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Station # 12

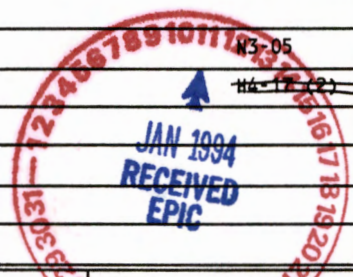
ENGINEERING DATA TRANSMITTAL

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Environmental Engineering 81234	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: ER	6. Cog. Engr.: K. A. Bergstrom	7. Purchase Order No.: N/A
8. Originator Remarks: <i>For approval & release</i>		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: N/A
11. Receiver Remarks:		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date:

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-EN-TI-141		0	Ground Penetrating Radar for Proposed Borehole 299-W11-32 200 West Area	4	1/2	2	

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 (See Impact Level for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1A List	2	Cog. Eng. K. A. Bergstrom	<i>K.A. Bergstrom</i>	6-18-93	G6-50	EDMC (1)			H6-08	3	
1A	2	Cog. Mgr. J. W. Fassett	<i>J.W. Fassett</i>	6-18-93	H6-06	J. H. Jimenez			H3-05	3	
		QA				RA Clearance			H4-12-93	3	
		Safety									
		Env.									
3		Geophysical Files (2)			G6-50						
3		Central Files (2)			L8-04						



18. <i>K.A. Bergstrom</i> K.A. Bergstrom Signature of EDT Originator Date: 6-18-93	19. _____ Authorized Representative Date for Receiving Organization	20. <i>J.W. Fassett</i> J. W. Fassett Cognizant/Project Engineer's Manager Date: 6-18-93	21. DOE APPROVAL (if required) Ltr. No. _____ <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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Date Received: 6/28/93 NS	INFORMATION RELEASE REQUEST	Reference: WHC-CM-3-4
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Complete for all Types of Release		
Purpose <input type="checkbox"/> Speech or Presentation <input type="checkbox"/> Full Paper (Check only one suffix) <input type="checkbox"/> Summary <input type="checkbox"/> Abstract <input type="checkbox"/> Visual Aid <input type="checkbox"/> Speakers Bureau <input type="checkbox"/> Poster Session <input type="checkbox"/> Videotape	<input type="checkbox"/> Reference <input checked="" type="checkbox"/> Technical Report <input type="checkbox"/> Thesis or Dissertation <input type="checkbox"/> Manual <input type="checkbox"/> Brochure/Flier <input type="checkbox"/> Software/Database <input type="checkbox"/> Controlled Document <input type="checkbox"/> Other	ID Number (include revision, volume, etc.) WHC-SD-EN-TI-141, Rev.0 List attachments. Date Release Required <p style="text-align: center;">8/15/93</p>

Title Ground-Penetrating Radar Investigation for Proposed Borehole 299-W11-32, 200 West Area	Unclassified Category UC-	Impact Level 4
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New or novel (patentable) subject matter? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If "Yes", has disclosure been submitted by WHC or other company? <input type="checkbox"/> No <input type="checkbox"/> Yes Disclosure No(s).	Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Identify)
Copyrights? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If "Yes", has written permission been granted? <input type="checkbox"/> No <input type="checkbox"/> Yes (Attach Permission)	Trademarks? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (Identify)

Complete for Speech or Presentation			
Title of Conference or Meeting N/A	Group or Society Sponsoring N/A		
Date(s) of Conference or Meeting	City/State	Will proceedings be published? <input type="checkbox"/> Yes <input type="checkbox"/> No	Will material be handed out? <input type="checkbox"/> Yes <input type="checkbox"/> No

Title of Journal N/A

CHECKLIST FOR SIGNATORIES			
Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval
Classification/Unclassified Controlled Nuclear Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Name (printed)</u> <u>Signature</u> <u>Date</u>
Patent - General Counsel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	J. SW BERGSTRM <i>[Signature]</i> 6/30/93
Legal - General Counsel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Applied Technology/Export Controlled Information or International Program	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
WHC Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Communications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
RL Program/Project	<input checked="" type="checkbox"/>	<input type="checkbox"/>	P. P. [Signature] 12/30/93
Publication Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	L. Hermann <i>[Signature]</i> 1/3/94
Other Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Information conforms to all applicable requirements. The above information is certified to be correct.

