JAN 21 1994 (11)
Station #12

ENGINEERING DATA TRANSMITTAL

1. EDT 602503

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Environmental Restoration Engineering	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: 200-UP-2 Operable Unit	6. Cog. Engr.: C. A. Rowley	7. Purchase Order No.: N/A
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		10. System/Bldg./Facility: N/A
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15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-EN-AP-154,		0	Field Characterization Plan for the 216-U-8 Vitrified Clay Pipeline	3Q	1/2	1	

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
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(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1/2	1	Cog.Eng. C.A. Rowley	[signature]	1-19-94	H6-04	EPIC (2)			H6-08	3	
1/2	1	Cog. Mgr. R.C. Roos	[signature]	1/19/94	H6-04	M.J. Galgoul	[signature]	1-19-94	H6-03	1/2	
1/2	1	QA R.L. Hand	[signature]	1/21/94	H4-16	M.A. Wasemiller	[signature]		H6-03	1/2	1
		Safety				P.M. Pak	[signature]	1/19/94	[illegible]-19	1/2	1
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3		Information Release Admin. (2)			H4-17	H.D. Downey			H6-27	3	
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18.	19.	20.	21. DOE APPROVAL (if required)
C.A. Rowley [signature] 1-19-94 Signature of EDT Originator Date	[signature] 1/28/94 R.A. Carlson Authorized Representative Date for Receiving Organization	R.C. Roos [signature] 1/19/94 Cognizant/~~Project~~ Engineer's Manager Date	Ltr. No. [] Approved [] Not approved

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Date Received: 12/21/93

INFORMATION RELEASE REQUEST

Reference: WHC-CM-3-4

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WHC-SD-EN-AP-154, Rev. 0

List attachments.
N/A

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12-22-93

Title Field Work and Sampling Plan Characterization for UP-2 Operable Unit
Field characterization Plan for the 216-U-8 Vitrified Clay Pipeline

Unclassified Category UC-630

Impact Level 3Q

New or novel (patentable) subject matter? [X] No [] Yes
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Information conforms to all applicable requirements. The above information is certified to be correct.

	Yes	No
References Available to Intended Audience	[x]	[]
Transmit to DOE-HQ/Office of Scientific and Technical Information	[x]	[]

Author/Requestor (Printed/Signature) Date
C. A. Rowley *Craig Rowley* 12/14/93

Intended Audience
[] Internal [] Sponsor [x] External

Responsible Manager (Printed/Signature) Date
R.C. Roos *R C Roos* 12/14/93

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

Stamp is required before release. Release is contingent upon resolution of mandatory comments.

APPROVED NS Date 1-21-94

Date Cancelled

Date Disapproved

SUPPORTING DOCUMENT

1. Total Pages 35

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Field Characterization Plan for the 216-U-8 Vitrified Clay Pipeline

3. Number
WHC-SD-EN-AP-154

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APPROVED FOR PUBLIC RELEASE

6. Author
Name: C.A. Rowley
Signature
Organization/Charge Code 81353/PT2WA

7. Abstract
Rowley, C.A., *Field Characterization Plan for the 216-U-8 Vitrified Clay Pipeline*, WHC-SD-EN-AP-154, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

9. Impact Level 3Q

10. RELEASE STAMP

OFFICIAL RELEASE (11)
BY WHC
DATE JAN 21 1994
Station # 12

DISCLAIMER

ACRONYMS

DOW	Description of Work
EPA	U.S. Environmental Protection Agency
FTL	Field Team Leader
GPR	Ground-penetrating radar
HWOP	Hazardous Waste Operations Plan
RCRA	*Resource Conservation and Recovery Act of* 1976
RWP	Radiation Work Permit
SCA	Surface Contamination Area
SSO	site safety officer
TAL	target analyte list
TCL	target compound list
VCP	vitrified clay pipe
VOA	volatile organic analysis
VOC	volatile organic compounds
WIDS	Waste Information Data System

CONTENTS

APPENDIXES:

FIGURES:

1.0 PURPOSE

This description of work (DOW) details the field activities associated with the characterization of the vitrified clay pipe (VCP) delivery line to the 216-U-8 Crib and subsurface soil sampling along the pipe route in the 200 West Area. It will serve as a field guide for those performing the work and will be used in conjunction with the *200-UP-2 RCRA Facility Investigation/Corrective Measures Study* (DOE-RL 1993,[LFI]) and *Environmental Investigations and Site Characterization Manual* (WHC 1988d). Soil sampling locations will be determined by a combination of radiological surface surveys and internal camera surveys of the VCP line.

2.0 OBJECTIVES

Depending on the condition of the pipeline and field conditions, the objectives are as follows:

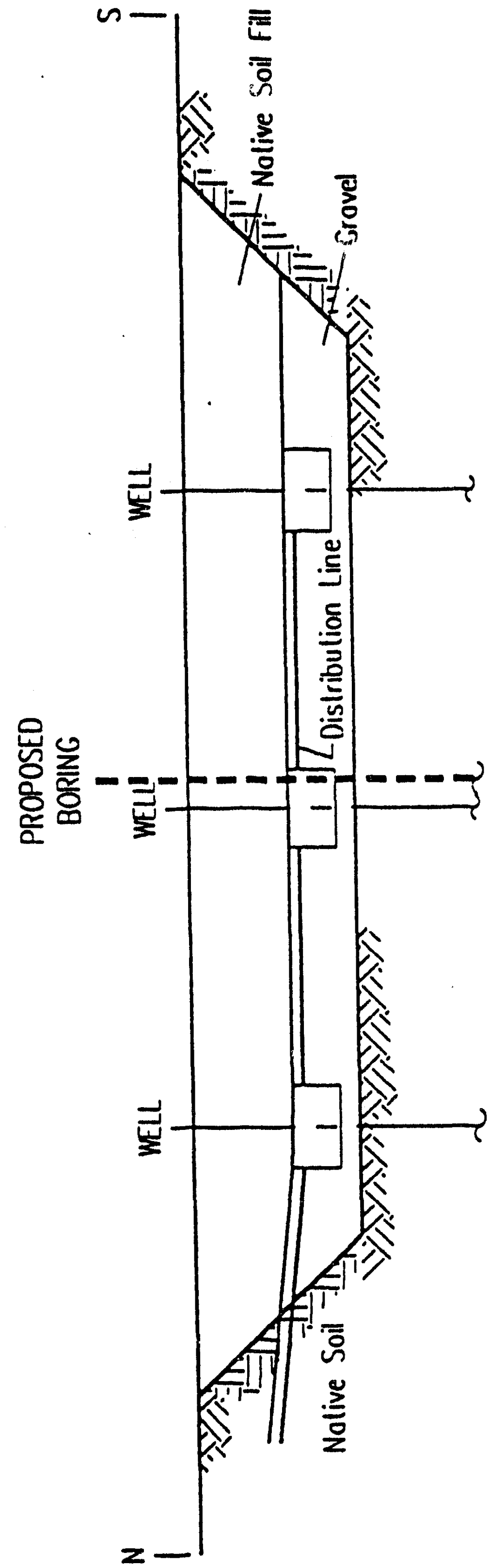
- Examine the internal condition of the VCP with a survey camera to the extent allowed by field conditions
- Determine precise location and depth of the VCP
- Document VCP integrity
- Document gamma radiation profile through the VCP
- Correlate any relationships between surface contamination zones at grade above the VCP to identify breaches in the pipe integrity.

