START

149

0026414

FEB 16 1993 (11)

Station #12

ENGINEERING DATA TRANSMITTAL

1. EDT 159247

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Geosciences	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Environmental Division	6. Cog. Engr.: B. A. Williams 1/5/93	7. Purchase Order No.: N/A
8. Originator Remarks: For review and approval of the attached borehole completion data package. Forward comments to D. B. Barnett, H6-06, 2-1284.		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:

A MAR 1993 RECEIVED EDMC

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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-DP-051		0	Borehole Completion Data Package for DOE 216-B-63 Trench, CY 1992	~~3~~ EQ 1/25/93	1	1/4	

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.
1/4	1	Cog.Eng. B. A. Williams H6-06 1/5/93	EDMC (2) H6-08	3	
1/4	1	Cog. Mgr. R. L. Jackson H6-06 1/20/93	Central Files (2) L8-04	3	
1/4	1	QA W. R. Thackaberry H4-16 1-21-93			
		Safety			
		Env.			
1	1	L. C. Swanson 1/5/93 H6-06			

18.	19.	20.	21. DOE APPROVAL (if required) Ltr. No. N/A
D. B. Barnett 1/5/93 Signature of EDT Originator Date	K. R. Fecht 1/21/93 Authorized Representative for Receiving Organization Date	R. L. Jackson 1/20/93 Cognizant/Project Engineer's Manager Date	[] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (07/91) GEF097

BD-7400-172-1 (02/89)

Date Received: 1-22-93

INFORMATION RELEASE REQUEST

Reference: WHC-CM-3-4

Complete for all Types of Release

Purpose

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- [] Full Paper
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[] Speakers Bureau
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[] Software/Database
[] Controlled Document
[] Other

ID Number (include revision, volume, etc.): WHC-SD-EN-DP-051, Rev. 0

List attachments.

Date Release Required: January 25, 1992

Title: Borehole Completion Data Package for the 216-B-63 Trench, CY 1992

Unclassified Category: UC- N/A

Impact Level: 3/Q

New or novel (patentable) subject matter? [X] No [] Yes
If "Yes", has disclosure been submitted by WHC or other company?
[] No [] Yes Disclosure No(s).

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Group or Society Sponsoring:

Date(s) of Conference or Meeting: N/A

City/State: N/A

Will proceedings be published? [] Yes [] No
Will material be handed out? [] Yes [] No

Title of Journal: N/A

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval: Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	[]	[X]			
Patent - General Counsel	[X]	[X]			
Legal - General Counsel	[X]	[X]			
Applied Technology/Export Controlled Information or International Program	[]	[X]			
WHC Program/Project	[]	[X]			
Communications	[]	[X]			
RL Program/Project	[]	[X]			
Publication Services	[X]	[]	L. Hermann	L. Hermann	1/22/93
Other Program/Project	[]	[X]			

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): B. A. Williams

Date

Intended Audience: [] Internal [] Sponsor [X] External

Responsible Manager (Printed/Signature): R. L. Jackson

Date: 1/20/93

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

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

APPROVED FOR RELEASE — OFFICIAL DOCUMENT — NS — Date 1-22-93

Date Cancelled

Date Disapproved

SUPPORTING DOCUMENT

1. Total Pages 146

2. Title	3. Number	4. Rev No.
Borehole Completion Data Package for the 216-B-63 Trench, CY 1992	WHC-SD-EN-DP-051	0

5. Key Words

RCRA, Monitoring wells, 216-B-63 Facility

APPROVED FOR PUBLIC RELEASE
1-22-93 M. Solis

6. Author

Name: B. A. Williams

Signature

Organization/Charge Code 81235/R4GD1

7. Abstract

Wells 299-E27-18 and 299-E27-19 were installed in CY 1992 as RCRA compliant groundwater monitoring wells around the 216-B-63 Trench on the Hanford Site. The data package summarizes the installation activities and includes information and records on drilling, construction, development, sampling, and aquifer testing. An interpretation of the aquifer test results is included in an appendix.

WHC, 1993, *Borehole Completion Data Package for the 216-B-63 Trench, CY 1992*, WHC-SD-EN-DP-051, Rev. 0, prepared by B. N. Bjornstad, Pacific Northwest Laboratory, for Westinghouse Hanford Company, Richland, Washington.

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9. Impact Level 3/Q

10. RELEASE STAMP

OFFICIAL RELEASE BY WHC (11)
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FIGURE:

1. Location Map Showing New (299-E27-18 and 299-E27-19) and Existing Wells within the 216-B-63 Groundwater Monitoring Network 2

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1.0 INTRODUCTION

Two new RCRA groundwater monitoring wells were installed around the 216-B-63 Trench in CY 1992 in support of the Tri-Party Agreement milestone M-24-13. Installation of the new wells took place between May 1992 and July 1992. The addition of the two new wells (299-E27-18 and 299-E27-19) increases the monitoring network to a total of 12 wells; five are upgradient and seven are downgradient of the 216-B-63 Trench.

The 216-B-63 Trench is located in the northeast portion of the 200 East Area on the Hanford Site. The locations of monitoring wells within the 216-B-63 Trench network are shown in Figure 1. Location coordinates and surveyed elevations of the new wells are presented in Appendix A. The groundwater monitoring plan for the 216-B-63 Trench (PNL 1989) describes the hydrogeology of the area. The new wells reported in this document were constructed to the specifications described by WHC (1991) and comply with the Washington Administrative Code (WAC) (Ecology 1992a, 1992b). Well construction, completion, and documentation followed procedures outlined in the *Environmental Investigations and Site Characterization Manual* (WHC 1988).

This document contains new well installation data and documentation of field activities, which include drilling, construction, development, aquifer testing, and permanent pump installation. Geologic descriptions, geophysical logs, and available soil physical and chemical analytical data results are also reported. All data have been validated per procedures outlined by WHC (1988). With the exception of the aquifer testing results, all the data are reported without interpretation.

For each well, the following data and documentation are included in appendices:

- Appendix A -
  - Well Construction Report
  - Well Summary Sheet
  - Borehole Log
  - Gross Gamma Log
  - Results of Radiological Monitoring of Soil Samples
  - Survey Data Report
- Appendix B - Physical/Chemical Data Results
- Appendix C -
  - Well Development Information Checklist
  - Well Development Record
  - Pump Installation Record
  - Well Checklist
- Appendix D -
  - Aquifer Test Summary
  - Equipment Configuration and Well-Head Diagram
  - Development Drawdown and Recovery Data
  - Slug Test Data.

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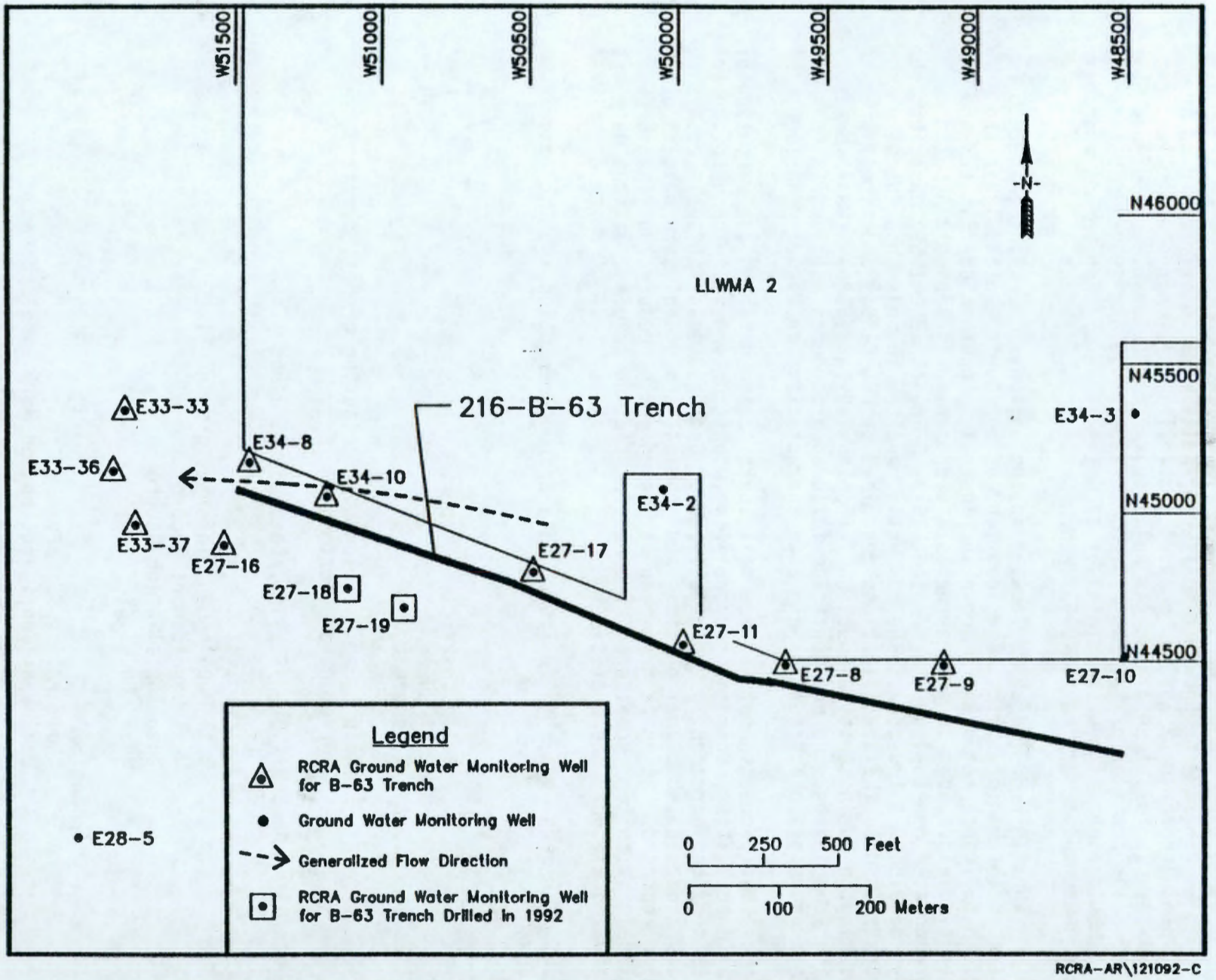

Figure 1. Location Map Showing New and Existing Wells Within the 216-B-63 Groundwater Monitoring Network.

