START

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Final

Meeting Minutes Transmittal/Approval
Unit Manager's Meeting: 200-UP-2 Operable Unit
740 Stevens Center, Room 1200, Richland, Washington
July 29, 1993

FROM/APPROVAL: [signature] Date 8/26/93
Paul M. Pak, 200-UP-2 Operable Unit Manager, RL (A5-19)

APPROVAL: [signature] signing for David Einan Date 8/25/93
David R. Einan, 200-UP-2 Operable Unit Manager, EPA (B5-01)

APPROVAL: [signature] Date Aug 25, 1993
Nancy Uziemblo, 200-UP-2 Operable Unit Manager, WA Dept of Ecology

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Meeting Minutes are attached. Minutes are comprised of the following:

Attachment #1	-	Meeting Summary
Attachment #2	-	Attendance Sheet for 200 AAMS and 200-UP-2
Attachment #3	-	Agenda
Attachment #4	-	Action Item Status List
Attachment #5	-	200-UP-2 RFI/CMS Work Plan/LFI
Attachment #6	-	200 NPL Agreement/Change Control Form dated 7/6/93
Attachment #7	-	200 Area Treated Effluent Disposal Facility Schedule and Plant Layout
Attachment #8	-	Agreement Activity Notification dated 7/22/93
Attachment #9	-	Waste Control Plan, Vadose Zone Investigation (Task 5) for 200-UP-2 Operable Unit - 261-U-10 Pond Test Pits
Attachment #10	-	Waste Control Plan, Vadose Zone Investigation (Task 5) for 200-UP-2 Operable Unit - Cribs

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Prepared by: [signature] Date: 8/25/93
Suzanne Clarke, Kay Kimmel, GSSC (A4-35)

Concurrence by: [signature] for Date: 8/25/93
Michael J. Galgoul, 200-UP-2 WHC Coordinator (H6-03)

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Attachment #1
Meeting and Summary of Commitments and Agreements
Unit Manager's Meeting: 200-UP-2 Operable Unit

July 29, 1993

1. SIGNING OF THE APRIL 200-UP-2 MEETING MINUTES:

Previous minutes had been reviewed and approved on May 26, 1993.

2. ACTION ITEM UPDATE (see Attachment #4):

2UP2.2 No update provided.
Paul Pak

3. NEW ACTION ITEMS:

2UP2.3 Provide detection limits associated with the sample volumes reported in the DOW to
Jeff Lerch the Regulators as soon as possible (by August 9, 1993).

4. INFORMATION ITEMS:

- Status of the RFI/CMS Work Plan/LFI - Michael Galgoul presented the status of the work plan/LFI (see attachment #5).

- DOW Status - DOWs for activities at the 216-U-10 pond were discussed. Approval was given to proceed with proposed activities, pending approval of the DOWs (see attachment #6).

- Overview of Project W-049H - Mark Carrigan presented an overview of W-049H, the 200 Area Treated Effluent Disposal Facility. This information transfer is part of an effort to describe non-CERCLA activities at the Operable Units (see attachment #7).

- Attachments - An Agreement Activity Notification Form was provided for U-Pond Cone Penetrometer Demonstration and U-Pond Test Pits (see attachment #8). Waste Control Plans for Vadose Zone Investigation (Task 5) for 200-UP-2 Operable Unit - 216-U-10 Pond Test Pits (attachment #9) and Cribs (attachment #10) were provided.

200-UP-2 Operable Unit Manager's Meeting
Official Attendance Record
July 29, 1993

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
Kay Kimmel	MACTEC	RL Support	376-1985
Michael J Galbraith	WHC	200-UP-2 Tech Coor	376-2038
Suzanne E. Clarke	Dameson Moore	GSSC to RL	376-8189
Dave Einan	EPA	Unit Mgr	509.376-3883
Jon Ball	WHC	HASM	372-2596
Jeff Lerch	WHC	HASM	372-2596
Brian Drost	USGS	EPA Support	206-593-6510
Jeff Phillips	Ecology	UM	736-3011.
Bob McLeod	DOE		372-0096
Mike Mahoney	Corps of Engrs		376-9580
David Holland	Ecology	UM support	736-3027
NANCY UZIEMBLO	Ecology	OU	736 3014
Hal Downey	WHC-ER Program	ER-Program	376-0568
Tom Jones	PNL	Program Office	375-2710
Mark Wasemiller	WHC	Tech Coordinating Coor	376-9808
Richard Carlson	WHC	200/300 RI/FS Mgr	376-9027
Mark C. Carrigan	WHC	Guest Speaker	372-3913

Attachment #3
Unit Manager's Meeting: 200-UP-2 Operable Unit
July 29, 1993

Agenda

200-UP-2 Status

- **Status** - Michael Galgoul
- **Overview of Project W-049H**- M. C. Carrigan

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Attachment #4

Action Item Status List
Unit Manager's Meeting: 200-UP-2 Operable Unit
July 29, 1993

ITEM NO.	ACTION/SOURCE OF ACTION	STATUS
2UP2.2	Place TPA Change Number C-93-03B, Reassignment of Waste Management Units Associated with the 200-UP-2 Operable Unit, on the agenda for signature at the May Project Managers meeting. Action: Paul Pak	Open 05/18/93.
2UP2.3	Provide detection limits associated with the sample volumes reported in the DOW to the Regulators as soon as possible (by August 9, 1993). Action: Jeff Lerch.	Open 07/29/93

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200-UP-2 RFI/CMS WORK PLAN/LFI

MICHAEL J. GALGOUL

TECHNICAL COORDINATOR

200UP2/UMM/7-29-93

- 200-UP-2 STATUS

- OVERVIEW OF W-049H PROJECT PRESENTED BY MARK CARRIGAN

200-UP-2 STATUS

- 200-UP-2 WP REV. 0, PUBLIC COMMENT PERIOD ENDS AUGUST 5
- DOW STATUS

  -TEST PIT DOW HAS HAD COMMENTS INCORPORATED AND IN FINAL REVIEW

  -BORING DOW IS OUT FOR CONCURRENT REVIEW PHASE COMMENTS DUE AUGUST 6, 1993

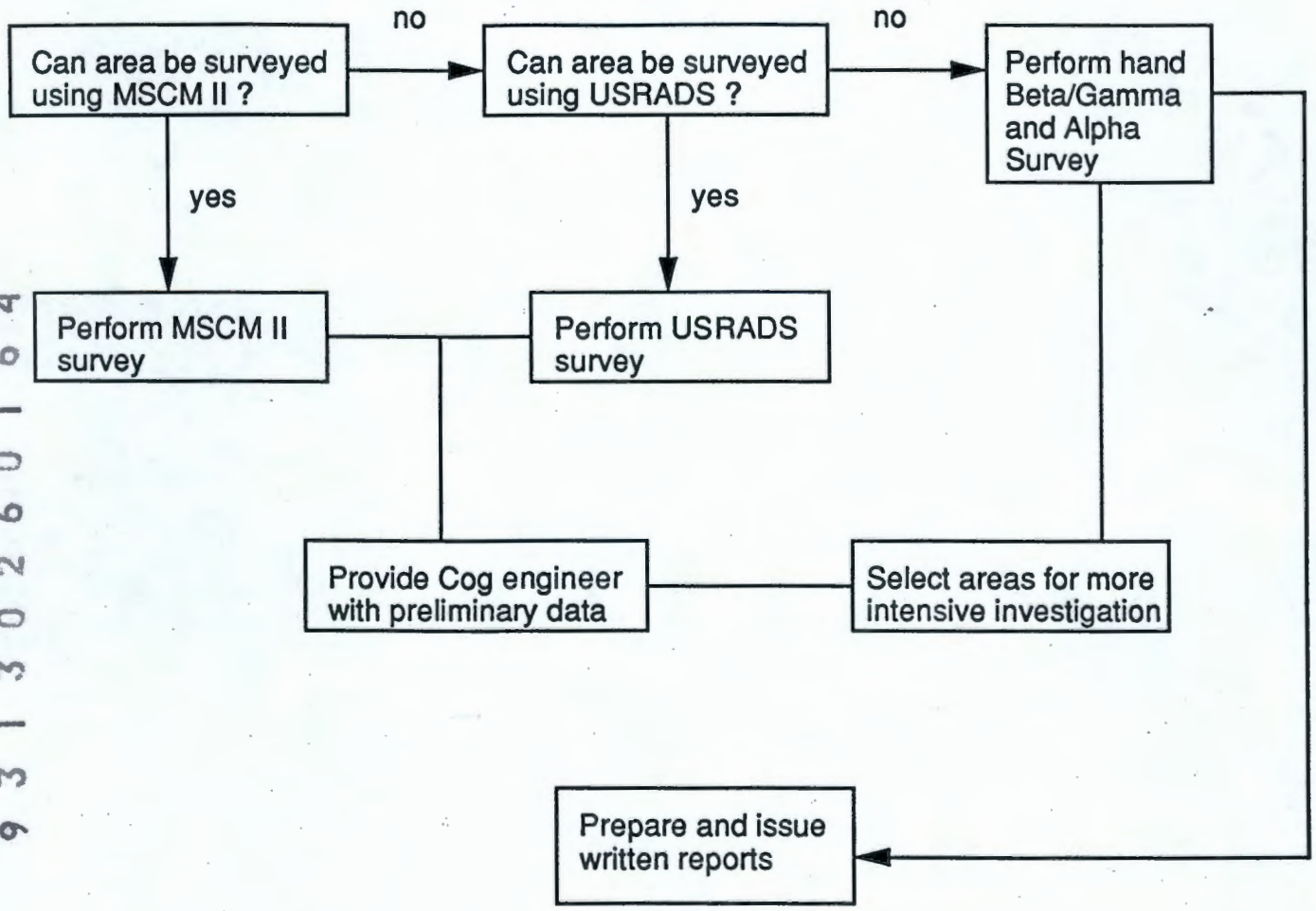
  -CONE PENETROMETER DOW APPROVED

- PLANNED ACTIVITIES

  -CONE PENETROMETER DEMONSTRATION SCHEDULED TO BEGIN JULY ~~29~~ 30 AT 0700 AT U POND KK

  -TEST PIT EXCAVATION #2 SCHEDULED TO BEGIN AUGUST 21, 1993

- RADIOLOGICAL SURVEY STRATEGY



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Flowchart for Surface Radiological Investigation
for 200-UP-2 Operable Unit LFI

Control Number:	200 NPL Agreement/Change Control Form __ Change ✓ Agreement __ Information Operable Unit(s):	Date Submitted: 7/6/93 Date Approved: 7/6/93

Document Number and Title: DOE/RL-91-19 Rev 0	Date Document Last Issued: June 1993
Originator: M.J. GALGOUL	Phone: 376-2038

Summary Description:
Approval is given to begin intrusive field activities prior to work plan approval by the regulators. This is contingent on approval of DOWs.