3.0 BACKGROUND

3.1 SITE HISTORY

The 216-U-8 Crib was constructed in 1952 and received waste as described in Appendix A. The unit consists of wooden structures, three in a series. Each structure is 16 by 16 by 10 ft. The site is backfilled with 1/2-in. crushed stone to the tops of the wooden structures (Figure 1). The acidic waste was transported through a 6-in. VCP line with acid-proof joints. (The nature of these joints is not known at this time. Determining the nature of these joints will be addressed in Section 6.) This site was active from 1952 to 1960. When ground settling occurred around the vent risers, the site was deactivated by blanking the pipeline north of the crib. The effluents were then rerouted to the newly constructed 216-U-12 Crib using VCP. This was active from 1960 to 1988. The Waste Information Data System (WIDS) General Summary Reports for the 216-U-8 and 216-U-12 Cribs are included in Appendix A.

Figure 1. Crib Layout: Longitudinal Section.



3.2 SITE DESCRIPTION

The process line (Figure 2) connecting 224-U to the 216-U-8 Crib is initially a 3-in. Schedule 40 stainless steel pipe, which is routed around the 2715-UP Building. The line then changes to a 6-in. VCP and extends approximately 1000 ft south until it reaches the U-8 Crib. Prior to crossing 16th Street (approximately 200 ft), the grade above the VCP consists primarily of backfilled gravel and soils. There are some small surface contamination areas (SCA) present that were most likely caused by the same pipeline conditions that exist south of 16th Street. After the line crosses 16th Street, the surface grade above the VCP consists of natural vegetation and is encompassed by an SCA (see Figure 2). The VCP section (~800 ft.) south of 16th Street underlying this surface contamination zone will be the focus of this effort. All distances will be established in the field and noted in the field logbook.

4.0 SCOPE OF WORK

An excavation will be performed to create an access point into the VCP for the camera survey system described below. Maximum excavation depth will be based on the depth of the VCP line, which varies between 8 to 12 ft below grade. The location for this access point will be determined by utilizing detailed pipeline maps, aboveground landmarks, and ground-penetrating radar, as appropriate.

Prior to excavation, a small auger will be used to verify acceptable radiological contamination levels in the soils above the VCP at the excavation site in accordance with the Radiation Work Permit (RWP). Should the RWP limits be exceeded, a new location will be chosen and the same routine will be followed until an excavation site is located. Ground-penetrating radar (GPR) will also be performed before drilling to confirm the absence of any obstructions. Contamination levels of the excavation area will be determined by Health Physics and recorded by the Field Team Leader (FTL).

A video camera mounted on a motorized platform with wheels will be utilized for the characterization of the VCP. A schematic of the system is provided in Figure 3. Access to the VCP will be gained by an excavation north of 216-U-8 Crib along the existing line (see Figure 2). The camera/survey instrumentation will be placed inside the pipe and will provide monitoring capabilities of pipe integrity. A standard approach for the camera survey will be employed for examining the internal portion of the 6-in. vitrified clay piping run. The VCP will be breached and contamination controlled per site safety processes and procedures. The camera survey system will be deployed and operated from this location. The instrument package will contain two color vision systems: one for forward viewing, and a rear-panning camera for examining joints and laterals. The package will also contain gross gamma measurement equipment that will provide general radiation information and will be distance encoded. This system is capable of negotiating mild sweeps or minor changes in horizontal direction. The data will be displayed with the image on the recorded videotape (image, axial location, radiation level). At

Figure 2. Access to the Vitrified Clay Pipe.

