</u> Ground 705 ft Water Table 464 ft(1973) Site Depth 10 ft	
<u>Source and Description of Waste</u> 2.25 x 10 <sup>6</sup> liters. Unirradiated uranium waste from cold start -up run at U Plant.			
<u>Description of Facility</u> Ditch, 40 ft x 40 ft bottom surface area. Deactivation: Above ground piping removed and trench backfilled.			
<u>Radionuclide Content (calculated from discharge data)</u>			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	<5.0 x 10 <sup>-2</sup>	<5.0 x 10 <sup>-2</sup>	
Beta, Ci	0.5	<0.11	
<sup>90</sup> Sr, Ci	<5.0 x 10 <sup>-2</sup>	<2.70 x 10 <sup>-2</sup>	
<sup>106</sup> Ru, Ci	<5.0 x 10 <sup>-2</sup>	<1.62 x 10 <sup>-9</sup>	
<sup>137</sup> Cs, Ci	<5.0 x 10 <sup>-2</sup>	<2.81 x 10 <sup>-2</sup>	
<sup>60</sup> Co, Ci	<5.0 x 10 <sup>-2</sup>	<1.85 x 10 <sup>-3</sup>	
U, kg	3.6 x 10 <sup>2</sup>	3.6 x 10 <sup>2</sup>	

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Trench		<u>Past Designation</u> 221-U Cold U Trench 216-U-5 "U" Facility Unirr.U Trench	<u>Number</u> 216-U-6
<u>Location</u> 200 West, S.E. Quadrant  500 ft west of Beloit Avenue and 300 ft North of 221-U. West of trench 216-U-5.		<u>Service Dates</u> 3/52-3/52	<u>Status</u> Inactive
<u>Site Coordinates</u> (approximate) N-39042, W-73038 to N-39079, W-73103	<u>Reference Drawings</u> H-2-32527	<u>Elevations</u> Ground 705 ft Water Table 464 ft(1964) <u>Site Depth</u> 10 ft	
<u>Source and Description of Waste</u>  2.25 x 10 <sup>6</sup> liters. Unirradiated uranium waste from cold start-up run at U Plant.			
<u>Description of Facility</u>  Ditch, 75 ft x 10 ft bottom surface area. Deactivation: Above ground piping removed and trench backfilled.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	<5.0 x 10 <sup>-2</sup>	<5.0 x 10 <sup>-2</sup>	
Beta, Ci	0.5	<0.11	
<sup>90</sup> Sr, Ci	<5.0 x 10 <sup>-2</sup>	<2.70 x 10 <sup>-2</sup>	
<sup>106</sup> Ru, Ci	<5.0 x 10 <sup>-2</sup>	<1.62 x 10 <sup>-9</sup>	
<sup>137</sup> Cs, Ci	<5.0 x 10 <sup>-2</sup>	<2.81 x 10 <sup>-2</sup>	
<sup>60</sup> Co, Ci	<5.0 x 10 <sup>-2</sup>	<1.85 x 10 <sup>-3</sup>	
U, kg	3.6 x 10 <sup>2</sup>	3.6 x 10 <sup>2</sup>	

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> French Drain		<u>Past Designation</u> 221- U Vessel Vent Blower Pit French Drain	<u>Number</u> 216-U-7
<u>Location</u> 200 West, S.E. Quadrant  20 ft southeast of 221-U, 460 ft west of Beloit Ave. Back side of 221-U Bldg, at R-3.		<u>Service Dates</u> 3/52-6/57	<u>Status</u> Inactive
<u>Site Coordinates</u> N-38519, W-73112	<u>Reference Drawings</u> H-2-32527 H-2-43039 H-2-43078	<u>Elevations</u> Ground 665 ft Water Table 468 ft <u>Site Depth</u> Unavailable	
<u>Source and Description of Waste</u>  Volume unknown. Counting box floor drainage.			
<u>Description of Facility</u> French drain, 30 in. diamter. Deactivation: cell jumpers were removed in 221-U.			
<u>Radionuclide Content</u> (calculated from discharge data)  <1 Ci Total Beta			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 216-WR-1, 2 & 3 Cribs 216-U-9	<u>Number</u> 216-U-8
<u>Location</u> 200 West, S.E. Quadrant 450 ft west of Beloit Ave. and 750 ft south of 16th Street.		<u>Service Dates</u> 6/52-3/60	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-36860, W-73100	<u>Reference Drawings</u> H-2-43028 H-2-31321	<u>Elevations</u> Ground 694 ft Water Table 464 ft Site Depth 31 ft	
<u>Source and Description of Waste</u> 3.79 x 10 <sup>8</sup> liters. Process condensate from 221-U and 224-U; 296-U-1 Stack Drainage. Acidic.			
<u>Description of Facility</u> One crib, wooden structure, bottom surface 160 ft x 50 ft. Deactivation: Pipeline blanked north of the crib.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	
	Pu, g	3.7 x 10 <sup>2</sup>	
	Beta, Ci	2.7 x 10 <sup>3</sup>	
	<sup>90</sup> Sr, Ci	<0.1	
	<sup>106</sup> Ru, Ci	2.3 x 10 <sup>2</sup>	
	<sup>137</sup> Cs, Ci	<0.1	
	<sup>60</sup> Co, Ci	<0.1	
	U, kg	2.4 x 10 <sup>4</sup>	
<u>Other Potential Hazards</u> Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			
<u>History:</u> Approximately 75 yards of fill dirt were used to fill sink holes that had settled over the three cribs in this waste site. Risers were cut off and capped below ground level. The ground surface has been stable since August 1975.			

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CONTAMINATED LIQUID DISPOSAL SITES

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u>	<u>Number</u> 216-U-12
<u>Location</u> 200 West, S.E. Quadrant 2130 ft south of 221-U, 460 ft north of Beloit Ave.		<u>Service Dates</u> 4/60 - Present	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-36350, W-73100	<u>Reference Drawings</u> H-2-31321 H-2-32527	<u>Elevations</u> Ground 693 ft Water Table 465 ft Site Depth Unavailable	
<u>Source and Description of Waste</u> 1.33 x 10 <sup>8</sup> liters. 291-U-1 stack drainage and process condensate via C-5 Tank in 224-U. Present: above effluents and occasional wastes via the C-7 Tank in 224-U.			
<u>Description of Facility</u> Gravel-fill crib, 100 ft x 10 ft bottom dimensions.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
Pu, g	1.0	1.0	
Beta, Ci	8.5 x 10 <sup>2</sup>	153.0	
<sup>90</sup> Sr, Ci	1.0 x 10 <sup>2</sup>	75.6	
<sup>106</sup> Ru, Ci	80	1.02 x 10 <sup>-2</sup>	
<sup>137</sup> Cs, Ci	< 0.10	< 7.42 x 10 <sup>-2</sup>	
<sup>60</sup> Co, Ci	< 0.10	1.80 x 10 <sup>-2</sup>	
U, kg	1.8 x 10 <sup>3</sup>	1.8 x 10 <sup>3</sup>	

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216-U-15 continued

History

The perimeter fence and all identification markings of this site have disappeared since its original use. Exploratory core samples taken in 1970 at the point of listed coordinates were not radioactive. It is this writers opinion that the UN-216-W-10 site is identical with the 216-U-15 site. Coordinate listings are the same.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Trench		<u>Past Designation</u> 388-U Tank Dumping	<u>Number</u> 216-U-15
<u>Location</u> 200 West, S.E. Quadrant 500 ft west of 271-U and 550 ft north of 16th Street.		<u>Service Dates</u> 5/57-5/57	<u>Status</u> Terminated (cannot locate)
<u>Site Coordinates (Approximate)</u> N-38270, W-73900	<u>Reference Drawings</u> H-2-34762	<u>Elevations</u> Ground 695 ft Water Table 466 ft(1973) Site Depth less than 20 feet	
<u>Source and Description of Waste</u>  6.81 x 10 <sup>9</sup> liters. Miscellaneous waste from 388-U Tank in 276-U Solvent Storage area. Deactivation: Above ground piping removed, hole backfilled.			
<u>Description of Facility</u>  An excavated hole, which was immediately backfilled after completing the discharge of waste to the hole.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	
	Pu, g	0.1	
	Beta, Ci	7.0	
	<sup>90</sup> Sr, Ci	0.1	
	<sup>106</sup> Ru, Ci	1.0	
	<sup>137</sup> Cs, Ci	0.1	
	<sup>60</sup> Co, Ci	0.1	
	U, kg	2.3	
<u>History:</u>  HW-60807; K. F. Baldrige, 1959.			
<u>388-U TANK DUMPING</u>			
"Approximately 7000 gallons of interface crud, activated charcoal, and diatomaceous earth, containing about one curie of fission products, was transferred from the 388-U Tank to a hole at coordinates N-38270 and W-73900. The hole was backfilled and the area was delimited by a wooden fence posted with signs stating 'underground contamination'."			

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CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> U Plant Retention Basin		<u>Past Designation</u>	<u>Number</u> 207-U
<u>Location</u> 200 West, SE Quadrant ~1700 ft west of 221-U Bldg. ~100 ft north of 16th Street. East of 241-U Tank Farm.		<u>Service Dates</u> 1962 to 1972	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-38000, W-75200	<u>Reference Drawings</u> W-73646	<u>Elevations</u> Ground 674 ft Water Table 472 ft Site Depth 6.5 ft	
<u>Source and Description of Waste</u> Received chemical sewer waste from the 221-U Building and cooling water from the 224-U Building. Activity levels were normally low and the water was discharged to the 216-U-10 Pond via the 216-U-14 Ditch.			
<u>Description of Facility</u> Divided concrete basin, approximately 1 million gal. capacity. Dimensions, 123 ft x 246 ft x 6.5 ft. deep. The system includes about 2000 ft of 24 in. vitrified pipe used to convey the waste water to the basin.			
<u>Radionuclide Content (calculated from discharge data)</u>  Unknown. Low-level contamination assumed.  The north basin is badly overgrown with aquatic type plant life.  In the 1960's sludge was scraped from the north basin and buried in a 40 x 10 x 8 ft deep trench on the north side of the north basin (within 10 ft of the basin). See UN-216-W-20. A similar action was taken to clean out the south basin. The burial trench is on the south side of the south basin. See UN-216-W-21.			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Vault		222-S Vault	218-W-7
<u>Location</u> 200 West, S.E. Quadrant		<u>Service Dates</u>	<u>Status</u>
200 West Area, directly east of the 222-S Bldg.		1953-1960	Inactive (Locked out from further use.)
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43675, W-73015	H-2-51440 H-2-5170	Ground	680 ft
		Water Table	462 ft (1973)
		<u>Site Depth</u>	NA
<u>Source and Description of Waste</u>			
Lab and sample wastes from 222-S Bldg. (approximately $5.6 \times 10^3$ ft <sup>3</sup> ).			
<u>Description of Facility</u>			
Underground compartment. Surface area is 250 ft <sup>2</sup> .			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Burial</u>	<u>As of 6/30/78</u>	
U, g	700	700	
Pu, g	0.70	0.70	
Total Beta, Ci	$4.0 \times 10^3$	196.	
<sup>90</sup> Sr, Ci	80	47.	
<sup>106</sup> Ru, Ci	$1.7 \times 10^2$	$1.08 \times 10^{-4}$	
<sup>137</sup> Cs, Ci	86	52.	

921211312

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Burial Ground		Dry Waste Burial No. 9	218-W-9
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, S. E. Quadrant 200 West Area, about 1000 ft northwest of 202-S Bldg. Shares the same zone with the UN-216-W-19 broken process line site.		9/54-9/54	Inactive
<u>Site Coordinates (Approx.)</u>	<u>Reference Drawings</u>	<u>Elevations (Approx.)</u>	
Center: N-35600, W-74475	H-2-34762	Ground	680 ft
		Water Table	468 ft(1973)
		Site Depth	~12 ft
<u>Source and Description of Waste</u>			
Contaminated metal scrap.			
<u>Description of Facility</u>			
Backfilled trench. Surface area not available.			
<u>Radionuclide Content</u> (calculated from discharge data.)			
<0.1 Ci total beta.			
<u>History:</u> HW-60807, K. F. Baldrige July 1959			
<u>Buried Metal Scrap</u>			
"Contaminated metal scrap including the 211-S tank taken from Redox facilities was buried in September 1954 northwest of the Redox exclusion area. The location is designated by four corner posts marked with 'Do Not Excavate' signs."			

92125 11543



<u>Name/Type of Facility</u> Unplanned Release		<u>Post Designation</u> 233-S Floor Overflow	<u>Number</u> UN-216-W-4
<u>Location</u> 200 West, S. E. Quadrant Adjacent to and directly north of 233-S.		<u>Service Dates</u> January 1969	<u>Status</u>
<u>Site Coordinates (Approx. Center)</u> N-34625, W-74050	<u>Reference Drawings</u> H-2-44510 Sheet 4	<u>Elevations</u> Ground 676 ft Water Table 470 ft(1973) Site Depth Surface	
<u>Source and Description of Waste</u>  Plutonium contaminated water from the filter house drain line.			
<u>Description of Facility</u>  233-S filter house drain line backed up and overflowed into a low spot on the ground (150 yd <sup>2</sup> ). Area was covered with 78 yards of clean gravel.			
<u>Radionuclide Content - (at time of discharge)</u>  Approximately 0.1 g <sup>239</sup> Pu.			
<u>History:</u>  On January 9, 1969 plutonium contaminated water backed up in the 233-S filter house drain and overflowed into a low spot in the ground north of the filter building. Smear samples taken of the water and surfaces involved were as follows:			
a) Water on the floor of 233-S filter exhaust building was >40,000 d/m.			
b) Smears of the concrete pad outside the door of the filter building were 10,000 d/m.			
c) Smears of the electric motor pad - 10,000 d/m.			
d) Water in the overflow pool - 600 d/m.			

921211615

UN-216-W-4 continued

History continued

Because of the frozen underground, the water did not drain into the ground but formed a pool over approximately 150 square yards of ground surface.

The affected area was subsequently covered with about 18 inches of washed gravel.

9 2 1 2 3 1 1 5 1 6

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u>		<u>Fast Designation</u>	<u>Number</u>
Unplanned Release		221-U Acid Spill R-1 Through R-5	UN-216-W-9
<u>Location</u> 200 West, S.E. Quadrant.		<u>Service Dates</u>	<u>Status</u>
Northeast end of 221-U, R-1 through R-9.		March 1957	
<u>Site Coordinates</u> (Approximate)	<u>Reference Drawings</u>	<u>Elevations</u>	
N-38730, W-73050 to N-38550, W-73230	H-2-44510 Sheet 4	Ground 695 ft Water Table 470 ft <u>Site Depth</u> 3 in.	
<u>Source and Description of Waste</u>			
Reclaimed acid.			
<u>Description of Facility</u>			
Acid spilled onto the ground; area approximately 65 x 90 ft was covered with 3 in. of sand and gravel.			
<u>Radionuclide Content (at time of discharge)</u>			
Approximately 1 Ci Fission Products.			
<u>History:</u> March 1957			
Reclaimed acid spilled onto the ground at the northeast end of the 221-U Building in March 1957, contaminated and area 65 ft by 90 ft. The spill was covered with three inches of sand and gravel.			
Redox Radiation Monitoring Management Report, 11/13/67:			
"Special Services Operation resealed approximately 20,000 square ft of ground surface at the rear of the 221-U Bldg. The area extends from section 1 through section 9 and out to the road east of the building. The original tar seal over an old radioactive liquid spill area had decomposed and permitted weeds to grow and bring beta contamination to the surface of the ground. Strontium-90 was identified as the active isotope. In effecting the reseal, all weeds were removed, a soil sterilizing agent was then sprayed over the ground, a hot tar base was applied, and this capped with fine mesh chipped gravel. Total cost - \$975."			

92125 11547

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Unplanned Release		<u>Past Designation</u> 216-U-7, 221-U Vessel Vent Blower Pit	<u>Number</u> UN-216-W-11
<u>Location</u> 200 West, S.E. Quadrant  Northwest corner of 221-U Building. Near R-3 entrance.		<u>Service Dates</u>  6/53	<u>Status</u>  Inactive
<u>Site Coordinates</u>  N-38670, W-73090	<u>Reference Drawings</u>  H-2-44510 Sheet 4	<u>Elevations</u>  Ground 695 ft Water Table 470 ft <u>Site Depth</u> NA	
<u>Source and Description of Waste</u>  UNH solution from the 221-U Building.			
<u>Description of Facility</u>  Solution overflowed to the 221-U Building vessel vent blower pit and then to ground through a french drain.			
<u>Radionuclide Content - (at time of discharge)</u>  13.6 kg U  History: June 1953.  An estimated 300 pounds of uranium (UNH solution) overflowed into the 221-U Building Vessel Vent Blower Pit and then to ground through the french drain.			

92125 11548

CONTAMINATED LIQUID DISPOSAL SITES

II. SE

RHO-CD-673

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Unplanned release site. Liquid waste from a Broken Process Waste transfer line.		None	UN-216-W-18
<u>Location</u> 200 West - S.E. Quadrant.		<u>Service Dates</u>	<u>Status</u>
Approximately 200 ft north of 13th Street at the south end of the 216-S-9 Crib.		January 8, 1969	Inactive
<u>Site Coordinates</u> Approximate	<u>Reference Drawings</u>	<u>Elevations</u>	
N-35850, W-74450	H-2-34762	From 10 to 20 ft below ground level.	
<u>Source and Description of Waste</u>			
Redox process condensate from the D-2 receiver tank in the 202-S Building. Acidic. Discharged from a broken waste transfer line.			
<u>Description of Facility</u>			
Buckled and broken process waste transfer line from the 240-S Diversion box to the 216-S-9 crib. The leak occurred at the line "Y" to the 216-S-23 Crib.			
<u>Radionuclide Content</u> - Unknown			
Re:			
January 31, 1969 - Radiation Monitoring Monthly Report - ARHCO .			
<p>"January 8 - During the tie-in of the 216-S-9 crib waste line to the new 216-S-23 crib, contaminated water was encountered coming from a break at the junction of the two crib lines. Further excavation disclosed a severe expansion buckle in the line at that point with a similar buckle within six feet up the line toward the 202-S Building.</p> <p>The original intended tie-in was successfully made. Dose rates of 40 R/hr from the bottom of the waste line were shielded with lead to reduce dose rates to personnel to 400 mR/hr. Approximately 30 gallons of waste solution was discharged into a hole in the ground dug below the opening of the line. This hole is approximately 20 feet below ground surface at that location."</p> <p>There is no way of determining how long the line had been leaking or how much waste was discharged to the ground at that location.</p>			

92121139

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SE

<u>Name/Type of Facility</u> Unplanned Release Site Liquid Waste from a broken process Waste transfer line.		<u>Past Designation</u> None	<u>Number</u> UN-216-W-19
<u>Location</u> 200 West, S.E. Quadrant Just inside the east perimeter chain of the 218-W-9 site. South of 13th Street and north of the 216-S-7 Crib.		<u>Service Dates</u> Jan. 24, 1969	<u>Status</u> Inactive
<u>Site Coordinates</u> Approximate N-35575, W-74450	<u>Reference Drawings</u> H-2-34762	<u>Elevations</u>	

Source and Description of Waste

Redox process condensate from the D-2 receiver tank in the 202-S Bldg. Acidic. Discharge from a buckled and broken process waste transfer line.

Description of Facility

Buckled and broken process waste transfer line from the 240-S Diversion Box.

Radionuclide Content - Unknown

History:

Related to the UN-216-W-18 Incident as described below:

- I. UN-216-W-18 Incident. Re: Radiation Monitoring Monthly Report, ARHCO, Jan. 1969

January 8 - During the tie-in of the 216-S-9 crib waste line to the new 216-S-23 crib, contaminated water was encountered coming from a break at the junction of the two crib lines. Further excavation disclosed a severe expansion buckle in the line at that point with a similar buckle within six feet up the line toward the 202-S Bldg.

The original intended tie-in was successfully made. Dose rates of 40 R/hr from the bottom of the waste line were shielded with lead to reduce dose rates to personnel to 400 mR/hr. Approximately 30 gallons of waste solution was discharged into a hole in the ground dug below the opening of the line. This hole is approximately 20 feet below ground surface at that location.