Justification and Impact of Change:
Change is required to assure funding remains available for planned work and that prioritization of activities may proceed ~~co~~

Michael J Galgoul WHC Operable Unit Coordinator	Date 8/13/93
Saul M. Duk DOE Unit Manager	Date 7/6/93
Nancy Uzemblo Ecology Unit Manager	Date 7/6/93
David R. Gi[illegible] Env. Protection Agency Unit Manager	Date 6 July 93

Per Action Plan for Implementation of the Hanford Consent Order and Compliance Agreement Section 9.3.

The DOWs, describing Cone Penetrometer Tests in the 216-U-10 Pond and Field Activities associated with test Pit Excavations and Soil Sampling at the 216-U-10 Pond, were discussed at the 7/6/93 meeting with the regulators and approval was given to ~~initiate~~ proceed with the proposed activities. Final versions of the DOWs will be provided to the regulators ~~by 7/20/93~~. at a later date.

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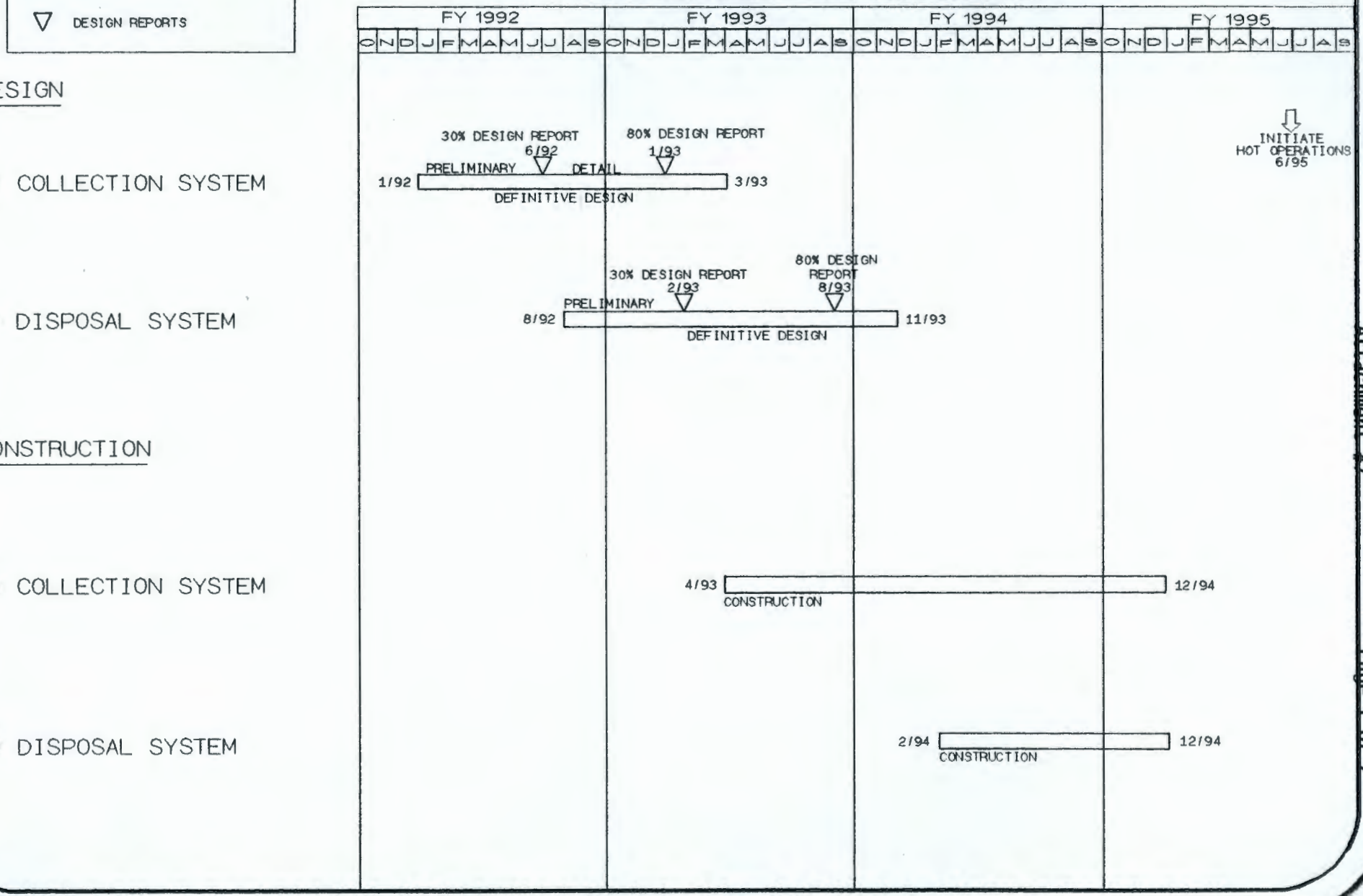
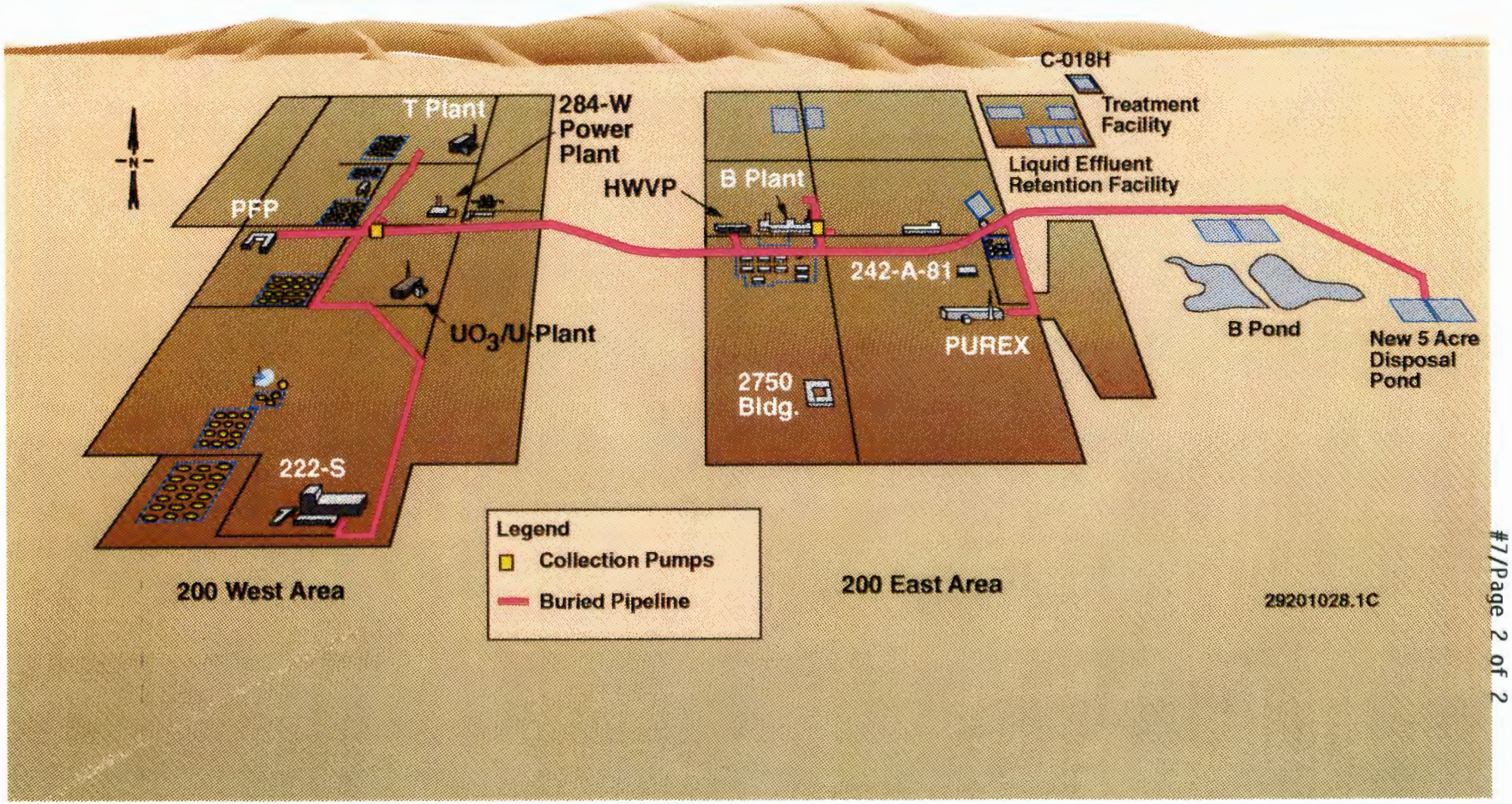
200 AREA TREATED EFFLUENT DISPOSAL FACILITY
W-049H DESIGN/CONSTRUCT SCHEDULE
COLLECTION AND DISPOSAL SYSTEMS



Subproject W-049H

200 Area Treated Effluent Disposal Facility



AGREEMENT ACTIVITY NOTIFICATION

OPERABLE UNIT 200-UP-2

DATE 7/22/93

TSD

OTHER

UNIT MANAGER
DOE-RL: P. M. Pak
EPA: D. Einan
WA DOE: N. Uziemblo

ACTIVITY PERIOD 7/22/93 - 8/22/93

ACTIVITIES	SCHEDULED START
U-Pond Cone Penetrometer Demonstration	7/29/93
U-Pond Test Pits	8/21/93

M. J. Galgoul
200-UP-2 Technical Coordinator

EPA/Ecology/DOE representatives that may want to observe any of the listed activities should verify the start date with the Unit Manager. Depending on the activity, location, and the individual's needs relative to observation/participation, the individual may be required to meet the training requirements of Environmental Investigation Instruction 1.7

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[41] From: Michael J Galgoul at ~WHC300 7/22/93 2:53PM (936 bytes: 11 ln)
To: ^Wash St Dept of Ecology at ~DOE_HANFORD_1, David R Einan at ~TPA1,
Paul M Pak at ~DOE6
Receipt Requested
cc: Julie K Erickson at ~DOE6, Harold D (Hal) Downey at ~WHC57,
Richard A Carlson at ~WHC249, Michael J Galgoul
Subject: notification of up 2 field activities/attn. N. Uziemblo
---------- Message Contents ----------

This message is to provided notification for the start of intrusive field activites at the 200-up-2 OU. These start dates are contingent on the approval of the applicable DOW.