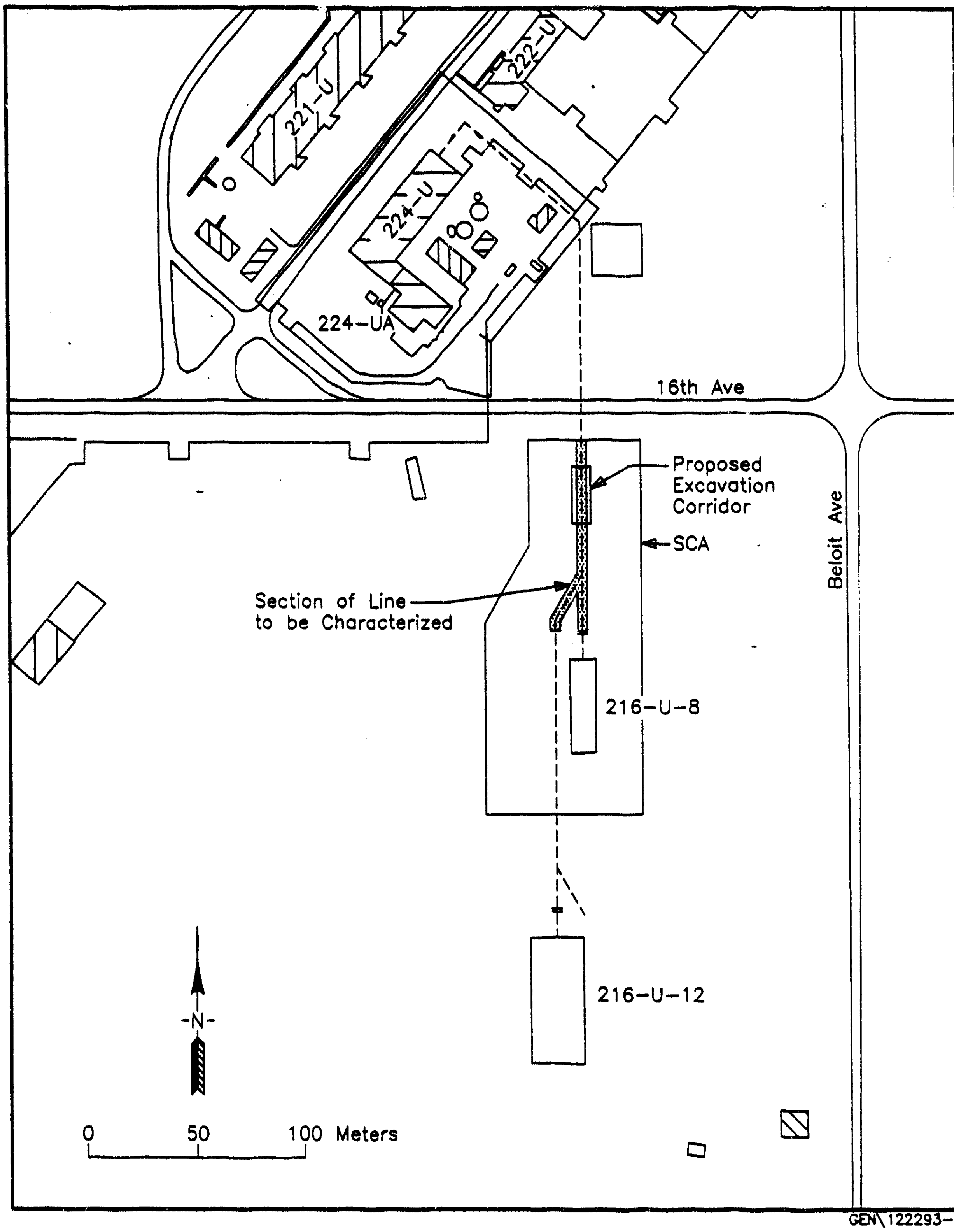
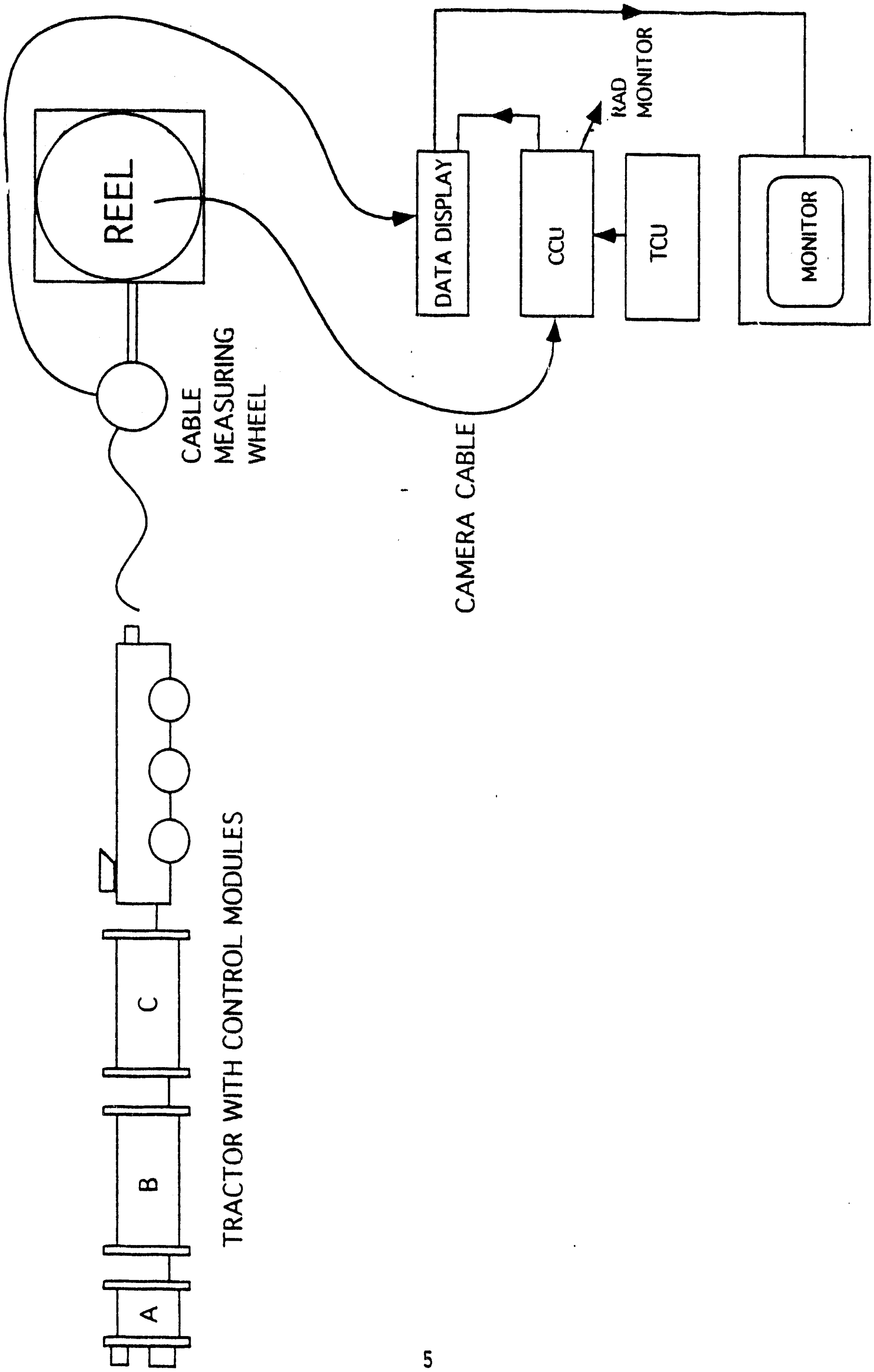


Figure 3. Pipe Inspection System with Radiation Monitor.



survey completion, the equipment will be decontaminated to the degree practical and transported to contaminated storage as necessary.

A pipe-mapping system will also be used to trace and surface mark the azimuthal location of the piping run. This will be accomplished electromagnetically utilizing the umbilical wiring of the survey system as it is deployed through the piping run.

Upon completion of preliminary field work, field data will be evaluated to select auger points. All field data will be reviewed with the assistance of the responsible regulatory personnel to establish a consensus prior to beginning field sampling activities.

5.0 GENERAL REQUIREMENTS

5.1 HANFORD SITE GENERAL REQUIREMENTS

All personnel working to this DOW will have completed the applicable Hazardous Waste Site Worker Training Program and will perform all work in accordance with the following:

- WHC-CM-7-7, *Environmental Investigations and Site Characterization Manual* (EII) (WHC 1988d)
- WHC-CM-7-5, *Environmental Compliance Manual* (WHC 1988c)
- WHC-CM-1-6, *Radiological Control Manual* (WHC 1993e)
- WHC-IP-0692, *Health Physics Procedures Manual* (WHC 1991)
- WHC-CM-4-11, *ALARA Program* (WHC 1988a)
- WHC-EP-0383, *Environmental Engineering, Technology, and Permitting Function Quality Assurance Program Plan* (WHC 1990)
- WHC-CM-4-3, *Industrial Safety Manual*, Vol. 1 through 4 (WHC 1987)
- WHC-CM-7-8, Vol 2, *Engineering and Geotechnology Functions and Procedures*, Rev. 1 (WHC 1988b)
- Site-specific health and safety plan/radiation work permits/job safety analysis.

5.2 200-UP-2 OPERABLE UNIT GENERAL REQUIREMENTS

The requirements and procedures applicable to the 200-UP-2 Operable Unit field activities are specified in the *Environmental Investigations and Site Characterization Manual* (WHC 1988d). Applicable EIIs include the following:

EII 1.1	"Hazardous Waste Site Entrance Requirements"
EII 1.5	"Field Logbooks"
EII 1.13	"Readiness Review"
EII 2.1	"Preparation of Hazardous Waste Operations Permit"
EII 3.2	"Calibration and Control of Monitoring Instruments"
EII 3.4	"Field Screening"
EII 4.3	"Control of CERCLA and Other Past-Practice Investigation Derived Waste"
EII 5.1	"Chain of Custody"
EII 5.2	"Soil and Sediment Sampling"
EII 5.4	"Field Decontamination of Drilling, Well Development, and Sampling Equipment"
EII 5.5	"1706 KE Laboratory Decontamination of RCRA/CERCLA Sampling Equipment"
EII 5.10	"Obtaining Sample Identification Numbers and Accessing HEIS Data"
EII 5.11	"Sample Packaging and Shipping"
EII 6.1	"Activity Reports of Field Operations"

Additional requirements and procedures applicable to the 200-UP-Operable Unit can be found in *Engineering and Geotechnology Functions and Procedures*, Vol. 2, specifically, "Test Pit Excavation in Radiological Areas" (WHC 1988b).