Other records, such as chain-of-custody forms, decontamination records, daily field activity reports, and training records are filed with Westinghouse Hanford Company (WHC).

2.0 WELL 299-E27-18

2.1 DRILLING

Well 299-E27-18 was drilled by Kaiser Engineers Hanford (KEH) using cable-tool drilling equipment. Drilling began on May 11, 1992 and ended on May 21, 1992, at a total depth of 265 ft below land surface (bls) when the top of basalt bedrock was encountered. The static water level, measured on May 27, 1992, was 244.0 ft bls. The well construction report in Appendix A summarizes all the drilling, construction, and surveying activities. The well as-built diagram is included on the Well Summary Sheet (Appendix A).

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The entire borehole was drilled using a drive barrel, except for the lowermost 0.6 ft, where the drillers switched to a button bit to penetrate into the top of basalt. No water was added during drilling of the borehole. During drilling, temporary casing was installed to maintain the open borehole; 12-in. diameter casing was set from the surface to a depth of 46.4 ft bls, 10-in. diameter casing was set from the surface to a depth of 147.7 ft bls, and 8-in. diameter casing was set from the surface to a depth of 264.3 ft bls. A gross gamma geophysical log was run through the temporary casing consecutively after the 10- and 8-in. diameter casing strings were set. Gross gamma logs are included in Appendix A. A straightness test was performed on May 22, 1992.

The geologic section consists of unconsolidated mixtures of silt, sand, and/or gravel; basalt bedrock was encountered at the very bottom of the borehole. Predominant sedimentary facies include silty sandy gravel, silty gravelly sand, and silty sand (see Appendix A, Well Summary Sheet). Detailed lithologic descriptions are documented on the Borehole Log (Appendix A).

Sediment samples were collected at depths of approximately every 5 ft (or more often at distinct lithologic changes) and analyzed in the laboratory for calcium carbonate and moisture content; these results are presented in Appendix B. These same intervals were also screened for radiological contamination and sent to the sediment library for archiving. No sieve data are available from this well. KEH conducted chemical health and safety monitoring during drilling and detected no contamination. WHC Health Physics Technicians (HPT) performed radiological surveys on all samples and drill cuttings with no detections above site background levels (Appendix A).

2.2 WELL COMPLETION

Construction of well 299-E27-18 began on May 26, 1992 and was completed on June 1, 1992. The well was designed as a shallow downgradient groundwater monitoring well with the screen installed to intersect the top of the unconfined aquifer. Approximately 20 ft of 10-slot (0.01 in.) continuous wrap screen was installed from 241.5 to 261.5 ft bls. All permanent casing and

screen is 4-in. diameter, type 304, schedule 5 stainless steel. Stainless steel centralizers were installed every 40 ft for proper alignment of the casing and screen within the borehole. Water level in the screen was 243.9 ft bls, measured on June 1, 1992.

All temporary casings and drilling shoes were removed as fill and annular sealing materials were added. The filter pack consisted of 20 to 40 mesh silica sand added from total depth to 237.1 ft bls. The annular sealant consists of 3/8-in. bentonite pellets from 237.1 to 232.4 ft bls, 8 to 20 mesh bentonite crumbles from 232.4 to 8.6 ft bls, and Portland cement from 8.6 to 2.0 ft bls. A 6-in. diameter stainless steel protective casing with pump base plate, locking well cap (installed over the well casing), and four posts were set into a reinforced-concrete surface pad. The well identification number was stenciled onto the protective casing and one post and engraved into a brass cap placed on the north side of the concrete surface pad.

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2.3 WELL DEVELOPMENT AND PUMP INSTALLATION

Development of 299-E27-18 occurred on July 8, 1992. A temporary submersible pump was used to remove 738. 5 gal of water from the well until the turbidity measured 4.0 NTU. The well development log is included in Appendix C. Water level drawdown and recovery data were measured with a transducer in the well during development and is included in Appendix D. A permanent Hydrostar (trademark of Instrumentation Northwest) sampling pump was installed and tested in 299-E27-18 on July 14, 1992. The pump intake is set at 258.5 ft bls. The pump installation record is included in Appendix C.

2.4 AQUIFER TESTING

A slug injection/withdrawal test was conducted in 299-E27-18 on July 14, 1992, after development. The data and interpretation are included in Appendix D.

3.0 WELL 299-E27-19

3.1 DRILLING

Well 299-E27-19 was drilled by KEH using cable-tool drilling equipment. Drilling began on May 11, 1992 and ended on May 21, 1992, at a total depth of 266.9 ft bls. The static water level, measured on May 22, 1992, was 245.2 ft bls. The well construction report in Appendix A summarizes all the drilling, construction and surveying activities. The well as-built diagram is included on the Well Summary Sheet (Appendix A).

The entire borehole was drilled using a drive barrel, except for the lowermost 11.8 ft (255.0 to 266.8 ft bls), where the drillers switched to the hard-tool method. No water was added during drilling of the borehole. During drilling, temporary casing was installed to maintain the open borehole; 12-in. diameter casing was set from the surface to a depth of 45.0 ft bls, 10-in. diameter casing was set from the surface to a depth of 159.1 ft bls, and 8-in.

diameter casing was set from the surface to a depth of 266.7 ft bls. A gross gamma geophysical log was run through the temporary casing consecutively after the 10- and 8-in. diameter casing strings were set. Gross gamma logs are included in Appendix A. A straightness test was performed on May 21, 1992.

The geologic section consists of unconsolidated mixtures of silt, sand, and/or gravel; basalt bedrock was not encountered in this borehole. Predominant sedimentary facies include sandy gravel, sand, and silty sand (see Well Summary Sheet in Appendix A). Detailed lithologic descriptions are documented on the Borehole Log (Appendix A).

Sediment samples were collected at depths of approximately every 5 ft (or more often at distinct lithologic changes) and analyzed in the laboratory for calcium carbonate and moisture content; these results are presented in Appendix B. These same intervals were also screened for radiological contamination and sent to the sediment library for archiving. No sieve data are available from this well. KEH conducted chemical health and safety monitoring during drilling and detected no contamination. WHC HPT performed radiological surveys on all samples and drill cuttings with no detections above site background levels (Appendix A).

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3.2 WELL COMPLETION

Construction of well 299-E27-19 began on May 26, 1992 and was completed on June 3, 1992. The well was designed as a shallow downgradient groundwater monitoring well with the screen installed to intersect the top of the unconfined aquifer. Approximately 20 ft of 10-slot (0.01 in.) continuous wrap screen was installed from 242.1 to 262.1 ft bls. All permanent casing and screen is 4-in. diameter, type 304, schedule 5 stainless steel. Stainless steel centralizers were installed every 40 ft for proper alignment of the casing and screen within the borehole. Water level in the screen was 244.7 ft bls, measured on June 3, 1992.

All temporary casings and drilling shoes were removed as fill and annular sealing materials were added. The filter pack consisted of 20 to 40 mesh silica sand added from total depth to 236.5 ft bls. The annular sealant consists of 3/8-in. bentonite pellets from 236.5 to 229.5 ft bls, 8 to 20 mesh bentonite crumbles from 229.5 to 8.5 ft bls, and Portland cement from 8.5 to 2.0 ft bls. A 6-in. diameter stainless steel protective casing with pump base plate, locking well cap (installed over the well casing), and four posts were set into a reinforced-concrete surface pad. The well identification number was stenciled onto the protective casing and one post and engraved into a brass cap placed on the north side of the concrete surface pad.

3.3 WELL DEVELOPMENT AND PUMP INSTALLATION

Development of 299-E27-19 occurred on July 8, 1992. A temporary submersible pump was used to remove 886 gal of water from the well until the turbidity measured 1.2 NTU. Water level drawdown and recovery data were measured with a transducer in the well during development and is included in Appendix D. The well development log is included in Appendix C. A permanent Hydrostar sampling pump was installed and tested in 299-E27-19 on July 8, 1992. The pump intake is set at 260.5 ft bls. The pump installation record is included in Appendix C.

3.4 AQUIFER TESTING

A slug injection/withdrawal test was conducted in 299-E27-19 on July 8, 1992, after development. The data and interpretation are included in Appendix D.

4.0 REFERENCES

PNL, 1989, *40CFR265 Interim Status Indicator-Evaluation Groundwater Monitoring Plan for the 216-B-63 Trench*, PNL-6862, Pacific Northwest Laboratory, Richland, Washington.

Ecology, 1992, *Minimum Standards for Construction and Maintenance of Wells*, WAC 173-160, Washington Administrative Code, Washington Department of Ecology, Olympia, Washington.

Ecology, 1992a, *Dangerous Waste Regulations/Solid Waste Handling*, WAC 173-303/304, Washington Administrative Code, Washington Department of Ecology, Olympia, Washington.

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

WHC, 1991, *Generic Specification Groundwater Monitoring Wells*, WHC-S-014, Rev. 6, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX A

DRILLING, CONSTRUCTION, AND SURVEY DATA

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WELL 299-E27-18

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WELL CONSTRUCTION REPORT

VALIDATED SIGNATURE/DATE 11/13/92

pecification No. WHC-S-014 Rev No. ~~6~~ 7

ECNs 166757, 119402, 166752, 172209, 150132, 164223, 127439, 150138, 150137, 150193

Project RCRA W017

Location 200 East 216-B63-Trench

Drilling Company Kaiser Drilling

Driller Darrell Ludtke

Other (Companies) MCE

Geologist(s) Dennis Anderson - WHC
Bret Thompson - MCE
R. S. Edrington - WHC
E.D. RAFUSE - WHC

Well No. 299-E27-18 Temp. Well No. 5

Coordinates 137,119.29 N, 574,299.61 E.