Cone Penetrometer work at U Pond: Thursday July 29, 1993

Test Pits at U Pond: Saturday August 21, 1993

If you have any questions please contact me at 6-2038.

Thank you.

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WASTE CONTROL PLAN

Work Scope Description: Vadose Zone Investigation (Task 5) for 200-UP-2 Operable Unit - 216-U-10 Pond Test Pits

List Constitutents of Concern: See Attachment 1

Site Description: 216-U-10 Pond of 200-UP-2 Operable Unit, Hanford Site, Richland, Washington

Reference: DOE/RL-91-19 Rev: 0 Date Approved:

Preparer/Project/RI Coordinator: MJ Galgoul (Print/Sign Name) Date: 7-9-93

Safety Class	Impact Level
3	3

Field Team Leader/Cognizant Engineer: LO Amos IDW Coordinator: GG Hopkins

Planned Drilling Start and Finish Dates: From 8/1/93 To: 8/31/93

Waste Storage Facility ID Number(s): N/A

Field Screening Methods

Method	Frequency	Reference	Detection Range	Analyst
OVM	Continuous	EII 3.4	0.1 - 1000 ppm	Geologist
GM	Per RWP	WHC IP 0692	0 - 100,000 cpm	HPT
PAM	Per RWP	WHC IP 0692	0 - 100,000 cpm	HPT

Laboratory Methods (constituents of concern)

Method	Frequency	Reference	Detection Limits	Contract Lab
See Attachment 2	DOE/RL-91-19 Section 5.3.1.4	See Attachment 2	See Attachment 2	Weston

APPROVALS (Print/Sign Name and Date)

GG Hopkins 7/9/93
IDW Coordinator

MJ Galgoul 7-9-93
Project/RI Coordinator

Safety Function (if required)

LO Amos 7-9-93
Field Team Leader/Cognizant Engineer

7/9/93
Quality Assurance (if required)

WASTE CONTROL PLAN

Drill Site Coordinate Location N36500 W77500 (center 216-U-10 Pond)
N36850 W77850 (approx. Delta Pit location)

Waste Container Storage Area(s) Coordinate Location(s) Roughly N36400 W72950

Requirements for Soil Pile Sampling (if any) N/A

Nonregulated Material Disposal Location(s) Test pit material removed during excavation will be returned to the point of generation in reverse order of removal. Only misc. waste items (i.e., paper, plastic, personnel protective equipment) generated in support of the excavation will be drummed and managed per the applicable sections of EII 4.3, "Control of CERCLA and other Past Practice Investigation Derived Waste." Field Screening of excavated material will be for health and safety purposes only.

SKETCH OF WORK SITE

Test pit locations, See Attachment #3
Centralized Waste Container Storage Area, See Attachment #4

9313026017

APPROVALS (Print/Sign Name and Date)

Lead Regulatory Agency Representative

DOE-RL

Project/RI Coordinator 7-9-93

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Attachment 1

Table 5-9. Analytical Methods for Target Analytes.

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Liquid Analysis Method[c]	Comments
Gross Alpha		900.0M	900.0	--
Gross Beta		900.0M	900.0	--
Acetone		8240	8240	--
Carbon Tetrachloride		8240	8240	--
Chloroform	Volatile	8240	8240	--
Methylene Chloride	Organic	8240	8240	--
MIBK (hexone)	Analysis	8240	8240	--
1,1,1 Trichloroethane		8240	8240	--
Toluene		8240	8240	--
Americium-243 (NP-239)		D3649M	D3649M	Am-243 measured by counting Np-239.
Cesium-134		D3649M	D3649M	--
Cesium-137 (Ba-137m)		D3649M	D3649M	Cs-137 measured by counting Ba-137m
Cobalt-60		D3649M	D3649M	--
Europium-152		D3649M	D3649M	--
Europium-154	Gamma	D3649M	D3649M	--
Europium-155	Spectrometry	D3649M	D3649M	--
Potassium-40		D3649M	D3649M	--
Ruthenium-106		D3649M	D3649M	Ru-106 measured by counting Rh-106
Sodium-22		D3649M	D3649M	--
Uranium-235 (PA-231)		D3649M	D3649M	For most samples U-235 measured by counting Pa-231

Table 5-9. Analytical Methods for Target Analytes.

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Liquid Analysis Method[c]	Comments
Uranium-234/238 (Pa-234m)		D3649M	D3649M	For most samples U-234/238 measured by counting Pa-234m
Americium-241		Am-01	Am-02	May also use gamma spectrometry
Curium-244	Alpha	907.0M	907.0	--
Neptunium-237	Spectrometry	907.0M	907.0	--
Plutonium-238		Pu-02	Pu-10	--
Plutonium-239/240		Pu-02	Pu-10	--
Uranium-234[d]		U	908.0	--
Uranium-235[d]	Alpha	U	908.0	--
Uranium-238[d]	Spectrometry	U	908.0	--
Iodine-129	Beta	902.0M	902.0	--
Strontium 90 (Y-90)	Counting[c]	SR-02	SR-02	Sr-90 measured by counting Y-90
Technetium-99		TC-01M	TC-01	--
Barium		6010	6010	--
Beryllium		600	610	--
Boron	ICP	6010	6010	--
Cadmium	Analysis	6010	6010	--
Chromium		6010	6010	--
Copper		6010	6010	--
Iron		6010	6010	--
Lead		6010	6010	--
Manganese		6010	6010	--

WHC(200UP2-4)/2-9-93/03997T

Table 5-9. Analytical Methods for Target Analytes.

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Liquid Analysis Method[c]	Comments
Nickel		6010	6010	--
Silver		6010	6010	--
Titanium	ICP	6010	6010	--
Vanadium	Analysis	6010	6010	--
Zinc		6010	6010	--
Arsenic		7061	7061	--
Selenium		7740	7740	--
Cyanide		9010	335.3	--
Tributyl Phosphate		8270	8270	--
Selenium-79	Beta	TBD	TBD	--
Samarium-151	Counting[c]	TBD	TBD	--
Zirconium-93		TBD	TBD	--
Mercury		7471	245.2	--
Kerosene		8015	8015	--
Nitrate		300	300	--
Nitrite		300	300	--
Additional Analyses for Water Samples Only				
Fluoride		--	300	--

Attachment 2

9 3 1 3 0 2 6 0 1 7 6

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
Volatile Organics[j/]	8240[c/]	TBD	±20	75-125	TBD	±20	75-125
TCL Semivolatile organics (kerosene)	8015[c/]	TBD	±20	75-125	TBD	±20	75-125
Tributyl Phosphate	8270[c/]	TBD	±20	75-125	TBD	±20	75-125
Arsenic	7061[c/]	TBD	±20	75-125	TBD	±20	75-125
Barium	6010[c/]	TBD	±20	75-125	TBD	±20	75-125
Beryllium	600/610[c/]	0.5/mg/kg	±20	75-125	5 mg/l	±20	75-125
Boron	6010[c/]	TBD	±20	75-125	STET	±20	75-125
Cadmium	6010[c/]	0.2 mg/kg	±20	75-125	2 mg/l	±20	75-125
Chromium	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Copper	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Iron	6010[c/]	5 mg/kg	±20	75-125	30 mg/l	±20	75-125
Lead	7420 or 7421 [c/]	0.5 mg/kg	±20	75-125	5 mg/l	±20	75-125
Manganese	7460 or 7461 [c/]	0.5 mg/kg	±20	75-125	5 mg/l	±20	75-125
Mercury	7471[c/e/]/245.2[c/d/]	0.1 mg/kg	±20	75-125	0.1 mg/l	±20	75-125
Nickel	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Selenium	7740[c/]	TBD	±20	75-125	TBD	±20	75-125
Silver	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Titanium	6010[c/]	TBD	±20	75-125	TBD	±20	75-125
Vanadium	6010[c/]	TBD	±20	75-125	TBD	±20	75-125

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a]	Precision, Soil[b]	Accuracy, Soil[b]	Target Quantitation Limit Water[a]	Precision, Water[b]	Accuracy, Water[b]
Zinc	7960 or 7951	0.5 mg/kg	±20	75-125	5 mg/l	±20	75-125
Cyanide	9010[c/e]/320.3[c/d]	TBD	±20	75-125	TBD	±20	75-125
Fluoride	EPA 300/modified[d/g]				100 μg/L	±20	75-125
Nitrate	EPA 300/modified[g]	1.0 mg/kg	±20	75-125	100 μg/L	±20	75-125
Nitrite	EPA 300/modified[g]	1.0 mg/kg	±20	75-125	100 μg/L	±20	75-125
Tritium	Water 906.0[d/h]				400 pCi/L	±20	75-125
Americium-241	Am-01[d/k]/ Am-02[d]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Barium-134m (Cesium-137)[m]	D3649 M	0.1 pCi/g	±30	±25	15 pCi/L	±25	±25
Cesium-134	D3649 M	TBD	±30	±25	TBD	±25	±25
Cobalt-60	D3649 M	0.05 pCi/g	±30	±25	25 pCi/L	±25	±25
Curium-244	907.0 M[c/h]/ 907.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Europium-152	D3649 M[o]	0.1 pCi/g	±30	±25	50 pCi/L	±25	±25
Europium-154	D3649 M[o]	0.1 pCi/g	±30	±25	50 pCi/L	±25	±25
Europium-155	D3649 M[o]	0.1 pCi/g	±30	±25	50 pCi/L	±25	±25
Iodine-129	902.0 M[c/h]/ 902.0[d/h]	2 pCi/g	±30	±25	5 pCi/L	±25	±25
Neptunium-237	907.0 M[e]/907.0[d]	1 pCi/g	±30	±25	1 pCi/L	±25	±25