Each item on the checklist for tasks requiring readiness review (EII 1.13, "Engineering and Geotechnology Readiness Review" [WHC 1988d]) will be signed and dated by the cognizant engineer or FTL prior to the start of work.

6.0 SAMPLING AND FIELD ACTIVITIES

Task 1--Preparatory Activities

A meeting with Health Physics and Environmental Restoration Operations will be held before the job is to be performed. At this meeting the exclusion and control zone layouts will be determined and appropriate plans will be made for potential contaminated dust control should the excavation have to remain open overnight.

A pre-job safety meeting, including all personnel associated with the job, will be held prior to the performance of any work. Any comments and concerns will be addressed and resolved at that time.

One day prior to the excavation, the exclusion and control zones will be set up. A tailgate safety meeting will be held at the job site prior to commencing operations each day.

Task 2--GPR

GPR will be performed by WHC Geophysics at the proposed excavation sites. The absence of underground structures, with the exception of the VCP line, must be verified before drilling or excavation can occur at each site.

Task 3--Field Screening

A drilling rig will be used to drill a borehole to a depth of approximately 10 ft at the proposed excavation sites. Health Physics and the Site Safety Officer (SSO) will field screen the cuttings for radiological contamination and volatile organic compounds (VOC). Should excessive contamination levels occur that exceed the RWP or the Hazardous Waste Operations Plan (HWOP), Health Physics, the SSO, and the FTL will determine whether to abandon that excavation site and choose another.

Task 4--Excavation

Before the commencement of each excavation, the backhoe bucket will be decontaminated per EII 5.4, "Field Decontamination of Drilling, Well Equipment, and Sampling Equipment." The decontaminated status of the bucket will be confirmed by a health physics technician.

The excavation will be to a depth sufficient to create a large enough access point in the VCP such that the camera apparatus can be placed correctly inside. At this point, an attempt will be made to secure the material that was used in the joints of the VCP sections. If this material can be secured, a sample will be submitted for analysis to determine its nature. If it is not possible to secure material from a joint, research to establish the possible composition will be conducted, and the composition of the joint will be assumed to be the worst case from this research. Any constituents from this information not on the target analyte list for this activity will be added to the list.

Should operations need to be suspended and continued the following day, provisions previously made by Site Remediation Management, Health Physics, and Environmental Restoration Operations for radiological control will be implemented.

Field screening of excavation materials will be conducted by the Site Safety Officer and Health Physics in order to ensure compliance with the HWOP and the RWP.

Task 5--Camera System Operations

Engineering Surveillance and Systems will provide the camera system and personnel trained to perform the video operations. After placing the camera apparatus inside the VCP, visual characterization, gamma logging, and delineation of the VCP will be conducted.

Field screening activities will continue to be conducted by the Site Safety Officer and Health Physics personnel in order to ensure compliance with the HWOP and RWP.

Task 6--Site Restoration

After camera operations have been satisfactorily completed, the excavation will be refilled. The excavated soils will be replaced in the reverse order of their excavation, and any stabilization requirements will be completed at this time.

Task 7--Correlation

Previous characterization efforts have provided data regarding the surface contamination levels in the surface contamination zone above the VCP and are shown in Figures 4 through 6. Video data with corresponding locations will be matched with the surface contamination data to determine if a correlation exists between any camera-survey detected breaches in the VCP and the surface contamination areas.

Task 8--Soil Sampling

Surface verification of the radiological data presented in Figures 4 through 6 will allow for selection of sample locations of contaminated vegetation and/or soil. At these points, a sample of deep-rooted vegetation will be collected, as well as a soil sample from greater than 1 ft in depth. These samples will be compared with samples collected at depth from near the pipeline to determine whether surface "indicators" can be utilized to detect leaks or breaching in the below-grade pipe system. Only four to eight samples will be required for this effort. In order to reduce laboratory costs, any vegetation samples collected need only be analyzed for radiological and metal constituents as applicable.

For samples collected at depth, a hollow-stem auger will be used to bore to the subsurface sampling zone. Depth to this sampling zone will be dependent upon location along the pipeline route. Samples will be collected based on correlation of camera survey information, surface radiation survey information, and field screening information. This may result in augerings with no

Figure 4. Survey Composite Track Map of 216-U-8.