Casing Elev. TOC 650.15 N. Ground Elev. 647.14 Top of Brass cap.

Drilling Method

Verification Method visual observation

Criteria WHC-S-014 5.2, 5.3, 7.5, EII 6.7 Sec 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D 0-264.9	Button Bit H 264.9-265.0	DJA	5/21/92
Drilling Fluid	raw H_2O	N/A	N/A	N/A
Other	Wellguard (2)	see comments	DJA	5/11/92

Geophysical Logging

Sondes	Interval	Date
Gross Gamma	2.3' - 156.2	5/15/92
Gross Gamma	125.0' - 262.2'	5/22/92
	-	
	-	
	-	

Completion Data

Drilled Depth 265.0'

Completed Depth 261.8'

Date Started 5/11/92

Date Completed 7/14/92

Static Water Level/Date 244.0' 5/27/92
243.9 6/1/92

Aquifer Testing

Type Instantaneous Slug test

Flow Meter I D No N/A

Cal Due Date N/A

Length of Test 1 hr.

Volume Pumped N/A

Drawdown N/A

Date of Test 7/8/92 RSE

Completion Results

Cleaning

Verification Method visual inspection + document review

Criteria WHC-S-014 4.2.2, 7.6, 7.7, EII 5.4

	Initials	Date
Drilling Tools/Rig	DJA	5/11/92
Temporary Materials	DJA	5/11/92
Permanent Materials	DJA	5/26/92

Screen

Type	Length	Slot Size
304 stainless steel	20.09'	10 slot
cont wrap Sch 5		

Depth(s) 241.4' - 261.8 w/cap
241.4' - 261.5 wo/cap

Verification Method steel tape measurements

Criteria WHC-S-014 4.2.3, 4.2.5, 12.2.1, 4.2.1

Initials DJA Date 5/26/92

Material Storage/Packing

Verification Method visual observation

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	DJA	5/26/92
Material Packing	DJA	5/26/92

Lubricants/Additives

Verification Method visual observation

Criteria WHC-S-014 7.2

	Identify	Initials	Date
Additives	raw H_2O	N/A	N/A
Lubricants	Well guard	DJA	5/11/92

Straightness Test

Verification Method visual observation

Criteria WHC-S-014 8.2

Initials DJA Date 5/22/92

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299-E27-18

WELL CONSTRUCTION REPORT
(continuation sheet)

VALIDATED
KDR/ 11/13/92
SIGNATURE/DATE

Casing (permanent)

Type	Size	Placement
304 stainless steel Sch 5	4.5" OD	0.0 - 261.8'
		-
		-
		-

Verification Method: Measurement w/ steel tape

Criteria: WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials: DJa Date: 5/26/92

Well Protection

Verification Method: Visual observation

Criteria: WHC-S-014 4.2.10

	Initials	Date
Protective Posts	RJE	7/8/92
Protective Casing	RJE	7/8/92
Site Restored	ECR	10/16/92
Cap, Hasp and Lock	RJE	7/8/92
Surface Pad	RJE	7/8/92

Annular Seal/Filter Pack

Verification Method: measurement w/steel tape Criteria: WHC-S-014 4.2.6, 4.2.7, 4.2.8, 4.2.9

Type	Interval	Volume cuft	Initials	Date
Silica sand 20-40 mesh	262.7' - 237.1'	14.56 (13 sks)	DJa	5/26/92
Bentonite pellets 3/8" no hyd.	237.1' - 232.4'	1.86 (3 bkts)	DJa	5/27/92
Bentonite crumbles 8-20 mesh	232.4' - 8.6'	142 (200 sks)	DJa	6/1/92
Cement grout - Portland I & II	2.0' - 8.6'	15.42 (12 sks)	DJa	6/1/92

Well Survey/Labeling

Verification Method: Review of Survey Report

Criteria: WHC-S-014 3.4, 4.2.10

	Initials	Date
Measurement Point/Surveyed	ECR	10/16/92
Protective Casing/Brass Cap Surveyed	ECR	10/16/92
Well Number Stenciled	ECR	10/16/92
Brass Cap Labeled	RJE	7/8/92

Pump Installation

Verification Method: visual observation

Criteria: WHC-S-014 4.2.11, 4.2.2

	Initials	Date
Pump Decon/Prep	RJE	7/8/92
Installed	RJE	7/8/92
Pump Tested	RJE	7/8/92

Other (initial if performed)

Well Abandonment _____ Downhole TV Inspection MB Complete As-Built Diagram, Driller's/Geologist's Logs

RJE 7/8/92 Well Development

Comments/Remarks

well guard 5/11/92

③ reed tools - 5/11/92

④ reed temp materials - 5/11/92

Reviewed By (Sign/Print Name) Kurt Reynolds / KD Reynolds Date 11/13/92

A-6000-436 (09/90)

WELL SUMMARY SHEET

Boring or Well No. 299-E27-18

Sheet 1 of 2

Location 200 E 216 863 TRENCH

Project RCRA-W017

Elevation 647.14 Top of brass cap.

Drilling Contractor KEH

Driller D. Ludtke

Drilling Method and Equipment CABLE TOOL - B.E. 22W

Prepared By D. Anderson (Sign/Print Name) Date 5/15/92

Reviewed By EDWARD C. KAFUSE (Sign/Print Name) Date 06/04/92

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
Stainless steel casing above surface = 1.2'.		5		silty gravelly SAND
Cement grout 2.0'-8.6'.		10		silty sandy GRAVEL
12" temporary carbon steel casing to 46.35' b/s		15		gravelly SAND
		20		SAND
		25		"
		30		sandy GRAVEL
		35		SAND
Bentonite Crumbles-8.6'-232.4'.		40		gravelly SAND
		45		" "
		50		" "
		55		silty sandy GRAVEL
10" temporary carbon steel casing to 147.69' b/s		60		silty gravelly SAND
		65		silty sandy GRAVEL
		70		silty SAND
		75		" "
		80		" "
		85		" "
		90		" "
		95		" "
8" temporary carbon steel casing to 264.31' b/s		100		" "
		105		" "
		110		" "
		115		" "
		120		silty SAND
		125		" "
		130		" "
		135		" "
		140		" "
		145		silty gravelly SAND
		150		" " "
		155		" " "
		160		" " "
		165		" " "

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A-6000-384 (04/90)

WELL SUMMARY SHEET

Boring or Well No. 299-E27-18

Sheet 2 of 2

Location 200 E 216-863 - TRENCH

Project RCRA - W017

Elevation 647.14 Top of brass cap.

Drilling Contractor KEH

Driller D. Ludtke

Drilling Method and Equipment CABLETOOL - BE 22W

Prepared By Dennis Anderson (Sign/Print Name) Date 5/18/92

Reviewed By EDWARD C. RAFUSE Edward C. Rafuse (Sign/Print Name) Date 06/04/92

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
		170		silty gravelly SAND
				" " "
		175		
8" temporary carbon steel		180		silty SAND "
casing to 269.31' b/s				" "
		185		
		190		silty gravelly SAND
				" " "
		195		
				" " "
		200		
Bentonite Crumbles - 232.4 -				" " "
- 8.6'		205		
		210		silty SAND
		215		silty sandy GRAVEL
				" " "
		220		
				" " "
		225		
				" " "
		230		
Bentonite pellets-237.1'-232.4'		235		" " "
Top of sand pack 237.1'				" " "
		240		
Top of screen 241.4'				" " "
		245		
Static water level-243.9' at 6/1/92				" " "
		250		
				" " "
		255		
				" " "
		260		
Filterpack (20-40) 262.7'-237.1'				
		265		Basalt
304 S.S. screen-10 slot-261.5-241.4'		270		
Bottom of S.S. at 261.8'				
Total depth 262.7 at 5/26/92				
Sluff 262.7 - 265				
Drilled depth 265.0' b/s				

A-6000-384 (04/90)

BOREHOLE LOG

VALIDATED KDR 11/13/92 SIGNATURE/DATE

Boring or Well No. 299-E27-18

Sheet 1 of 14

Location 200 E. 216-B63 | Project RCRA W017

Elevation 647' ground elevation | Drilling Contractor K.E.H.