9212511550

UN-216-W-19 continued

History continued

II. UN-216-W-19 Incident

After repairing the buckled portions of the waste line, a pressure test indicated another leak in the line at some point upstream towards the 202-S Bldg. Further excavation and pressure testing finally determined a leak to be somewhere between the first discovered leak at the crib lines junction and the northwest corner of the Redox area fence.

January 24 - Additional hydrostatic testing finally forced water to bubble to the ground surface inside the radiation zone marking the metal burial trenches 218-W-9 Burial site northwest of the Redox exclusion area. Dose rates of the liquid were 450 mR/hr at surface; but as the water sank back into the ground, surface dose rates dropped to 20 mrad per hour. Excavation of the bubble site disclosed a vertical buckling of the pipe line with a sizeable break in the line at that point.

9 2 1 2 5 1 1 5 5 1

CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> Unplanned Release Site		<u>Past Designation</u>	<u>Number</u> UN-216-W-21
<u>Location</u> 200 West, S.E. Quadrant South side of the 207-U South Retention Basin (within 10 feet of the concrete wall)		<u>Service Dates</u> Unknown	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-37850, W-75180	<u>Reference Drawings</u>	<u>Elevations</u>	
<u>Source and Description of Waste</u> Sludge scraped from the bottom of the south retention basin of the 207-U site.			
<u>Description of Facility</u> A trench dug 8 to 10 ft deep, 40 ft long and 15 ft wide. The sludge was covered with 4 feet of clean dirt fill.			
<u>Radionuclide Content</u> (calculated from discharge data) NA			

9212511552

CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> Unplanned Release Site		<u>Past Designation</u>	<u>Number</u> UN-216-W-22
<u>Location</u> 200 West, S.E. Quadrant North side of the 207-U North Retention Basin (within 10 feet of the concrete wall)		<u>Service Dates</u> Unknown	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-38150, W-75180	<u>Reference Drawings</u>	<u>Elevations</u>	
<u>Source and Description of Waste</u> Sludge scraped from the bottom of the north retention basin of the 207-U site.			
<u>Description of Facility.</u> A trench dug 8 to 10 ft deep, 40 ft long and 15 ft wide. The sludge was covered with 4 feet of clean dirt fill.			
<u>Radionuclide Content</u> (calculated from discharge data) NA			

9 2 1 2 5 1 1 5 5 3

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Redox Lab Retention Basin			207-SL
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, S.E. Quadrant. 200 West Area, ~200 ft East of 222-S Bldg. ~1000 ft West of Beloit Ave.		2/52-12/54 12/54-10/55 (Inactive) 10/55 to present	Active
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-34500, W-73500	H-2-5227	Ground	676 ft
		Water Table	461 ft
		Site Depth	12 ft
<u>Source and Description of Waste</u>			
<p>Receives ventilation cooling water and miscellaneous wastes from laboratory hoods and sinks in the 222-S Laboratory. These wastes are normally low in radioactivity and are discharged to the 216-S-19 Pond. The basin was inactive from 12/54 to 10/55 due to activity levels in the waste exceeding prescribed limits.</p>			
<u>Description of Facility</u>			
<p>Divided concrete basin, 50,000 gal. volume. Dimensions, 50 ft x 50 ft x 12 ft deep. Reinforced concrete walls, 12 to 16 in. thick; floor, 15 in. thick.</p>			
<u>Radionuclide Content (calculated from discharge data)</u>			
<p>Unknown. Basin is still being used.</p>			

9 2 1 2 1 1 3 1 4

207-S continued

History: Redox Radiation Monitoring Monthly Reports - October 1952.

Followup investigation of an above normal reading on the 207-S retention pond HM chamber lead to the discovery that gross amounts of contamination was being sent to the pond and the Redox swamp via the process cooling water. Surveys of the swamp revealed the area to be generally contaminated with a maximum dose rate of 2 rep/hr including 35 mr/hr at one inch from ground surface being detected. Dose rates up to 50 mrep/hr including 18 mr/hr both measured at five feet from the surface of the water at the 207-S pond were observed. Vegetation removed from the pond gave dose rates to 2.2 rep/hr including 80 mr/hr at two inches. Analytical results of this vegetation revealed approximately 42 uc of Beta activity per gram of sample. Approximately 75% of the activity was due to Rare Earths with only a few percent of the activity due to Ru, Zr, or I.

Investigation of possible sources within the building revealed that the D-12 waste concentrator had a steam coil leak.

November - 1952

Although the activity of the process cooling water dropped considerably following replacement of the D-12 cooling coil last month, sporadic increases were detected by the 207-S monitoring chamber early this month. Investigation showed that a similar leak in the H-4 coil existed. An attempt was made to prevent contamination of the cooling water by keeping pressure on the coil at all times pending its replacement at the next scheduled shut down. As the coil rupture became worse, this failed, and gross amounts of contamination were again being discharged to the Redox swamp late in the month. During a three day period, dose rates increased from 20 to 200 mr/hr at two inches from the process cooling water header, from 80 mrep/hr including 40 mr/r to 250 mrep/hr including 70 mr/hr approximately five feet above the water at 207-S, and from approximately 6 mrep/hr to 700 mrep/hr including 30 mr/hr six inches above the water at the swamp inlet.

August - 1953

A leaking coil in the H-4 pot was detected near the end of the month. Since the spare was not yet completed, operations in H-4 continued, attempting to minimize leakage into the coil by maintaining pressure on the coil at all times. This was not completely successful, however, as dose rates rose from 25 to 180 mr/hr two inches from the utility outlet header and from 30 to 350 mrep/hr approximately five feet above the water at 207-S.

September - 1953

Waste Area: The leak in the H-4 pot coil became worse rapidly. Before the coil was blanked off, dose rates rose to 2 rep/hr over the 207-S retention basin and to 1 r/hr at 2 inches from the utility outlet header. Replacement of the H-4 pot eliminated this as a source of further contamination going to the Redox swamp, but another leak in the D-12 pot coil was discovered late in the month.

9212 11555

CONTAMINATED LIQUID DISPOSAL SITES

II. SE

<u>Name/Type of Facility</u> Redox Retention Basin		<u>Past Designation</u>	<u>Number</u> 207-S Also (UN-216-W-2)
<u>Location</u> 200 West, S.E. Quadrant  200 West Area, ~1200 ft West of 222-S Bldg. ~200 ft North of 10th Street.		<u>Service Dates</u>  10/51-4/54	<u>Status</u>  Inactive
<u>Site Coordinates</u>  N-34300, W-75200	<u>Reference Drawings</u>  H-2-1170 H-2-5326 Sheet 2	<u>Elevations</u> Ground 666 ft Water Table 468 ft Site Depth 8 ft	

Source and Description of Waste

Received process cooling and steam condensate from the 202-S Bldg. Activity levels were normally low and the water was discharged to the 216-S-17 Pond.

Description of Facility

Concrete basin, 130 ft x 130 ft x 8 ft deep, volume, 853,000 gal. Walls are about 10 in. thick and floor is about 8 in. thick.

System includes about 2000 ft of 24 in. diameter vitrified clay pipe used to convey the waste water to and from the basin.

The 207-S Retention Basin, pipeline, and 216-S-17 Pond were removed from service in 1954 following a coil leak in the 202-S Bldg. which contaminated these facilities above permissible limits. The basin has been backfilled with several feet of soil.

Radionuclide Content

Unknown. Low Level contamination assumed.

History: See next page.

92125 11556

207-S continued

History continued:

November - 1953

A rise in activity of the 207-S retention basin water was noted when steam was introduced to D-12 pot coils, but the activity returned to normal. Dose rates around the 207 basin significantly higher with the low water flow.

March - 1954

Redox swamp was bypassed on the 15th of the month and Minor Construction forces are filling the original swamp. The retention pond will be bypassed and backfilled during current scheduled shutdown.

April - 1954

The 207-S retention pond was bypassed during the shutdown early this month. A moderate amount of water has been held in the pond until Minor Construction can acquire adequate funds to backfill this area.

June 25, 1975

The contamination to 500 c/m in the 216-S-7 Redox Retention Basin, brought to the surface by radioactive weed growth, was covered with 9 inches of gravel fill. The bottom of the pond will be further treated with a herbicide to inhibit further radioactive weed growth.

SUMMARY

A number of leaks in process vessel coils in the Redox Plant released radioactivity into the 207-S retention basins from late 1952 until April of 1954 when the basins were taken out of service. The gross amounts of radioactivity remaining on the concrete floors and walls of the basins was subsequently covered with an overfill of dirt to prevent further spread of contamination. During the ensuing years, a few scattered Russian thistle were found to be growing each year through the surface of the overfill. In June of 1975, the soil was treated with herbicides and covered with an additional 9 inches of gravel to stop the radioactive weed growth. The surface of the site is presently free of radioactivity.

92131157

VOLUME II 200 WEST AREA - Southwest Quadrant (SW)

## Waste Disposal Sites and Associated Radiation Zones

## Quadrant Boundaries

- East Boundary - Camden Avenue from 10th Street to 19th Street.
- South Boundary - 10th Street and 13th Street.  
(South Fenceline Road)
- West Boundary - Dayton Avenue (West Fenceline Road)
- North Boundary - 19th Street from Camden Avenue to Dayton Avenue.

See Area and Quadrant maps at the end of this section.

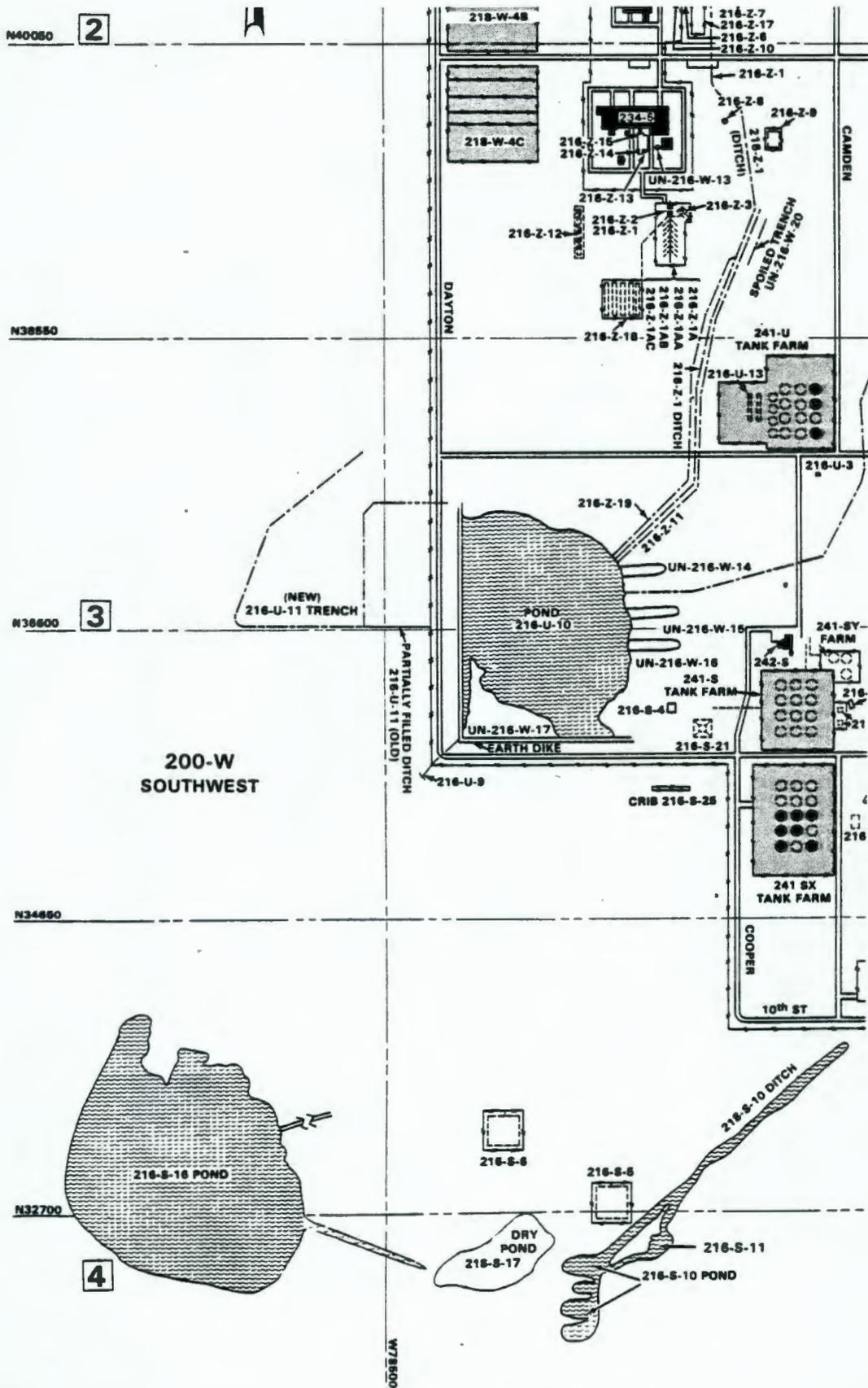
How to read the Index and locate a site:

Example - 216-U-10 Pond

<u>Site Number</u>	<u>Volume</u>	<u>Quadrant</u>
216-U-10 Pond	II.	SW (Southwest)

92121158

9 2 1 2 5 1 1 5 5 9



INDEX - VOLUME II 200 WEST AREA  
Southwest Quadrant

216-S-4 French Drain	II. SW
216-S-21 Crib	II. SW
216-U-10 Pond	II. SW
216-U-13 Crib	II. SW
216-Z-1 Ditch	II. SW
216-Z-1 and Z-2 Cribs	II. SW
216-Z-1A Tile Field	II. SW
216-Z-1AA Tile Field	II. SW
216-Z-1AB Tile Field	II. SW
216-Z-1AC Tile Field	II. SW
216-Z-3 Crib	II. SW
216-Z-8 French Drain	II. SW
216-Z-9 Crib	II. SW
216-Z-11 Ditch	II. SW
216-Z-12 Crib	II. SW
216-Z-13 French Drain	II. SW
216-Z-14 French Drain	II. SW
216-Z-15 French Drain	II. SW
216-Z-18 Crib	II. SW
216-Z-19 Ditch	II. SW
218-W-4C Burial Ground	II. SW
UN-216-W-13 Unplanned Release	II. SW
UN-216-W-14 Leach Trench	II. SW
UN-216-W-15 Leach Trench	II. SW
UN-216-W-16 Leach Trench	II. SW
UN-216-W-17 Pond Flood Plain	II. SW
UN-216-W-20 Trench (covered)	II. SW

9 2 1 2 1 1 3 0

CONTAMINATED LIQUID DISPOSAL SITES

II. SW

<u>Name/Type of Facility</u> French Drain		<u>Past Designation</u> 216-S-7 216-S-4 Sump or Crib UN-216-W-1		<u>Number</u> 216-S-4	
<u>Location</u> 200 West, S. W. Quadrant Between the 241-S Tank Farm and the 216-U-10 Pond. Northwest from the 216-S-21 Crib.			<u>Service Dates</u> 8/53-8/56		<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-36000, W-76500		<u>Reference Drawings</u> H-2-39574 H-2-2430		<u>Elevations</u> Ground 662 ft Water Table 474 ft(1973) Site Depth 20 ft	
<u>Source and Description of Waste</u> Volume unknown. Condensate and cooling water from condensers on the 101-S and 107-S tanks in 241-S Tank Farm.					
<u>Description of Facility</u> Two French drains, 30-inch diameter encasement. Deactivation: Above ground piping removed.					
<u>Radionuclide Content</u> (calculated from discharge data) Data not available. Assumed to be low-level contamination.					
<u>History:</u> The crib is located west of the 241-S Tank Farm and was first used in August 1953 for the disposal of condensate from the 101-S and 104-S tank cascades in the 241-S Tank Farm. Its construction consisted of two metal culvert pipes, 30 inches in diameter, placed on end to a depth of 20 feet. Radioactivity accumulated at the bottom of the pipes. Above ground service piping has been removed.					
<u>Note:</u> The marker "216-S-4 Crib" appears to have been placed 40 yards too far to the south of the site.					

92125 11561

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-SX-1 Cavern or Crib 216-SX-1	216-S-21
<u>Location</u> 200 West, S.W. Quadrant		<u>Service Dates</u>	<u>Status</u>
2736 ft northwest of 202-S 152 ft north of 13th Street		11/54-12/70	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
H-35920, W-76400	H-2-39549 H-2-39574	Ground	662 ft
		Water Table	475 ft(1973)
		Site Depth	21 ft
<u>Source and Description of Waste</u>			
8.71 x 10 <sup>7</sup> liters. 241-SX condensate. Low salt, neutral/basic.			
<u>Description of Facility</u>			
Crib, wooden structure, 50 ft x 50 ft bottom dimension.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time Of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	2.1	2.1	
Beta, Ci	1.3 x 10 <sup>3</sup>	284	
<sup>90</sup> Sr, Ci	<43	<30.1	
<sup>106</sup> Ru, Ci	44	0.013	
<sup>137</sup> Cs, Ci	1.6 x 10 <sup>2</sup>	116	
<sup>60</sup> Co, Ci	<0.41	< .10	
U, kg	4.2	4.19	
<u>Other Potential Hazards</u>			
Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			

92123 11562

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> Pond	<u>Past Designation</u> 231 Swamp U Swamp 216-U-1	<u>Number</u> 216-U-10
<u>Location</u> 200 West, S.W. Quadrant  3720 ft southwest of 221-U, 532 ft south of 16th Street (S.W. corner of 200 West Area)	<u>Service Dates</u> 3/52- to present	<u>Status</u> Active
<u>Site Coordinates</u> N-37200, W-78010 to N-35800, W-77000	<u>Reference Drawings</u> H-2-2430 SK-2-1888	<u>Elevations</u> Ground 660 ft Water Table 475 ft (1973) <u>Site Depth</u> 0 (Surface)

Source and Description of Waste

1.21 x 10<sup>11</sup> liters. Water from 216-Z-11, 216-U-14, 216-Z-19 and 231-Z Ditches; effluents and cooling water from 401-SX condensers.

Description of Facility

Pond, 22 acres.

Radionuclide Content (calculated from discharge data)

<u>Radionuclides</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	8.1 x 10 <sup>3</sup>	8.21 x 10 <sup>3</sup>
Beta, Ci	3.1 x 10 <sup>3</sup>	<53
<sup>90</sup> Sr, Ci	<23	<14.7
<sup>106</sup> Ru, Ci	3.1 x 10 <sup>2</sup>	<4.29 x 10 <sup>-2</sup>
<sup>137</sup> Cs, Ci	<16	<10.6
<sup>60</sup> Co, Ci	<4.4	< 1.19
U, kg	1.4 x 10 <sup>3</sup>	1.6 x 10 <sup>3</sup>
AM-241 g.	2.42 x 10 <sup>-4</sup>	2.42 x 10 <sup>-4</sup>

(See Next Page)

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The U Pond (216-U-10) is a diked surface depression in the southwest corner of the 200 West Area on the Hanford Project reservation. The original use of the site for the disposal of waste water began in 1943 when water from the 200 West Power House (284-W) and Protective Clothing Laundry (2723-W) wash and rinse water were routed into the site by means of an open ditch (216-U-14). No measurements of the radioactivity in this water were routinely made or recorded at that time and surveillance of the site consisted of regular radiation activity measurements in and near the site using portable survey instruments.

With the construction of the Plutonium Metal Conversion facility (234-5) in late 1949, the drains, cooling water, pump and compressor seal water from this building were routed to the U Pond Site through a retention basin and another open ditch (216-Z-11). Samples from the retention pond were routinely analyzed and a total of 145 grams of plutonium were reported to have been released to the ditch through 1965.

At the time the 234-5 Building was constructed, the cooling water from the Plutonium Purification Building (231-Z) was also routed to the Z-11 Ditch. No analysis of this stream was performed routinely and radioactive releases were judged to be quite small. Measurements at the pond site continued in the same manner. It was subsequently learned that a significant amount of plutonium was released to the Z-11 Ditch through the 26-inch vacuum pump seal water for the 234-5 Building process vacuum system. A few samples from the bottom of this ditch were taken in 1958 when the ditch was relocated. A new ditch was constructed parallel to the old ditch when the old one became clogged with vegetation. Spoil from the new ditch was used to backfill the old trench. ARCHO Research and Engineering reevaluated the total inventory of the material released from the 234-5 Building and raised the estimated release to 8 kilograms of plutonium, of which about 1.5 kilograms might be in the pond itself. This estimate was first reported in 1966.