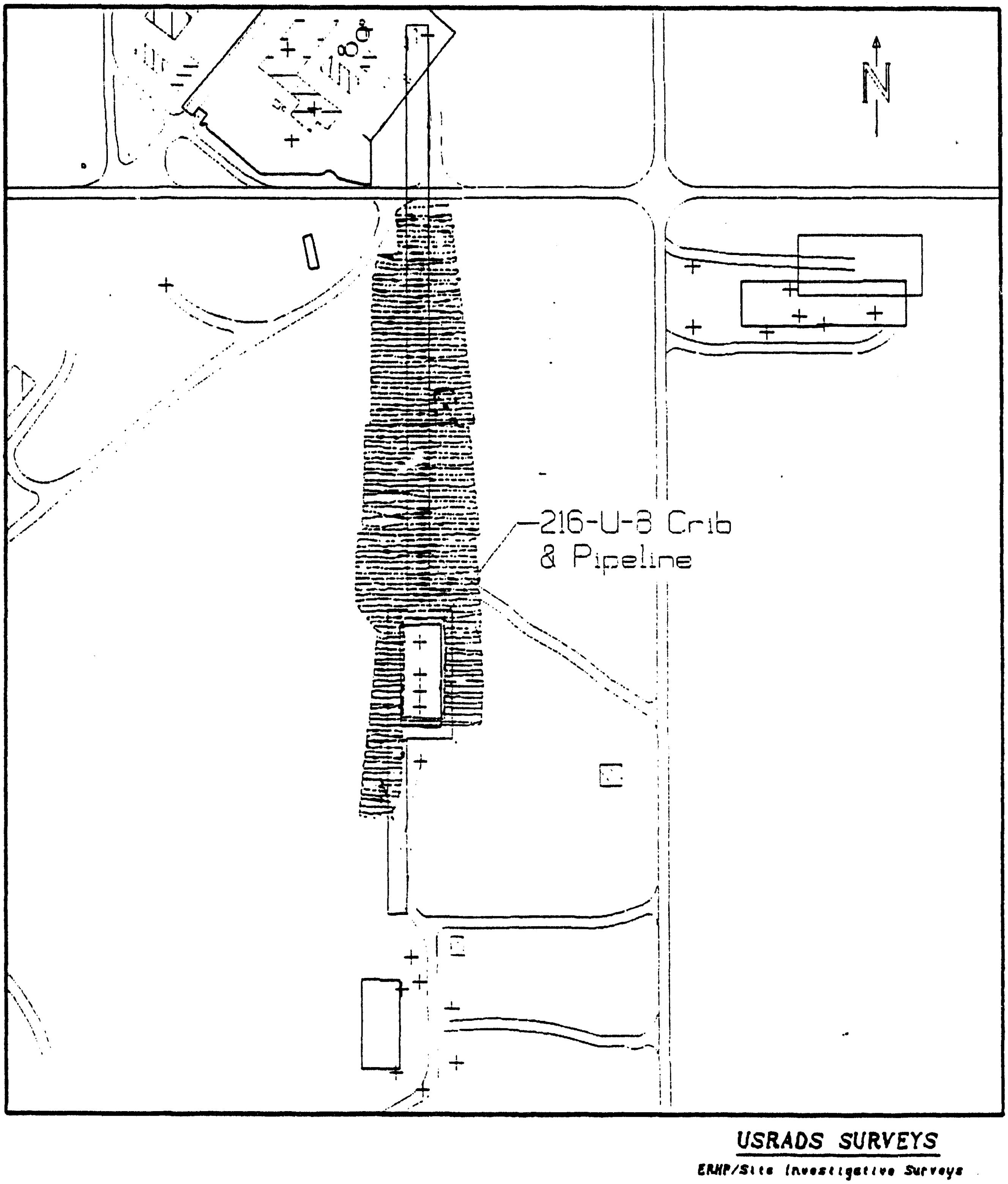


Figure 5. Radiological Contour of U8 Crib and Pipeline.

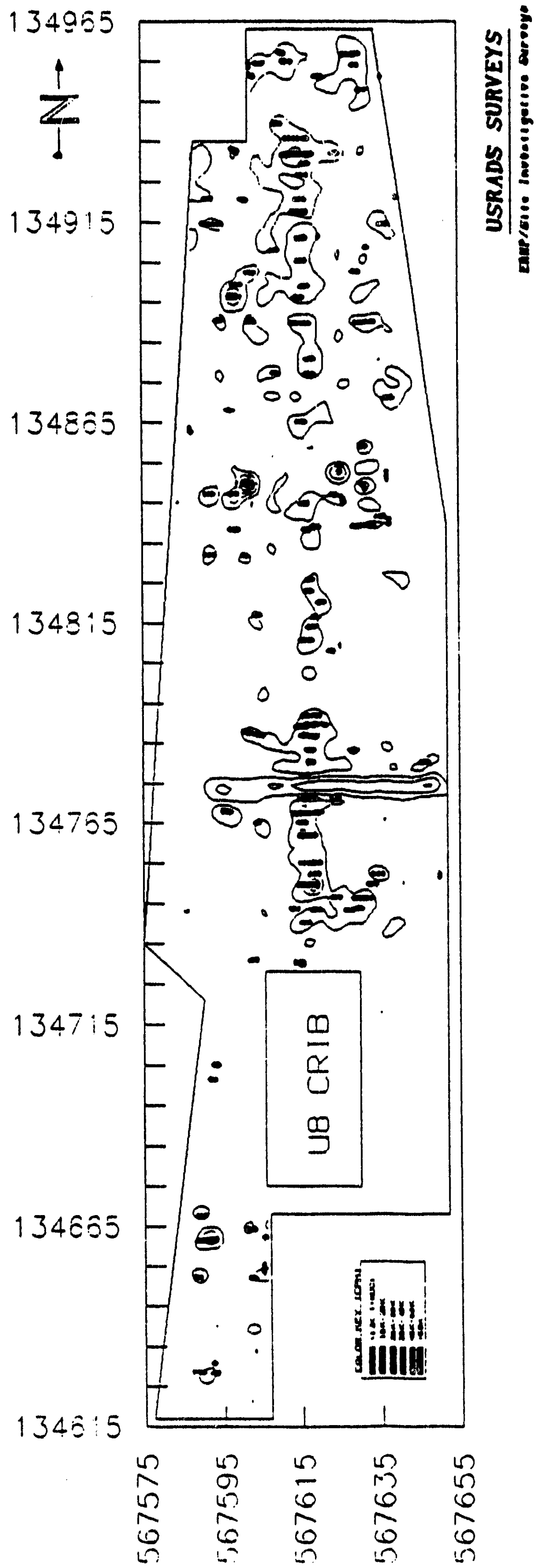
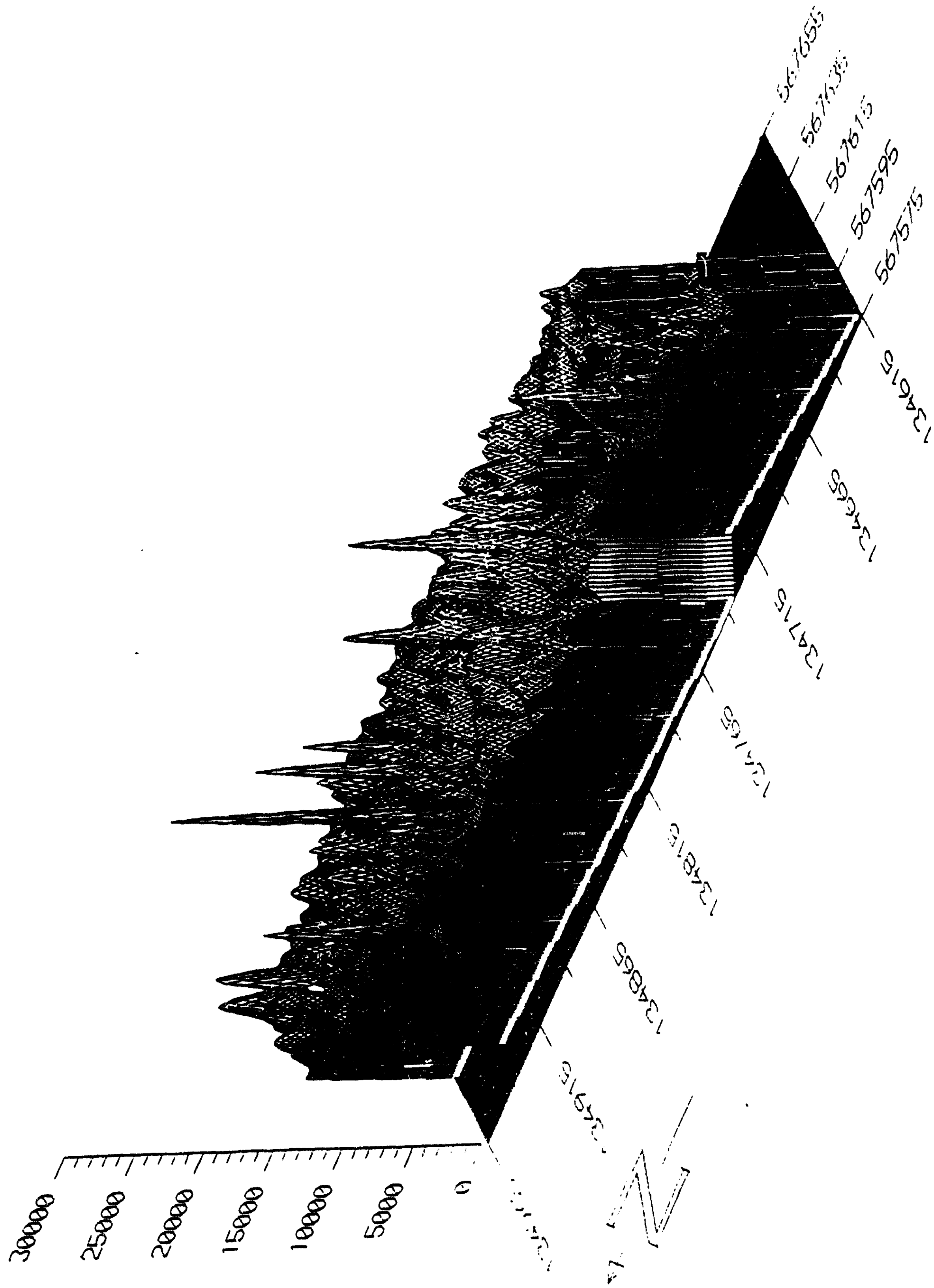