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit. Page 3 of 6

Parameter	Analytical Method	Target Quantitation Limit Soil[a]	Precision, Soil[b]	Accuracy, Soil[b]	Target Quantitation Limit Water[a]	Precision, Water[b]	Accuracy, Water[b]
Neptunium-239 (Am-243)	D3649 M	TBD	±30	±25	TBD	±25	±25
Plutonium-238	Pu-02[c/k]/Pu[o/d/k]	TBD	±30	±25	TBD	±25	±25
Plutonium-239/240	Pu-02[c/k]/Pu[o/d/k]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Potassium-40	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Protactinium-231 (U-235)[m]	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Protactinium-234m (U-234/238)[m]	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Ruthenium-106	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Samarium-151	TBD	TBD	±30	±25	TBD	±25	±25
Selenium-79	TBD	TBD	±30	±25	TBD	±25	±25
Sodium-22	D3469 M[o]	TBD	±30	±25	TBD	±25	±25
Tritium	906.0 M[e/h]/ 906.0[d/h]	400 pCi/g	±30	±25	400 pCi/L	±25	±25
Uranium-234	U-04[e/k]/908.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Uranium-235	U-04[e/k]/908.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Uranium-238	U-04[e/k]/908.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Zirconium-93	TBD	TBD	±30	±25	TBD	±25	±25
Carbon-14	C-01[d/n]				200 pCi/L	±25	±25
Yttrium-90 (SR-90)[p]	Sr-02[k]	1 pCi/g	±30	±25	2 pCi/L	±25	±25
Technetium-99	TC-01 M[e/k]/ TC-01[d/k]	15 pCi/g	±30	±25	15 pCi/L	±25	±25

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
Gross alpha	Water 900[h/] Soil 900.0M[k/]	10 pCi/g	±30	75-125	3pCi/L	±20	75-125
Gross beta	Water 900[h/] Soil 900.0 M[k/]	15 pCi/g	±30	75-125	4 pCi/L	±20	75-125
Groundwater Parameters							
Specific Conductance	[l/]	NA	NA	NA	25 μmhos/cm	±20	NA
pH	[l/]	NA	NA	NA	NA	NA	NA
Temperature	[l/]	NA	NA	NA	NA	±1°C	NA
Dissolved Oxygen	360.1[f/]	NA	NA	NA	100 μg/L	±20	NA
Total Disolved Solids	160.1[f/]	NA	NA	NA	10,000 μg/L	±20	NA
Total Organic Carbon	415.1[f/]	NA	NA	NA	1,000 μg/L	±20	75-125
Turbidity	180.1[f/]	NA	NA	NA	0.05 NTU	±.05 NTU	NA
Soil Physical and Chemical Properties	--	NA	NA	NA	NA	NA	NA
Bulk Density	ASTM D3550-87	--	--	--	--	--	--
Particle Size Distribution	ASTM D433	--	--	--	--	--	--
Moisture Content	ASTM D2216-90	--	--	--	--	--	--
$CaCO_3$ Content	ASTM D4373	--	--	--	--	--	--
Saturated Hydraulic Conductivity	ASTM D5084						

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit. Page 5 of 6

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
Unsaturated Hydraulic Conductivity	--	--	--	--	--	--	--
Matric Potential and Soil Moisture Retention Curves	ASTM D2325-68, D3152-72	--	--	--	--	--	--
Particle Density	ASTM D854	--	--	--	--	--	--
Cation Exchange Capacity	SW 846 9081	--	--	--	--	--	--
Organic Carbon Content	SW 846 9060	--	--	--	--	--	--
Iron and Manganese Content	--	--	--	--	--	--	--

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
pH and if possible Eh	ASTM G51, SW 846 9050	--	--	--	--	--	--
Minerology	--	--	--	--	--	--	--

a/ Values are to be considered requirements in the absence of known or suspected analytical interferences which may hinder achieving the limit by the analytical laboratory.

b/ Precision is expressed as relative percent difference; accuracy is expressed as percent recovery. These limits apply to sample results greater than five times the target quantitation limit and are to be considered requirements in the absence of known or suspected analytical interferences which may hinder achieving the limit by the analytical laboratory.

c/ Methods specified from *Test Methods for Evaluating Solid Waste: Chemical/Physical Methods* (EPA 1990).

d/ Water analysis.

e/ Soil analysis.

f/ Methods specified from *Methods for Chemical Analysis of Water and Wastes* (Kopp and McKee 1983).

g/ Method is from *Determination of Inorganic Anions in Aqueous and Solid Samples by Ion Chromatography* (Lindahl 1984) and is modified from EPA method 300.0.

h/ Methods from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (Krieger and Whittaker 1980) or an equivalent method.

i/ Methods, quantitation limits, and target values for precision and accuracy shall be developed in compliance with Westinghouse Hanford or Westinghouse Hanford-approved participant contractor or subcontractor procedures.

j/ At a minimum: acetone, carbon tetrachloride, chloroform, methylene chloride, MIBK, toluene, and 1,1,1-trichlorethane will be tested for.

k/ Applicable methods shall be selected from the *EML Procedures Manual* (Volchok and dePlanque 1982) or an equivalent method.

l/ Parameter measured in the field in compliance with EII 5.8, "Groundwater Sampling."

m/ The first radionuclide is analyzed in order to derive a concentration for the radionuclide in parentheses.

n/ Method from Radiochemistry Procedures Manual, Eastern Environmental Radiation Facility (EPA 1987) or an equivalent method.

o/ Method from Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water (ASTM 1991) or equivalent method. Soils counted using reproducible geometry, e.g., Marinelli beakers of Petri dishes and standards with sand matrix.

Attachment 3

9 3 1 3 0 2 6 0 1 8 3

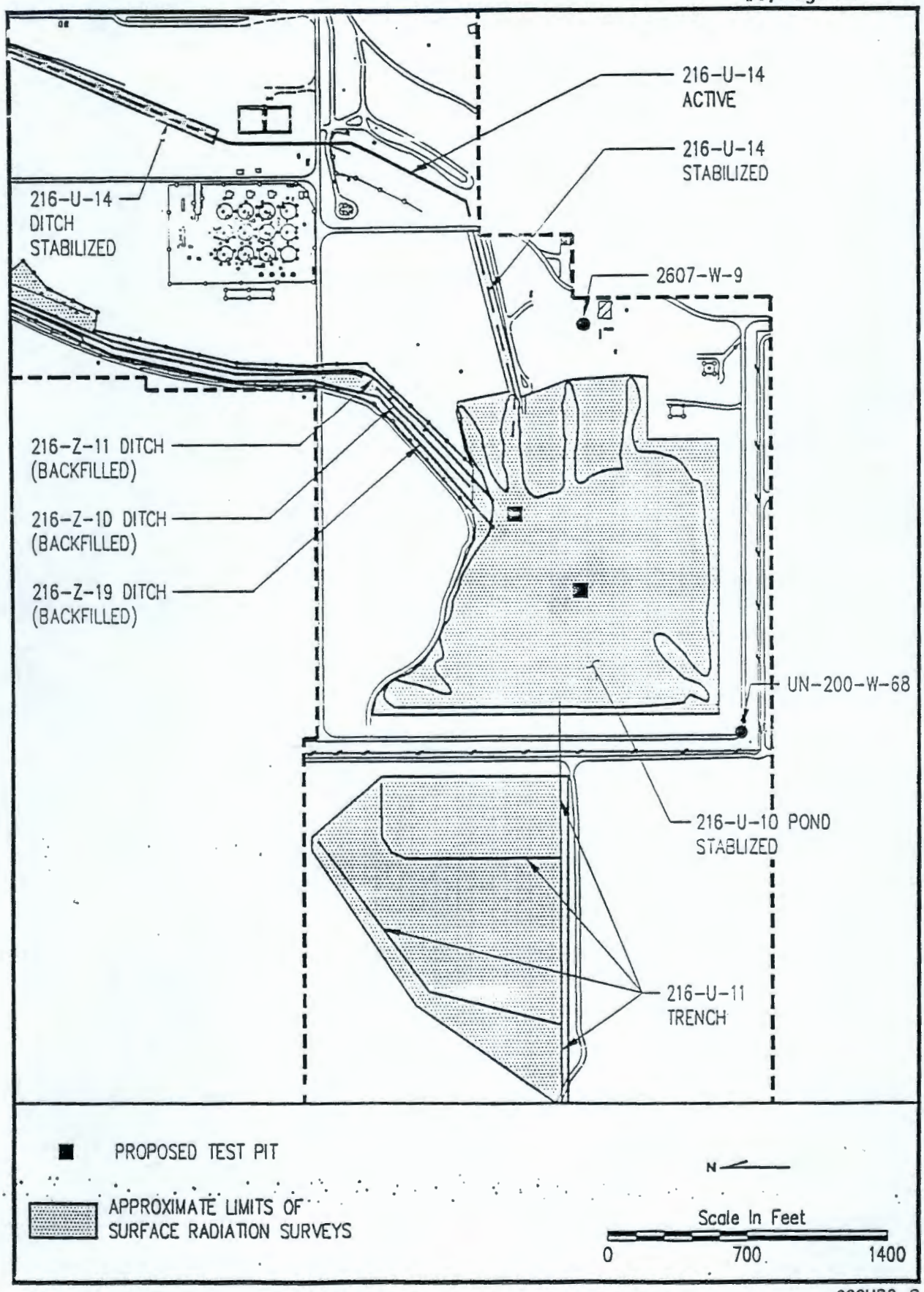

Figure 5-9. Map of the 216-U-10 Pond and its Associated Ditches.