The second ditch from the 234-5 Building was again relocated in 1971 for the same reasons of vegetation growth in the ditch. Approximately 65 grams of plutonium were calculated to reside in this ditch based upon mud samples from the ditch bottom. The third ditch currently in use is assigned the designation 216-Z19 and also runs parallel to the original ditch.

In 1951 and 1952 the Waste Metal Recovery program was started to recover the uranium stored with the fission products in underground waste storage tanks in both 200 East and 200 West Areas. A solvent extraction process was installed and operated in the spare U Canyon Building from 1952 through 1957. Process cooling water from this process was released into the 216-U-14 Ditch and then to the U Pond. Significant unmeasured releases of cesium and strontium by this route occurred during the last two years of operation (1956-57).

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		241-UR Steam Cleaning Pit 216-U-13 Trench	216-U-13
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, S. W. Quadrant  About 2400 ft west of the 221-U Bldg. (within the confines of the 241-U Tank Farm)		3/52-3/56	Surface decontaminated and trenches filled
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-37980, W-76020 to N-38180, W-76020, N-37980, W-76070 to N-38180, W-76070	H-2-32537	Ground 674 ft Water Table 472 ft (1973) Site Depth Not Available	
<u>Source and Description of Waste</u>			
1.14 x 10 <sup>4</sup> liters. Decontamination waste from 241-UR Steam Cleaning Plant.			
<u>Description of Facility</u>			
Two cribs, 200 ft x 20 ft bottom dimensions. Site has been back-filled with clean soil.			
<u>Radionuclide Content (calculated from discharge data)</u>			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	<0.1	<0.1	
Beta, Ci	50.0	<0.25	
<sup>90</sup> Sr, Ci	<0.1	<0.058	
<sup>106</sup> Ru, Ci	10.0	1.29 x 10 <sup>-6</sup>	
<sup>137</sup> Cs, Ci	<0.1	<0.06	
<sup>60</sup> Co, Ci	<0.1	<5.50 x 10 <sup>-3</sup>	
U, kg	0.45	0.45	

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<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Ditch		Drain Ditch to U Swamp Z Plant Ditch	216-Z-1 Ditch
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, S.W. Quadrant  Begins East of the 231-Z Bldg. and 234-5 Bldg. and runs South to the 216-U-10 Swamp.		12/44-3/59	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-37050, W-76950 to N-40829, W-76505	H-2-576 H-2-10011 H-2-14035	Ground 660 ft to 673 ft Water Table 475 ft Site Depth 4 to 10 ft	
<u>Source and Description of Waste</u>			
12/44 to 7/49 received process cooling water and steam condensate from 231-Z. 7/49 to 5/53 received process cooling water and steam condensates from both the 231-Z Bldg. and the 234-5 Bldg. plus vacuum pump seal water from the 291-Z Bldg. 5/53 to 5/59 received laboratory waste from 231-Z Bldg. and process cooling water and steam condensate from 234-5 Bldg. plus vacuum pump seal water from 291-Z Bldg			
<u>Description of Facility</u>			
A 4,150 ft long ditch that ran from the east side of the 231-Z Bldg. in a southerl direction to the 216-U-10 Pond. In 1949, a 1,480 ft section of the head-end was backfilled and the 231-Z plant effleunt was rerouted via an underground pipeline to the new head-end of the ditch (coordinates N-39420, W-75991).			
A 2,005 ft section of the ditch was deactivated after release of contamination from the 231-Z Bldg. (coordinates N-37495, W-76460 to N-39420, W-75991). The 2,005 ft section of ditch was backfilled with berm from the excavation of the 216-Z-11 ditch. Used 665 ft of ditch south of 16th Street as part of new ditch (216-Z-11).			
<u>Radionuclide Content</u> (calculated from discharge records)			
Radionuclide content included in 216-U-10 Swamp Inventory.			
Approximately 425 feet of the 216-Z-1 covered ditch (south from the confluence of the 234-5 stream with the Z-1 Ditch) was mistakenly dug up during the excavation of the Z-19 Ditch in 1971. The resulting spoil pile of contaminated dirt was buried in a trench dug parallel and adjacent to the 216-Z-11 Ditch.			
<u>Note:</u> See the UN-216-W-13 Site report of incident.			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Crib	234-5 No. 1 Crib 216-Z-7	216-Z-1 and 216-Z-2 cribs
<u>Location</u>	<u>Service Dates</u>	<u>Status</u>
200 West, S.W. Quadrant  About 400 ft South of the 234-5 Building	6/49-6/52 5/66-6/69	Inactive

<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-39379, W-76601 - Z-1 N-39411, W-76601 - Z-2	H-2-16459 H-2-24924 No. 2 H-2-32528	Ground 676 ft Water Table 475 ft(1973) <u>Site Depth</u> 17 ft

Source and Description of Waste

3.4 x 10<sup>7</sup> liters of neutral basic process waste, analytical and development laboratory waste from 234-5 Bldg. via the 241-Z settling tank during period 6/49 to 6/52 including 236-Z and 242-Z wastes during period 5/66 to 6/66. Cribs 216-Z-1 and 2 were inactive during period 6/52 to 6/66. Infiltration capacity was exceeded in 6/52.

Description of Facility

Wooden structure crib with bottom 14 ft x 14 ft. Effluent pipeline was blanked directly west of the crib.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	7.0 x 10 <sup>3</sup>	7.0 x 10 <sup>3</sup>
Beta, Ci	50	<.218
<sup>90</sup> Sr, Ci	<0.1	<5.15 x 10 <sup>-2</sup>
<sup>106</sup> Ru, Ci	10	1.46 x 10 <sup>-7</sup>
<sup>137</sup> Cs, Ci	<0.1	<5.37 x 10 <sup>-2</sup>
<sup>60</sup> Co, Ci	<0.1	<2.84 x 10 <sup>-3</sup>
U, kg	81	81

Other Potential Hazards

Wooden structure of crib may collapse--requiring prompt remedial action to prevent spread of contamination and to correct other hazards.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> Tile Field		<u>Past Designation</u> 234-5 Tile Field 216-Z-7	<u>Number</u> 216-Z-1A Tile Field
<u>Location</u> 200 West, S.W. Quadrant About 500 ft south of the 234-5 Building		<u>Service Dates</u> 6/49-3/59 5/64-4/69	<u>Status</u> Inactive
<u>Site Coordinates (Approximately)</u> N-39023, W-76501 N-39435, W-76815	<u>Reference Drawings</u> H-2-16459 H-2-24923 H-2-32528	<u>Elevations</u> Ground 676 ft Water Table 475 ft Site Depth 12 ft	
<u>Source and Description of Waste</u>  Same as 216-Z-1 and 2 cribs. Reviewed overflow from these cribs--estimated to be $1.0 \times 10^6$ liters. Acidic.			
<u>Description of Facility</u> Tile Field covering an area of 260 ft x 100 ft. Use of 216-Z-1 and Z-2 cribs and tile field was discontinued in 3/59 when groundwater samples in vicinity of crib showed alpha contamination. Returned to active status 5/64 to 4/69 for 236-Z Bldg. and 242-Z Bldg. wastes. (See date sheets for 216-Z-1AA, 1AB, 1AC for subsequent history of this tile field.) <u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	
	Pu, g	50	
	Beta, Ci	28	
	<sup>90</sup> Sr, Ci	< 0.1	
	<sup>106</sup> Ru, Ci	10	
	<sup>137</sup> Cs, Ci	< 0.1	
	<sup>60</sup> Co, Ci	< 0.1	
	U, kg	< 0.05	
<u>History:</u> Subject: Radiation Monitoring Monthly Report - January 1954  216-Z-1A Crib - The first of a series of dry wells has been drilled to a depth of 31 feet into the Z-1A Crib. Soil samples from the well read a maximum of 60,000 c/m. All samples were packaged in plastic which prevented alpha readings being taken. The control of contamination was excellent.			

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<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Tile Field	Part of former Z-1A tile field	216-Z-1AA
<u>Location</u>	<u>Service Dates</u>	<u>Status</u>
200 West, S.W. Quadrant About 500 ft South of the 234-5 Bldg.	6/64 to 6/66	Inactive
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-39334, W-76601 to N-39234, W-76601	H-2-16459 H-2-32528 H-2-24923 H-2-27503	Ground 676 ft Water Table 475 ft(1973) Site Depth 12 ft
<u>Source and Description of Waste</u>		
Received 236-Z and 242-Z process waste (AAW). Approximate chemical composition: $\text{HNO}_3$ - 0.15M, $\text{Al}(\text{NO}_3)_3$ - 0.2M, $\text{AlF}(\text{NO}_3)_2$ - 0.3M, $\text{Mg}(\text{NO}_3)_2$ - 0.3M, $\text{Ca}(\text{NO}_3)_2$ - 0.2M, $\text{NaNO}_3$ - 0.95M. Also received organic waste mixed with AAW--includes TBP and DBBP and CC/4. Waste volume = $1.9 \times 10^6$ liters. Acidic.		
<u>Description of Facility</u>		
Same tile field as 216-Z-1A except that the waste effluent line was positioned further into the main trunk line of the tile field to feed this particular section of the field.		
<u>Radionuclide Content (calculated from discharge data)</u>		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	$3.0 \times 10^4$	$3.0 \times 10^4$
Beta, Ci	210	<0.389
$^{90}\text{Sr}$ , Ci	<0.1	<0.07
$^{106}\text{Ru}$ , Ci	100	0.02
$^{137}\text{Cs}$ , Ci	<0.1	<0.07
$^{60}\text{Co}$ , Ci	<0.1	<0.02
U, kg	<0.05	<0.05

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Tile Field		Part of former Z-1-A tile field	216-Z-1AB
<u>Location</u> 200 West, S.W. Quadrant		<u>Service Dates</u>	<u>Status</u>
About 600 ft South of the 234-5 Bldg.		6/66-10/67	Inactive
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-39234, W-76601 to N-39159, W-76601	H-2-27503 H-2-32528	Ground	676ft
		Water Table	475ft(1973)
		<u>Site Depth</u>	12ft
<u>Source and Description of Waste</u>			
Same as 216-Z-1AA. Waste volume = $1.9 \times 10^6$ liters. Acidic.			
<u>Description of Facility</u>			
Same as 216-Z-1AA			
<u>Radionuclide Content (calculated from discharge data)</u>			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	$1.7 \times 10^4$	$1.66 \times 10^4$	
Beta, Ci	105	< .399	
<sup>90</sup> Sr, Ci	<0.1	<0.07	
<sup>106</sup> Ru, Ci	50	0.03	
<sup>137</sup> Cs, Ci	<0.1	<0.077	
<sup>90</sup> Co, Ci	<0.1	<0.023	
U, kg	<0.05	<0.05	

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> Tile Field		<u>Past Designation</u> Part of former 2-1-A Tile Field	<u>Number</u> 216-Z-1AC
<u>Location</u> 200 West, S.W. Quadrant About 700 ft South of the 234-5 Bldg.		<u>Service Dates</u> 10/67-5/69	<u>Status</u> Inactive
<u>Site Coordinates</u> N-39159, W-76601 to N-39063, W-76601	<u>Reference Drawings</u> H-2-27503 H-2-3-2528	<u>Elevations</u> Ground 676 ft Water Table 475 ft(1973) <u>Site Depth</u> 12 ft	
<u>Source and Description of Waste</u> Same as 216-Z-1AA. Waste Volume = $1.4 \times 10^6$ liters. Acidic.			
<u>Description of Facility</u> Same as 216-Z-1AA.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As Of 6/30/77</u>	
Pu, g	$1.1 \times 10^4$	$1.1 \times 10^4$	

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<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 216-Z-3 Culvert 234-5 No. 3 and No.4 Cribs, 216-Z-8	<u>Number</u> 216-Z-3
<u>Location</u> 200 West, S.W. Quadrant  West of Camden Ave. and 250 ft South of 241-Z Retention Basin	<u>Service Dates</u>  6/52-3/59	<u>Status</u>  Inactive
<u>Site Coordinates</u> N-39435, W-76461	<u>Reference Drawings</u> H-2-12292 H-2-24923 H-2-32528	<u>Elevations</u> Ground 676 ft Water Table 475 ft(1973) Site Depth 25 ft
<u>Source and Description of Waste</u>  1.78 x 10 <sup>8</sup> liters of miscellaneous neutral-basic waste from Z-Plant process, analytical lab and development lab. Discharged to crib via 241-Z settling tank.		
<u>Description of Facility</u>  Rock crib with 70 ft x 5 ft bottom area.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	5.7 x 10 <sup>3</sup>	5.7 x 10 <sup>3</sup>
Beta, Ci	10.5 x 10 <sup>2</sup>	< .261
<sup>90</sup> Sr, Ci	<0.1	<0.06
<sup>106</sup> Ru, Ci	40.0	5.64 x 10 <sup>-5</sup>
<sup>137</sup> Cs, Ci	<0.1	< .06
<sup>60</sup> Co, Ci	<0.1	< .008
U, kg	<5.0 x 10 <sup>-2</sup>	<0.05

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

92125011574

<u>Name/Type of Facility</u> French Drain	<u>Past Designation</u> 216-Z-8 Crib 234-5 Recuplex French Drain 216-Z-9	<u>Number</u> 216-Z-8
<u>Location</u> 200 West, S.W. Quadrant 300 ft East of 234-5Z and 350 ft South of 19th St.	<u>Service Dates</u> 7/55-4/62	<u>Status</u> Inactive

<u>Site Coordinates</u> N-40000, W-76250	<u>Reference Drawings</u> H-2-16653 H-2-32528	<u>Elevations</u> Ground 667 ft Water Table 475 ft(1973) <u>Site Depth</u> 17 ft
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Source and Description of Waste  
9.59 x 10<sup>3</sup> liters of neutral-basic Recuplex waste via overflow from the silica slurry tank.

Description of Facility  
Concrete crib, 36 in. diameter. Deactivated; effluent piping disconnected in 234-5Z Bldg.

Radionuclide Content (calculated from discharge data)

<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu 48.4 g	48.4

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> <b>Crib</b>	<u>Past Designation</u> 216-Z-9 Cavern 234-5 Recuplex Cavern 216-Z-10	<u>Number</u> 216-Z-9
<u>Location</u> 200 West, S.W. Quadrant  750 ft east of the 234-5 Bldg. and 500 ft south of 19th St.	<u>Service Dates</u> 7/55-6/62	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-39830, W-75910 N-39890, W-75910	<u>Reference Drawings</u> H-2-15492 H-2-20986 H-2-32528	<u>Elevations</u> Ground 662 ft Water Table 473 ft (1973) Site Depth 20 ft

Source and Description of Waste

Received acidic Recuplex CAW and aqueous and organic waste from the 234-5 Bldg. Waste composition similar to 236-Z/242-Z waste except for higher HNO<sub>3</sub> and Al(NO<sub>3</sub>)<sub>2</sub> concentrations in Recuplex CAW. Further, organic fraction did not contain DBBP (see source and description of waste 216Z-1AA).

Description of Facility

Concrete covered trench with a bottom surface area of 30 x 60 ft. The effluent line from the 234-5 Bldg. was disconnected in 6/62.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>
Pu, g	3.8 x 10 <sup>4</sup>
Beta, Ci	48
<sup>90</sup> Sr, Ci	< 0.1
<sup>106</sup> Ru, Ci	20
<sup>137</sup> Cs, Ci	< 0.1
<sup>60</sup> Co, Ci	< 0.1
U, kg	<5 x 10 <sup>-2</sup>

This crib was thoroughly characterized near the bottom surface as a result of a suspected criticality problem in 1973. All surveys showed the vast bulk of the plutonium was in the south half of the crib bottom which has the lowest floor elevation. Surface soil in the south half ranged from 15 to 25 g Pu/liter of soil. Most of the north half ranged from 1 to 5 g Pu/liter of soil.

A detailed study of the area of maximum concentration revealed the following vertical Distribution:

(See next Page)

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216-Z-9 continuedRadionuclide Content

<u>Depth</u>	<u>Gram <sup>239</sup>Pu/liter of Soil</u>
0 - 1 in. (0 - 2.5 cm)	13 - 20
2 - 3 in. (5 - 7.5 cm)	1 - 9
4 - 6 in. (10 - 15 cm)	0.1 - 0.3
7 - 9 in. (17.5 - 22.5 cm)	0.1 - 0.8
10 - 15 in. (25 - 30 cm)	0.1 - 0.3

Core samples taken down to a depth of eight feet indicated that the Pu concentration remained constant at about 0.1 g/liter after a depth of about 1 foot. Future programs were planned for determining how far the Pu extended down the soil column. (For further details on the 1973 study, refer to ARH-2915, "Nuclear Reactivity Evaluations of the 216-Z-9 Enclosed Trench.")

Disposition Plans

Excavate top 1 ft layer of soil and package for retrievable storage. Excavation planned to begin in 1976 (Ref ARH-2651-1).

During 1977 mining operations with a clam shell miner removed the top one foot of soil from the surface of the north half of the crib. Approximately 28.5 kg of plutonium were removed. 95% of the activity was found to be trapped within the first 12 inches of soil, with 85% of the total activity found in the first inch of soil on the surface of the crib bottom. Mining of the south half of the crib will continue through an estimated date of August 1978.

The excavation and removal of plutonium contaminated soils from the bottom of the 216-Z-9 Crib was completed July 14, 1978. See document RHO-ST-21 for details and summary of the project.

9212 | 1376

<u>Name/Type of Facility</u> Ditch		<u>Past Designation</u> 216-Z-1 Ditch Z Plant Ditch	<u>Number</u> 216-Z-11
<u>Location</u> 200 West, S.W. Quadrant Starts 750 ft north of 234-5Z, 1000 ft west of Camden Avenue		<u>Service Dates</u> 3/59-4/71	<u>Status</u> Inactive
<u>Site Coordinates</u> N-37050, W-76950 to N-39420, W-75991	<u>Reference Drawings</u> H-2-576 H-2-10011 H-2-32528 H-2904W #18	<u>Elevations</u> Ground 673 ft Water Table 475 ft(1973) Site Depth 2 ft	
<u>Source and Description of Waste</u> Volume unknown. Process cooling water and steam condensate from 234-5; vacuum pump seal water from 291-Z; cooling water from lab operations in 231-Z.			
<u>Description of Facility</u> Ditch, 2615 ft x 4 ft bottom dimension			
<u>Radionuclide Content</u> (calculated from discharge data) Unknown. Low level. Mud samples taken from the bottom of the 216-Z-11 Ditch February 1971 were <10 nanocuries/gm.			
<u>History:</u> In 1959 the 216-Z-11 Ditch was dug to replace the middle section of the old 216-Z-1 Ditch. The dirt taken from the new ditch was used to cover the contaminated 216-Z-1 Ditch. The new 216-Z-11 Ditch was not dug all of the way to the U-Pond, but cut back into the south end of the 216-Z-1 Ditch approximately 665 feet from the U-10 Pond. The entire ditch was then redesignated as the 216-Z-11 Ditch.  The Z-11 Ditch was used until April 1971, at which time it became necessary to dredge it or dig a new one to lower the water level at the head-end of the ditch in order to receive water from the Z-9 bypass storm sewer. The decision was made to dig a new ditch, the 216-Z-19 Ditch.			
<u>Contamination Status:</u> The 216-Z-11 covered ditch bears plutonium and americium contamination in the old mud and aquatic plant layer or mat that formed on the ditch bottom. Concentrations are generally less than 10 nanocuries per gram of soil.			

92125 11577

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Crib	216-Z-12 Crib	216-Z-12
<u>Location</u> 200 West, SW Quadrant	<u>Service Dates</u>	<u>Status</u>
530 ft Southwest of 234-5Z and 970 ft South of 19th St.	3/59-5/73	Inactive

<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>
N-39480, W-77209 to N-39400, W-77200	H-2-20986 H-2-20987 H-2-20988 H-2-32528	Ground 683 ft Water Table 475 ft Site Depth 20 ft

Source and Description of Waste

2.81 x 10<sup>8</sup> liters of neutral-basic process, analytical laboratory and development laboratory waste from 234-5 Z via the 241-Z Settling Tank.