Figure 6. Radiological Profile of U8 Crib and Pipeline.



samples collected. Whether or not to collect a sample at each site will be an FTL decision and will be documented in the field logbook. It is anticipated that roughly 20 samples will be collected for this project. Soil samples will be taken at a depth just around the pipe bed and adjacent to the VCP, remaining as close as reasonably possible to the VCP wall. Samples will be taken with a split-spoon sampler. If the soil to be sampled is too sandy to be sampled with a split spoon, the auger cuttings will be sampled.

Any investigation waste generated by soil-sampling activities will be handled in accordance with the waste control plan that was developed and used for vadose zone borehole activities associated with the 216-U-8 Crib because this VCP is a part of the waste management unit. Backhoe and hollow-stem auger soils will not be considered as investigation waste and will be returned to the point of origin in the approximate order that they were removed from the site.

7.0 LABORATORY ANALYSIS

Samples collected for chemical and radiological analysis will be analyzed for the 200-UP-2 target analytes. The Level IV CLP method will be used at contracted laboratories to test for the presence of specific analytes (EPA 1986) except radionuclides, which will be analyzed using standard methods defined in the laboratory statement of work. If onsite analysis is necessary due to activity levels, Pacific Northwest Laboratory will be the onsite lab and will use their own testing methods for all analytes. Appendix B identifies the complete list of analytes and the general methods utilized for their testing.

8.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

Internal quality control samples shall be collected at each facility by the sampling scientist as specified in the *Quality Assurance Project Plan*, (DOE-RL 1993, Attachment 1) with the revisions as outlined below. The sampling shall be documented in the sampling logbook per EII 1.5, "Field Logbooks," (WHC 1988a).

- Field Duplicate Samples--A minimum of one duplicate per every 20 samples shall be collected. Duplicate samples shall be retrieved from the same sampling location using the same equipment and sampling technique and shall be placed in two sets of identically prepared and preserved containers. All field duplicates shall be analyzed independently to provide an indication of the reproducibility of sampling and/or analysis techniques.

- Split Samples--At the direction of the cognizant engineer, and if a laboratory is designated, split samples shall be collected at the same frequency as duplicate samples.

- Field Blanks--Field blanks shall consist of silica sand transferred into clean sample containers at the site. Field blanks are used as a check on environmental contamination and shall be collected in one of every 20 samples.

- Equipment Blanks--Equipment blanks consist of pure silicon sand that is run through decontaminated sampling equipment and placed in clean sample containers. Equipment blanks are used to verify the adequacy of sampling equipment decontamination procedures and shall be collected at the same frequency as field duplicate samples where applicable.

- VOA Trip Blanks--The VOA trip blanks consist of silica sand added to clean sample containers. These accompany each batch of coolers containing site soils for VOC analysis shipped to the analytical facility. Trip blanks shall be returned unopened to the laboratory and prepared as a check of possible contamination originating from the container preparation methods, shipment, handling, storage, or site conditions. The trip blanks shall be analyzed for volatile organic compounds (the U.S. Environmental Protection Agency's [EPA] target compound list).

9.0 PROPOSED SCHEDULE

TASK	START DATE	ESTIMATED END DATE
Camera Operations	1/24/94	1/31/94
Data Interpretation	2/1/94	2/20/94
Soil Sampling	2/21/94	3/4/94
Laboratory Analysis	3/5/94	7/5/94

10.0 REFERENCES

DOE-RL 1993, *200-UP-2 RCRA Facility Investigation/Corrective Measures Study*, DOE/RL-91-19 Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA 1986, *Test Methods for Evaluating Solid Wastes*, SW-846, Third Edition, U.S. Environmental Protection Agency/Office of Solid Waste and Emergency Response, Washington, D.C.

WHC, 1987, *Industrial Safety Manual*, WHC-CM-4-3, Vols. 1 through 3, Westinghouse Hanford Company, Richland, Washington.

WHC, 1988a, *ALARA Program*, WHC-CM-4-11, Westinghouse Hanford Company, Richland, Washington.

WHC, 1988b, *Engineering and Geotechnology Functions and Procedures*, Rev. 1, WHC-CM-7-8, Westinghouse Hanford Company, Richland, Washington.

WHC, 1988c, *Environmental Compliance Manual*, WHC-CM-7-5, Westinghouse Hanford Company, Richland, Washington.

WHC, 1988d, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

WHC, 1988e, *Radiological Control Manual*, WHC-CM-1-6, Westinghouse Hanford Company, Richland, Washington.

WHC, 1990, *Environmental Engineering, Technology, and Permitting Function Quality Assurance Program Plan*, WHC-EP-0383, Westinghouse Hanford Company, Richland, Washington.

WHC, 1991, *Health Physics Procedures Manual*, WHC-IP-0692, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A

WASTE INFORMATION DATA SYSTEM GENERAL SUMMARY REPORT

Waste Information Data System
General Summary Report
February 27, 1992

SITE NAME: 216-U-8 [309]
ALIASES:
216-WR-1,2,3 Cribs, 216-U-9 [309]

SITE TYPE: Crib [309]
WASTE CATEGORY: Mixed Waste [309]
WASTE TYPE: Liquid [309]

STATUS: Inactive [309] Pre-1980 [309]
START DATE: June 1952 [309]
END DATE: March 1960 [309]

OPERABLE UNIT: 200-UP-2 [329]
O.U. CATEGORY: CERCLA Past Practice [323]
DOE/RL PROGRAM: Radiation Areas Reduction [358]

This site is included in the Tri-Party Agreement Action Plan [329]

PNL Hazardous Ranking System Migration Score: 1.20 [309]

HANFORD AREA: 200 West, U Plant [309]
COORDINATES: N36860 W73100 (center of #2) [309]
LOCATION: 450 ft west of Beloit Avenue and 750 ft south of 16th Street [58]

WASTE VOLUME RECEIVED: 379,000,000.00 liters [612]
CONTAMINATED SOIL VOLUME: 3,900.00 cubic meters [253]
OVERBURDEN SOIL VOLUME: 10,000.00 cubic meters [253]

GROUND ELEVATION: 692.00 feet above MSL [309]
WATER TABLE DEPTH: 227.00 feet below grade [309]

SITE DIMENSIONS (Bottom) [309]: **Length:** 160.00 feet [309]
Width: 50.00 feet [309]
Depth: 31.00 feet [309]

SITE DESCRIPTION: The unit consists of wooden structures, three in series, each structure 16 by 16 by 10 ft. The site is backfilled with 1/2-in. crushed stone to the tops of the wooden structures. There is ~73,000 cu ft of gravel fill [309].