Driller K.C Olson | Drilling Method and Equipment B.E. 22W

Prepared By Brett Thompson / Brett Thompson (Sign/Print Name) Date 5/12/92 Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 05/22/92

Depth (5')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description (Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl)	Comments (Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level)
	1. HPT 2. Lith 1 CaCO3+ H2O.	DB		Silty Gravelly Sand	5' at 0912 5-11-92
				Silt 3% Gravel 40% Sand 57%	
				Cp 50% Cs 10%	
				mp 20% ms 20%	
				fp 30% fs 70%	Gravel lense at 7'
				Color Dry 2.5y 5/3 lite olive brown	
				wet 5y 4/3 olive	
				Poorly Sorted, Round to Sub angular	
				Mineralogy of sand: 86% Qtz 1%	
10'				mica 8% feldspar 5% undiff volc.	
	1 HPT 2 Lith 1 CaCO3+ H2O	DB		Silty Sandy Gravel	10' at 1025 5-11-92
				silt 5%, Sand 90% Gravel 5%	Carbonate present in
				100% silt, C.S. 15% 100% f.p.	Crystalline lenses.
				M.S. 25%	strong reaction to HCl
				F.S. 60%	
				color is Same as last observation —	increasin sorting.
				or S.L.O. moderate sorting, Angularity	
				s.l.o. Mineralogy is s.l.o. Vigorouse	
				reaction to HCL.	
15'					
	1 HPT 2 Lith 1 CaCO3+ H2O	DB		Gravelly Sand	well sorted gravel
				40% Pebble 60% Sand	lease, silt lense at
				Cp 10% 90% Cs	17' 15' at 1320 5-11-
				mp 15% 9% ms	92
				fp 75% 1% fs	
				Color wet 5y 2.5/1 Black	Note No reaction to HCL
				Dry 5y 4.1 Drk grey	
				moderate sorting, subangular to Sub-	
				round. Mineralogy of sand 15% Qtz 5%	
20'				feldspar 80% Basalt Mineralogy pebbles => 40% undiff volc 60 Basalt	
	1 HPT 2 Lith 1 CaCO3+ H2O	DB		Sand C.S 15%	20' at 1415 "
				M.S 82%	eolean sand.
				F.S 3%	
				Color Dry 2.5y 6/2 grey brown	
				wet 5y 4/1 Drk grey	
				well sorted, Angular to sub angular	
				Minerology 35% qtz 10% feldspar	
				20% undiff volc. 35% Basalt	
				No reaction to HCL	

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BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 2 of 14

Location 200 E, 216, B63 — Project RCRA W017

Elevation 647' ground elevation — Drilling Contractor K.E.H

Driller K.C. Olson — Drilling Method and Equipment B.E. 22W

Prepared By Brett Thompson / Brett Thompson (Sign/Print Name) Date 5/12/92 — Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 05/12/92

Depth (25')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 Lith 1 CaCo3 + H2O	DB		Sand Same as last observed	25' at 1655
					Damp silt, Sand lense
30'	1 HPT 2 Lith 1 CaCo3 + H2O	DB		Sandy Gravell (29-31.5)	30' at 1710
				35% Sand 65% Gravell	
				65% CS mp 20%	
				25% MS fp 80%	
				10% F.S	
				color wet 5y 5/3 olive	
				Dry 5y 7/2 lt/grey moderate	
				sorting, Subround to Subangular	
				Mineralogy 25 qtz 20% undiff rock 30%	
				Basalt 25% feldspar lite reaction to HCL.	
35'	1 HPT 2 Lith 1 CaCo3 + H2O	DB		Sand (31.5 to 40) occasional pebble	35' at 1258 5/12/92
				3% CS	
				95% MS	
				2% FS	
				color Dry 2.5y 6/2 light brown/grey	Fine silt lense at
				wet 5y 4/2 olive grey	37'
				well sorted subround to subangular	
				Mineralogy 60% qtz to 10% feldspar	
				10% Basalt 20% undiff volc. NO	
				Reaction to HCL	
40'	1 HPT 2 Lith 1 CaCo3 + H2O	DB		Gravelly Sand	40' at 1324 5/12/92
				10% Gravell 90% Sand	Coarser Sand and fine
				100% f.p CS. 20%	pebble present.
				MS. 70%	
				F.S 10%	
				Color Dry 2.5y 6/2 lt/brn/grey	
				wet 5y 4.5 olive grey	
				Moderate sorting round to sub-	
				angular Mineralogy 60% qtz 15% feldspar	
				5% Basalt 20% undiff volc NO Reaction HCL	

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BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 3 of 14

Location 200 E 216-B63 | Project RCRA W017

Elevation 647' ground elevation BRT 5-13-92 | Drilling Contractor K.E.H.

Driller ~~K.C. Olson~~ / Darrell Ludke | Drilling Method and Equipment B.E. 22W

Prepared By ~~Brett Thompson~~ / Brett R. Thompson (Sign/Print Name) Date 5/13/92 | Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/13/92

Depth (45')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description (Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.)	Comments (Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level)
	1 HPT 2 Lith 1 CaCO3	DB		Gravelly Sand	45' @ 1650
				40% Gravell 60% Sand	
				3% Cp 70% Cs	Note mineralogy of the
				5% mp. 29% ms	Sand 70% Qtz 5% Basalt
				92% fp. 2% fs	5% undiff volc 10% kspar.
				color 5Y 3/1 Dark Grey wet	
				Dry 5Y 5/2 olive grey	Increased in fine
				Sorting is moderate, Round to	Pebble and coarse
				Sub angular Mineralogy 15% Qtz	Sand.
50'				10% kspar 10% undiff volc 65% Basalt	
	1 HPT 2 Lith 1 CaCO3	DB		Gravelly Sand	50' at 1710 cloudy
				20% Gravell 80% Sand	weather.
				5% mp. cs. 30	
				95% fp. ms. 60.	
				fs. 10	
				color Dry 2.5Y 6/2 light Brownish grey	
				wet 2.5Y 4/2 Dark grey brown	
				Sorting is poor, Subround to Subangular	
				Mineralogy 25% Basalt, 30% Qtz, 25% feldspar	
55'				20% undiff. volc, No reaction to HCL	
	1 HPT 2 Lith 1 CaCO3 - H2O	DB		Silty Sandy Gravell	1045, 60'
				Silt 1% Sand 39% Gravell 60%	
				Silt 1% cs 50% cp 15%	increase in gravell
				ms 45% mp 5%	
				fs 4% fp 80%	
				Color Dry 2.5Y 6/2, wet 5Y 4/1 Dark grey	
				moderate Sorting, Subangular round	
				Mineralogy 25% Qtz, 25% feldspar 25%	
				undiff volc 25% Basalt, moderate	
60'				reaction to HCL	
	1 HPT 2 Lith 1 CaCO3 - H2O	DB		Silty Gravelly Sand	1100, 60'
				2% silt 15% Gravel 83% Sand	
				10% Silt cp 5% cs 80%	increase in Sand
				mp 25% ms 17%	
				fp 20% fs 3%	
				color 2.5Y 6/2 Dry, wet 2.5Y 4/2	
				moderate sorting, Subangular to round	
				Mineralogy 30% Qtz, 25% feldspar	
				25% undiff. volc. 20% Basalt	
				pebbles, light Reaction to HCL	

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BOREHOLE LOG

Boring or Well No. 299 - E27-18

Sheet 4 of 14

Location 200E 216-B63 | Project RCRA W017

Elevation 647' ground elevation | Drilling Contractor K.E.H

Driller Darrell Ludke | Drilling Method and Equipment B.E. 22W

Prepared By Brett Thompson (Sign/Print Name) Date 5/14/92 | Reviewed By Edward C. Rohrer (Sign/Print Name) Date 05/20/92

Depth (65')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 Lith 1 CaCO3/H2O	DB		Silty Sandy Gravel	0812 69' end of
				1% silt 39% Sand 59% Gravel 1%	Gravel
				Cobble 90% C.S. Cp 20%	
				7% M.S. mp 35%	
				2% F.S. 1% S. fp 45%	
				Color wet: 5Y 3/2 Dry olv/grey	
				Dry: 5Y 5/2 olive gray poor sorting	
				Subangular to well rounded mineralogy	
				Sand 86% Qtz 14% Feldspar 3% undiff	
70'				Volc 3% Basalt Light Reaction to HCL	
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sand	0831
				3% silt 57% MS	
				~~38% FS~~ ECD 05/20/92 ~~38% FS~~ 40% F.S	
				Color wet: 2.5Y 4/3 olive brn	
				Dry: 2.5Y 5/4 lt olive brn.	
				Angular to subround well sorted	
				mineralogy 80% Qtz 15% feldspar	
				5% undiff volcanics Light Reaction	
				to HCL	
75'					
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sand	0840 78' silt lense
				79% CS 5% FS	
				15% MS 1% S	
				Color wet: 2.5Y 4/3	
				Dry: 5Y 5/2	
				Angular to sub round moderately sorted	
				Mineralogy 60% Qtz, 20% Feldspar	
				20% undiff volc. ~~Light~~ reaction	
				to HCL Light → E.C.C. 05/20/92	
80'					
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sand	0849 increase in
				86% CS 3% FS	Sand grain size
				10% MS 1% S	
				Color same as last observed.	
				well sorted Angular to Subangular.	
				mineralogy Same as last observation	
				light reaction to HCL	

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BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet ~~6 of 5~~ of 14

Location 200E 216-B63

Project RCRA W017

Elevation 647' ground elevation

Drilling Contractor K.E.H

Driller Darrell Ludke

Drilling Method and Equipment B.E. 22W

Prepared By Brett Thompson (Sign/Print Name) Date 5-14-92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/20/92

Depth (85')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 Lith 1 CaCO3-H2O	DB		Silty Sand Same as the last observation at 80'.	1024, 85' 5/14/92
90'	1 HPT 2 Lith 1 CaCO3-H2O	DB		Silty Sand 2% s 10% cs 40% fs 48% ms color 5y 6/2 dry, wet 5y 5/3 Moderate sorting subround to angular Minerology 80% qtz, 3% Basalt 10% feldspar 7% undiff volc. Reacts lightly to HCL.	1036' 90' 5/14/92 finer sand
95'	1 HPT 2 Lith 1 CaCO3-H2O	DB		Silty Sand 90% cs ~~1.5% fs~~ ECC 10% ms ~~0.5% s~~ 05/22/92 Color 5y 6/2 + 5y 5/3 Lt Brn/gray well sorted Angular to Subround Minerology 80% qtz, 3% Basalt 10% feldspar 7% undiff volc. Reacts litely to HCL	1045, 95' 5/14/92
100'	1 HPT 2 Lith 1 CaCO3-H2O	DB		Silty Sand Same as last observation	1058 100' 5/14/92

BOREHOLE LOG

Boring or Well No. 299-E27-18

BRS 5-21-92 Sheet 6 of 14

Location 200 E 216-B63 Project RCRA W017

Elevation 647' ground elevation Drilling Contractor K.E.H

Driller Darrell Ludke Drilling Method and Equipment B.E. 22W

Prepared By Brett R Thompson / Brett R Thompson (Sign/Print Name) Date 5/14/92 Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 05/20/92