9 3 1 3 0 2 6 0 1 8 4

Attachment 4

9 3 1 3 0 2 6 0 1 8 5

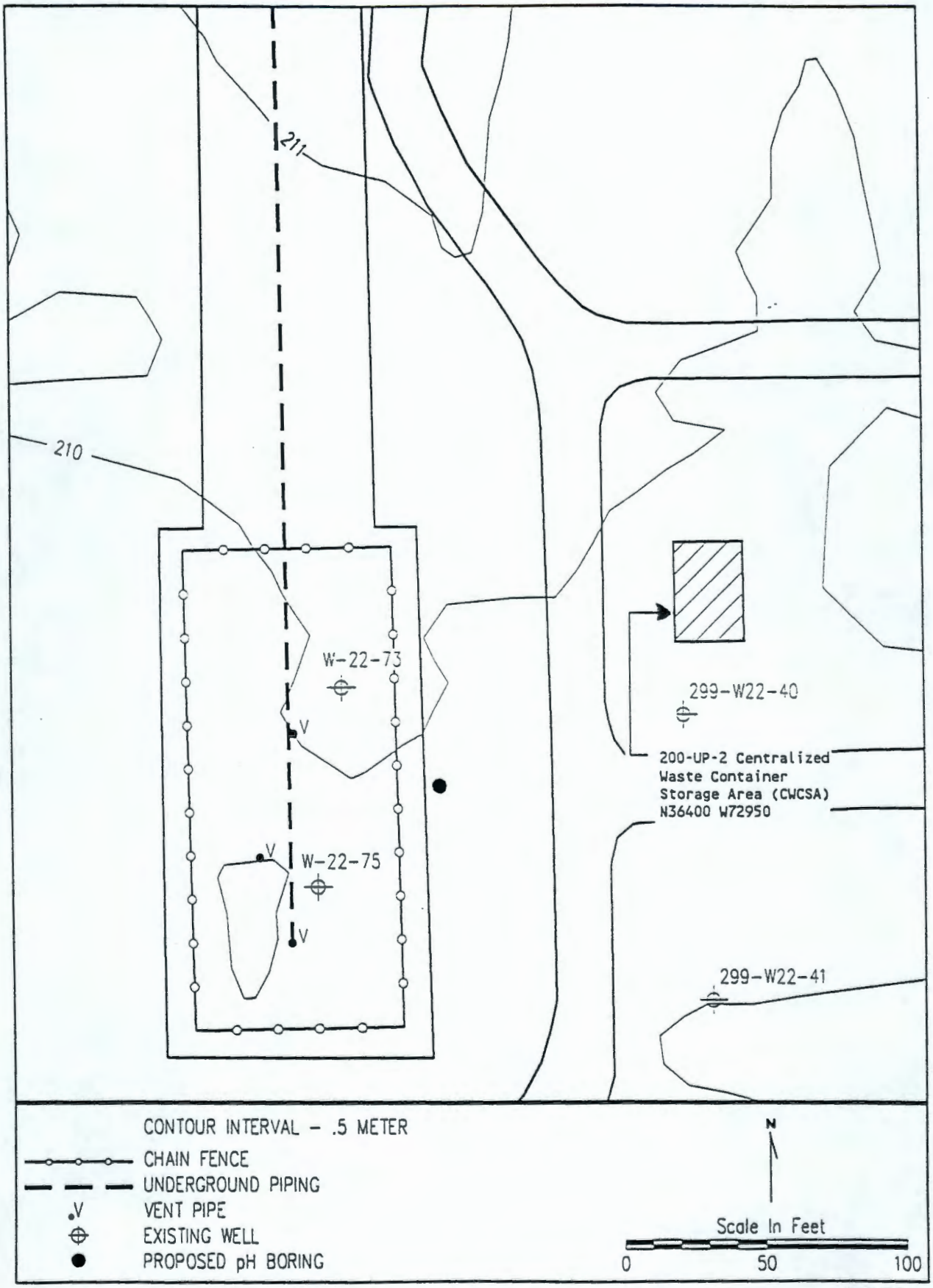

Figure 5-12. Map of the 216-U-12 Crib.

9 3 1 3 0 2 6 0 1 8 6

WASTE CONTROL PLAN

Page 1 of 20

Work Scope Description Vadose Zone Investigation (Task 5) for 200-UP-2 Operable Unit - Cribs (see 5.3.1.2 of DOE/RL-91-19)

List Constitutents of Concern See Attachment 1

Site Description 216-U-1&2, U-4, U-8, and U-12 Cribs of 200-UP-2 Operable Unit, Hanford Site, Richland, Washington (Hanford Site well #'s: 299-W14-94, 299-W19-95, 299-W19-96, 299-W99-97, 299-W19-98, 299-W22-78)

Reference DOE/RL-91-19 **Rev** 0 **Date Approved**

Preparer/ Project/RI Coordinator	Print/Sign Name	Date	Safety Class	Impact Level
MJ Galgoul	MJ Galgoul	7-9-93	3	3

Field Team Leader/ Cognizant Engineer JA Bultena **IDW Coordinator** GG Hopkins

Planned Drilling Start and Finish Dates: From 9/1/93 **To:** 3/15/94

Waste Storage Facility ID Number(s) N/A

Field Screening Methods

Method	Frequency	Reference	Detection Range	Analyst
OVM	Continuous	EII 3.4	0.1 - 1000 ppm	Geologist
GM	Per RWP	WHC IP 0692	0 - 100,000 cpm	HPT
PAM	Per RWP	WHC IP 0692	0 - 100,000 cpm	HPT

Laboratory Methods (constituents of concern)

Method	Frequency	Reference	Detection Limits	Contract Lab
See Attachment 2	See DOE/RL-91-19 Section 5.3.1.2	See Attachment 2	See Attachment 2	See Attachment 2

APPROVALS (Print/Sign Name and Date)

GG Hopkins 7/9/93
IDW Coordinator

MJ Galgoul 7-9-93
Project/RI Coordinator

Safety Function (if required)

JA Bultena 7-12-93
Field Team Leader/Cognizant Engineer

7/13/93
Quality Assurance (if required)

WASTE CONTROL PLAN

Drill Site Coordinate Location 216-U-1&2 (N37860 W74247) 216-U-4 (N38209 W73218) 216-U-4A (N38215 W73215) 216-U-8 (N36860 W73100) 216-U-12 (N36350 W73100)

Waste Container Storage Area(s) Coordinate Location(s) Roughly N36400 W72950

Requirements for Soil Pile Sampling (if any) N/A

Nonregulated Material Disposal Location(s) Paper, plastic, etc., will be disposed of at the Central Landfill. Non-regulated soils will be disposed of at the site where they were generated, at a distance from the borehole which will prevent any liquids from migrating via the anulus back into the groundwater.

SKETCH OF WORK SITE

9 3 1 3 0 2 6 0 1 0 8

Borehole locations, See Attachment #3
Centralized Waste Container Storage Area, See Attachment #4

APPROVALS (Print/Sign Name and Date)

Nancy A. Kiemhli
Lead Regulatory Agency Representative

Saul M. Dark
DOE-RL

M D Galgow 7-9-93
Project/RI Coordinator

A-6000-903R (04/92)

9 3 1 3 0 2 6 0 1 8 9

Attachment 1

Table 5-9. Analytical Methods for Target Analytes.

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Liquid Analysis Method[c]	Comments
Gross Alpha		900.0M	900.0	--
Gross Beta		900.0M	900.0	--
Acetone		8240	8240	--
Carbon Tetrachloride		8240	8240	--
Chloroform	Volatile	8240	8240	--
Methylene Chloride	Organic	8240	8240	--
MIBK (hexone)	Analysis	8240	8240	--
1,1,1 Trichloroethane		8240	8240	--
Toluene		8240	8240	--
Americium-243 (NP-239)		D3649M	D3649M	Am-243 measured by counting Np-239.
Cesium-134		D3649M	D3649M	--
Cesium-137 (Ba-137m)		D3649M	D3649M	Cs-137 measured by counting Ba-137m
Cobalt-60		D3649M	D3649M	--
Europium-152		D3649M	D3649M	--
Europium-154	Gamma	D3649M	D3649M	--
Europium-155	Spectrometry	D3649M	D3649M	--
Potassium-40		D3649M	D3649M	--
Ruthenium-106		D3649M	D3649M	Ru-106 measured by counting Rh-106
Sodium-22		D3649M	D3649M	--
Uranium-235 (PA-231)		D3649M	D3649M	For most samples U-235 measured by counting Pa-231

Table 5-9. Analytical Methods for Target Analytes.

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Liquid Analysis Method[c]	Comments
Uranium-234/238 (Pa-234m)		D3649M	D3649M	For most samples U-234/238 measured by counting Pa-234m
Americium-241		Am-01	Am-02	May also use gamma spectrometry
Curium-244	Alpha	907.0M	907.0	--
Neptunium-237	Spectrometry	907.0M	907.0	--
Plutonium-238		Pu-02	Pu-10	--
Plutonium-239/240		Pu-02	Pu-10	--
Uranium-234[d]		U	908.0	--
Uranium-235[d]	Alpha	U	908.0	--
Uranium-238[d]	Spectrometry	U	908.0	--
Iodine-129	Beta	902.0M	902.0	--
Strontium 90 (Y-90)	Counting[c]	SR-02	SR-02	Sr-90 measured by counting Y-90
Technetium-99		TC-01M	TC-01	--
Barium		6010	6010	--
Beryllium		600	610	--
Boron	ICP	6010	6010	--
Cadmium	Analysis	6010	6010	--
Chromium		6010	6010	--
Copper		6010	6010	--
Iron		6010	6010	--
Lead		6010	6010	--
Manganese		6010	6010	--

Table 5-9. Analytical Methods for Target Analytes.