ASSOCIATED STRUCTURES:
Six 4-in. risers, 2 per structure, capped below grade, ~18 ft long;
Three 8-in. SCH 40 steel test wells, 50 ft deep, one per structure, capped, 2 ft above grade;
A 6-in. V.C.P. waste line with acid-proof joints at 12 ft below grade, 140 ft long [395].

SITE NAME: 216-U-8 — **WIDS 2/27/92 Page 2**

WASTE TYPES AND AMOUNTS: The site received process condensate from 221-U [309] and 224-U [58] buildings and the 291-U Stack drainage. The waste is acidic [309].

COMMENTS: When ground settling occurred around the vent risers, the site was deactivated by blanking the pipeline north of the unit. ~75 cu yd of fill dirt were used to fill sink holes at this site. The effluents were rerouted to the 216-U-12 Crib [4]. The ground surface has been stable since August 1975 [58].

SURVEILLANCE INFORMATION [678]

SURVEY DATE: 8/90
SURVEY SCHEDULE: Annual
SITE POSTING: Surface Contamination
CAVEIN POTENTIAL: Yes, only the perimeters were surveyed.

RESULTS/STATUS: No contamination was detected. No change since the 8/88 survey.

ACTION REQUIRED: Continue to monitor for change.

This unit is in compliance with the Environmental Compliance Manual.

WIDS Radionuclide Inventory
March 2, 1992
216-U-8

Isotope data [612] Curies decayed through 12/31/89

^{137}Cs: 4.550e-002 Ci

^{106}Ru: 1.160e-008 Ci

^{90}Sr: 4.310e-002 Ci

Gross Data:

Plutonium:	3.700e+002 g	[260]
Alpha:	2.270e+001 Ci	[612]
Beta:	6.500e-001 Ci	[612]
U-Gross:	8.010e+000 Ci	[612]

3/02/92

Waste Information Data System
Hazardous Chemical Inventory
(In Kilograms)

Site Name: 216-U-8
Operable Unit: 200-UP-2
Bibliography: [315]

INORGANICS

Aluminum Nitrate:		Nitrite:	
Aluminum Fluoride/Nitrate:		Nitric Acid:	200000.00000
Ammonium Carbonate:		Oxalate:	
Ammonium Nitrate:		Phosphate:	
Beryllium:		Potassium:	
Calcium Nitrate:		Potassium Borate:	
Cadmium (II):		Silver (I):	
Chromium (VI):		Sodium:	
Copper (II):		Sodium Aluminate:	
Copper Sulfate:		Sodium Dichromate:	
Ferric Nitrate:		Sodium Hydroxide:	
Ferrocyanide:		Sodium Oxalate:	
Flouride:		Sodium Silicate:	
Lead (II):		Sodium Sulfamate:	
Magnesium Nitrate:		Sulfamic Acid:	
Mercury:		Sulfate:	
Nickel (II):		Sulfuric Acid:	
Nitrate:		Uranium	
		Zinc (II):	

ORGANICS

CCL4:		Normal Paraffin Hydrocarbons:	
BP:		Tributyl Phosphate:	
DBBP:		Tributyl Phosphonate:	
MIBK:		Trichloroethylene:	

Waste Information Data System
General Summary Report
October 15, 1992

SITE NAME: 216-U-12 [58]
ALIASES:
216-U-12 Crib [315]

SITE TYPE: Crib [315]

WASTE CATEGORY: Mixed Waste [315]
WASTE TYPE: Liquid [315]

STATUS: Inactive [349] Post-1980 [306]
START DATE: April 1960 [58]
END DATE: January 31, 1988 [306]

OPERABLE UNIT: 200-UP-2 [329]
O.U. CATEGORY: TSD [323]
TSD NUMBER: D-2-8 [323]
SWMU: Yes [606]
TPA: Yes [329]

The following have been submitted for this site: Part A Permit [308]

HANFORD AREA: 200 West, U Plant [315]
COORDINATES: N36350 W73100 [58]
LOCATION: 2,130 ft south of the 221-U Building and 460 ft north of Beloit Avenue [58]

WASTE VOLUME RECEIVED: 150,000,000.00 liters [612]
CONTAMINATED SOIL VOLUME: 2,200.00 cubic meters [253]
OVERBURDEN SOIL VOLUME: 2,700.00 cubic meters [253]

GROUND ELEVATION: 688.00 feet above MSL [58]
WATER TABLE DEPTH: 223.00 feet below grade [NR]

SITE DIMENSIONS (Bottom) [58]: **Length:** 100.00 feet [58]
Width: 10.00 feet [58]
Depth: 13.00 feet [39]

SITE DESCRIPTION: The bottom is filled with gravel (~9,320 cu ft). A perforated 12-in. V.C.P. pipe is placed horizontally the length of the unit, 10 ft below grade [39].

ASSOCIATED STRUCTURES:
A 6-in.-diameter V.C.P. waste line to the unit;
A 12-in.-diameter V.C.P. riser at the south end, rising from 10 ft below grade to 3 ft above, 13 ft long;
An 8-in.-diameter liquid level gage well, 17 ft long;
An 18-in.-diameter liquid level gage well, 17 ft long [39].

SITE NAME: 216-U-12

WIDS
10/15/92
Page 2

WASTE TYPES AND AMOUNTS: From 4/60 to 5/67, the site received waste from the 291-U-1 Stack drainage [4], 244-WR Vault waste [134], and 224-U process condensate via C-5 Tank [4]. Disposal of contaminated water from 244-WR Vault was accomplished in October 1965 and included 3.14 kg thorium [134]. From 5/67 to 9/72, the site received the above wastes excluding the 244-WR Vault waste and occasional waste via the C-7 Tank in the 244-U Building [4]. From 9/72 to 11/81, the site was taken out of service [386]. Since 11/81, the site has been receiving process condensate (corrosive: typical pH less than 1) from the 224-U Building [254]. In the past, this facility also received miscellaneous storm drain wastes from 224-U Building [386].

COMMENTS: This unit replaced the 216-U-8 disposal site because the 216-U-8 site showed signs of potential cave-in [105]. This unit was replaced by 216-U-17. It was isolated and will not be used again [306]. The Part A Permit Application will be withdrawn [308].

ENVIRONMENTAL MONITORING: Radiological surveys of the surface are performed quarterly [349].

SURVEILLANCE INFORMATION [679]

SURVEY DATE: 9/90
SURVEY SCHEDULE: Semiannual
SITE POSTING: Surface Contamination

RESULTS/STATUS: No contamination detected and no change since the 9/89 survey.

ACTION REQUIRED: Check into posting status change.

This unit is in compliance with the Environmental Compliance Manual.