Depth (105')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Calog-H2O 1 HPT	DB		Silty Sand Same as the last observation.	1120 5/14/92
110'	2 Lith 1 HPT 1 CaCO3-H2O	DB		Silty Sand Same as the last observation.	1136 5/14/92
115'	2 Lith 1 HPT 1 CaCO3-H2O	DB		Silty Sand Same as the last observation except for a few sparce fine pebble	sparce fine pebble @ 1340
120'	2 Lith 1 HPT 1 CaCO3-H2O	DB		Silty Sand Same as last observed without the sparce fine pebble	SAMPLE @ 1500

BOREHOLE LOG

Boring or Well No. 299-E27-18
DRT 5-21-92
Sheet 6 7 of 14

Location 200 E216-B63
Project RCRA W017
Elevation ~~Daniel Lu~~ DRT 5-14-92 647' ground elevation
Drilling Contractor N.E.H
Driller Daniel Ludke
Drilling Method and Equipment B.E. 22W
Prepared By Brett Thompson / Brett Thompson (Sign/Print Name) Date 5/14/92
Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 05/20/92

Depth (125')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 CaCo3 Tbc 1 HPT	DB		Silty Sand	slightly finer grained
				40% c.s. 9% fin	Than the last sample
				50% m.s 1% silt	1515
				wet 5Y 5/1 grey	
				Dry 5Y 6/2 lt/olv/grey moderatly	
				sorted, Subangular to angular,	
				Mineralology 70% qtz 20% feldspar	
				5% undif volcanics 5% Basalt	
				lite Reaction to HCL	
130'	2 lith 1 CaCo3 Tbc 1 HPT	DB		Silty Sand	130' at 1520'
				Same as last observation.	
~~135'~~ 135' DRT 5-14-92	2 lith 1 CaCo3 Tbc 1 HPT	DB		Silty Sand	135' at 1528
				Same as last observation	
140'	2 lith 1 CaCo3 Tbc 1 HPT	DB		Silty Sand	a few more larger
				Same as the last observation.	sand grains are present.
					140' at 1554

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BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 8 of 14

Location 200 E 216-B63 | Project RCRA W017

Elevation 647' ground elevation | Drilling Contractor K.E.H

Driller Darrel Ludtke | Drilling Method and Equipment B.E. 22W

Prepared By Bret Thompson (Sign/Print Name) Date 5-15-92 Reviewed By Edward C. Rafuse (Sign/Print Name) Date 5/20/92

Depth (145')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 HPT 1 $CaCO_3$+ H_2O	DB		Silty Gravelly Sand. 1% Silt 25% Gravel 74% Sand; Fp 100%; 80% CS; color 2.5Y 6/1 lt brn/gry; ms 7 15%; fs 7 5; Dry, wet 5Y 4/2 olv/grey. Subround to angular mostly ~~angular~~ sub-angular. Mineralogy: 60% qtz 25% undiff volcanics 15% Basalt. No reaction to HCL	5/15/92 at 145' at 0812 increase in fine pebble. 2/3 of the sand is in the .5 to 1mm range
150'	2 Lith 1 HPT 1 $CaCO_3$+ H_2O	DB		Silty Gravelly Sand. Same as last observed.	5/15/92 at 150' at 0825
155'	2 Lith 1 HPT 1 $CaCO_3$+ H_2O	DB		Silty Gravelly Sand 1% Silt 15% Gravel 84% Sand; 100% fp; 60% V.C.S. 35% 55% C.S. 5% M.S. 5% f.S; color 2.5Y 5/3 lt olive/brn Dry, wet 5Y 4/3 olive grey. Moderate to well sorted sub-round to sub angular. Mineralogy 25% qtz 35% undiff. Vdc 25% feld. spar 15% Basalt. Lite to mod. reation to HCL	5/15/92, 155' at 0948. Cemented, increase in $CaCO_3$ ~~Lite~~ to moderate reaction ~~Sid is~~
160'	2 Lith 1 HPT 1 $CaCO_3$+ H_2O	DB		Silty Gravelly Sand. Same as last observation.	5/15/92 160' at 0958. Less Cemented, Damper. Moisture Content is greater. Mineralogy looks like Ringold gravels at 200W.

A-6000-282 (04/90)

BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 9 of 14

Location 200 E216 - B63

Project RCRA WO17

Elevation 647' ground elevation

Drilling Contractor K.E.H.

Driller Darrel Ludtke

Drilling Method and Equipment B.F. 22W

Prepared By Brett Thompson / Brett Thompson (Sign/Print Name) Date 5/15/92

Reviewed By E.C. Rafuse / E.C. Rafuse (Sign/Print Name) Date 05/21/92

Depth (165')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1. HPT 2. Lith 1. CaCO3 + H2O	DB		Silty Gravelly Sand.	Increase in Carbonate
				1.5% silt, 5% Gravel, 93.5% Sand	mild cementation.
				100% F.P. 70% C.S	165' at 1145. 5-18-92.
				Color: Dry 2.5Y 6/2 Light olive grey 20% M.S	
				Wet 5Y 4/2 10% F.S	
				moderate sorting, subangular to	
				Angular. Mineralogy 45% Basalt	
				5% undifferentiated 15% feldspar 76% Qtz	
				moderate reaction to HCL	
170'	1 HPT 2. Lith. 1 CaCO3 + H2O	DB		Silty Gravelly Sand -	170' at 1300' 5-18-92.
				Same as the last observation.	
175'	1 HPT 2. Lith 1 CaCO3 + H2O	DB		Silty Gravelly Sand - Same as	175' at 1325, 5-18-92.
				the last observation.	Less Cemented than the
					previous Sample.
					177' silty sand appears
					in the core barrel, estimated
					depth.
180'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sand	180' at 1445, 5-18-92
				20% silt 80% F.S.	Rolls up like clay
					strong reaction to HCL
				color wet 5Y 4/2 olive grey	
				Dry 2.5Y 6/2	
				well rounded well sorted round	
				to subround. Mineralogy 96%	
				Qtz, 1% mica, 3% feldspar.	
				moderate to vigorous reaction to	
				HCL.	

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BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 10 of 14

Location 200 E216-B63 | Project RCRA W017

Elevation 647' ground elevation | Drilling Contractor K.E.H

Driller Darrell Ludtke | Drilling Method and Equipment B.E. 22W

Prepared By Brett Thompson (Sign/Print Name) Date 5/19/92 | Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/21/92

Depth (185')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sand.	185' at 0905 5/19/92
187'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sand, Wet color 5Y 4/2 olive grey 60% V.F.S., Dry color 2.5Y 5/2 lt brn grey 40% silt	187' at 0915 5/19/92 Plastic Clay like behavior.
				well sorted well rounded Mineralogy 53% Qtz 5% mica 2% magnitite 40% undiff. clay silt.	188' end of silt zone.
				Moderate to strong reaction to HCL	
190'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Gravelly Sand. 1% Silt 15% Gravell 84% Sand 100% silt, 100% f.p. 60% C.S 35% MS 5% f.S	190' at 0930 5/19/92
				Subangular to angular moderate sorting, mineralogy 5% Basalt 30% undiff volc. 25% feldspar. 40% Qtz	
				NO Reaction to HCL.	
195'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Gravelly Sand. Same as the last observation	195' at 0940 5-19-92
200'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Gravelly Sand 1% silt 20% Gravell 79% Sand 100% silt 5% m.p. CS. 80% 95% f.p. MS. ~~10%~~ 15% (bet 5-21-92) f.S. 5%	200' at 1130' 5-19-92 Increase in fine pebble and medium pebble.
				color wet 5Y 5/3 Dry 2.5Y 5/2 Brn/Gry	
				Moderate sorting Subround subangular.	
				Mineralogy 30% Qtz 35% undiff. volc 25%	
				feldspar 10% Basalt. Lite Reaction to HCL.	

BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 11 of 14

Location 200 E 216-B63

Project RCRA W017

Elevation 677' ground elevation

Drilling Contractor K.E.H

Driller Darrel Ludtke

Drilling Method and Equipment B.E. 22W

Prepared By Scott Thomson/Brett Thompson (Sign/Print Name) Date 5/19/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/21/92

Depth (205')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 Lith 1 Calcs + H20	DB		Silty Gravelly Sand. Same as last observation.	1140' Reach 205' on 5-19-92
210'	1 HPT 2 Lith 1 Calcs + H20	DB		Silty Sand 1% silt 99% fine sand. color 5Y 4/2 olive grey wet, Dry 2.5Y 6/2 lite brownish grey. well sorted rand to subround. mineralogy 2% feldspar 2% Basalt 95 % qtz 1% mica with detectable Magnetite. Moderate reaction to HCL.	1355 at 210' on 5-19-92 Silty Sand well sorted loose.
215'	1 HPT 2 Lith 1 Calcs + H20	DB		Silty Sandy Gravell 1% silt 39% Sand 60% Gravell 100% silt 80% C.S. Cp. 25% 15% M.S. 10% small cobble 5% F.S. M.P. 30% color dry 2.5Y 5/2 F.P. 35% wet 5Y 4/2 poor sorted subround to subangular. mineralogy: 25% qtz, 25% feldspar 5 % Basalt 45% undifferiok. NO Reaction to HCL	1418 at 215' on 5-1992
220'	1 HPT 2 Lith 1 Calcs + H20	DB		Silty Sandy Gravell 3% silt. 32% Sand, 65% Gravell 100% silt 80% C.S. 30% C.P 15% M.S. 35% M.P 5% ~~15%~~ F.S. 35% F.P Color Dry 2.5Y 6/2 lite Brn/gry. wet 5Y 3/2 Dark olive grey mineralogy - Same as last observation poor sorted. round to angular. Moderate reaction to HCL.	220' at 1630' 5-19-92 increase in fine sand and silt.

BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 12 of 14

Location 200 E216 B63 | Project RCRA W017

Elevation 647' ground elevation | Drilling Contractor K.E.H

Driller Darrel Ludtke | Drilling Method and Equipment B.E. 22W

Prepared By Brett Thompson (Sign/Print Name) Date 5/19/92 Reviewed By Edward G. Rafuse (Sign/Print Name) Date 05/22/92

Depth (225')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel	225' at 1332, 5/20/92
				Same as the last observation.	
					Pebbles are sandstone, granit, volcanic & basalt and metamorphic in origin indicating several different source terrians.
230'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel	230' at 1345, 5/20/92
				Same as the last observation.	
235'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel	1632 at 235' 5/20/92
				1% silt, 19% Sand, 80% Gravel	
				100% silt Cs 7% Cp 7% 60	
				Ms 15% Mp 20%	
				Fs 5% Fp 20%	
				Color Dry 5Y 5/2 olive grey	
				wet 5Y 3/2	
				Poorly Sorted subangular to Round.	
				Mineralogy 25% qtz 25% Basalt 50%	
				undiff. volcanics. No Reaction to HCL	
240'	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel Same as above.	240' at 1644 5/20/92

BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 13 of 14

Location 200 E216 B63 | Project RCRA WOIT

Elevation 647' ground elevation | Drilling Contractor K.E.H.

Driller Darrel Lothke | Drilling Method and Equipment B.E. 22W

Prepared By Brett Thorvson (Sign/Print Name) Date 5/22/92 | Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/22/92

Depth (245')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT 2 lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel	245' at 0858 on 5/21/92
				1% silt, 15% Sand, 84% Gravel	large pore spaces.
				100% silt 70% CS 3% S.C.	Angular f.p is from the
				20% ms 57% C.P.	D.B. crushing the cobble
				10% fs 30% M.P	and pebble aggragate.
				color wet 5Y 4/3 olive 10% F.P	
				moderately sorted, round to subangular	
				Mineralogy 25% qtz, 10% Basalt, 65%	
250'				undiff volcanics/metamorphics. NO Reaction to HCL	
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel	250' at 1030 5/21/92
				0.5% silt 8.5% Sand 91% Gravel	Gravels look like Ringold
				48% C.S S.C. 10%	Gravels.
				5% ms C.P. 60%	Gravell is well sorted
				45% fs M.P 10%	Angular pieces are from
				2% silt F.P. 20%	the Drive Barrel crushing
				color wet 5Y 4/3 olive, well rounded	the rock pebbles.
				to subround. Moderate to well sorted.	large pore spaces.
				Mineralogy 25% qtz 20% Basalt 55	NO Reaction to HCL *
255'				% undiff volcanics, plutonics, metamorphics	
	1 HPT 2 Lith 1 CaCO3 + H2O	DB		Silty Sandy Gravel	
				Same as last observation.	255' at 1050 5/21/92
260'		DB		Silty Sandy Gravel	260' at 1330 5/21/92
				Same as the last observation.	

9313091.1551

BOREHOLE LOG

Boring or Well No. 299-E27-18

Sheet 14 of 14

Location 200 E216 B63

Project RCRA W017

Elevation ~~Darrel Ludtke~~ BRO 5/22/92 647' ground elev.

Drilling Contractor K.E.H

Driller Darrel Ludtke

Drilling Method and Equipment B.E. 22W

Prepared By ~~Brett Thompson~~ / Brett Thompson (Sign/Print Name) Date 5/22/92

Reviewed By ~~Edward C. Rogers~~ Edward C. Rogers (Sign/Print Name) Date 05/22/92

Depth 265'	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 HPT	BB		Silty Sand Basalt	265' at 1700' 5/21/92
	2 Lith			1% silt 10% Sand	Sand sized crushed Bas-
	1 Color			100% silt 60% c.s	alt with a Button Bit.
				30% m.s	TOTAL DEPTH 265' on
				10% f.s	Basalt.
				color wet 2.5/1 Black, subround to	
				angular moderate sorting Mineralogy	
				60% Basalt, 15% Qtz 25% undiff.	
				Volcanics.	
				TOTAL DEPTH END OF LOG.	

9313091.1552

A-6000-182 (04/90)

VALIDATED 3pages KDR 11/13/92 SIGNATURE/DATE

ENVIRONMENTAL RESTORATION HEALTH AND SAFETY

Requested by:	Phone No:	Well No. 299-E27-18	Date:

Sample No. (Depth)	Sample Date	Sample Description	Analysis Date	Lab No.	Results Beta/Gamma (pci/g)	Results Alpha (pci/g)
5'	5-12-92	SOIL	5-12-92	0932-92	17	<D
10'	5-12-92		5-12-92	0933-92	14	1
15'	5-12-92		5-12-92	0934-92	10	<D
20'	5-12-92		5-12-92	0935-92	18	<D
25'	5-12-92		5-12-92	0936-92	15	<D
30'	5-12-92		5-12-92	0937-92	17	<D
35'	5-13-92		5-13-92	0942-92	13	<D
40'	5-14-92		5-14-92	0950-92	14	1
45'	5-14-92		5-14-92	0952-92-10	16	1
50'	5-14-92		5-14-92	0953-92-11	18	1
55'	5-14-92		5-14-92	0954-92-12	16	1
60'	5-14-92		5-14-92	0955-92-13	20	1
65'	5-14-92		5-15-92	0976-92-34	17	<D
70'	5-14-92		5-15-92	0977-92-35	19	<D
75'	5-14-92		5-15-92	0978-92-36	16	1
80'	5-14-92		5-15-92	0979-92-37	15	<D
85'	5-14-92		5-15-92	0980-92-38	15	<D
90'	5-14-92		5-15-92	0981-92-39	18	1
95'	5-14-92		5-15-92	0982-92-40	16	1
100'	5-14-92		5-15-92	0983-92-41	16	1
105'	5-18-92		5-18-92	0994-92-5	15	<D
110'	5-18-92		5-18-92	0995-92-6	19	<D
115'	5-18-92		5-18-92	1004-92-15	17	<D

Performed By: C. Allessio Date: 5-18-92

Supervisor Review: [signature] Date: 6/18/92

Page: 1 of 3

9313091.1553

ENVIRONMENTAL RESTORATION HEALTH AND SAFETY

Requested by:			Phone No.	Well No. 299-E27-18		Date:
Sample No. (Depth)	**Sample Date**	**Sample Description**	**Analysis Date**	**Lab No.**	**Results Beta/Gamma (pci/g)**	**Results Alpha (pci/g)**
120'	5-18-92	SOIL	5-18-92	1005-92-16	17	1
125'	5-18-92		5-18-92	1006-92-17	15	<D
130'	5-18-92		5-18-92	1007-92-18	18	<D
135'	5-18-92		5-18-92	1008-92-19	17	1
140'	5-18-92		5-18-92	1009-92-20	14	<D
145'	5-18-92		5-18-92	1010-92-21	15	<D
150'	5-18-92		5-19-92	1011-92-22	12.	<D
155'	5-18-92		5-19-92	1012-92-23	15	<D
160'	5-18-92		5-19-92	1013-92-24	16	2
165'	5-13-92		5-20-92	1060-92-24	10	<D
170'	5-13-92		5-20-92	1061-92-25	23	<D
175'	5-13-92		5-20-92	1062-92-26	21	<D
180'	5-19-92		5-21-92	1074-92-38	15	1
185'	5-19-92		5-21-92	1075-92-39	13	<D
187'	5-19-92		5-21-92	1076-92-40	21	<D
190'	5-19-92		5-21-92	1077-92-41	11	1
195'	5-19-92		5-21-92	1078-92-42	8	<D
200'	5-19-92		5-21-92	1079-92-43	16	<D
205'	5-19-92		5-21-92	1080-92-44	14	<D
210'	5-21-92		5-26-92	1104-92-27	19	2
215'	5-21-92		5-26-92	1105-92-28	13	<D
220'	5-21-92		5-26-92	1106-92-29	20	<D
225'	5-21-92		5-27-92	1114-92-37	15	1

Performed By: [illegible] Date: 5-27-92

Supervisor Review: [illegible] Date: 6/18/92

Page: 2 of 3

9313091.1554

ENVIRONMENTAL RESTORATION HEALTH AND SAFETY

Requested by:	Phone No.	Well No.	Date:
		299-E27-18	

Sample No. (Depth)	Sample Date	Sample Description	Analysis Date	Lab No.	Results Beta/Gamma (pci/g)	Results Alpha (pci/g)
230'	5-21-92	SOIL	5-27-92	1115-92-38	17	1
235'	5-21-92		5-27-92	1116-92-39	13	<D
240'	5-21-92		5-27-92	1117-92-40	12	1
245'	5-21-92		5-27-92	1120-92-43	13	<D
250'	5-21-92		5-27-92	1121-92-44	14	1
255'	5-22-92		5-27-92	1122-92-45	13	1
260'	5-22-92		5-27-92	1137-92-9	12	<D
265'	5-22-92		5-27-92	1138-92-10	15	1

Performed By: C. Albesio Date: 5-27-92

Supervisor Review: [signature] Date: 6/18/92

Page: 3 of 3

A-6000-828 (10/91)

9313091.1555

PROJECT NAME / # RCRA

WELL # 299-E27-18

LOCATION 200 East 216-B63 Trench

WELL DRILLING OPERATIONS	WELL COMPLETION OPERATIONS	WELL DEVELOPMENT ACTIVITIES
START DATE 5-11-92	START DATE 5-26-92	AQUIFER TEST DATE 7-14-92
FINISH DATE 5-21-92	FINISH DATE 6-1-92	
TOTAL DAYS 9	TOTAL DAYS 5	DEVELOPMENT DATE 7-8-92
TOTAL DEPTH 265.0	COMPLETION DEPTH 262.7	
AVERAGE RATE 29.4 ft/Day	SCREENED INTERVAL 241.4 - 261.5	WATER REMOVED (gallons) 738.5
WATER ADDED (gallons) 0	WATER ADDED (gallons) 0	
DATE / DEPTH TO WATER 5-21-92 241.59 5-21-92 244.1 5-22-92 249.2	WATER REMOVED (gallons) 45 gal DATE/DEPTH TO WATER 5-26-92 245.35 6-1-92 243.9	HYDROSTAR PLACEMENT DATE 7-14-92
		DATE / DEPTH TO WATER * 7-8-92
OTHER	OTHER	OTHER * 247.67 Top of casing 244.17 Ground surface

KAISER ENGINEERS HANFORD

SURVEY DATA REPORT

Request No. —|9|2|4|—|2|5|7

Project/W.O. No.