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Liquid Analysis Method[c]	Comments
Nickel		6010	6010	--
Silver		6010	6010	--
Titanium	ICP	6010	6010	--
Vanadium	Analysis	6010	6010	--
Zinc		6010	6010	--
Arsenic		7061	7061	--
Selenium		7740	7740	--
Cyanide		9010	335.3	--
Tributyl Phosphate		8270	8270	--
Selenium-79	Beta	TBD	TBD	--
Samarium-151	Counting[e]	TBD	TBD	--
Zirconium-93		TBD	TBD	--
Mercury		7471	245.2	--
Kerosene		8015	8015	--
Nitrate		300	300	--
Nitrite		300	300	--
Additional Analyses for Water Samples Only				
Fluoride		--	300	--

9 3 1 3 0 2 6 0 1 9 3

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
Volatile Organics[j/]	8240[c/]	TBD	±20	75-125	TBD	±20	75-125
TCL Semivolatile organics (kerosene)	8015[c/]	TBD	±20	75-125	TBD	±20	75-125
Tributyl Phosphate	8270[c/]	TBD	±20	75-125	TBD	±20	75-125
Arsenic	7061[c/]	TBD	±20	75-125	TBD	±20	75-125
Barium	6010[c/]	TBD	±20	75-125	TBD	±20	75-125
Beryllium	600/610[c/]	0.5/mg/kg	±20	75-125	5 mg/l	±20	75-125
Boron	6010[c/]	TBD	±20	75-125	STET	±20	75-125
Cadmium	6010[c/]	0.2 mg/kg	±20	75-125	2 mg/l	±20	75-125
Chron ium	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Copper	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Iron	6010[c/]	5 mg/kg	±20	75-125	30 mg/l	±20	75-125
Lead	7420 or 7421 [c/]	0.5 mg/kg	±20	75-125	5 mg/l	±20	75-125
Manganese	7460 or 7461 [c/]	0.5 mg/kg	±20	75-125	5 mg/l	±20	75-125
Mercury	7471[c/e/]/245.2[c/d/]	0.1 mg/kg	±20	75-125	0.1 mg/l	±20	75-125
Nickel	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Selenium	7740[c/]	TBD	±20	75-125	TBD	±20	75-125
Silver	6010[c/]	1 mg/kg	±20	75-125	10 mg/l	±20	75-125
Titanium	6010[c/]	TBD	±20	75-125	TBD	±20	75-125
Vanadium	6010[c/]	TBD	±20	75-125	TBD	±20	75-125

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a]	Precision, Soil[b]	Accuracy, Soil[b]	Target Quantitation Limit Water[a]	Precision, Water[b]	Accuracy, Water[b]
Zinc	7960 or 7951	0.5 mg/kg	±20	75-125	5 mg/l	±20	75-125
Cyanide	9010[c,e]/320.3[c,d]	TBD	±20	75-125	TBD	±20	75-125
Fluoride	EPA 300/modified[d,g]				100 µg/L	±20	75-125
Nitrate	EPA 300/modified[g]	1.0 mg/kg	±20	75-125	100 µg/L	±20	75-125
Nitrite	EPA 300/modified[g]	1.0 mg/kg	±20	75-125	100 µg/L	±20	75-125
Tritium	Water 906.0[d,h]				400 pCi/L	±20	75-125
Americium-241	Am-01[d,k]/ Am-02[d]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Barium-134m (Cesium-137)[m]	D3649 M	0.1 pCi/g	±30	±25	15 pCi/L	±25	±25
Cesium-134	D3649 M	TBD	±30	±25	TBD	±25	±25
Cobalt-60	D3649 M	0.05 pCi/g	±30	±25	25 pCi/L	±25	±25
Curium-244	907.0 M[c,h]/ 907.0[d,h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Europium-152	D3649 M[o]	0.1 pCi/g	±30	±25	50 pCi/L	±25	±25
Europium-154	D3649 M[o]	0.1 pCi/g	±30	±25	50 pCi/L	±25	±25
Europium-155	D3649 M[o]	0.1 pCi/g	±30	±25	50 pCi/L	±25	±25
Iodine-129	902.0 M[c,h]/ 902.0[d,h]	2 pCi/g	±30	±25	5 pCi/L	±25	±25
Neptunium-237	907.0 M[e]/907.0[d]	1 pCi/g	±30	±25	1 pCi/L	±25	±25

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a]	Precision, Soil[b]	Accuracy, Soil[b]	Target Quantitation Limit Water[a]	Precision, Water[b]	Accuracy, Water[b]
Neptunium-239 (Am-243)	D3649 M	TBD	±30	±25	TBD	±25	±25
Plutonium-238	Pu-02[c/k]/Pu[o/d/k]	TBD	±30	±25	TBD	±25	±25
Plutonium-239/240	Pu-02[c/k]/Pu[o/d/k]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Potassium-40	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Protactinium-231 (U-235)[m]	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Protactinium-234m (U-234/238)[m]	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Ruthenium-106	D3649 M[o]	TBD	±30	±25	TBD	±25	±25
Samarium-151	TBD	TBD	±30	±25	TBD	±25	±25
Selenium-79	TBD	TBD	±30	±25	TBD	±25	±25
Sodium-22	D3469 M[o]	TBD	±30	±25	TBD	±25	±25
Tritium	906.0 M[c/h]/ 906.0[d/h]	400 pCi/g	±30	±25	400 pCi/L	±25	±25
Uranium-234	U-04[c/k]/908.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Uranium-235	U-04[c/k]/908.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Uranium-238	U-04[c/k]/908.0[d/h]	1 pCi/g	±30	±25	1 pCi/L	±25	±25
Zirconium-93	TBD	TBD	±30	±25	TBD	±25	±25
Carbon-14	C-01[d/n]				200 pCi/L	±25	±25
Yttrium-90 (SR-90)[p]	Sr-02[k]	1 pCi/g	±30	±25	2 pCi/L	±25	±25
Technetium-99	TC-01 M[c/k]/ TC-01[d/k]	15 pCi/g	±30	±25	15 pCi/L	±25	±25

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
Gross alpha	Water 900[h/] Soil 900.0M[k/]	10 pCi/g	±30	75-125	3pCi/L	±20	75-125
Gross beta	Water 900[h/] Soil 900.0 M[k/]	15 pCi/g	±30	75-125	4 pCi/L	±20	75-125
Groundwater Parameters							
Specific Conductance	[l/]	NA	NA	NA	25 μmhos/cm	±20	NA
pH	[l/]	NA	NA	NA	NA	NA	NA
Temperature	[l/]	NA	NA	NA	NA	±1°C	NA
Dissolved Oxygen	360.1[f/]	NA	NA	NA	100 μg/L	±20	NA
Total Disolved Solids	160.1[f/]	NA	NA	NA	10,000 μg/L	±20	NA
Total Organic Carbon	415.1[f/]	NA	NA	NA	1,000 μg/L	±20	75-125
Turbidity	180.1[f/]	NA	NA	NA	0.05 NTU	±.05 NTU	NA
Soil Physical and Chemical Properties	--	NA	NA	NA	NA	NA	NA
Bulk Density	ASTM D3550-87	--	--	--	--	--	--
Particle Size Distribution	ASTM D433	--	--	--	--	--	--
Moisture Content	ASTM D2216-90	--	--	--	--	--	--
$CaCO_3$ Content	ASTM D4373	--	--	--	--	--	--
Saturated Hydraulic Conductivity	ASTM D5084						

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
Unsaturated Hydraulic Conductivity	--	--	--	--	--	--	--
Matric Potential and Soil Moisture Retention Curves	ASTM D2325-68, D3152-72	--	--	--	--	--	--
Particle Density	ASTM D854	--	--	--	--	--	--
Cation Exchange Capacity	SW 846 9081	--	--	--	--	--	--
Organic Carbon Content	SW 846 9060	--	--	--	--	--	--
Iron and Manganese Content	--	--	--	--	--	--	--

Table QAPjP-1. Analytical Methods, Analytes of Interest, Quantitation Limits, and Precision and Accuracy Guidelines for the 200-UP-2 Source Operable Unit.

Parameter	Analytical Method	Target Quantitation Limit Soil[a/]	Precision, Soil[b/]	Accuracy, Soil[b/]	Target Quantitation Limit Water[a/]	Precision, Water[b/]	Accuracy, Water[b/]
pH and if possible Eh	ASTM G51, SW 846 9050	--	--	--	--	--	--
Minerology	--	--	--	--	--	--	--

a/ Values are to be considered requirements in the absence of known or suspected analytical interferences which may hinder achieving the limit by the analytical laboratory.

b/ Precision is expressed as relative percent difference; accuracy is expressed as percent recovery. These limits apply to sample results greater than five times the target quantitation limit and are to be considered requirements in the absence of known or suspected analytical interferences which may hinder achieving the limit by the analytical laboratory.

c/ Methods specified from *Test Methods for Evaluating Solid Waste: Chemical/Physical Methods* (EPA 1990).

d/ Water analysis.

e/ Soil analysis.

f/ Methods specified from *Methods for Chemical Analysis of Water and Wastes* (Kopp and McKee 1983).

g/ Method is from *Determination of Inorganic Anions in Aqueous and Solid Samples by Ion Chromatography* (Lindahl 1984) and is modified from EPA method 300.0.

h/ Methods from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (Krieger and Whittaker 1980) or an equivalent method.

i/ Methods, quantitation limits, and target values for precision and accuracy shall be developed in compliance with Westinghouse Hanford or Westinghouse Hanford-approved participant contractor or subcontractor procedures.

j/ At a minimum: acetone, carbon tetrachloride, chloroform, methylene chloride, MIBK, toluene, and 1,1,1-trichlorethane will be tested for.

k/ Applicable methods shall be selected from the *EML Procedures Manual* (Volchok and dePlanque 1982) or an equivalent method.

l/ Parameter measured in the field in compliance with EII 5.8, "Groundwater Sampling."

m/ The first radionuclide is analyzed in order to derive a concentration for the radionuclide in parentheses.

n/ Method from Radiochemistry Procedures Manual, Eastern Environmental Radiation Facility (EPA 1987) or an equivalent method.

o/ Method from Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water (ASTM 1991) or equivalent method. Soils counted using reproducible geometry, e.g., Marinelli beakers of Petri dishes and standards with sand matrix.