References Available to Intended Audience <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Transmit to DOE-HQ/Office of Scientific and Technical Information <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Author/Requestor (Printed/Signature) <u>Date</u> K. A. Bergstrom <i>[Signature]</i> 6-18-93	INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP Stamp is required before release. Release is contingent upon resolution of mandatory comments. <div style="text-align: center;">  </div>
Intended Audience <input type="checkbox"/> Internal <input type="checkbox"/> Sponsor <input checked="" type="checkbox"/> External Responsible Manager (Printed/Signature) <u>Date</u> J. W. Fassett <i>[Signature]</i> 6-18-93	Date Cancelled _____ Date Disapproved _____

SUPPORTING DOCUMENT

1. Total Pages *56*

2. Title

Ground-Penetrating Radar Investigation for North Proposed Borehole 299-W11-32, 200 West Area

3. Number

WHC-SD-EN-TI-141

4. Rev No.

0

5. Key Words

Geophysics

**APPROVED FOR
PUBLIC RELEASE***V. Burkland 1/3/94*

6. Author

Name: K. A. Bergstrom

K. A. Bergstrom
SignatureOrganization/Charge Code
81234/P12EC

7. Abstract

K. A. Bergstrom and T. H. Mitchell, 1993, *Ground-Penetrating Radar Investigation for Proposed Borehole 299-W11-32, 200 West Area*, WHC-SD-EN-TI-141, Rev. 0, Westinghouse Hanford Company, Richland, Washington

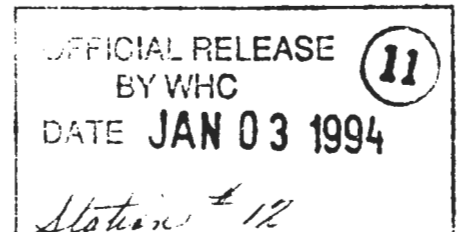
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10.

RELEASE STAMP



9. Impact Level 4

Ground-Penetrating Radar Investigation for Proposed Borehole 299-W11-32 , 200 West Area.

Objective

The objective of the survey was to locate subsurface obstructions that may affect the drilling of proposed borehole, 299-W11-32. The proposed drill site is located between boreholes 299-W11-29 and 299-W11-30 (Figure 1). Based upon the results of the survey, sites within the surveyed area, with the least likelihood of encountering identified obstructions, were identified.

Ground-Penetrating Radar Methodology

The Ground-Penetrating Radar (GPR) system used for this work utilized a 300-megahertz (MHz) antenna to transmit the electromagnetic (EM) energy into the ground. The transmitted energy is reflected back to a receiving antenna where variations in the return signal are recorded. Common reflectors include natural geologic conditions such as bedding, cementation, moisture, and clay, or man-made objects such as pipes, barrels, foundations, and buried wires.

Depth of penetration, which varies from site to site, was 10-12 feet for this survey. The method is limited in depth by transmit power, receiver sensitivity, and attenuation of the transmitted energy. Depth of investigation is also influenced by highly conductive material, such as metal drums, which reflect all the energy back to the receiver. Therefore, the method cannot "see" below such objects.

Display and interpretation of the data are similar to seismic reflection data. In some areas, interpretations can be straight forward, but often unknown parameters within a highly variable subsurface yield complex data.

Data for these surveys were collected with a Geophysical Survey Systems Inc. (GSSI) Subsurface Interface Radar (SIR)[™] System 8, model 4800 and digitally stored on a GSSI DT6000A tape drive. A recording window of 100 nanoseconds, two-way travel time, was used.

[™] A trademark of Geophysical Survey Systems Inc. (GSSI).

Grid Location

The survey boundary is a square, measuring 50 feet by 50 feet, Figure 2. Green stakes mark the corners of the grid. The long axis of the survey strikes approximately north-south. All distances were measured and posted in feet. The southwestern corner of the grid is designated E100/N100 and serves as the "origin" for the survey locations. The letters "N" or "E" refer to a direction that trends generally north or east, respectively. The number refers to a distance in feet. For example, grid point E135/N120 lies 35 feet "east" and 20 feet "north" of grid point E100/N100.