Description of Facility

A gravel-filled crib, 300 x 20 ft.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
Pu, g	2.51 x 10 <sup>4</sup>	2.5 x 10 <sup>4</sup>
Beta, Ci	2.25 x 10 <sup>2</sup>	<0.34
<sup>90</sup> Sr, Ci	<0.10	<0.07
<sup>106</sup> Ru, Ci	1.00 x 10 <sup>2</sup>	0.008
<sup>137</sup> Cs, Ci	<0.10	<0.07
<sup>60</sup> Co, Ci	<0.10	<0.02
U, kg	<0.05	<0.05

Site Characterization Status

Wells W18-5A and W18-5B were drilled next to the 216-Z-12 crib in 1966 to determine the distribution of alpha contamination below this disposal site. Well W18-5A was drilled to a depth of 212 feet (ground water level) at 135 feet. Alpha emitters were not detectable in the ground water or throughout the remainder of the soil column. Well W18-5B showed trace alpha contamination (23 d/m/g) in the 50 foot sample only.

9 2 1 2 5 8 1 5 7 8

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> French Drain		<u>Past Designation</u> 234-5 Dry Well #1 216-Z-13 Dry Well	<u>Number</u> 216-Z-13
<u>Location</u> 200 West, S.W. Quadrant 190 ft south of 234-5, 1250 ft west of Camden Avenue. Directly behind 234-5 Bldg.		<u>Service Dates</u> 6/49-	<u>Status</u> Active
<u>Site Coordinates</u> N-39769, W-76762	<u>Reference Drawings</u> H-2-16412 H-2-32528	<u>Elevations</u> Ground 680 ft Water Table 475 ft Site Depth 6 ft	
<u>Source and Description of Waste</u> Volume unknown. Steam condensate and floor drainage from 291-Z.			
<u>Description of Facility</u> French Drain, 36 in. diameter.			
<u>Radionuclide Content</u> (calculated from discharge data) Not known. Low Level contamination assumed.  This site is not identified.			

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CONTAMINATED LIQUID DISPOSAL SITES

RH0-CD-673

II. SW

<u>Name/Type of Facility</u> French Drain		<u>Past Designation</u> 234-5 Dry Well #2 216-Z-14 Dry Well	<u>Number</u> 216-Z-14
<u>Location</u> 200 West, S.W. Quadrant Directly behind the 234-5 Bldg.		<u>Service Dates</u> 6/49-	<u>Status</u> Active
<u>Site Coordinates</u> N-39774, W-76822	<u>Reference Drawings</u> H-2-16412 H-2-32528	<u>Elevations</u> Ground 680ft Water Table 475ft(1973) <u>Site Depth</u> Unknown	
<u>Source and Description of Waste</u>  Volume unknown. Steam condensate from the turbine for the ET-9 exhaust fan in 291-Z.			
<u>Description of Facility</u>  French drain, 36 in. diameter.			
<u>Radionuclide Content</u> (calculated from discharge data)  Low-level contamination assumed.  This site is not identified.			

9 2 1 2 1 1 5 3 0

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> French Drain	<u>Past Designation</u> 234-5 Dry Well #3 216-Z-15 Dry Well	<u>Number</u> 216-Z-15
<u>Location</u> 200 West, S.W. Quadrant. 20 ft south of 234-5 Z, 1368 ft west of Camden Ave. Directly behind 234-5 Bldg. (Fig C.1.10)	<u>Service Dates</u> 6/49-	<u>Status</u> Active
<u>Site Coordinates</u> N-39911, W-76810	<u>Reference Drawings</u> H-2-16412 H-2-32528	<u>Elevations</u> Ground 680 ft Water Table 475 ft <u>Site Depth</u> 6 ft
<u>Source and Description of Waste</u> Volume unknown. Drainage from evaporator cooler in 291-Z.		
<u>Description of Facility</u> French drain, 36 in. diameter.		
<u>Radionuclide Content</u> (calculated from discharge data) Unknown. Low-level contamination assumed.  This site is not identified.		

9 2 1 2 5 1 1 5 8 1

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-Z-18 Crib	216-Z-18
<u>Location</u> 200 West, S.W. Quadrant. 200 West Area. 1000 ft South of 234-5Z and 1500 ft West of Camden Ave. Approx. 750 ft due south of the 291-Z-1 stack.		<u>Service Dates</u>	<u>Status</u>
		3 Cribs: 4/69- 5/73 2 Cribs: 6/72- 5/73	Active
<u>Site Coordinates (Approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-38670, W-76800, N-38930, W-76930, N-38903, W-76930	H-2-26093 H-2-26094 SK-2-21808 H-2-36551, SL 1&2	Ground 680 ft Water Table 475 ft(1973) <u>Site Depth</u> 20 ft	
<u>Source and Description of Waste</u>			
3.86 x 10 <sup>6</sup> liters of acidic waste from 236-Z and 241-Z.			
<u>Description of Facility</u>			
Five parallel cribs, each 207 x 10 ft.			
<u>Radionuclide Content (calculated from discharge data)</u>			
Pu	2.29 x 10 <sup>4</sup> g		
Other	None		

921213 1502

<u>Name/Type of Facility</u>		<u>Fast Designation</u>	<u>Number</u>
Ditch		Z Plant Ditch 216-U-10 Ditch	216-Z-19
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West Area. Starts 760 ft SE of 234-5 Bldg. 450 ft West of Camden Ave. and runs in south- westerly direction to the U-10 Pond.  (Figure C.1.10)		5/71-	Active
<u>Site Coordinates (approximate)</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-37050, W-76950 to N-39420, W-75991	H-2-34762	Ground	673 ft
		Water Table	475 ft(1973)
		<u>Site Depth</u>	Unknown
<u>Source and Description of Waste</u>			
Volume included in data for 216-U-10 Pond. Process cooling water and steam condensate from 234-5 Building; vacuum pump seal water from 291-Z; cooling water from PNL laboratory operations in 231-Z.			
<u>Description of Facility</u>			
Ditch, 2765 ft x 4 ft (includes approximately 665 ft of old 216-Z-1 Ditch and 235 ft of old 216-Z-11 Ditch).			
<u>Radionuclide Content</u>			
Included in data for 216-U-10 Pond.			
<u>History:</u>			
I - In April of 1971, excavation was started on the 216-Z-19 Ditch as a replacement for the contaminated 216-Z-11 Ditch in use at that time. The excavation was mistakenly started directly over the old buried 216-Z-1 Ditch near the confluence of the 234-5 cooling water stream with the 216-Z-11 Ditch (just south of the water sampler station and 120 feet south of the 231-Z stream fallout). Approximately 425 feet of the contaminated 216-Z-1 covered ditch was dug up before the mistake was noticed. At that point, the new 216-Z-19 Ditch was turned to the West from the 216-Z-1 covered ditch and followed a new route approximately 35 feet West of and parallel to the 216-Z-1 Ditch.			

9 2 1 2 : 1 5 3 3

216-Z-19 continued

## History continued

It continued on this course until just before reaching 16th Street where it was redirected east under the 216-Z-11 Ditch road culvert. This routing was used with moderate success until October of 1971 when a new culvert was installed 50 feet west of the 216-Z-11 culvert. The remainder of the 216-Z-19 Ditch was then dug from that point to the 216-U-10 Pond, a distance of approximately 1000 feet. Soil from the 216-Z-19 Ditch excavation was used to cover the old 216-Z-11 Ditch.

SUMMARY

The first 120 feet of the 216-Z-19 Ditch from the fallout of the 231-Z cooling water pipeline is common with the old 216-Z-1 and 216-Z-11 Ditches. The next 425 feet running south is common with the 216-Z-1 Ditch (See Report of incident UN-216-W-20 this document). The remainder of the 216-Z-19 Ditch to the 216-U-10 Pond was completed in the fall of 1971.

II - Subject: RADIATION MONITORIN MONTHLY ACTIVITY REPORT - APRIL 1976

An estimated 30 to 60 grams of alpha activity were accidentally released March 25, 1976 from the Z-Plant complex into the 216-Z-19 Ditch and 216-U-10 Pond. The waste water discharge from 234-5 was subsequently reduced to approximately one third of the normal flow, and measures were initiated to control the radioactivity in the ditch from further spread. Three dams placed at intervals along the length of the ditch raised the ditch water level to inundate the contaminated ditch water line and also stopped the water flow from reaching the U-10 Pond. A water sprinkler system was installed to keep the bottom of the ditch, between the last dam and the pond, from drying out.

The ditch, under the water, is grossly contaminated with plutonium and americium at the head end, but diminishes to a few hundred d/m per 100 cm<sup>2</sup> surface as it approaches the 216-U-10 Pond. Heavy growth of plant life within the ditch and along the banks help in preventing redeposition of the contamination by wind action.

9212011584

CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

II. SW

<u>Name/Type of Facility</u> Burial Ground	<u>Past Designation</u> Dry Waste No. 04C	<u>Number</u> 218-W-4C
<u>Location</u> 200 West, S.W. Quadrant Approximately 500 ft. west of 234-5 Bldg.	<u>Service Dates</u> 1974 to present	<u>Status</u> Active
<u>Site Coordinates</u> N-78079, W-40350 N-77457, W-40350 N-78079, W-40800 N-77457, W-40800	<u>Reference Drawings</u> H-2-34762	<u>Elevations</u> Ground 685 ft Water Table 474 ft(1973) <u>Site Depth</u> ~12 ft
<u>Source and Description of Waste</u> For miscellaneous dry waste (not used).		
<u>Description of Facility</u> Four trenches running east-west, 600 ft long - retrievable waste storage facilities. No. 1 trench (the furthest north, N-40305) is designated as the Navy Core Barrel Trench. It contains a number of core barrels from Navy sub-reactors. These are sitting at the east end of the open trench.  No. 2 Trench contains drums filled with plutonium contaminated soil from the 216-Z-9 Crib.  No. 3 Trench contains drums of assorted transuranic wastes.  The drums in trenches No. 2 and 3 have been stored on pallets on the asphalt bottom of the wide trench. When five tiers high, the drums are covered with heavy plastic sheeting and topped with fill dirt.		
<u>Radionuclide Content</u> (calculated from discharge data) Not Available.		

9212115000

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u> Unplanned Release Site		<u>Past Designation</u>	<u>Number</u> UN-216-W-13
<u>Location</u> 200 West, S.W. Quadrant Within the confines of the Z Plant exclusion area. Near southwest corner of the 236-Z Bldg.		<u>Service Dates</u> 4/71	<u>Status</u>
<u>Site Coordinates</u> N-39750, W-76650	<u>Reference Drawings</u>	<u>Elevations</u>	
<u>Source and Description of Waste</u> 216-Z-18 crib line from the 234-5 complex broke releasing alpha contamination into the ground.			
<u>Description of Facility</u> Line leak (underground)			
<u>Radionuclide Content</u> (calculated from discharge data)  <10 grams Pu.			
<u>History:</u> The 216-Z-18 crib line from 234-5 complex broke at location approximately six feet south and 12 feet west of southwest corner of 236-Z Building. An excavation 25-feet long by 6-feet wide by 7 feet deep uncovered gross alpha contamination in soil to greater than 6 million d/m per 100 cm <sup>2</sup> of surface. Approximately one hundred 55-gallon barrels of contaminated soil were removed and buried in 200 West Area Pu "storage for recovery" burial ground. Much contamination still remains under six feet of clean soil.			

9 2 1 2 5 8 1 5 8 6

CONTAMINATED LIQUID DISPOSAL SITES

II. SW

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>				
Leach Trench	None	UN-216-W-14				
<u>Location</u> 200 West, S.W. Quadrant	<u>Service Dates</u>	<u>Status</u>				
Running Northwest from the northeast corner of 216-U-10 Pond.	Not Known (Probably during mid 1950's)	Inactive				
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>				
N-36880, W-77075 N-37090, W-76520	H-2-34762					
<u>Source and Description of Waste</u>						
Low-Level beta-gamma and alpha activity on the ground surface in the bottom of the Leach trench.						
<u>Description of Facility</u>						
A trench dug approximately 580 ft long, 40 ft wide, and 10 ft deep to give additional leaching surface for overflow water from the 216-U-10 Pond.						
<u>Radionuclide Content</u> (calculated from discharge data)						
N.A.						
G.M. readings in the bottom of the trench, 1/13/78, were generally 2000 c/m beta-gamma activity. (A P-11 Probe was used for these readings.)						
1/13/78 - Analyses of soil samples taken from the ground surface of the bottom of the trench were as follows:						
<u>Sample Location</u>	<u>Concentrations in pCi/grams - dry weight</u>					
	<sup>40</sup> K	<sup>89</sup> <sup>90</sup> Sr	<sup>137</sup> Cs	<sup>144</sup> Ce	<sup>155</sup> Eu	<sup>241</sup> Am
E. end - trench	19.1	3.8	1870.			
Mid. of trench	14.7	4.9	324.	4.6	2.8	1670.
W. end - trench	13.3	5.2	275.	6.5	3.3	28000.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>	
Leach Trench		None	UN-216-W-15	
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>	
200 West, S.W. Quadrant Running directly east from the center of the east side of the 216-U-10 Pond.		Not Known (Probably during mid 1950's)	Inactive	
<u>Site Coordinates</u>		<u>Reference Drawings</u>	<u>Elevations</u>	
N-36585, W-76948 N-36560, W-76440		H-2-34762		
<u>Source and Description of Waste</u>				
Low-level beta-gamma and alpha activity in the ground surface in the bottom of the leach trench.				
<u>Description of Facility</u>				
A leach trench dug approximately 500 ft long, 45 ft wide, and 15 ft deep to give additional leaching surface for overflow water from the 216-U-10 Pond.				
<u>Radionuclide Content</u> (calculated from discharge data)				
N.A.				
G.M. readings in the bottom of the trench taken 1/13/78 were generally 2000 c/m in the east end of the trench and 3000 c/m in the west end of the trench. (A P-11 Probe was used for the readings.)				
1/13/78 - Analyses of soil samples taken from the ground surface of the bottom of the trench were as follows:				
<u>Sample Location</u>	<u>Concentrations in pCi/grams - dry weight</u>			
	<u><sup>40</sup>K</u>	<u><sup>89</sup> <sup>90</sup>Sr</u>	<u><sup>137</sup>Cs</u>	<u><sup>144</sup>Ce    <sup>154</sup>Eu</u>
E. end - trench	15.2	40.2	1010.	
Mid. of trench	14.1	80.2	1620.	
W. end - trench	13.6	38.8	2030.	1.1

9 2 1 2 5 1 1 5 8 8

CONTAMINATED LIQUID DISPOSAL SITES

II. SW

<u>Name/Type of Facility</u> Leach Trench	<u>Past Designation</u> None	<u>Number</u> UN-216-W-16			
<u>Location</u> 200 West, S.W. Quadrant Running east from the east side of the 216-U-10 Pond. (South of UN-216-W-15 trench.)	<u>Service Dates</u> Not Known (Probably during mid 1950's)	<u>Status</u> Inactive			
<u>Site Coordinates</u> N-36320, W-76810 N-36290, W-76415	<u>Reference Drawings</u> H-234762	<u>Elevations</u>			
<u>Source and Description of Waste</u>  Low-Level beta-gamma and alpha activity on the ground surface in the bottom of the leach trench.					
<u>Description of Facility</u>  A leach trench dug approximately 400 ft long, 25 ft wide, and 8 ft deep to give additional leaching surface for overflow water from the 216-U-10 Pond.					
<u>Radionuclide Content</u> (calculated from discharge data)  N.A.  G.M. readings in the bottom of the trench taken 1/13/78 were generally 2000 c/m in the east end of the trench and 3000 c/m in the west end of the trench. A P-11 Probe was used on the G.M. instrument.  1/13/78 - Analyses of soil samples taken from the ground surface of the bottom of the trench were as follows:					
<u>Sample Location</u>	<u>Concentrations in pCi/grams - dry weight</u>				
	<u>40K</u>	<u>89 90Sr</u>	<u>137Cs</u>	<u>144Ce</u>	<u>154Eu</u>
E. end - trench	14.4	26.9	978.		
Mid. of trench	13.4	32.2	1020.		
W. end - trench	13.3	58.5	1350.		

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. SW

9 2 1 2 5 1 1 5 9 0

<u>Name/Type of Facility</u> Pond Flood Plain		<u>Past Designation</u>	<u>Number</u> UN-216-W-17
<u>Location</u> 200 West, S.W. Quadrant  216-U-10 Pond overflow flood plane to the south of the U-10 Pond.		<u>Service Dates</u>  1952 through 1957	<u>Status</u>  Inactive
<u>Site Coordinates</u> approximate. (center of site)  N-36000, W-77700	<u>Reference Drawings</u>  H-2-34762	<u>Elevations</u>	
<u>Source and Description of Waste</u>  This area was inundated with rising water from the 216-U-10 Pond, which received waste water from the 216-U-14 Laundry Ditch, the 216-Z-11 Ditch, and cooling water from the 401-SX Bldg. condensers in the 241-SX Tank Farm.			
<u>Description of Facility</u>  Overflow zone or flood plain exposed by receding waters of the 216-U-10 Pond.			
<u>Radionuclide Content</u> (calculated from discharge data)  Included in the 216-U-10 Pond inventory.  A survey in January 1978 found beta-gamma activity on the surface of the ground to a maximum of 8000 c/m, (G. M., P-11 probe).  1/13/78 - Analyses of soil samples taken from the ground surface of the flood plain south of 216-U-10 Pond:  Concentrations in pCi/gram - dry weight			
<u>Sample Location</u>	<u><sup>40</sup>K</u>	<u><sup>89</sup> <sup>90</sup>Sr</u>	<u><sup>137</sup>Cs</u> <u><sup>141</sup>Ce</u>
East end	13.8	26.4	851.0
West end	13.7	98.4	2600.      28.2

<u>Name/Type of Facility</u> Trench (covered)	<u>Past Designation</u> None	<u>Number</u> UN-216-W-20
<u>Location</u> 200 West, S. W. Quadrant  Adjacent and parallel to the head end of the 216-Z-19 Ditch.	<u>Service Dates</u> 4/14/71 4/21/71	<u>Status</u> Inactive (buried)
<u>Site Coordinates</u> N-38850, W-76125 N-39275, W-75950	<u>Reference Drawings</u> H-234762	<u>Elevations</u>
<u>Source and Description of Waste</u> Americium and plutonium contamination originating from process leaks contaminated the Z Plant cooling water discharge system. The contamination subsequently settled out of the water or was absorbed by aquatic plant life growing on the sides and bottom of the 216-Z-1 Ditch. It was mistakenly excavated from the covered Z-1 Ditch during the digging of the new 216-Z-19 Ditch.		
<u>Description of Facility</u> Excavated trench 15 feet deep - 425 ft. long, filled with 7 ft. of contaminated spoil dirt and topped to grade level with 8 ft. of clean dirt overfill.		
<u>Radionuclide Content</u> (calculated from discharge data) NA.		
<u>History:</u> Redox Radiation Monitoring Monthly Report - April, 1971  Plant Forces mistakenly dug into the contaminated backfill of the abandoned 216-Z-1 Ditch in 200 West Area, April 14, 1971, while excavating a new ditch. Approximately 425 feet of the abandoned ditch was uncovered before the error was discovered. An inch-thick decayed vegetation matting from the bottom of the old ditch was found to contain alpha contamination to a maximum of 100,000 d/m. The matting was broken up during the excavation and scattered through the "spoil pile" of the new ditch. Only a trace of contamination was detected in the excavation. Work was discontinued until surveys could be completed for a proper routing of the new ditch. A sprinkler system was installed to prevent the wind from spreading contamination from the spoil pile. The new ditch (216-Z-19) has since been dug approximately 35 feet to the west of the original buried ditch. It is ready for water diversion as soon as the 16th Street culvert is cleaned free of sludge and weeds. A 15-foot deep burial trench is being dug east of and adjacent to the presently used 216-Z-11 ditch.		

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UN-216-W-20 continued

History continued

The contaminated spoil pile will be dozed into this trench and covered with eight feet of clean soil. Radioactivity computed from soil samples taken from the spoil pile showed an alpha concentration of .34 nanocuries per gram of soil, approximately 30 times less than the minimum 10 nanocuries per gram standard that requires "packaging for recover" plutonium burials.