9 3 1 3 0 2 6 0 2 0 0

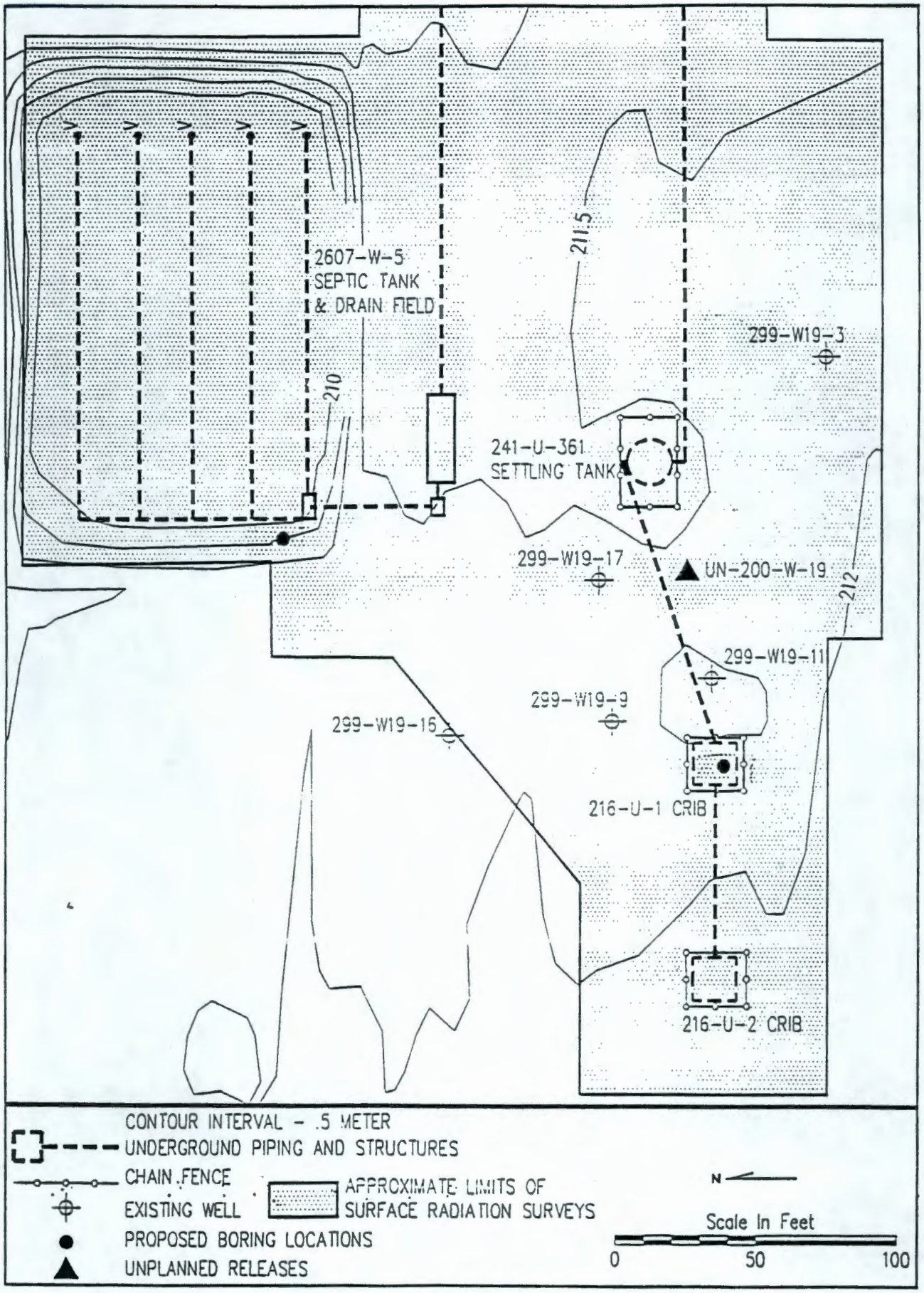

Figure 5-1. Map of the 216-U-1/216-U-2 Crib Area.

9 3 1 3 0 2 6 0 2 0 1

9 3 1 3 0 2 6 0 2 0 2

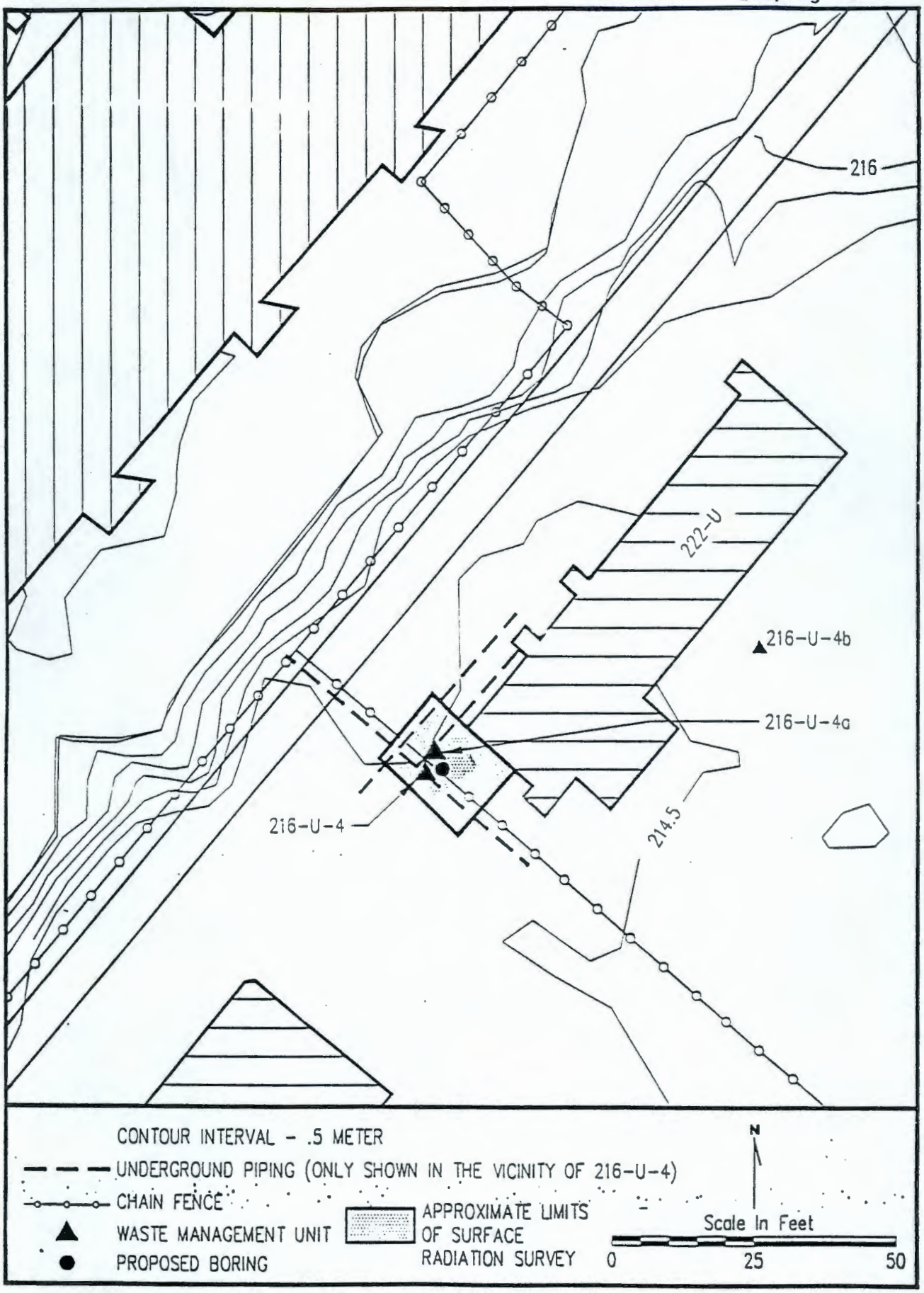

Figure 5-7. Map of the 216-U-4 Reverse Well and 216-U-4A French Drain.