Title: 200E AREA WELL SURVEY

File No. |2|9|9|—| E| 2|7

Job No.: CR9696-31-77-20

Prepared By: M.F. Harrington

Date: 8/12/92

Reviewer: [signature] 1 | 1

DESCRIPTION OF WORK

Horizontal and vertical location of wells 299-E27-18, 299-E27-19.

ACCEPTABILITY (Within Plan Tolerance)

- Yes ☐
- No ☐
- NA ☐
- TBD by Requestor ☐

DISTRIBUTION

Survey File	OR
Field Project File	--
F. Clawson	1
D. Weekes	1
J. Rieger	1

SURVEY RESULTS AND COMMENTS

9313091.1557

WELL NO. WELL NO.	COORDINATES ℄ CASING 200E FEET	WCS83S (METERS)	VERT. DATUM	ELEVATIONS TOP OF BRASS CAP	HYDROSTAR PLATE N. SIDE	TOP OUTER CASING N. SIDE	TOP INNER CASING N. SIDE
299-E27-18	N:44,745.6 W:51,150.0	N:137,119.29 E:574,299.61	NGVD'29 FEET	647.14	650.16	650.15	
299-E27-19	N:44,693.6 W:50,968.2	N:137,103.59 E:574,355.07	NGVD'29 FEET	647.83	650.89	650.88	

KEH-159.1 (6-84)

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Westinghouse Hanford Company | VALIDATED KDR 11/3/92 SIGNATURE/DATE | LOG HEADER | Page 1 of 2

Well No. 299-E27-18 Area 200 East Date 5/15/92

Log Run #1 Log Type Gross Gamma

Elevation Datum top of brass cap Elevation 647.14

Survey Coordinates 137,119.29 N 574,299.61 E

Log Measured From Ground Surface

Location Description B-63 Trench

Ground Surface Elevation 674.14

Surface Temperature NA Weather Overcast - Warm

BOREHOLE INFORMATION

Driller Darrel Ludtke

Drill Rig Type Cable Tool | Bit Type/Diameter Drive Barrel/10"

Borehole Diameter(s)/Depth 12"/46.4 10"/157.0'

Depth Driller 157.0' | Depth Logger 156.2'

Liquid Level NA (none) | Liquid Density NA

Temperature NA

CASING RECORD

Type 12" Carbon Steel Sch. 40 | Interval +0.5' - 46.35'

Type 10" Carbon Steel Sch. 40 | Interval +2.8' - 147.79'

Type | Interval

Type | Interval

Well Screen Interval NA

Comments: Return Error = +0.15' high
Centralizer used.

LOG HEADER

EQUIPMENT DATA

Logging Company: PNL

Operator(s): Alan Pearson

Equipment Brand: MLS

Equipment Type: Analog

Tool Type: Gamma Ray

Serial No.: CG27-A97

Base Calibration Date: 5/91

Calibration Reference: PNL-7785 UC-606

Calibration/Probe Factor: 8.84×10^{-3} cu (rm/c/s)

Day Calibration Datum (eU): Position 1: 297.4 eU

Position 2: 64.3 eU

Dead Time: 11.8 μsec

Warm Up Time: >15 min

LOGGING INFORMATION

Log Interval From: 156.2

To: 2.3'

Rerun(s): 850' to 200'

Pre Survey Verification: Position 1: 302.3 eU Position 2: 63.2 eU Background: 80 c/s

Base Calibration Difference: Position 1: 4.9 eU Position 2: 1.1 eU

Logging Speed: 5 ft./min.

Rerun Scales, CPS/in.: 50 c/s/in

Start Time: 0945

Completion Time: 1130

Chart Speed(s), ft/in.: 10 ft./in.

Chart Recorder Horizontal Scale, CPS/in.: 50 c/s/in.

Time Constant(s): TC-1

Post Survey Verification: Position 1: 297.7 Position 2: 62.1 eU Background: 82 c/s

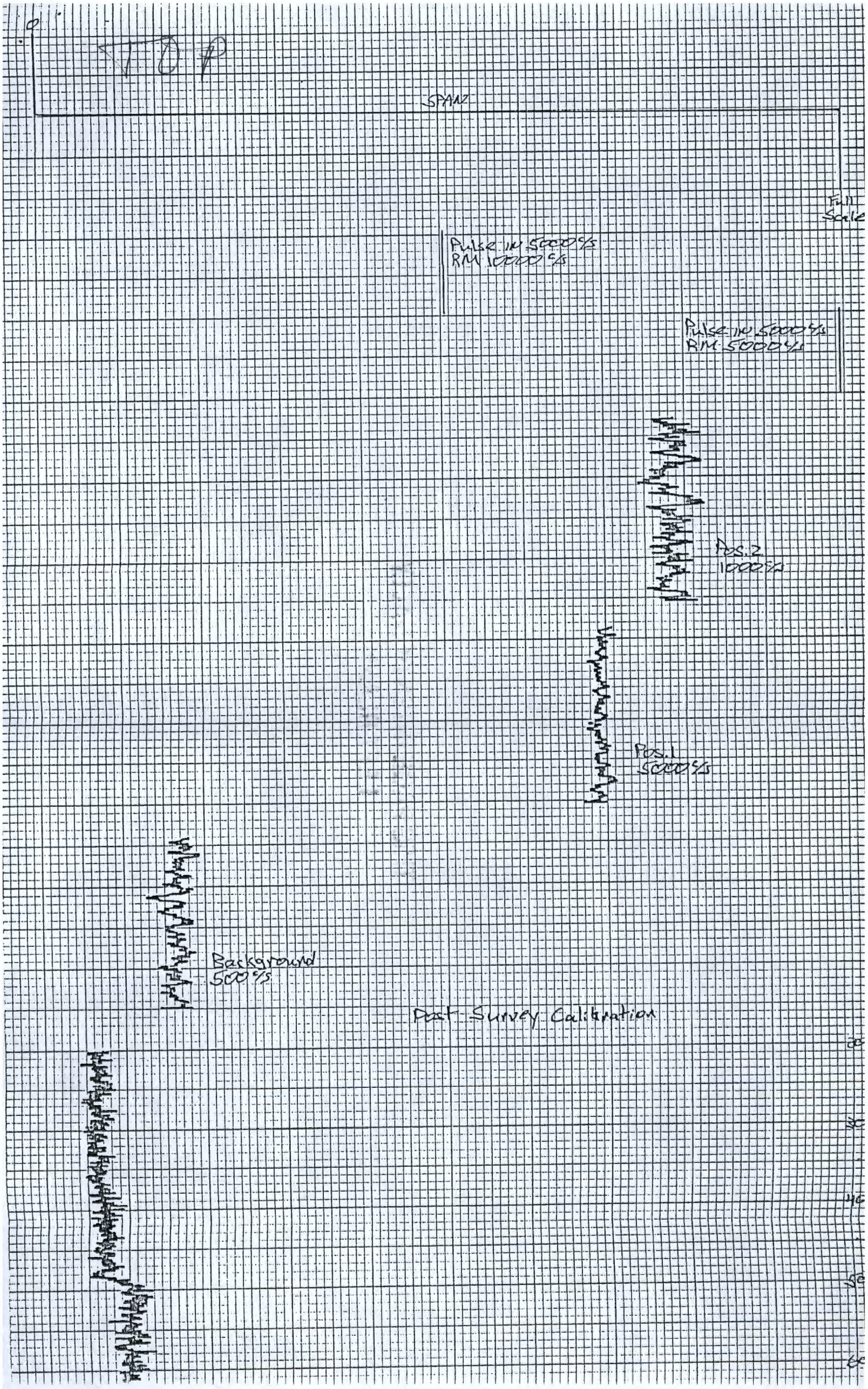
Percent Change: Position 1: 1.5% Position 2: 1.7%