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VOLUME II 200 WEST AREA - Northwest Quadrant (NW)

## Waste Disposal Sites and Associated Radiation Zones

## Quadrant Boundaries

- East Boundary - Camden Avenue from 19th Street to 27th Street (North Fenceline Road).
- South Boundary - 19th Street from Camden Avenue to Dayton Avenue. (West Fenceline Road)
- West Boundary - Dayton Avenue (West Fenceline Road) from 19th Street to 27th Street (North Fenceline Road).
- North Boundary - 27th Street (North Fenceline Road) from Dayton Avenue to Camden Avenue.

See Area and Quadrant maps at the end of this section.

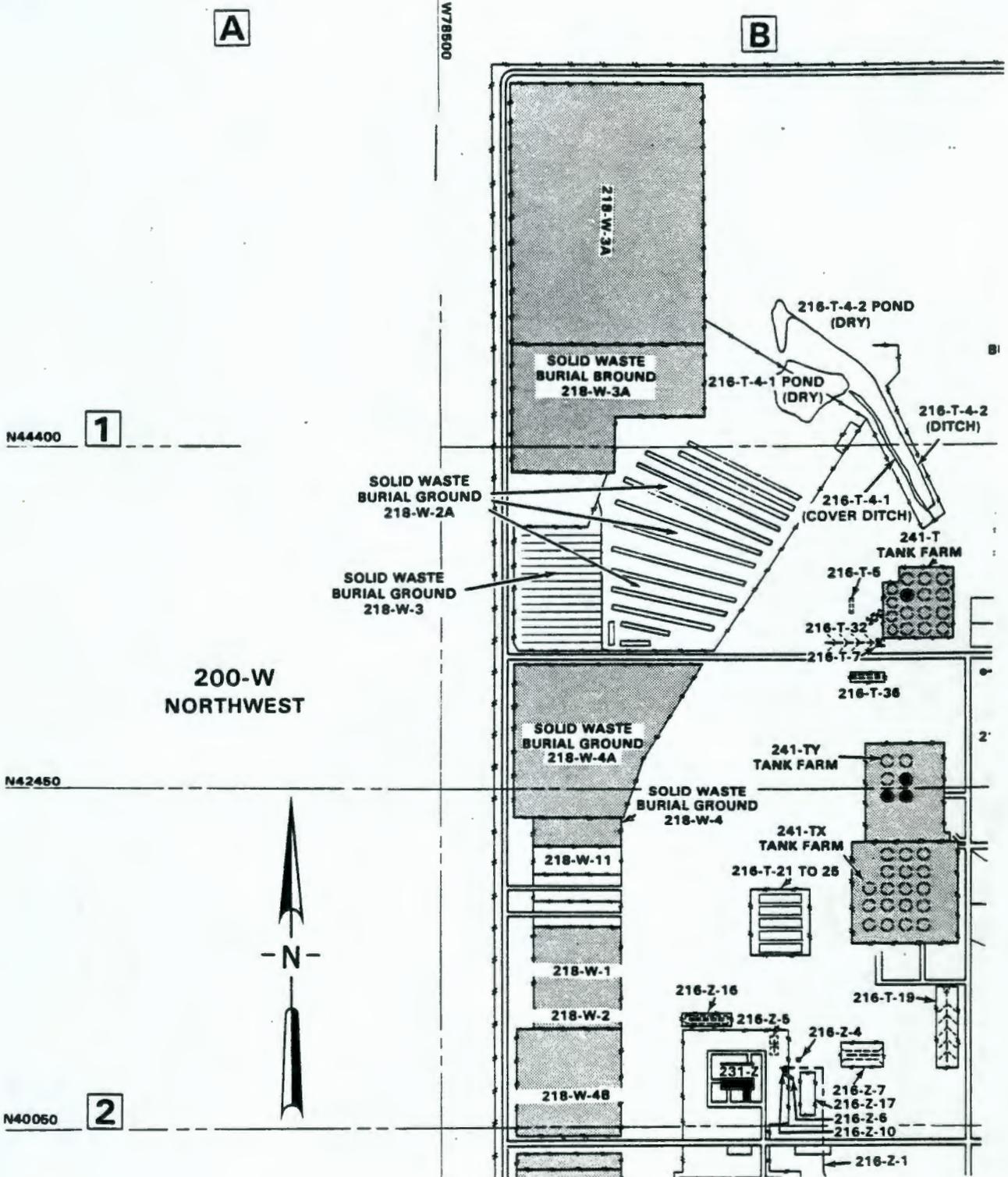
How to read the Index and locate a site:

Example - 216-T-22 Crib

<u>Site Number</u>	<u>Volume</u>	<u>Quadrant</u>
216-T-22 Crib	II.	NW (Northwest)

9 2 1 2 5 1 1 0 3

9 2 1 2 5 1 1 5 9 4



## INDEX - VOLUME II 200 WEST AREA

## Northwest Quadrant

216-T-4-1 Ditch	II. NW
216-T-4-1 Pond	II. NW
216-T-4-2 Ditch	II. NW
216-T-4-2 Pond	II. NW
216-T-5 Crib	II. NW
216-T-7 Crib	II. NW
216-T-13 Trench	II. NW
216-T-19 Crib and Tile Field	II. NW
216-T-21 Crib	II. NW
216-T-22 Crib	II. NW
216-T-23 Crib	II. NW
216-T-24 Crib	II. NW
216-T-25 Crib	II. NW
216-T-31 French Drain	II. NW
216-T-32 Crib	II. NW
216-T-36 Crib	II. NW
216-Z-4 Crib	II. NW
216-Z-5 Crib	II. NW
216-Z-6 Crib	II. NW
216-Z-7 Crib	II. NW
216-Z-10 Crib	II. NW
216-Z-16 Crib	II. NW
216-Z-17 Crib	II. NW
218-W-1 Burial Ground	II. NW
218-W-2 Burial Ground	II. NW
218-W-2A Burial Ground	II. NW
218-W-3 Burial Ground	II. NW
218-W-3A Burial Ground	II. NW
218-W-4A Burial Ground	II. NW
218-W-4B Burial Ground	II. NW
218-W-11 Burial Ground	II. NW

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Ditch (covered)		<u>Past Designation</u> 216-T-4 Ditch	<u>Number</u> 216-T-4-1 Ditch
<u>Location</u> 200 West - N.W. Quadrant Ditch begins 2432 ft west of 221-T and 760 ft north of 23rd Street. 600 ft northwest of the 207-T Retention Basin.		<u>Service Dates</u> 11/44-5/72	<u>Status</u> Inactive
<u>Site Coordinates</u> N-44000, W-75630 N-44550, W-76050	<u>Reference Drawings</u> H-2-34762 H-2-2430 H-2-578	<u>Elevations</u>	
<u>Source and Description of Waste</u> 4.19 x 10 <sup>10</sup> liters. Process cooling water from 221-T and 224-T via 207-T Retention Basin; steam condensate from 221-T and from 242-T waste evaporator; Decontamination waste from 2706-T; (current) condenser cooling water from 242-T.			
<u>Description of Facility</u> Ditch, 750 ft x 8 ft bottom dimensions.			
<u>Radionuclide Content</u> (calculated from discharge data) Included in 216-T-4-1 Pond inventory - see History of the 216-T-4-1 Pond.			
<u>History:</u> The 216-T-4-1 Ditch first received water from the 207-T Retention Basin in November of 1944 and continued until a new ditch, 216-T-4-2, was dug in May of 1972. The original ditch had become contaminated to a maximum of 20,000 c/m in the mud and vegetation matting in the bottom of the ditch and was badly overgrown with aquatic plants, shrubs and small willow trees. It was an attractive nuisance for area waterfowl. The berm from the new 216-T-4-2 Ditch was used to cover the old original ditch.			
<u>Recommendations:</u> Continued surveillance will be necessary because there is enough radioactivity ( <sup>90</sup> Sr and <sup>137</sup> Cs) buried in the bottom of the ditch within reach of deep-rooted plants that it could become a transport problem.			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u>  Pond	<u>Past Designation</u>  216-T-4 Swamp	<u>Number</u>  216-T-4-1 Pond																		
<u>Location</u> 200 West, N.W. Quadrant  Approximately 100 feet northwest of the burial grounds railroad spur, and 1350 feet S.E. of the N.W. corner of 200 West Area.	<u>Service Dates</u>  11/44 to 5/72	<u>Status</u>  Removed from Pond status.																		
<u>Site Coordinates (Approximate)</u> N-46000, W-76850 N-44600, W-76100 N-44450, W-76800 (L shaped)	<u>Reference Drawings</u> H-2-44510 #3 H-2-2430 SK-2-2409 H-2-34998	<u>Elevations</u> Ground 670 ft Water Table 471 ft(1973) Site Depth 6 ft																		
<u>Source and Description of Waste</u>  4.19 x 10 <sup>10</sup> liters. Process cooling water from 221-T and 224-T via 207-T Retention Basin; steam condensate from 221-T and from 242-T waste evaporator; Decontamination waste from 2706-T.																				
<u>Description of Facility</u>  16 Acres (this acreage has since been decontaminated by scraping the pond bottom into a waste trench.)																				
<u>Radionuclide Content</u> (calculated from discharge data) <table border="0" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;"><u>Radionuclide</u></th> <th style="text-align: left;"><u>At Time of Discharge</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Pu, g</td> <td>&lt;3.7</td> <td rowspan="7" style="vertical-align: top; padding-left: 20px;"> <u>Note:</u>                      The radionuclide contents of the 216-T-4-1 Pond were moved into burial trench #27 on the north side of 218-W-2A Burial Ground.                 </td> </tr> <tr> <td>Beta, Ci</td> <td>5.0 x 10<sup>2</sup></td> </tr> <tr> <td><sup>90</sup>Sr, Ci</td> <td>&lt;6.2</td> </tr> <tr> <td><sup>106</sup>Ru, Ci</td> <td>1.1 x 10<sup>2</sup></td> </tr> <tr> <td><sup>137</sup>Cs, Ci</td> <td>11</td> </tr> <tr> <td><sup>60</sup>Co, Ci</td> <td>&lt;3.4</td> </tr> <tr> <td>U, kg</td> <td>&lt;690</td> </tr> </tbody> </table>			<u>Radionuclide</u>	<u>At Time of Discharge</u>		Pu, g	<3.7	<u>Note:</u> The radionuclide contents of the 216-T-4-1 Pond were moved into burial trench #27 on the north side of 218-W-2A Burial Ground.	Beta, Ci	5.0 x 10 <sup>2</sup>	<sup>90</sup> Sr, Ci	<6.2	<sup>106</sup> Ru, Ci	1.1 x 10 <sup>2</sup>	<sup>137</sup> Cs, Ci	11	<sup>60</sup> Co, Ci	<3.4	U, kg	<690
<u>Radionuclide</u>	<u>At Time of Discharge</u>																			
Pu, g	<3.7	<u>Note:</u> The radionuclide contents of the 216-T-4-1 Pond were moved into burial trench #27 on the north side of 218-W-2A Burial Ground.																		
Beta, Ci	5.0 x 10 <sup>2</sup>																			
<sup>90</sup> Sr, Ci	<6.2																			
<sup>106</sup> Ru, Ci	1.1 x 10 <sup>2</sup>																			
<sup>137</sup> Cs, Ci	11																			
<sup>60</sup> Co, Ci	<3.4																			
U, kg	<690																			
<u>History:</u>  See next page.																				

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216-T-4-1 Pond continuedHistory:

The use of the 216-T-4-1 Pond site began in November 1944 with the startup of the 221-T Chemical Separations Plant. Waste water received from the 216-T-4-1 Ditch came through a culvert under the railroad tracks and ran out into a shallow ditch cut through a natural surface depression in the desert floor. Very little vegetation was cleared from the initial site. The water formed an "L" shaped shallow pond of approximately 16 acres.

A number of process vessel leaks in the 221-T Building released radioactivity to the 216-T-4-1 Pond over the ensuing years. At the shutdown of the 221-T process in 1957, GM radiation readings taken around the shoreline of the pond ranged from 2,000 to 15,000 c/m.

In May 1972, a dike and a new 216-T-4-2 Pond were constructed (east of the middle of the original pond) to assure isolation of surface water from entering the nearby burial trenches in the 218-W-3A Burial Ground.

During February of 1973, a burial trench (#27) was dug between the railroad spur and the 218-W-3A Burial Ground (approximate coordinates: N-44575, W-76150, and N-44900, W-77150). Into this 18 foot deep trench was buried contaminated soil scraped from the top six to nine inches off the bottom of the old 216-T-4-1 Pond. The spoil was covered with 10 feet of clean soil. Final radiation surveys of the pond bottom were generally less than 200 c/m, with isolated coarse sandy spots, less than 2 feet in diameter, ranging to a maximum of 400 c/m. The radioactivity buried in the trench was predominately strontium 90 and cesium 137. The area covered by the old pond can be safely used for additional burial trenches. Spot checking the soil by Radiation Monitoring personnel during the excavation of a trench is recommended as a precautionary measure.

In April 1973, five acres of the scraped pond bottom were seeded to siberian wheat grass to help stabilize the ground surface.

921211593

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Ditch	<u>Past Designation</u>	<u>Number</u> 216-T-4-2
<u>Location</u> 200 West - N.W. Quadrant Ditch begins at the outfall of the pipe from the 207-T Retention Basin and into the 216-T-4-1 Ditch. (600 ft northwest of the 207-T Retention Basin)	<u>Service Dates</u> 5/72- to present	<u>Status</u> Active
<u>Site Coordinates</u> N-44000, W-75630 N-45350, W-76700	<u>Reference Drawings</u>	<u>Elevations</u>
<u>Source and Description of Waste</u> Steam condensate and condenser cooling water from the 242-T Evaporator.		
<u>Description of Facility</u> Ditch - 1750 ft x 8 ft bottom dimensions.		
<u>Radionuclide Content</u> (calculated from discharge data) Included in the 216-T-4 Pond Inventory.		
<u>History:</u> The 216-T-4-2 Ditch was dug as a replacement for the 216-T-4-1 Ditch, May 1972. The first 50 ft from the fallout (head of the ditch) is common with the old 216-T-4-1 covered ditch. At that point, it makes a 90° turn to the north for approximately 35 ft then angles northwest, paralleling the old covered 216-T-4-1 Ditch to the railroad tracks where it goes through a culvert and continues on to the new 216-T-4 Pond. A radiation survey made January 17, 1978, showed the 216-T-4-2 Ditch to be free of contamination excepting the first 50 feet of trench below the head end fallout, which portion is common with the old ditch. Radioactivity at that point ranged from 2000 to 4000 c/m, GM readings. There also, the ditch is covered with a rank growth of vegetation.		

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CONTAMINATED LIQUID DISPOSAL SITES

II. NW

<u>Name/Type of Facility</u> Pond	<u>Past Designation</u> None	<u>Number</u> 216-T-4-2 Pond
<u>Location</u> 200 West, N.W. Quadrant East of the 218-W-3A Burial Ground west of the 218-W-2A Burial Ground approximately 1750 ft S.E. of the N.W. corner of 200 West Area.	<u>Service Dates</u> May 1972 to Present	<u>Status</u> Active
<u>Site Coordinates</u> Pond Center N-45200, W-76750	<u>Reference Drawings</u> H-2-34762	<u>Elevations</u> Ground 670 ft Water Table 471 ft(1973)
<u>Source and Description of Waste</u> Steam condensate from 242-T Evaporator.		
<u>Description of Facility</u> Pond, 1.5 acres (dry in 1977 and 1978). Constructed in 1972 as a replacement for the 216-T-4-1 Pond.		
<u>Radionuclide Content</u> (calculated from discharge data) No radioactivity.		
<u>Note:</u> The stream in the 216-T-4-2 Ditch is not sufficiently large as to flow into the 216-T-4-2 Pond. The water sinks into the ground in the upper 1/4 of the ditch.		

92125 11600

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		216-T-5 Grave or Trench 216-T-12 241-T-5	216-T-5
<u>Location</u> 200 West, N.W. Quadrant		<u>Service Dates</u>	<u>Status</u>
300 ft north of 23rd Street and 1000 ft west of 207-T Retention Basin. Inside the west fence of the 241-T Tank Farm.		5/55-5/55	Inactive
<u>Site Coordinates</u> (Approximate)	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43500, W-76200 to N-43550, W-76200	H-2-2430 H-2-44510 Sheet 3	Ground	672 ft
		Water Table	471 ft(1972)
		Site Depth	12 ft
<u>Source and Description of Waste</u>			
2.6 x 10 <sup>6</sup> liters. Second cycle supernatant waste from 221-T via the 112-T tank in the 241-T Tank Farm. High-salt, neutral/basic.			
<u>Description of Facility</u>			
One crib, trench structure, 50 ft x 10 ft bottom surface. Deactivation: Above-ground piping was removed and the trench backfilled when the specific retention capacity was reached.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>	
Pu, g	1.8 x 10 <sup>2</sup>	180	
Beta, Ci	2.08 x 10 <sup>2</sup>	< 82.4	
<sup>90</sup> Sr, Ci	1.0	0.582	
<sup>106</sup> Ru, Ci	30.0	7.70 x 10 <sup>-6</sup>	
<sup>137</sup> Cs, Ci	70.0	42.2	
<sup>60</sup> Co, Ci	5.0	0.275	
U, kg	4.54	4.54	

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CONTAMINATED LIQUID DISPOSAL SITES

II. NW

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 241-T-C Crib and Tile Field	<u>Number</u> 216-T-7
<u>Location</u> 200 West, N.W. Quadrant 50 ft north of 23rd Street and 1000 ft west of 207-T Retention Basin within the southwest quarter of the 241-T Tank Farm.	<u>Service Dates</u> 4/48-11/55	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-43285, W-76000 to N-43285, W-76356	<u>Reference Drawings</u> H-2-578 HW-72182 No. 1	<u>Elevations</u> Ground 673 ft Water Table 479 ft(1973) Site Depth 26 ft
<u>Source and Description of Waste</u> 1.1 x 10 <sup>8</sup> liters. Second gate supernatant from 221-T via the 112-T tank in the 241-T Tank Farm (4/48-6/51); 221-T effluent and cell drainage from Tank 5-6 in 221-T (6/51-6/52); effluent from 221-T and waste from 224-T (6/52-11/55). High-salt, neutral/basic.		
<u>Description of Facility</u> One crib, wooden structure, 12 ft x 12 ft bottom area. One tile field, 26,200 sq ft bottom area. Deactivation: Pipeline to the crib was capped when the prescribed radionuclide inventory was reached.		
<u>Radionuclide Content (calculated from discharge data)</u>		
	<u>At Time of Discharge</u>	<u>As of 6/30/77</u>
<u>Radionuclide</u>		
Pu, g	1.3 x 10 <sup>2</sup>	1.3 <sup>2</sup>
Beta, Ci	3.1 x 10 <sup>3</sup>	1.23 <sup>2</sup>
<sup>90</sup> Sr, Ci	60.0	33.2
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>2</sup>	9.55 <sup>-6</sup>
<sup>137</sup> Cs, Ci	50.0	28.7
<sup>60</sup> Co, Ci	1.0	4.36 <sup>-2</sup>
U, kg	9.1	9.1
<u>Other Potential Hazards</u> Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct the hazards.		
<u>Site Characterization Status</u> Well W10-60 is a shallow well monitoring the 216-T-7 Crib. The scintillation log of this well shows gross subsurface contamination throughout most of the soil column penetrated by the well.		