RADIONUCLIDE INVENTORY

Isotope data [612] — Curies decayed through 12/31/89

^{241}Am:	6.450e-003 Ci	^{3}H:	1.880e-003 Ci	^{106}Ru:	2.180e-006 Ci
^{137}Cs:	5.660e-002 Ci	^{239}Pu:	1.230e-002	^{90}Sr:	5.590e+001 Ci

Gross Data:

Plutonium:	1.000e+000 g	[260]
Alpha:	1.050e-001 Ci	[612]
Beta:	1.120e+002 Ci	[612]
U-Gross:	6.770e-001 Ci	[612]

APPENDIX B

ANALYTICAL METHODS FOR TARGET ANALYTES (SOILS)

Table B-1. Analytical Methods for Target Analytes. (sheet 1 of 4)

Analyte [a]	General Analytical Technique [b]	Soil and Sediment Analysis Method [c]	Container and Volume [d]	Comments
Gross Alpha	Gas proportional	h	f	--
Gross Beta				--
Acetone	Volatile Organic Analysis	CLP-VOAs	Gs 250 ml	--
Carbon Tetrachloride				--
Chloroform				Gs 125 ml Weston
Methylene Chloride				--
MIBK (hexone)				--
1,1,1 Trichloroethane				--
Toluene				--
Americium-243 (NP-239)	Gamma Spectrometry	h	f	Am-243 measured by counting NP-239
Cesium-134				--
Cesium-137 (Ba-137m)				Cs-137 measured by counting Ba-137m
Cobalt-60				--
Europium-152				--
Europium-154				--
Europium-155				--
Potassium-40				--
Ruthenium-106				Ru-106 measured by counting Rh-106
Sodium-22				--
Uranium-235 (PA-231)				For most samples U-235 measured by counting Pa-231
Uranium-234/238 (Pa-234m	Alpha Spectrometry	h	f	For most samples U-234/238 measured by counting Pa-234m

Table B-1. Analytical Methods for Target Analytes. (sheet 2 of 4)

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Container and Volume[f]	Comments
Americium-241	Alpha Spectrometry	h	f	May also use gamma spectrometry
Curium-244				--
Neptunium-237				--
Plutonium-238				--
Plutonium-239/240				--
Uranium-234[d]				--
Uranium-235[d]	Alpha Spectrometry	h	f	--
Uranium-238[d]				--
Iodine-129	Beta Counting[e]	h	f	--
Strontium-90 (Y-90)				Sr-90 measured by counting Y-90
Technetium-99				--
Barium	ICP Analysis	CLP-Metals	g	--
Beryllium				--
Boron				--
Cadmium				--
Chromium				P 500 mL Weston
Copper				--
Iron				
Lead				--
Manganese				--

Table B-1. Analytical Methods for Target Analytes. (sheet 3 of 4)

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Container and Volume[d]	Comments
Nickel	ICP Analysis	CLP-Metals	g	--
Silver				--
Titanium				P 500 ml Weston
Vanadium				--
Zinc				--
Arsenic	GFAA	CLP-Metals	g	--
Selenium	GFAA	CLP-Metals	g	--
Cyanide	Colorimetric	CLP-TAL	G 125 ml	G 250 ml Weston
Tributyl Phosphate	GC	CLP-Semi-VOAs	aG 250 ml	aG 500 ml Weston
Selenium-79	Beta Counting[e]	h	f	--
Samarium-151				--
Zirconium-93				--
Mercury	Atomic Adsorption	CLP-Metals	g	--
Kerosene	GCFID	8015[c]	Gs 125 ml	--
Nitrate	Colorimetric	353.2	P/G 125 ml	--
Nitrite		353.2		--
Additional Analyses for Water Samples Only				
Fluoride	Ion Chromatography	300	P/G 125 ml	--

Table B-1. Analytical Methods for Target Analytes. (sheet 4 of 4)

Analyte[a]	General Analytical Technique[b]	Soil and Sediment Analysis Method[c]	Container and Volume[j]	Comments
Carbon-14	Beta Counting[e]	--	--	Not applicable for soil samples
Tritium		--	--	Not applicable for soil samples

G = Glass; P = Plastic; Gs = Glass septum w/zero headspace; aG = amber Glass
TBD = To Be Determined
M = method modified to include extraction from the solid medium, extraction method is matrix and laboratory-specific
Prescribed Procedures for Measurement of Radioactivity in Drinking Water (EPA 1980a)
Test Methods for Evaluating Solid Waste (SW 846) Third Edition (EPA 1986)
Methods for Chemical Analysis of Water and Waste (EPA 1983)
Radionuclide Method for the Determination of Uranium in Soil and Air (EPA 1980b)
EML Procedures Manual (DOE/EML 1990)
Eastern Environmental Radiation Facility RadioChemistry Procedures Manual (EPA 1984)
High-Resolution Gamma-Ray Spectrometry of Water (ASTM 1985)

[a] In addition to the analytes listed in this table, there are many progeny isotopes whose concentrations may be derived from known parent concentrations. Radionuclides related to U-238 include: Th-230, Bi-210, Bi-214, Po-214, and Po-218. Radionuclides related to U-235 include: Th-231, Tl-207, Pb-211, Pb-214, and Bi-211. Nb-93m is related to Zr-93. Pu-241 concentrations are inferred from Pu-238, Pu-239, and Pu-240. The radionuclides listed in parenthesis under the analyte column are measured as part of the analysis of the adjacent radionuclide.

[b] The analytical techniques are listed in the order that they should be performed. Gross alpha, gross beta, and VOA analyses will always be done first. Gamma Spectrometry will be done next because it generally does not require destruction of any sample. Alpha spectrometry, Sr-90 and Tc-99 analyses will next be done if sufficient sample exists. The next priority is to perform ICP analyses. Approximately 2 lbs (1 kg) of material will be required to perform these primary analyses. If more sample exists, then several additional, secondary analyses may be performed. These are shown on the table below the ICP analysis. In borings, additional drive samples should be collected, if possible, to insure that all analyses can be run.

[c] These analytical methods should be considered examples of possible analytical techniques to use. Individual labs may have other techniques developed for some analytes.

[d] The uranium analyses will be conducted periodically to confirm the uranium concentrations calculated from the Pa-234m or Pa-231 analyses. Two samples from each deep boring and one sample from each test pit or shallow boring will undergo this confirmatory analysis. No uranium analyses will be done on surface soil or sediment samples.

[e] Analytes that will be studied by beta counting are listed in the order that they should be analyzed. For instance, the Sr-90 analysis should be made first, followed by the Tc-99 analysis.

[f] All samples submitted for radionuclide analysis will be placed in a P/G 750 ml bottle.

[g] All samples submitted for CLP-Metals analysis will be placed in a P 250 ml bottle.

[h] Analytical methods for radionuclide analysis are laboratory specific. (Examples of standard methods include ASTM D3549, ASTM D3865, ASTM D3972, ASTM D2334.)

[i] Samples collected for the 200-UP-2 Limited Field Investigation (LFI) activities that require analysis for kerosene will be analyzed at TMA by SW-846 method 8015. Kerosene is not listed in the SW-846 reference procedure as a compound that is included on the target list for 8015, Non-Halogenated Volatile Organics. Through its contract with HWC, TMA has adapted method 8015 to include kerosene as a target compound using its characteristic "fingerprint."

[j] Volumes listed are for TMA except where noted in comment column for split analysis where bottle size differs.

END

DATE
FILMED
3/28/94