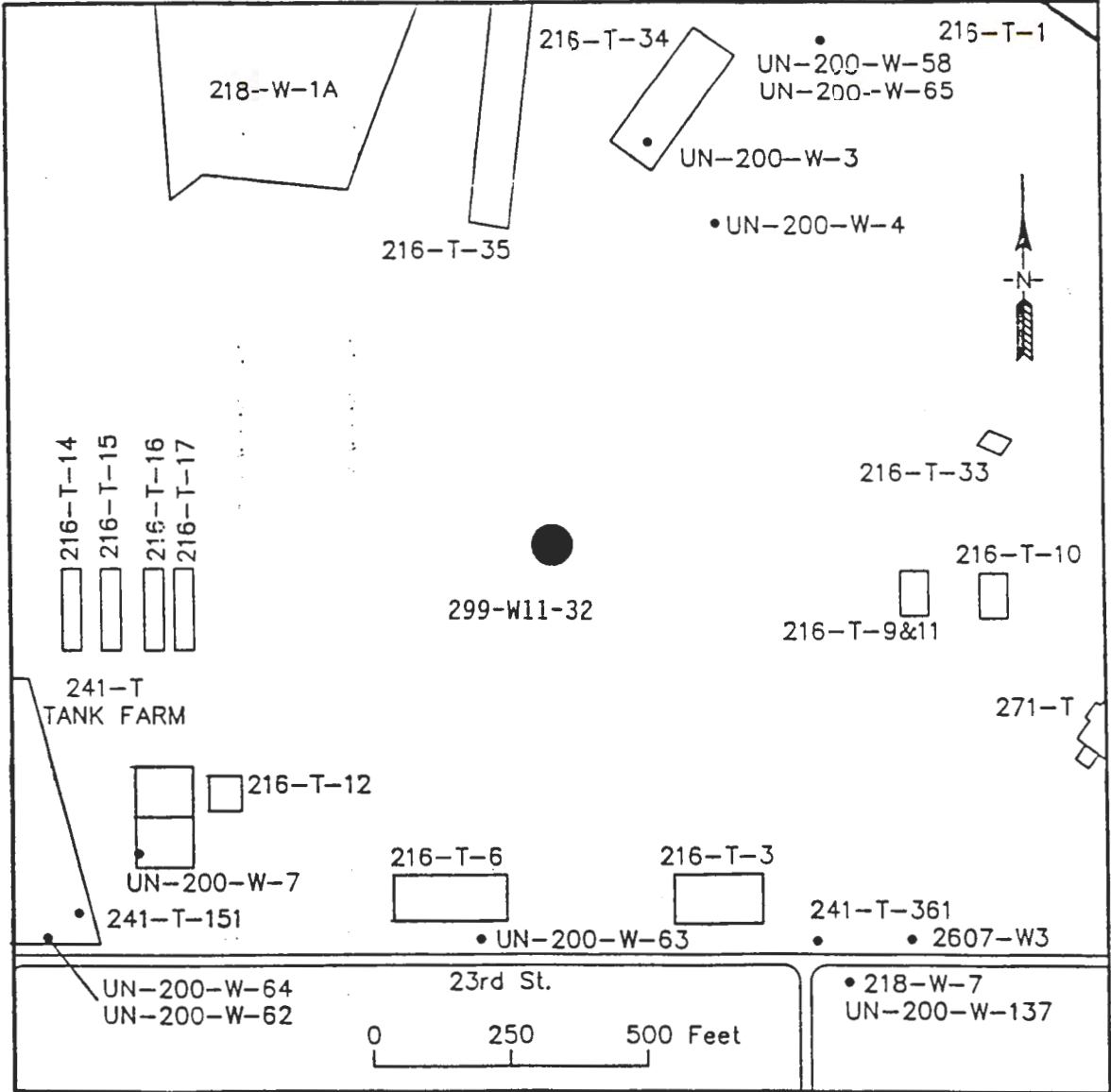
Data were collected along two sets of profiles perpendicular to each other. Spacing between profiles was 5 feet .

Quality Control

These data were collected using procedures in WHC-CM-7-7 EII 11.2, Rev. 3, Environmental Investigations and Site Characterization Manual, Westinghouse Hanford Company. The data and records are stored in the Geophysics files. Figure 3 summarizes survey parameters.