92125 11602

CONTAMINATED LIQUID DISPOSAL SITES

II. NW

<u>Name/Type of Facility</u> Trench		<u>Past Designation</u> 269-W Regulated Garage 269-W Decontamination Pit or Trench; 216-T-12	<u>Number</u> 216-T-13
<u>Location</u> 200 West, N.W. Quadrant 2280 ft southwest of 221-T, 228 ft south of 23rd Street.		<u>Service Dates</u> 6/54-6/64	<u>Status</u> Released from Radiation Zone Status
<u>Site Coordinates (Approximate)</u> N-42850, W-75840	<u>Reference Drawings</u> H-2-1495 H-2-44510 #3 M-2600 W #10	<u>Elevations</u> Ground 670 ft Water Table 467 ft(1973) Site Depth 10 ft	
<u>Source and Description of Waste</u>  Volume unknown. Vehicle decontamination waste.			
<u>Description of Facility</u>  Trench, 20 x 20 ft bottom surface. Deactivation: Backfilled.			
<u>Radionuclide Content</u> (calculated from discharge data) - <u>NONE</u>  Exerpt from Document ARH-2757-4:  216-T-13 Equipment Decontamination Pit, 241-TY Tank Farm. Excavated and found 1,500 c/m in approximately four yards of soil which were buried in 200 West Area Dry Waste Burial Ground.			
		<u>Date</u> April 1972	<u>Document Reference</u> HW-83718 p. 8

9212511603

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib and Tile Field		<u>Past Designation</u> 241-TX-153 Crib and Tile Field; 241-TX-3 216-TX-1	<u>Number</u> 216-T-19
<u>Location</u> 200 West, N.W. Quadrant  3100 ft southwest of 221-T Bldg. 40 ft west of Camden Ave. Directly south of 241-TX Tank Farm.		<u>Service Dates</u> 9/51- Present	<u>Status</u> Active
<u>Site Coordinates</u> Crib: N-41270, W-75600 Tile Field: N-41270, W-75600 N-40870, W-75600	<u>Reference Drawings</u> H-2-806 H-2-3019	<u>Elevations</u> Ground 662 ft Water Table 470 ft(1973) Site Depth 30 ft	
<u>Source and Description of Waste</u>  4.21 x 10 <sup>8</sup> liters. 9/51-7/55: Process condensate from 242-T waste evaporator. 12/55-8/56: Cell drainage from Tank 5-6; second cycle supernatant waste from 221-T; waste from 224-T. 12/65-Present: Process and steam condensates from 242-T waste evaporator. Low-salt, neutral/basic.			
<u>Description of Facility</u> Crib: Wooden structure, 12 ft x 12 ft bottom surface.  Tile Field: 390 ft x 85 ft			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
Pu, g	14	14.4	
Beta, Ci	4.5 x 10 <sup>3</sup>	522.0	
<sup>90</sup> Sr, Ci	62	37.6	
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>3</sup>	2.83 x 10 <sup>-2</sup>	
<sup>137</sup> Cs, Ci	3.7 x 10 <sup>2</sup>	232.0	
<sup>60</sup> Co, Ci	1.1	7.48 x 10 <sup>-2</sup>	
U, kg	<9.5	9.58	
<u>Other Potential Hazards</u>  Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

92125 11605

<u>Name/Type of Facility</u>  Crib	<u>Past Designation</u> 241-TX-1 Trench 216-TX-1 Grave 216-TX-3	<u>Number</u>  216-T-21
<u>Location</u>  200 West, N.W. Quadrant  700 ft north of 231-Z Bldg. and 250 ft west of 241-TX Tank Farm.	<u>Service Dates</u>  6/54-8/54	<u>Status</u>  Inactive
<u>Site Coordinates (Approximate)</u>  N-41530, W-76450 N-41530, W-76690	<u>Reference Drawings</u>  SK-2-2409 H-2-36849	<u>Elevations</u>  Ground 672 ft Water Table 470 ft(1973) Site Depth 10 ft
<u>Source and Description of Waste</u>  4.65 x 10 <sup>5</sup> liters. First cycle supernatant waste from 221-T via the 109, 110, and 111-TX tanks in the 241-TX Tank Farm. High-salt, neutral/basic.		
<u>Description of Facility</u>  Trench structure, 240 ft x 10 ft bottom surface. Deactivation: The underground piping was removed and the trench backfilled when the specific retention capacity was reached. This trench shares a common radiation zone with trenches T-22, T-23, T-24, and T-25.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	1.0	1.0
Beta, Ci	8.2 x 10 <sup>3</sup>	< 4.54 x 10 <sup>2</sup>
<sup>90</sup> Sr, Ci	8.0	4.44
<sup>106</sup> Ru, Ci	62	4.01 x 10 <sup>-6</sup>
<sup>137</sup> Cs, Ci	4.0 x 10 <sup>2</sup>	2.30 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	2.0	8.45 x 10 <sup>-2</sup>
U, kg	1.0	1.0
<u>Site Characterization Status</u>  Shallow well W-15-80 monitors the 216-T-21 trenches. Disposal was on a specific retention basis. The well log shows thin bands of contamination at 35 feet and 55 feet, the count rate again rises at the bottom of the well (100 feet) which indicates a probable third contamination zone.		
<u>History:</u>  In September 1969, Russian thistle containing radioactivity to a maximum of greater than 100,000 c/m (15 mrads/hr) were found growing on the surface of the 216-T-21 trench.		

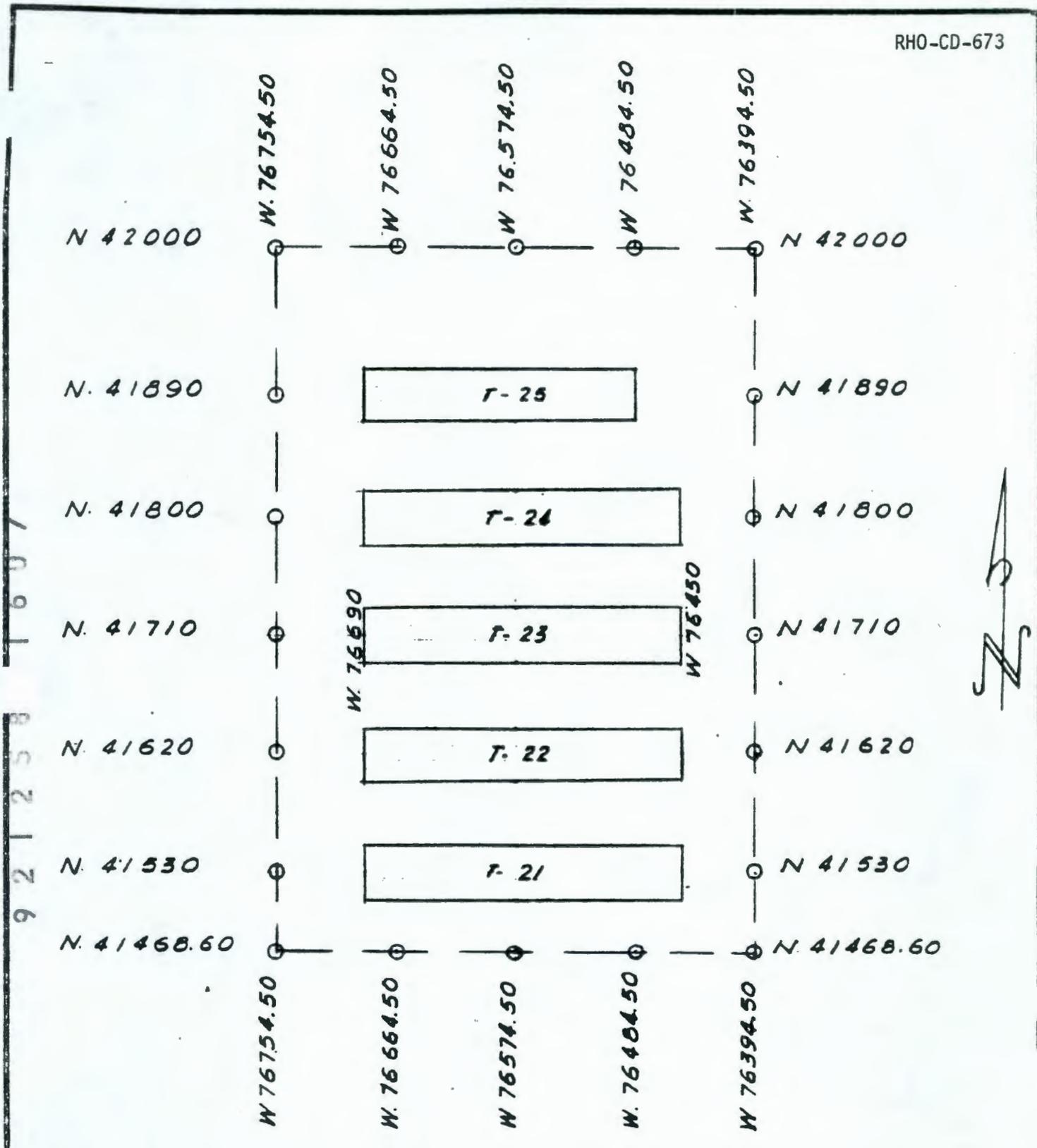
216-T-21 continued

History:

The weeds were removed and buried. In May of 1970 the surface of the ground within the confines of the radiation zone was treated with a herbicide to prevent the growth of weeds. As of December 1977, the area had recovered its vegetation cover but no radioactive weeds were observed.

Frequent surveillance must be maintained of this site because under certain ground moisture conditions, plant roots may again penetrate the soil down to the predominately Strontium and Cesium sources of radiation below.

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REF. DWG. H-2-36849

				U. S. ATOMIC ENERGY COMMISSION RICHLAND OPERATIONS OFFICE				216-1-14 WASTE DISPOSAL CRIB AS-BUILT NEW BOUNDARIES				
				AUTOMATION INDUSTRIES, INC. WTRD ENGINEERING DIVISION								
1	9/74	CORRECTED T-25	42			SCALE	NONE	APPD.				
NO.	DATE	DESCRIPTION	BY	CH	AP	DRAWN		CLASSIFICATION	NONE			
REVISIONS						CHKD.		CLASS. BY				
											SKETCH NO.	FS 74-15

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 241-TX-2 Trench 216-TX-2 Grave 216-TX-4	<u>Number</u> 216-T-22
<u>Location</u> 200 West, N.W. Quadrant  750 ft north of 231-Z Bldg. and 250 ft west of 241-TX Tank Farm		<u>Service Dates</u> 7/54-8/54	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-41620, W-76450 N-41620, W-76690	<u>Reference Drawings</u> SK-2-2409 H-2-36849	<u>Elevations</u> Ground 672 ft Water Table 470 ft (1973) Site Depth 10 ft	
<u>Source and Description of Waste</u>  1.53 x 10 <sup>6</sup> liters. First cycle supernatant waste from 221-T via the 109, 110 and 111-TX tanks in the 241-TX Tank Farm. High-salt, neutral/basic.			
<u>Description of Facility</u> Trench structure, 240 x 10 ft bottom surface. Deactivation: Above-ground piping was removed and the trench backfilled when the specific retention capacity was reached. This trench shares a common radiation zone with trenches T-21, T-23, T-24, and T-25.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
	Pu, g	2.0	2.0
	Beta, Ci	3.9 x 10 <sup>3</sup>	< 2.1 x 10 <sup>3</sup>
	<sup>90</sup> Sr, Ci	51	2.83 x 10 <sup>1</sup>
	<sup>106</sup> Ru, Ci	30	1.94 x 10 <sup>-6</sup>
	<sup>137</sup> Cs, Ci	1.9 x 10 <sup>3</sup>	1.07 x 10 <sup>3</sup>
	<sup>60</sup> Co, Ci	1.0	4.22 x 10 <sup>-2</sup>
	U, kg	2.0	2.0
<u>History:</u> In May, 1970, the surface of the ground within the confines of the radiation zone was treated with a herbicide to prevent the growth of radioactive weeds (See 216-T-21 & 216-T-24). As of December, 1977, the area had recovered its vegetation cover. Frequent continued surveillance is necessary because of the potential for radioactive weed growth.			

9 2 1 2 5 1 6 0 8

CONTAMINATED LIQUID DISPOSAL SITES

II. NW

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 241-TX-3 Trench 216-TX-3 Grave 216-TX-5	<u>Number</u> 216-T-23
<u>Location</u> 200 West, N.W. Quadrant  800 ft north of 231-Z Bldg. and 250 ft west of 241-TX Tank Farm	<u>Service Dates</u> 7/54-8/54	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-41710, W-76450 N-41710, W-76690	<u>Reference Drawings</u> SK-2-2409 H-2-36849	<u>Elevations</u> Ground 672 ft Water Table 470 ft (1973) Site Depth 10 ft
<u>Source and Description of Waste</u>  1.48 x 10 <sup>6</sup> liters. First cycle supernatant waste from 221-T via the 109, 110 and 111-TX tanks in the 241-TX Tank Farm. High-salt, neutral/basic.		
<u>Description of Facility</u> Trench structure, 240 x 10 ft bottom surface. Deactivation: Above-ground piping was removed and the trench backfilled when the specific retention capacity was reached. This trench shares a common radiation zone with trenches T-21, T-22, T-24, and T-25.		
<u>Radionuclide Content</u> (calculated from discharge data)		
	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	1.0	1.0
Beta, Ci	3.5 x 10 <sup>3</sup>	< 1.52 x 10 <sup>3</sup>
<sup>90</sup> Sr, Ci	41	2.27 x 10 <sup>1</sup>
<sup>106</sup> Ru, Ci	26	1.68 x 10 <sup>-6</sup>
<sup>137</sup> Cs, Ci	1.3 x 10 <sup>3</sup>	7.66 x 10 <sup>2</sup>
<sup>60</sup> Co, Ci	1.0	4.22 x 10 <sup>-2</sup>
U, kg	1.0	1.0
<u>History:</u> In May, 1970, the surface of the ground within the confines of the radiation zone was treated with a herbicide to prevent the growth of radioactive weeds (See 216-T-21 & 216-T-24). As of December, 1977, the area had recovered its vegetation cover. Frequent continued surveillance is necessary because of the potential for radioactive weed growth.		

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 241-TX-4 Trench 216-TX-4 Grave 216-TX-6		<u>Number</u> 216-T-24
<u>Location</u> 200 West, N.W. Quadrant  850 ft north of 231-Z Bldg. and 250 ft west of 241-TX Tank Farm.		<u>Service Dates</u> 8/54-8/54		<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-41800, W-76450 N-41800, W-76690		<u>Reference Drawings</u> SK-2-2409 H-2-36849		<u>Elevations</u> Ground 672 ft Water Table 470 ft(1973) Site Depth 10 ft
<u>Source and Description of Waste</u> 1.53 x 10 <sup>6</sup> liters. First cycle supernatant waste from 221-T via the 109, 110, and 111-TX tanks in the 241-TX Tank Farm. High-salt, neutral/basic.				
<u>Description of Facility</u> Trench structure, 240 ft x 10 ft bottom surface. Deactivation: The aboveground piping was removed and the trench backfilled when the specific retention capacity was reached. This trench shares a common radiation zone with trenches T-21, T-22, T-23, and T-25.				
<u>Radionuclide Content (calculated from discharge data)</u>				
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
	Pu, g	2.0	2.0	
	Beta, Ci	4.4 x 10 <sup>3</sup>	< 1.61 x 10 <sup>3</sup>	
	<sup>90</sup> Sr, Ci	40	2.22 x 10 <sup>1</sup>	
	<sup>106</sup> Ru, Ci	32	2.07 x 10 <sup>-6</sup>	
	<sup>137</sup> Cs, Ci	1.4 x 10 <sup>3</sup>	8.17 x 10 <sup>2</sup>	
	<sup>60</sup> Co, Ci	1.0	4.22 x 10 <sup>-2</sup>	
	U, kg	8.3	8.3	
<u>History:</u> In September 1969, Russian thistle containing radioactivity to a maximum of greater than 100,000 c/m (15 mrads/hr) were found growing on the surface of the 216-T-21 trench.				

92125-11610

216-T-24 continued

History:

The weeds were removed and buried. In May of 1970 the surface of the ground within the confines of the radiation zone was treated with a herbicide to prevent the growth of weeds. As of December 1977, the area had recovered its vegetation cover but no radioactive weeds were observed.

Frequent surveillance must be maintained of this site because under certain ground moisture conditions, plant roots may again penetrate the soil down to the predominately Strontium and Cesium sources of radiation below.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 241-TX-5 Trench	<u>Number</u> 216-T-25
<u>Location</u> 200 West, N.W. Quadrant 200 West Area, 400 ft N.E. of 231-Z Bldg.	<u>Service Dates</u> 9/54-9/54	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) il-41350, W-76570	<u>Reference Drawings</u>	<u>Elevations</u> Ground 672 ft Water Table 470 ft(1973) Site Depth 10 ft

Source and Description of Waste

3.0 x 10<sup>6</sup> liters. First cycle evaporator bottoms from 242-T via the 101 and 102-TY tanks in the 241-TY Tank Farm. High-salt, neutral/basic.

Description of Facility

Trench structure, 180 x 10 ft bottom surface. Deactivation: The aboveground piping was removed and the trench backfilled.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	1.0	1.0
Beta, Ci	1.8 x 10 <sup>4</sup>	< 9.84 x 10 <sup>3</sup>
<sup>90</sup> Sr, Ci	4.0	2.22
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>2</sup>	6.46 x 10 <sup>-6</sup>
<sup>137</sup> Cs, Ci	8.9 x 10 <sup>3</sup>	5.12 x 10 <sup>3</sup>
<sup>60</sup> Co, Ci	<0.1	< 4.22 x 10 <sup>-3</sup>
U, kg	0.91	0.91

(See Next Page)

92125 1612

216-T-25 continued

NOTE:

Print H-2-34762 shows 216-T-25 Trench with the center axis running north and south and the location to be south of 216-T-21 Trench. During the summer of 1974, a backhoe was used to cut a 10-foot deep trench from east to west across the center of the axis of 216-T-25 Trench as shown on print H-2-34762. No trace of radioactivity was found.

Print H-2-2430 shows 216-T-25 south of 216-T-21 Trench; but with the center line running east and west.

It is the writers opinion that 216-T-25 Trench was dug parallel to and just north of 216-T-24 Trench, and is within the confines of the radiation zone delineating the location of 216-T-21, T-22, T-23, T-24, and T-25. An enlargement of picture BNW #49755-44 would tend to substantiate this opinion.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

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<u>Name/Type of Facility</u> French Drain		<u>Plant Designation</u> French Drain near 241-X Tank Farm	<u>Number</u> 216-T-31
<u>Location</u> 200 West, N.W. Quadrant 2980 ft southwest of 221-T, 80 ft west of Camden Ave.		<u>Service Dates</u> 10/59-2/62	<u>Status</u> Removed from Radiation Zone Status
<u>Site Coordinates</u> N-41660, W-75530	<u>Reference Drawings</u> H-2-802 H-2-849 H-2-1495 H-70445	<u>Elevations</u> Ground 662 ft Water Table 470 ft(1973) <u>Site Depth</u> Not Available	
<u>Source and Description of Waste</u>  Volume unknown. Contaminated steam condensate from a blowout through the steamline during efforts to unplug a waste line in October 1959.			
<u>Description of Facility</u>  French Drain, 36 ft diameter. Deactivation: removed contaminated culvert, rock and soil.			
<u>Radionuclide Content</u> (calculated from discharge data)  None.			
<u>History:</u>  The contaminated gravel and soil were removed from the site and buried in the 200 West Dry Waste Burial Grounds.			

CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib		<u>Plant Designation</u> 241-T No. 1 & 2 Cribs 216-T-6	<u>Number</u> 216-T-32
<u>Location</u> 200 West, N.W. Quadrant 250 ft north of 23rd Street and 750 ft west of 207-T Retention Basin. Within the confines of the 241-T Tank Farm.		<u>Service Dates</u> 11/46-5/52	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-43397, W-76058 N-43447, W-76000	<u>Reference Drawings</u> H-2-558 H-2-578 HW-72182 No. 1	<u>Elevations</u> Ground 673 ft Water Table 479 ft(1973) Site Depth 26 ft	
<u>Source and Description of Waste</u> 2.9 x 10 <sup>7</sup> liters. Waste from 224-T via the 201-T tank in the 241-T Tank Farm. High-salt, neutral/basic.			
<u>Description of Facility</u> One crib, wooden structure, 68 ft x 14 ft bottom surface. Deactivation: Pipeline to crib blanked East of the 241-T-151 and 152 Diversion Boxes.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
Pu, g	3.2 x 10 <sup>3</sup>	3.2 x 10 <sup>3</sup>	
Beta, Ci	1.5 x 10 <sup>3</sup>	< 5.46 x 10 <sup>1</sup>	
<sup>90</sup> Sr, Ci	30	1.48 x 10 <sup>1</sup>	
<sup>106</sup> Ru, Ci	50	2.08 x 10 <sup>-7</sup>	
<sup>137</sup> Cs, Ci	25	1.29 x 10 <sup>1</sup>	
<sup>60</sup> Co, Ci	1.0	2.22 x 10 <sup>-2</sup>	
U, kg	23	2.27 x 10 <sup>1</sup>	
<u>Other Potential Hazards</u> Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct the hazards.			
<u>Site Characterization Status</u> Well W10-3 monitors the 216-T-32 cribs (241-T-1 and 2). The scintillation log shows moderate subsurface contamination from 35 ft to 90 ft and low-level contamination from 90 to about 155 ft (1963).			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib			216-T-36
<u>Location</u> 200 West, N.W. Quadrant		<u>Service Dates</u>	<u>Status</u>
40 ft south of 23rd Street and directly south of 241-T Tank Farm.		5/67-12/68	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-43093, W-76000 N-43093, W-76155	H-2-33472	Ground	670 ft
		Water Table	471 ft(1973)
		Site Depth	15 ft
<u>Source and Description of Waste</u>			
5.22 x 10 <sup>5</sup> liters. 221-T and 221-U Decontamination Facility wastes; steam condensate, decontamination and miscellaneous waste. Low-salt, neutral/basic.			
<u>Description of Facility</u>			
Crib, rock-filled, 160 ft x 10 ft bottom dimension.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
Pu, g	2.5	2.48	
Beta, Ci	7.1 x 10 <sup>2</sup>	< 2.16 x 10 <sup>1</sup>	
<sup>90</sup> Sr, Ci	7.7	5.89	
<sup>106</sup> Ru, Ci	46	2.45 x 10 <sup>-2</sup>	
<sup>137</sup> Cs, Ci	6.4	5.02	
<sup>60</sup> Co, Ci	< 0.51	< 0.131	
U, kg	1.2	1.18	
<u>History:</u>			
No surface contamination has been found on this crib site.			

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 231-W-3 Pit, Sump or Crib 216-Z-3	<u>Number</u> 216-Z-4
<u>Location</u> 200 West, N.W. Quadrant 250 ft east of 231-Z and 500 ft north of 2709-Z	<u>Service Dates</u> 6/45-6/45	<u>Status</u> Inactive
<u>Site Coordinates</u> N-40875, W-76475	<u>Reference Drawings</u> H-2-511 H-2-32528	<u>Elevations</u> Ground 670 ft Water Table 475 ft(1973) Site Depth 15 ft

Source and Description of Waste

<1.1 x 10<sup>4</sup> liters of neutral-basic waste from 231-Z.

Description of Facility

A pit, bottom area 10 x 10 ft. Deactivated in 6/45 when increased building effluent flow exceeded the infiltration capacity of the pit. The building effluent was rerouted to 216-Z-6: the pipeline from 231-Z to the pit was capped west of the 231-W-151 Diversion Box. The pit was back-filled.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	2.0	2.0
Beta, Ci	2.6	<0.18
<sup>90</sup> Sr, Ci	<0.1	<4.44 x 10 <sup>-2</sup>
<sup>106</sup> Ru, Ci	1.0	1.30 x 10 <sup>-10</sup>
<sup>137</sup> Cs, Ci	<0.1	<4.68 x 10 <sup>-2</sup>
<sup>60</sup> Co, Ci	<0.1	<1.29 x 10 <sup>-3</sup>
U, kg	<5.0 x 10 <sup>-2</sup>	<5.00 x 10 <sup>-2</sup>

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Crib		231-W Sumps 231-W-1&2 Cribs	216-Z-5
<u>Location</u> 200 West, N.W. Quadrant		<u>Service Dates</u>	<u>Status</u>
150 ft east of 231-Z and 600 ft north of 2704-Z. Northeast of 231-Z Bldg.		6/45-2/47	Inactive
<u>Site Coordinates</u> (Approximate)	<u>Reference Drawings</u>	<u>Elevations</u>	
N-40912, W-76600 N-40992, W-76600	H-2-346	Ground	671 ft
		Water Table	475 ft
		Site Depth	24 ft
<u>Source and Description of Waste</u>			
3.1 x 10 <sup>9</sup> liters. Process waste from 231-Z.			
<u>Description of Facility</u>			
Wooden structure, 12 ft x 12 ft, in 80 ft x 14 ft bottom dimension crib. Deactivation: pipeline to crib blanked west of 231-W-151 Diversion Box.			
<u>Radionuclide Content</u> (calculated from discharge data)			
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>	
Pu, g	3.4 x 10 <sup>2</sup>	340.0	
Beta, Ci	2.5 x 10 <sup>2</sup>	< 13.7	
<sup>90</sup> Sr, Ci	5.0	2.26	
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>2</sup>	2.42 x 10 <sup>-8</sup>	
<sup>137</sup> Cs, Ci	10	4.77	
<sup>60</sup> Co, Ci	0.50	6.99 x 10 <sup>-3</sup>	
U, kg	<5.0 x 10 <sup>-2</sup>	< 5.00 x 10 <sup>-2</sup>	
<u>Other Potential Hazards</u>			
Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.			
<u>Site Characterization Status</u>			
Eight wells were drilled around the number one crib of the 216-Z-5 site in 1947 to determine the distribution of Pu in the soil beneath this crib. Only 0.5 g of Pu could be accounted for in the drilling pattern which did not include a well or wells through the bottom of the crib.			

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216-Z-5 continued

History

It was concluded that the remainder of the Pu was within the crib or in the soil directly beneath the crib. The waste discharged to the crib was reported to contain sludge which eventually sealed the bottom of the crib.

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673  
II. NW

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 231-W-4 Crib 216-W-4		<u>Number</u> 216-Z-6	
<u>Location</u> 200 West, N.W. Quadrant 300 ft east of 231-Z and 200 ft north of 19th Street			<u>Service Dates</u> 6/45-6/45		<u>Status</u> Inactive
<u>Site Coordinates</u> N-40712, W-76480 N-40753, W-76508		<u>Reference Drawings</u> H-2-508 H-2-32528 H-2-32682		<u>Elevations</u> Ground 664 ft Water Table 475 ft(1973) <u>Site Depth</u> 2 ft	
<u>Source and Description of Waste</u> 9.8 x 10 <sup>4</sup> liters of neutral-basic process waste from 231-Z.					
<u>Description of Facility</u> Wooden structure crib with bottom area 50 x 6 ft. A temporary crib during construction of 216-Z-5. Deactivated: Pipeline to the crib was capped west of the 231-W-151 Diversion Box.					
<u>Radionuclide Content</u> (calculated from discharge data)					
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>		
	Pu, g	5.0	2000.0		
	Beta, Ci	2.6	<1080.0		
	<sup>90</sup> Sr, Ci	<0.1	275.0		
	<sup>106</sup> Ru, Ci	1.0	2.41 x 10 <sup>-2</sup>		
	<sup>137</sup> Cs, Ci	<0.1	272.0		
	<sup>60</sup> Co, Ci	<0.1	0.206		
	U, kg	<5.0 x 10 <sup>-2</sup>	4.5		
<u>Other Potential Hazards</u> Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.					

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CONTAMINATED LIQUID DISPOSAL SITES

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 231-W Trench or Crib 231-Z-6	<u>Number</u> 216-Z-7
<u>Location</u> 200 West, N.W. Quadrant 500 ft east of 231-Z and 500 ft north of 19th Street.	<u>Service Dates</u> 2/47-2/67	<u>Status</u> Inactive
<u>Site Coordinates (Approximate)</u> N-40888, W-76055 to N-40888, W-76195. N-40912, W-76055 to N-40912, W-76195	<u>Reference Drawings</u> H-2-511	<u>Elevations</u> Ground 664 ft Water Table 471 ft (1973) Site Depth 36 ft
<u>Source and Description of Waste</u> 7.99 x 10 <sup>7</sup> liters. 2/47-5/53, process waste from 231-Z. 5/53-2/67, waste from Hanford Laboratories and PNL Laboratories operations in 231-Z.		
<u>Description of Facility</u> Two cribs, wooden structure, in a 5 ft x 140 ft trench.		
<u>Radionuclide Content (calculated from discharge data)</u>		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	2.0 x 10 <sup>3</sup>	2000.0
Beta, Ci	2.5 x 10 <sup>3</sup>	<1080.0
<sup>90</sup> Sr, Ci	3.7 x 10 <sup>2</sup>	275.0
<sup>106</sup> Ru, Ci	1.0 x 10 <sup>2</sup>	2.41 x 10 <sup>-2</sup>
<sup>137</sup> Cs, Ci	3.6 x 10 <sup>2</sup>	272.0
<sup>60</sup> Co, Ci	1.0	0.206
U, kg	4.5	4.5
<u>Other Potential Hazards</u> Wooden structure may collapse. Prompt remedial action would be required to prevent spread of contamination and correct other hazards.		
<u>Note:</u> Early in 1967 this writer was present when the west end of the crib was opened down to the planking. The tar paper, or black plastic, covering the planking and the planking itself showed no signs of deterioration.		

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CONTAMINATED LIQUID DISPOSAL SITES

II. NW

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 231-W Reverse Well 231-W-150 Dry Well or Reverse Well 216-Z-2		<u>Number</u> 216-Z-10
<u>Location</u> 200 West, N.W. Quadrant 100 ft east of 234-5Z and 400 ft north of 19th Street.		<u>Service Dates</u> 2/45-6/45		<u>Status</u> Inactive
<u>Site Coordinates</u> N-40804, W-76535		<u>Reference Drawings</u> H-2-32528 H-2-32682		<u>Elevations</u> Ground 670 ft Water Table 475 ft Site Depth 151 ft
<u>Source and Description of Waste</u> 1.0 x 10 <sup>6</sup> liters of neutral-basic process and laboratory waste from 231-Z.				
<u>Description of Facility</u> A reverse well, 6 in. diameter. The well was plugged with sludge. The pipeline to the well was capped west of the 231-W-151 Diversion Box.				
<u>Radionuclide Content</u> (calculated from discharge data)				
Pu 50 g 50 g				
Other None				

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CONTAMINATED LIQUID DISPOSAL SITES

II. NW -

<u>Name/Type of Facility</u> Crib	<u>Past Designation</u> 216-Z-16 Crib	<u>Number</u> 216-Z-16
<u>Location</u> 200 West, N.W. Quadrant 1000 ft north of 234-5Z and 1370 ft west of Camden Ave.	<u>Service Dates</u> 3/68- to present	<u>Status</u> Active
<u>Site Coordinates</u> N-41113, W-76892 N-41113, W-77072	<u>Reference Drawings</u> H-2-21718 H-2-26074 H-2-26075	<u>Elevations</u> Ground 673 ft Water Table 475 ft Site Depth 15 ft
<u>Source and Description of Waste</u>  9.38 x 10 <sup>7</sup> liters of neutral-basic waste from BNW experimental operations in 231-Z.		
<u>Description of Facility</u>  Rock crib, 180 x 10 ft.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
Pu, g	<70.8	71.6
Beta, Ci	< 1.00	< 1.68 x 10 <sup>-2</sup>

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CONTAMINATED LIQUID DISPOSAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Crib		<u>Past Designation</u> 216-Z-17 Ditch or Trench	<u>Number</u> 216-Z-17
<u>Location</u> 200 West, N.W. Quadrant 250 ft north of 19th Street and 300 ft east of 231-Z.		<u>Service Dates</u> 2/67-2/68	<u>Status</u> Inactive
<u>Site Coordinates</u> N-40595, W-76435 N-40795, W-76435	<u>Reference Drawings</u> H-2-32528 H-2-32682 SK-2-21718	<u>Elevations</u> Ground 670 ft Water Table 475 ft Site Depth 15 ft	
<u>Source and Description of Waste</u>  3.68 x 10 <sup>7</sup> liters of neutral-basic waste from BNW experimental operations in 231-Z.			
<u>Description of Facility</u>  A temporary trench, -200 x 10 ft. The pipeline was capped at the trench and valved out west of the 231-W-151 Diversion Box. The trench was backfilled.			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Discharge</u>	<u>As of 6/30/78</u>
	Pu, g	50.2	50.2
	Beta, Ci	1.04	< 5.78 x 10 <sup>-3</sup>
<u>History:</u>  This trench, although used only a year, remained open for approximately seven years before it was finally covered. Field surveys taken in the bottom of the trench read generally 2000 d/m of alpha activity. The ground surface is presently free from radioactive contamination.			

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

II. NW

<u>Name/Type of Facility</u> Burial Ground		<u>Past Designation</u> Dry Waste No. 001	<u>Number</u> 218-W-1
<u>Location</u> 200 West, N.W. Quadrant 200-West Area, approximately 1800 ft north-west of 234-5 Bldg. Between 218-W-2 and 218-W-11.		<u>Service Dates</u> 1944-1953	<u>Status</u> Inactive
<u>Site Coordinates</u> N-42100, W-77458 N-41641, W-77458 N-41641, W-77973 N-42100, W-77976		<u>Reference Drawings</u> H-2-123 H-2-31268	<u>Elevations</u> Ground 690 ft Water Table 470 ft(1973) Site Depth ~12 ft
<u>Source and Description of Waste</u> Miscellaneous dry waste (approximately $2.5 \times 10^5$ ft <sup>3</sup> ).			
<u>Description of Facility</u> Three large and 12 small backfilled dry waste trenches. (Approx. $2.5 \times 10^5$ ft <sup>3</sup> .)			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Burial</u>	
	U, g	$7.0 \times 10^5$	
	Pu, g	$9.4 \times 10^4$	
	Total Beta-gamma, Ci	$2.0 \times 10^2$	
	<sup>90</sup> Sr, Ci	4.0	
	<sup>106</sup> Ru, Ci	8.6	
	<sup>137</sup> Cs, Ci	4.3	
<u>History:</u> Some of the waste trenches in this burial ground did not receive the required 4-foot overfill. Waste boxes have been observed to be less than 4 feet from the ground surface. Contaminated weeds have been found to be growing over the trenches. Continued surveillance will be necessary.			

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u>		<u>Past Designation</u>	<u>Number</u>
Burial Ground		Dry Waste No. 002	218-W-2
<u>Location</u>		<u>Service Dates</u>	<u>Status</u>
200 West, N.W. Quadrant  200 West Area, approximately 1800 ft north-west of 234-5 Bldg. Between 218-W-4B and 218-W-1.		1/53-12/56	Inactive
<u>Site Coordinates</u>	<u>Reference Drawings</u>	<u>Elevations</u>	
N-41641, W-77458	H-2-2503	Ground	690 ft
N-41061, W-77458	H-2-31268	Water Table	470 ft(1973)
N-41061, W-77973		Site Depth	~12 ft
N-41641, W-77973			
<u>Source and Description of Waste</u>			
Miscellaneous dry waste; (approximately $2.9 \times 10^5$ ft <sup>3</sup> ). Contains 20 dry waste burial trenches.			
<u>Description of Facility</u>			
Twenty trenches 465 ft in length, running east-west. Surface area is $3.06 \times 10^5$ ft <sup>2</sup> .			
<u>Radionuclide Content</u> (calculated from discharge data)			
	<u>Radionuclide</u>	<u>At Time of Burial</u>	
	U, g	$1.4 \times 10^6$	
	Pu, g	$1.3 \times 10^5$	
	Total Beta-gamma, Ci	$5.0 \times 10^2$	
	<sup>90</sup> Sr, Ci	9.9	
	<sup>106</sup> Ru, Ci	21	
	<sup>137</sup> Cs, Ci	11	
<u>History:</u>			
Some of the waste trenches in this burial ground did not receive the required 4 foot overfill. Waste boxes have been observed to be within 18 inches of the ground surface.			
Routine Radiation surveys of the surface of the trenches have found contaminated Russian thistle growing mostly along the edges of the trenches. All sink holes were filled in 1974. Continued surveillance will be necessary.			

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Burial Ground	<u>Past Designation</u> Industrial Waste No. 002	<u>Number</u> 218-W-2A
<u>Location</u> 200 West, N.W. Quadrant  200 West Area, approximately 3500 ft west of 221-T Bldg. North of 23rd Street and directly east of 218-W-3.	<u>Service Dates</u>  3/57-Present	<u>Status</u>  Active
<u>Site Coordinates</u> N-43947, W-77659 N-44640, W-76005 N-44340, W-77515 N-43230, W-76954 N-44580, W-77515 N-73230, W-77600 N-44580, W-77150 N-43947, W-77600 N-45220, W-77150	<u>Reference Drawings</u>  H-2-32095 Rev. 4 H-2-36841 D0101ER0101, Fig. F-1	<u>Elevations</u> Ground ~690 ft Water Table ~470 ft (1973) Site Depth ~15-25 ft

Source and Description of Waste

1. Failed equipment and industrial waste (approximately  $6.5 \times 10^5 \times \text{ft}^3$ ).
2. Trench #27 contains the contaminated soil scraped from the bottom of the 216-T-4-1 Pond.

Description of Facility 34.5-acres. Ref. Ltr. Rockwell 1/09/80 #65421-80-005  
As of this date, Jan. 9, 1979, the burial ground contains 25 filled trenches. All trenches have been dug with their centerlines running northwest from the railroad track excepting trenches #1, 2, and 3, which are comparatively short trenches grouped in the extreme southwest corner of the burial ground. The burial site of the cell blocks from the 221-T Canyon is near the head end of Trench #27. (See History below).

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Burial</u>	<u>As of 6/30/78</u>
U, g	$2.0 \times 10^6$	$2.0 \times 10^6$
Pu, g	$6.4 \times 10^3$	$6.4 \times 10^3$
Total beta-gamma, Ci	$2.4 \times 10^5$	$1.26 \times 10^4$
<sup>90</sup> Sr, Ci	$4.8 \times 10^3$	$2.98 \times 10^3$
<sup>106</sup> Ru, Ci	$1.0 \times 10^4$	1.82
<sup>137</sup> Cs, Ci	$5.2 \times 10^3$	$3.28 \times 10^3$

History:

Cell cover blocks (6 feet thick) were buried in this burial ground along the west side of the railroad tracks within a stake and chained site at coordinates:

- N-44520, W-76108
- N-44361, W-76211
- N-44395, W-76263
- N-44555, W-76160

The block lifting bales are within inches of the ground surface.

221017

Burial Ground: 218-W-2A

Interim stabilization activities were initiated in burial ground 218-W-2A during the summer and fall months of the year 1979. The purpose of the work done was to eliminate the hazards of subterranean voids, reduce wind surface erosion, remove ground surface contamination, and establish deterrents against the growth of undesirable vegetation.

Description of Work Done

- o Land coordinate surveys were made to verify the location of each trench and to establish safe road routes between trenches. The total surface area of Burial Ground 218-W-2A was determined to be 34.5 acres.
- o The surface of each trench was load tested to determine the location of existing subterranean voids. This was done by carefully driving a loaded piece of earth moving equipment (estimated 40 tons) over the entire surface of the trench.
- o The burial ground was decontaminated and prepared for receiving surface fill soil by removing all vegetation and radioactive contamination from the ground surface.
- o A total of 24,000 yds<sup>3</sup> of fill dirt was hauled in to fill voids, and to spread over the ground surface to a depth ranging from six inches to one foot.
- o The established seed beds over the trenches were seeded with drought resistant grasses as a deterrent against noxious deep-rooted plants (Russian thistle). See attachment - Table 2 - 218-W-2A for details of seeding.
- o A soil surface stabilizer of wheat straw mulch was crimped into the seeded areas in the amount of two tons per acre.
- o At this writing, road surfaces within the burial ground are being stabilized with a three to six inch overfill of bank run gravel. All road surface will be treated with ureabor at the rate of 500 lbs/acre.

The 218-W-2A Burial Ground will be routinely inspected and studied to determine the relative worth of the described stabilization technique.

Reference Document - D0101WP0105, Test Procedure of Stabilization Techniques in 218-W-2A by S. M. O'Toole.

Attachments follow.

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TABLE 2 218-W-2A STATUS

TRENCH NO.*	SOIL DEPTH (NO. BIOBARRIER)	REVEGETATION SPECIES
1	1'	Cheatgrass
2	1'	Cheatgrass
3	1'	Cheatgrass
4	1'	Cheatgrass
5	1'	Cheatgrass
6	1'	Cheatgrass
7	1'	Siberian Wheatgrass
8	1'	Siberian Wheatgrass
9	1'	Siberian Wheatgrass
10	1'	Siberian Wheatgrass
20	1'	Thickspike Wheatgrass
21	1'	Thickspike Wheatgrass
22	1'	Thickspike Wheatgrass
23	1'	Thickspike Wheatgrass
24	1'	Crested Wheatgrass
27	1'	Crested Wheatgrass
OTHERS (except cover block mound at this time)	1'	Crested Wheatgrass

\*Roads will be covered with 4" to 6" of pit run gravel treated with Ureabor during FY '80.