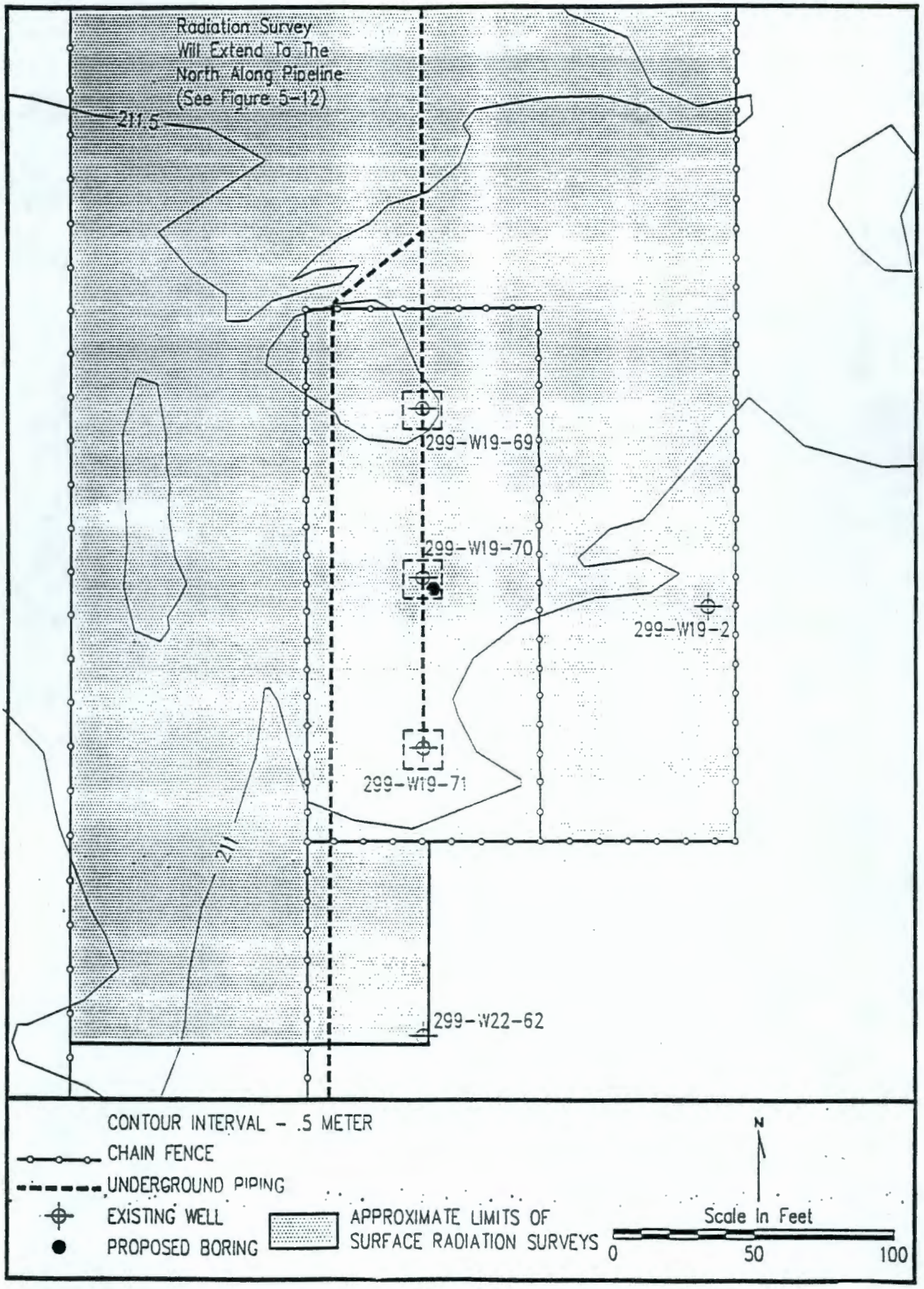

Figure 5-4. Map of the 216-U-8 Crib.

9 3 1 3 0 2 6 0 2 0 3

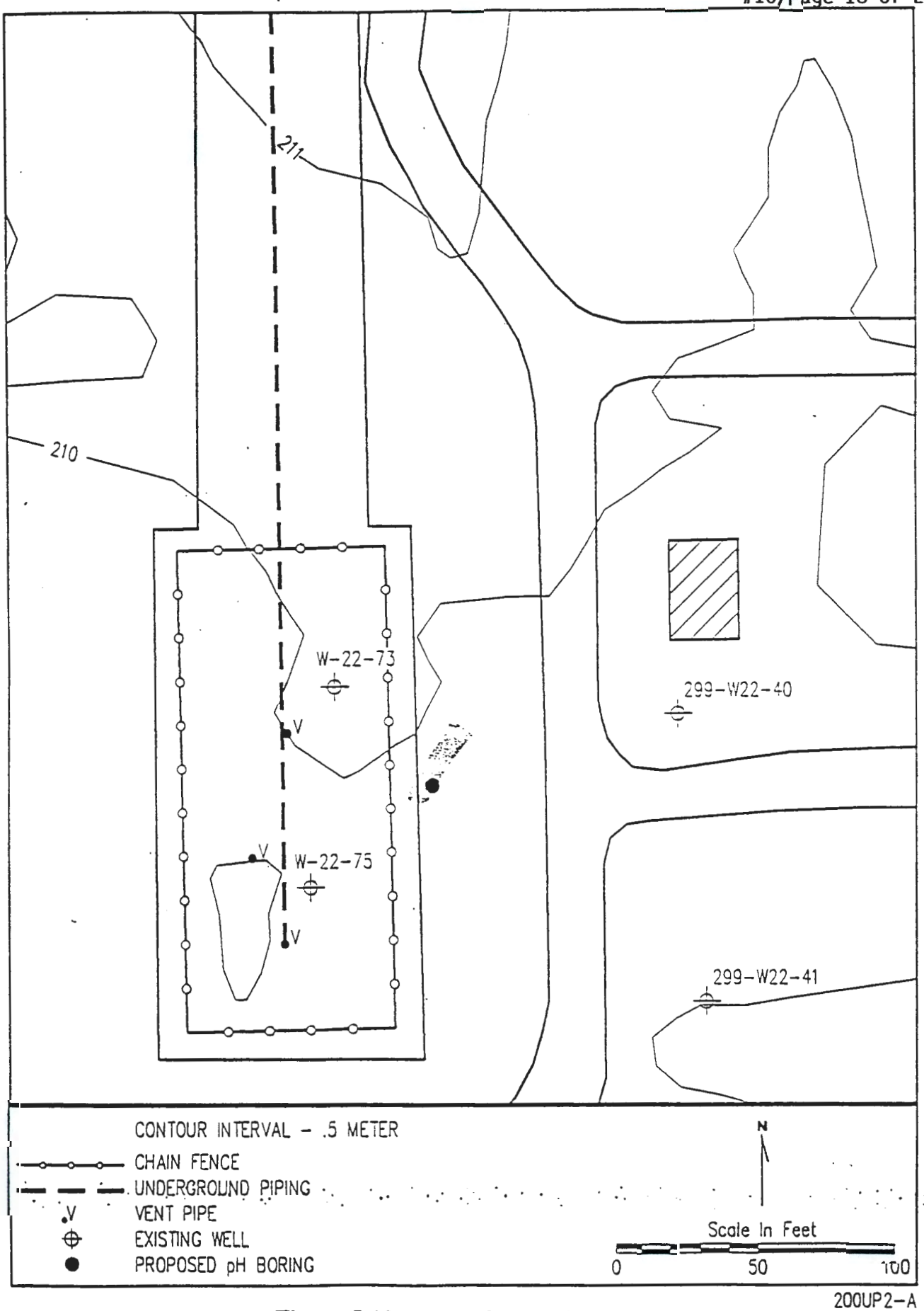

Figure 5-12. Map of the 216-U-12 Crib.

Attachment 4

9 3 1 3 0 2 6 0 2 0 5

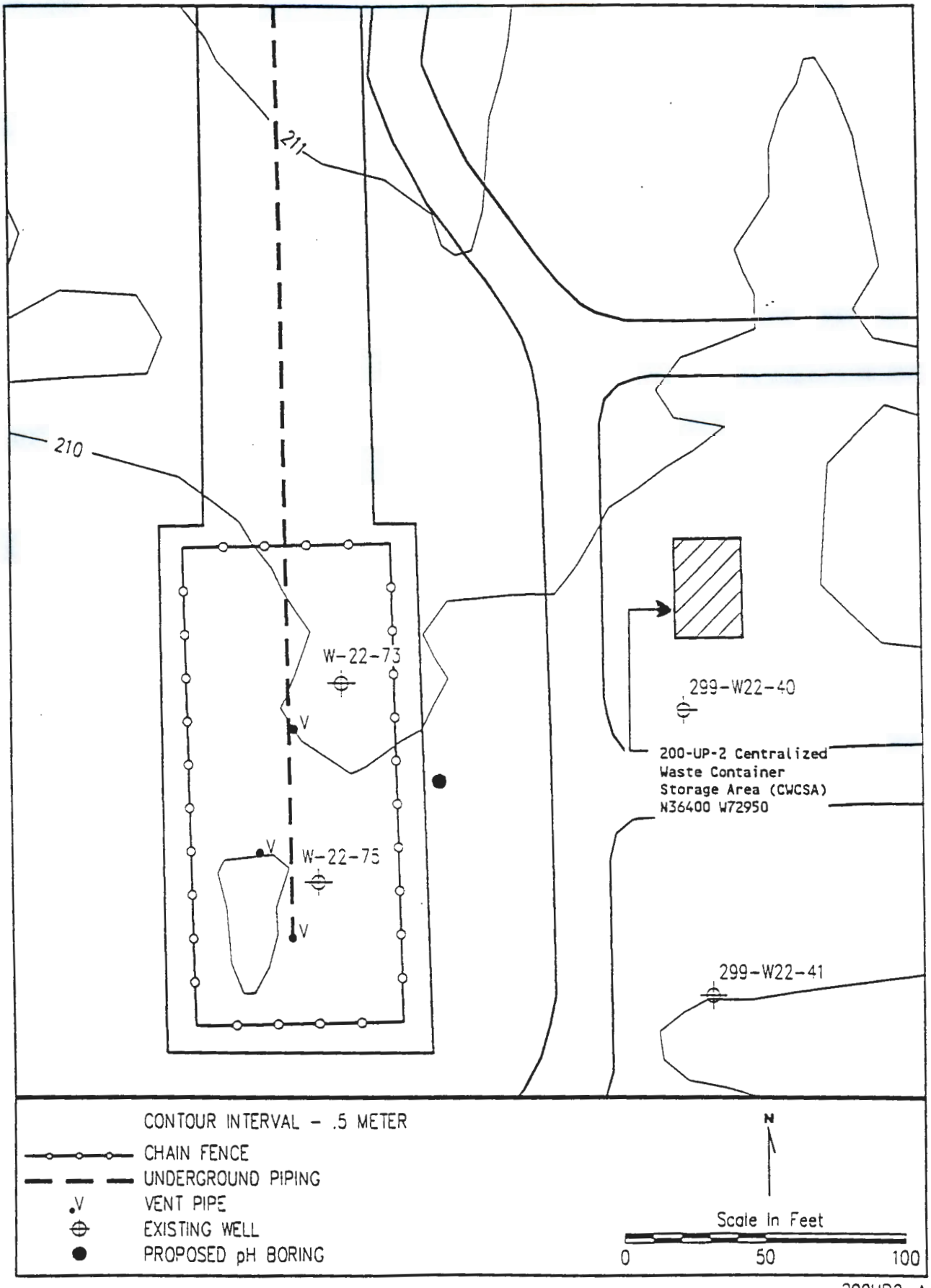

Figure 5-12. Map of the 216-U-12 Crib.

Distribution

Unit Manager's Meeting: 200-UP-2 Operable Unit
July 29, 1993

Julie K. Erickson /Paul M. Pak . . . . . DOE-RL, ERD (A5-19)
Mike Thompson . . . . . DOE-RL, EAP/RPB (A5-15)
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Audree DeAngeles . . . . . PRC, Support to EPA

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