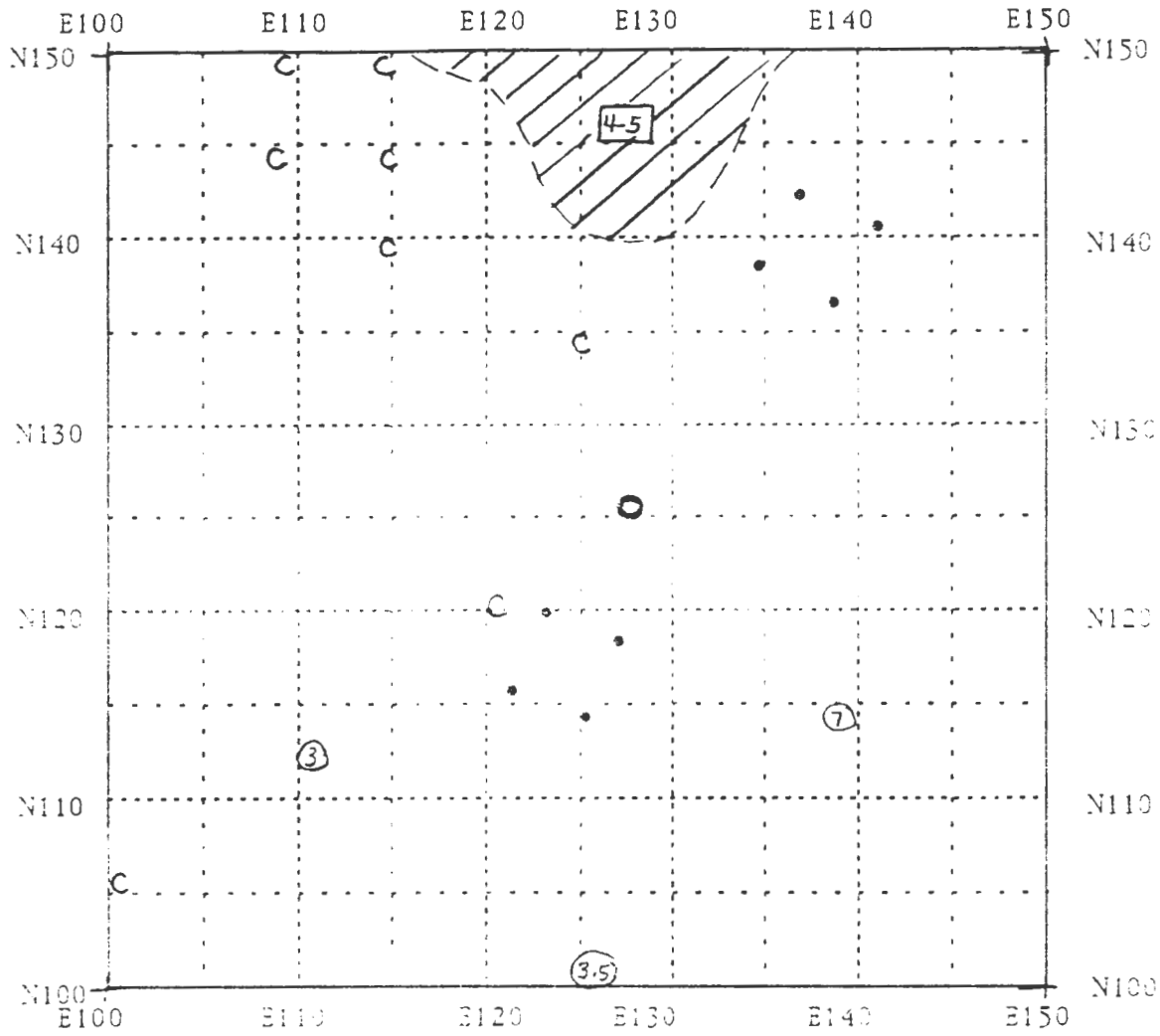
Results

The GPR survey located several isolated anomalies and one substantial disturbed zone (Figure 2). The disturbed zone has the characteristics of buried debris in the range of 4-5 feet below the surface. This zone and other isolated anomalies should be avoided when selecting the drill site. There are no shallow (0-10 feet) anomalous features beneath the staked borehole location at E127/N125.



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Figure 1. Location Map.



⊙	Buried anomaly; depth in feet.
C	Buried anomaly; depth = 1.5 feet
⊘	Disturbed zone 4-5 feet below the surface.
•	Poles surrounding existing boreholes.
○	Proposed borehole location.

N ↑

Questions: Contact surface geophysics @ 6-1747
T.H. Mitchell, K. A. Bergstrom

GPR Survey 299-W11-32
200 West Area

Figure 2 Interpretation Map

GROUND PENETRATING RADAR (GPR) SURVEY

Team Geophysics, Westinghouse Hanford Operations

TITLE: Borehole 299-W11-31, Bioremediation test		DATE: 3-18-93
LOCATION: 200 West Area, West of T plant		
CLIENT: Joe Jimenez	DATA COLLECTED BY K.A. Bergstrom & T.H. Mitchell	
EQUIPMENT USED: GSSI System 8, model 4800 Calibrator Model P731 Digital Tape Recorder DT6000A	ANTENNA(S) USED: 100 ____ 300 <u>XX</u> 100 BISTATIC ____	
	LOG BOOK: EFL 1052	
	TIME WINDOW (NS): 100	
PROCEDURES FOLLOWED: WHC-CM-7-7 EII 11.2, REV. 3		
GRID : <u>50x50'</u> NO. OF PROFILES: <u>22</u> TOTAL FOOTAGE COLLECTED: <u>1100</u>		
PARAMETERS: Two sets of perpendicular profiles; five feet between profiles.		
DATA TAPE NO.: <u>93-9</u> RECORDS LOCATION: <u>Geophysical files</u>		
TAPE ADDRESS : <u>5393-1670</u> CALIBRATION ADDRESS: <u>16029-16700</u>		
INTERPRETED BY : <u>K. A. Bergstrom</u> REVIEWED BY : <u>T.H. Mitchell</u>		
INTERPRETATION DELIVERED TO <u>Joe Jimenez</u> DATE : _____		
OBJECTIVE(S): To check for drilling obstructions.		
NOTES: Antenna pulled by hand at 1-2 mph. 50-meter cable. Pulled on south and east side of survey marks.		