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# Internal Letter



Rockwell International

Date January 18, 1980

No. 65421-80-011

TO: *Name, Organization, Internal Address*  
· H. L. Maxfield  
· Effluent Controls  
· 222-T/200-West

FROM: *Name, Organization, Internal Address, Phone*  
· S. M. O'Toole  
· D&D Unit  
· 2704-E/200-East  
· 942-2746

Subject: Status of Burial Ground Stabilization FY '79 and FY '80  
To Date

Interim stabilization activities have been initiated in seven burial grounds; W-2A, ~~E-2~~, E-2A, E-5, E-5A, E-9 and E-12A. The W-2A and E-12A are being used as test sites for interim stabilization materials and techniques. Details are presented in the two attached Work Procedures, D0101WP0105 and D0101WP0106. Comparisons will be drawn from data collected over the next three years on cost, time, success rate, and transport of radionuclides. E-2, E-2A, E-5, E-5A and E-9 are being stabilized to eliminate surface contamination conditions and the potential spread of radionuclides from these sites.

During the last year aerial photographs, plans, and load testing have confirmed or indicated the location of the burial trenches. Seven trenches (three in E-12A, four in E-2, E-5, E-5A, and E-9) previously unrecorded have been identified. Additions and corrections are being made on H-2 drawings by drafting.

Earth moving to date is limited to the placement of clean fill dirt over the trenches and roads. The estimated amounts of rock and dirt are shown in Table 1.

TABLE 1 QUANTITIES OF DIRT AND ROCK USED

BURIAL GROUND	CUBIC YARDS DIRT	CUBIC YARDS ROCK
W-2A	24,000	None
E-2, E-5, E-5A, E-9	9,000	3,000
E-12A	38,000	6,500

A description of the cross section of individual trenches are described in Table 2 thru 4. All work on these burial grounds will be completed during FY '80.

S. M. O'Toole  
D&D Unit  
Waste Technology

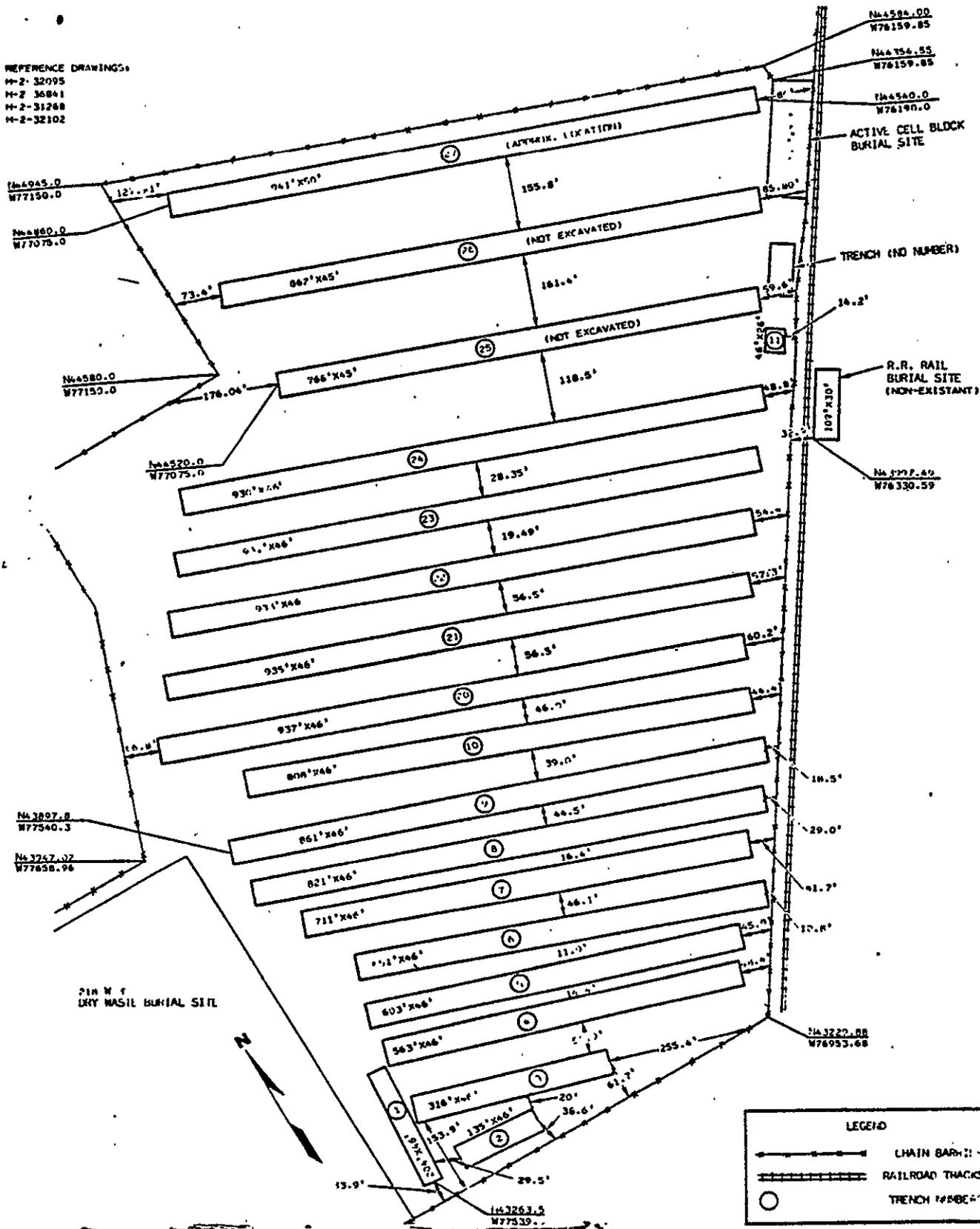
SMO/cah

cc:  
File/LB  
J. E. Toomey

FIGURE F-1: BURIAL GROUND 218-W-2A\*

REFERENCE DRAWINGS:

- M-2-32095
- M-2-36841
- M-2-31268
- M-2-32102



**LEGEND**

- CHAIN BARRIER
- RAILROAD TRACKS
- TRENCH (NO NUMBER)

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Burial Ground		<u>Past Designation</u> Dry Waste No. 003	<u>Number</u> 218-W-3
<u>Location</u> 200 West, N.W. Quadrant Approximately 4,000 ft west of 221-T Bldg. The north corner of the junction of 23rd Street and Dayton Avenue.		<u>Service Dates</u> 1/57-7/61	<u>Status</u> Inactive
<u>Site Coordinates</u> Approximate N-43947, W-77659 N-43229, W-77600 N-43229, W-78091 N-43945, W-78091	<u>Reference Drawings</u> H-2-3399 H-2-32095 Rev. 5 H-2-31268	<u>Elevations</u> Ground 690 ft Water Table 470 ft(1973) <u>Site Depth</u> ~ 12 ft	

Source and Description of Waste

Miscellaneous dry waste (approximately  $3.9 \times 10^5 \text{ ft}^3$ ).

Description of Facility

Twenty trenches running east-west. Trenches No. 1-3 400 ft. in length.  
Trenches No. 3-20 475 ft. in length. Surface area is  $4.02 \times 10^5 \text{ ft}^2$ .

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Burial</u>
U, g	$7.0 \times 10^7$
Pu, g	$6.8 \times 10^4$
Total beta-gamma, Ci	$9.0 \times 10^2$
<sup>90</sup> Sr, Ci	18
<sup>106</sup> Ru, Ci	39
<sup>137</sup> Cs, Ci	19

History:

Although the site is covered with a good growth of native grasses and rabbit brush, there is no evidence of transport of radioactivity by plant root penetration.

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

II. NW

<u>Name/Type of Facility</u>	<u>Past Designation</u>	<u>Number</u>
Burial Ground	Dry Waste No. 03A	218-W-3A
<u>Location</u> 200 West, N.W. Quadrant Approximately 4000 ft west of 221-T Bldg. Generally in the northwest corner of 200 West Area. Adjoins 218-W-3 on the south.	<u>Service Dates</u> 1970-Present	<u>Status</u> Active
<u>Site Coordinates</u> N-46500, W-77150 N-43947, W-77659 N-44580, W-77150 N-43945, W-78091 N-44580, W-77515 N-46500, W-78090 N-44340, W-77515	<u>Reference Drawings</u> H-2-34880	<u>Elevations</u> Ground ~690 ft Water Table ~470 ft (1973) Site Depth ~15 ft (except No. 17 which is 16 ft.)
<u>Source and Description of Waste</u> Miscellaneous dry waste (approximately $4.6 \times 10^5 \times \text{ft}^3$ ).		
<u>Description of Facility</u> Fifty trenches running east-west. Trenches No. 1-6 are 535 ft long. Trenches No. 7-50 are 900 ft long. Surface area approximately 50 acres.		
<u>Radionuclide Content</u> (calculated from discharge data)		
<u>Radionuclide</u>	<u>At Time of Burial</u>	
U, g	$1.5 \times 10^7$	
Pu, g	$8.9 \times 10^3$	
Total beta-gamma, Ci	$6.8 \times 10^5$	
$^{90}\text{Sr}$ , Ci	$1.7 \times 10^4$	
$^{106}\text{Ru}$ , Ci	$6.2 \times 10^3$	
$^{137}\text{Cs}$ , Ci	$1.8 \times 10^4$	
<u>History:</u>		
This site is reserved for approximately 50 trenches. Twenty-three of the trenches have been filled or partially filled as of 3/1/78. Trenches No. 8 and 17 contain segregated transuranic wastes.		
In late November 1973, a radioactive salt waste spill from the 102-S tank transfer piping covered a portion of the ground surface in the 241-S tank farm. The surface of the affected area was subsequently scraped up, and buried in 10 large concrete burial boxes that had been placed in Trench 14, 218-W-3A Burial Ground. Dose rates taken at the site of the salt waste on the surface of the ground before removal ranged to a maximum of 9 rads/hr.		

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

RHO-CD-673  
II. NW

<u>Name/Type of Facility</u> Burial Ground	<u>Past Designation</u> Dry Waste No. 04A	<u>Number</u> 218-W-4A
<u>Location</u> 200 West, N.W. Quadrant Approximately 4000 ft west of 221-T Bldg. Running south and east from the corner of 23rd and Dayton Avenue.	<u>Service Dates</u> 1961-1967	<u>Status</u> Inactive
<u>Site Coordinates</u> N-43158, W-77012 N-42278, W-77431 N-42278, W-78079 N-43158, W-78079	<u>Reference Drawings</u> H-2-32487 H-2-31268	<u>Elevations</u> Ground 690 ft Water Table 470 ft (1973) Site Depth ~12 ft <u>Caisson Depth</u> ~48 ft
<u>Source and Description of Waste</u> Miscellaneous dry waste (approximately $6.3 \times 10^5$ ft <sup>3</sup> ).		

Description of Facility

Twenty-one trenches running east-west and six caissons.

Radionuclide Content (calculated from discharge data)

<u>Radionuclide</u>	<u>At Time of Burial</u>
U, g	$5.0 \times 10^8$
Pu, g	$3.5 \times 10^4$
Total beta-gamma, Ci	$3.0 \times 10^3$
<sup>90</sup> Sr, Ci	60
<sup>106</sup> Ru, Ci	$1.3 \times 10^2$
<sup>137</sup> Cs, Ci	64

Special Features:

Six 15 foot deep dry wells were installed in Trench #16 at coordinates N-42918, W-77465 and N-42918, W-77390. The wells were made of 55 gallon steel drums welded together with the ends of the drums cut out excepting the bottom of the lower drum. The resultant wells were then placed on end in the trench. After each can drop containing waste, dirt was shoveled into the well to shield the gamma radiation from reaching ground level.

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218-W-4A continued

Inventories in the Wells are as follows:

## Dry Well #1

Waste from H. L. 327 Bldg. Salt Pot containing 90 grams Pu.

## Dry Well #2

Waste from H. L. 327 Bldg., 7 grams Pu, 50 lbs. uranium (7-21-64)

## Dry Well #3

H. L. scrap metal, 99 grams Pu (9-4-64)

## Dry Well #4

Empty

## Dry Well #5

H. L. capsule - 103.3 grams Pu and 8.2 Kg's depleted u. (11-25-64)

## Dry Well #6

Empty

History:

10-21-75 (ARHCO Occurrence #75-121) Gross alpha contamination and lesser amounts of beta-gamma contamination was found on contaminated waste (bottles, pipets, etc.) that had been uncovered from near the ground surface by wind erosion. The waste had obviously not been buried a minimum of four feet underground as required at the time of the burial. The contaminated waste was disposed of and the affected area 50 x 50 feet was covered with a sheet of 10 mil plastic topped with 18 inches of sand and gravel to stabilize the area. The approximate location of the sight is near the west fence line of the 218-W-4A Burial Ground. It can be easily seen from Dayton Avenue as a raised portion of the ground surface. Approximate coordinates of the site center are: N-42600, W-78050.

During the years from 1965 to 1974 routine radiation surveys disclosed contaminated Russian thistle to be growing in a loosely scattered pattern over many of the burial ground trenches. In 1974 all sunken holes were filled to ground level. Although no contaminated weeds appeared in 1975, 1976, and 1977, the potential is still present. It also has been observed that coverage of waste, particularly along the edges of the trench, was generally less than the standard requiring four feet overfill. Some waste boxes are within 18 inches of the ground surface. This condition is not peculiar to the 218-W-4A grounds, but is common in burial grounds 218-W-1, and 218-W-2, and is suspect in 218-W-3.

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

RHO-CD-673  
II. NW

<u>Name/Type of Facility</u> Burial Ground		<u>Past Designation</u> Dry Waste No. 04B	<u>Number</u> 218-W-4B
<u>Location</u> 200 West, N.W. Quadrant 200 West Area, approximately 500 ft northwest of the 234-5 Bldg. Directly west of 231-Z Bldg.		<u>Service Dates</u> 1967-present	<u>Status</u> Active
<u>Site Coordinates</u> N-41052, W-77458 N-40450, W-77458 N-40450, W-78079 N-41052, W-78079		<u>Reference Drawings</u> H-2-33055	<u>Elevations</u> Ground 690 ft Water Table 470 ft (1973) <u>Site Depth</u> <sup>Trench</sup> 12 ft Caisson 25 ft
<u>Source and Description of Waste</u> Miscellaneous dry waste (approximately 3.3 x 10 <sup>5</sup> ft <sup>3</sup> ).			

Description of Facility

The site contains 13 trenches and 10 caissons. Two of the trenches, #7 and #11, contain transuranic retrievable waste. The other 11 trenches are standard burial trenches, similar to those found in 218-W-1 and which contain alpha-beta and gamma contaminated dry waste.

The ten caissons are as follows - starting at the southeast corner of the 218-W-4B Burial Ground:

	<u>Coordinates</u>	<u>Activity</u>	<u>Print No.</u>
Caisson #1	N-40490, W-77483	Beta-gamma-alpha	H-2-3397T
Caisson #2	N-40490, W-77498	Beta-gamma-alpha	H-2-33971
Caisson, UNI Type #1	N-40483, W-77519		H-2-38022
Caisson, UNI Type	N-40483, W-77541	Not used	H-2-38022
Alpha #3	N-40481, W-77563	Alpha	H-2-35570
Caisson #5	N-40483, W-77625	Beta-gamma	H-2-37071
Caisson #3	N-40483, W-77740	Beta-gamma-alpha	H-2-34375
Caisson #4	N-40483, W-77725	Beta-gamma-alpha	H-2-34375
Alpha #2	N-40482, W-77853	Alpha	H-2-35279 & H-2-35570
Alpha #1	N-40492, W-77969	Alpha	H-2-35570

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218-W-4B continuedRadionuclide Content (calculated from discharge data)

<u>Trenches and Caissons</u>	<u>At Time of Burial</u>
U, g	$5.69 \times 10^6$
Pu, g	$5.10 \times 10^4$
Total beta-gamma, Ci	$2.52 \times 10^5$
<sup>90</sup> Sr, Ci	343
<sup>106</sup> Ru, Ci	741
<sup>137</sup> Cs, Ci	366

Caissons Only at Time of Burial

## Caisson No. 1

U, g	$1.54 \times 10^5$
Pu, g	473
Total beta-gamma, Ci	818
<sup>90</sup> Sr, Ci	16.3
<sup>106</sup> Ru, Ci	35.0
<sup>137</sup> Cs, Ci	17.4

## Caisson No. 2

U, g	
Pu, g	< .5
Total beta-gamma, Ci	20.0
<sup>90</sup> Sr, Ci	.398
<sup>106</sup> Ru, Ci	.857
<sup>137</sup> Cs, Ci	.425

## Caisson No. 3

U, g	$1.0 \times 10^5$
Pu, g	474
Total beta-gamma, Ci	$1.85 \times 10^4$
<sup>90</sup> Sr, Ci	368
<sup>106</sup> Ru, Ci	792
<sup>137</sup> Cs, Ci	393

## Caisson No. 4

U, g	$4.86 \times 10^4$
Pu, g	730
Total beta-gamma, Ci	$5.71 \times 10^4$
<sup>90</sup> Sr, Ci	1140
<sup>106</sup> Ru, Ci	2440
<sup>137</sup> Cs, Ci	1210

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218-W-4B continued

	<u>At Time of Burial</u>
Caisson No. 5	
U, g	
Pu, g	
Total beta-gamma, Ci	1270
<sup>90</sup> Sr, Ci	440
<sup>106</sup> Ru, Ci	10.9
<sup>137</sup> Cs, Ci	80.4

	<u>At Time of Burial</u>
Caisson - UNI No. 1	
Total beta-gamma, Ci (cobalt)	3.50
Caisson - Alpha 1	

U, g	$4.07 \times 10^4$
Pu, g	$1.45 \times 10^3$
Total beta-gamma, Ci	$1.39 \times 10^5$
<sup>90</sup> Sr, Ci	695
<sup>106</sup> Ru, Ci	1500
<sup>137</sup> Cs, Ci	742

## Caisson - Alpha 2\*

U, g	3260
Pu, g	1150
Total beta-gamma, Ci	$2.01 \times 10^4$
<sup>90</sup> Sr, Ci	401
<sup>106</sup> Ru, Ci	863
<sup>137</sup> Cs, Ci	428

## Caisson - Alpha 3

U, g	1100
Pu, g	472
Total beta-gamma, Ci	$1.26 \times 10^4$
<sup>90</sup> Sr, Ci	250
<sup>106</sup> Ru, Ci	539
<sup>137</sup> Cs, Ci	267

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CONTAMINATED SOLIDS STORAGE AND BURIAL SITES

RHO-CD-673

II. NW

<u>Name/Type of Facility</u> Burial Ground		<u>Past Designation</u> Solid Waste Burial and Regulated Storage	<u>Number</u> 218-W-11
<u>Location</u> 200 West, N.W. Quadrant About 2000 ft northwest of 234-5 Bldg. (between 218-W-1 and 218-W-4A).		<u>Service Dates</u> 1960	<u>Status</u> Inactive
<u>Site Coordinates</u> (Approximate) N-42278, W-77458 N-42100, W-77458 N-42100, W-77979 N-42278, W-77979	<u>Reference Drawings</u> H-234762 H-2-44511-Sheet 20	<u>Elevations</u> Ground 691 ft Water Table 472 ft(1973)	<u>Site Depth</u>
<u>Source and Description of Waste</u>  Regulated equipment storage.			
<u>Description of Facility</u> Aboveground storage. Contains one 150 ft long equipment burial trench.			
<u>Radionuclide Content</u> (calculated from discharge data)  NA  The burial ground was used as an aboveground storage site for low-level contaminated equipment storage. The one burial trench within the burial ground runs 150 feet east and west with coordinates at N-42203 (centerline), W-77699 and W-77849. The trench was used for burial of low-level contaminated sluicing equipment that had been used in the uranium recovery program. Some of the equipment was later taken from the trench and is now in use in the strontium-caesium recovery program.			

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