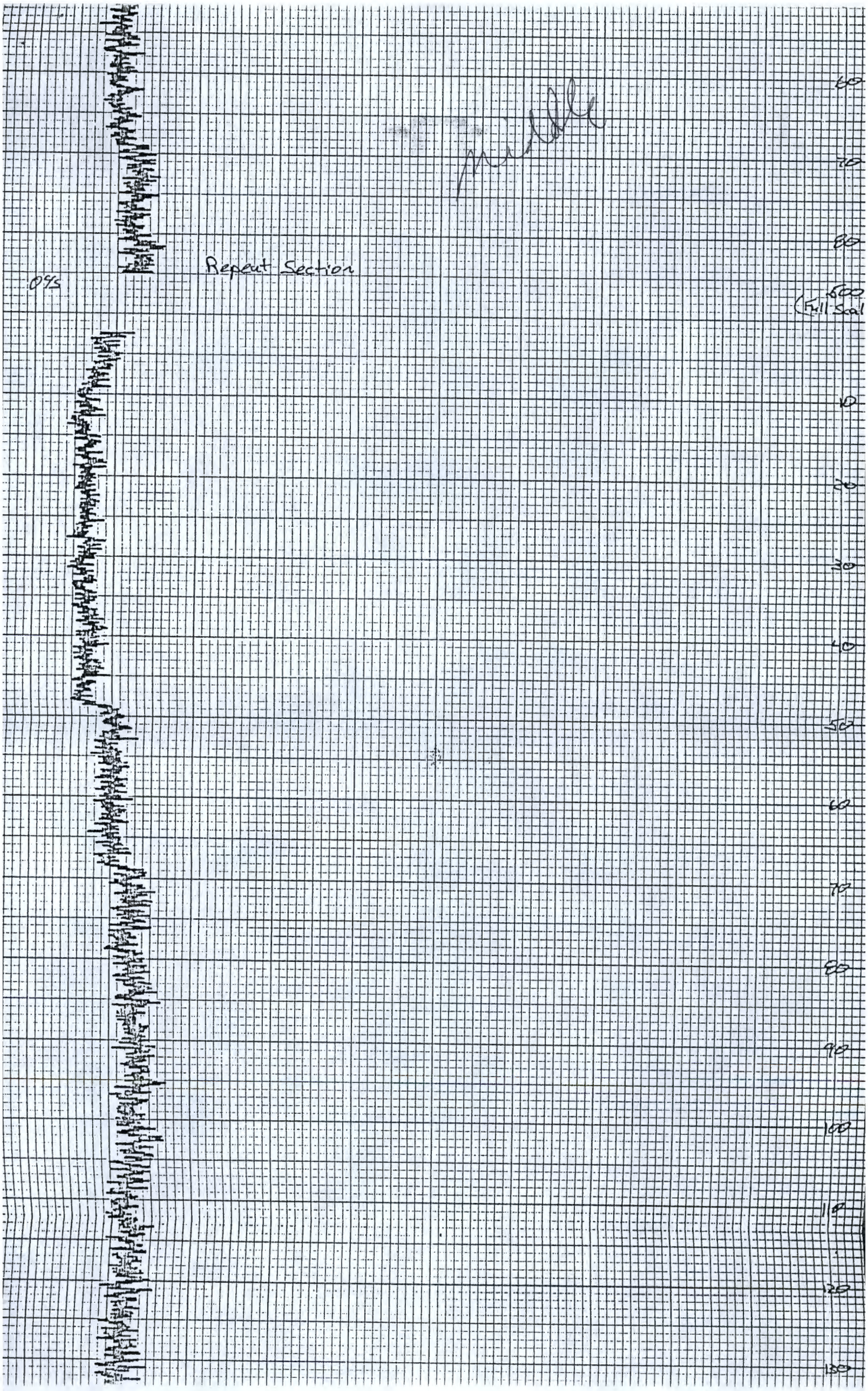
Comments: Return Error = +0.15' hi

Centralizer used.

Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson

Date: 5/15/92


0
SPAN
Full Scale
Pulse IN 5000%
RM 10000%
Pulse IN 5000%
RM 5000%
Pos. 2
10000%
Pos. 1
5000%
Background
500%
Post Survey Calibration
20
30
40
50
60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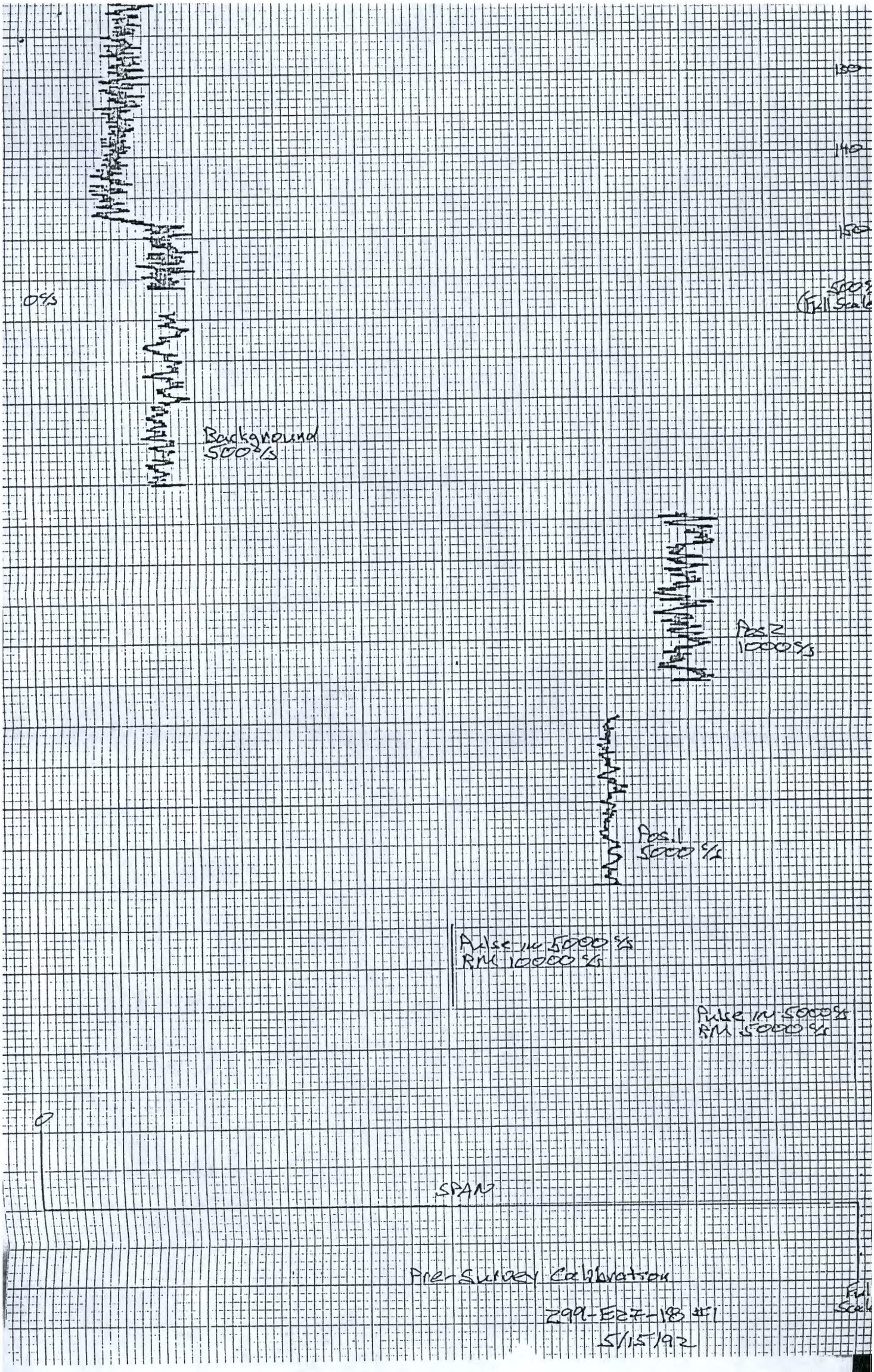
130
140
150
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500°/s
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Background
500°/s
Pos 2
10000°/s
Pos 1
5000°/s
Pulse in 5000°/s
RM 10000°/s
Pulse in 5000°/s
RM 5000°/s
0
SPAN
Pre-Survey Calibration
299-E27-18 #1
5/15/92
Full
Scale

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Westinghouse Hanford Company | VALIDATED KDR 11/13/92 SIGNATURE/DATE | LOG HEADER | Page 1 of 2

Well No. 299-E27-18 Area 200 East Date 5/22/92

Log Run #2 Log Type Gross Gamma

Elevation Datum top of brass cap ~~casing~~ 9/4/92 Elevation 647.14

Survey Coordinates 137,119.29 N 574,299.61 E

Log Measured From Ground Surface

Location Description B-63 Trench

Ground Surface Elevation 674.14

Surface Temperature NA Weather Clear - Warm

BOREHOLE INFORMATION

Driller Darrel Ludtke

Drill Rig Type Cable Tool | Bit Type/Diameter Button Bit / 8"

Borehole Diameter(s)/Depth 12" / 46.4 10" / 147.7' 8" / 265.0'

Depth Driller ~~260.0'~~ 265.0' | Depth Logger 262.2'

Liquid Level 249.2' Not at Static | Liquid ~~Density~~ Appearance

Temperature NA

CASING RECORD

Type 12" Carbon Steel Sch.40 | Interval +0.5 - 46.35'

Type 10" Carbon Steel Sch.40 | Interval +1.0 - 147.69

Type 8" Carbon Steel Sch.40 | Interval 2.7' - 264.31'

Type | Interval

Well Screen Interval NA

Comments: Return Error = +0.2' high

Centralizer used.

A-6000-320 (05/

LOG HEADER

EQUIPMENT DATA

Logging Company: PNL

Operator(s): Alan Pearson

Equipment Brand: MLS

Equipment Type: Analog

Tool Type: Gamma Ray

Serial No.: CG27-A97

Base Calibration Date: 5/91

Calibration Reference: PNL-7785 UC-606

Calibration/Probe Factor: 8.84×10^{-3} eU/cps

Base Calibration Datum (eU): Position 1: 297.4 eU

Position 2: 64.3 eU

Dead Time: 11.8 μsec.

Warm Up Time: >15 min

LOGGING INFORMATION

Log Interval From: 262.2'

To: 125.0'

Rerun(s): 200.0' to 170.0'

Pre Survey Verification: Position 1: 301.4 eU Position 2: 63.2 eU Background: 90 c/s

Base Calibration Difference: Position 1: 4.0 eU Position 2: 1.1 eU

Logging Speed: 5 ft./min.

Rerun Scales, CPS/in.: 50 c/s/in

Start Time: 0915

Completion Time: 1130

Chart Speed(s), f/in.: 10 ft./in.

Chart Recorder Horizontal Scale, CPS/in.: 50 c/s/in.

Time Constant(s): TC-1

Post Survey Verification: Position 1: 303.7 eU Position 2: 63.6 eU Background: 90 c/s

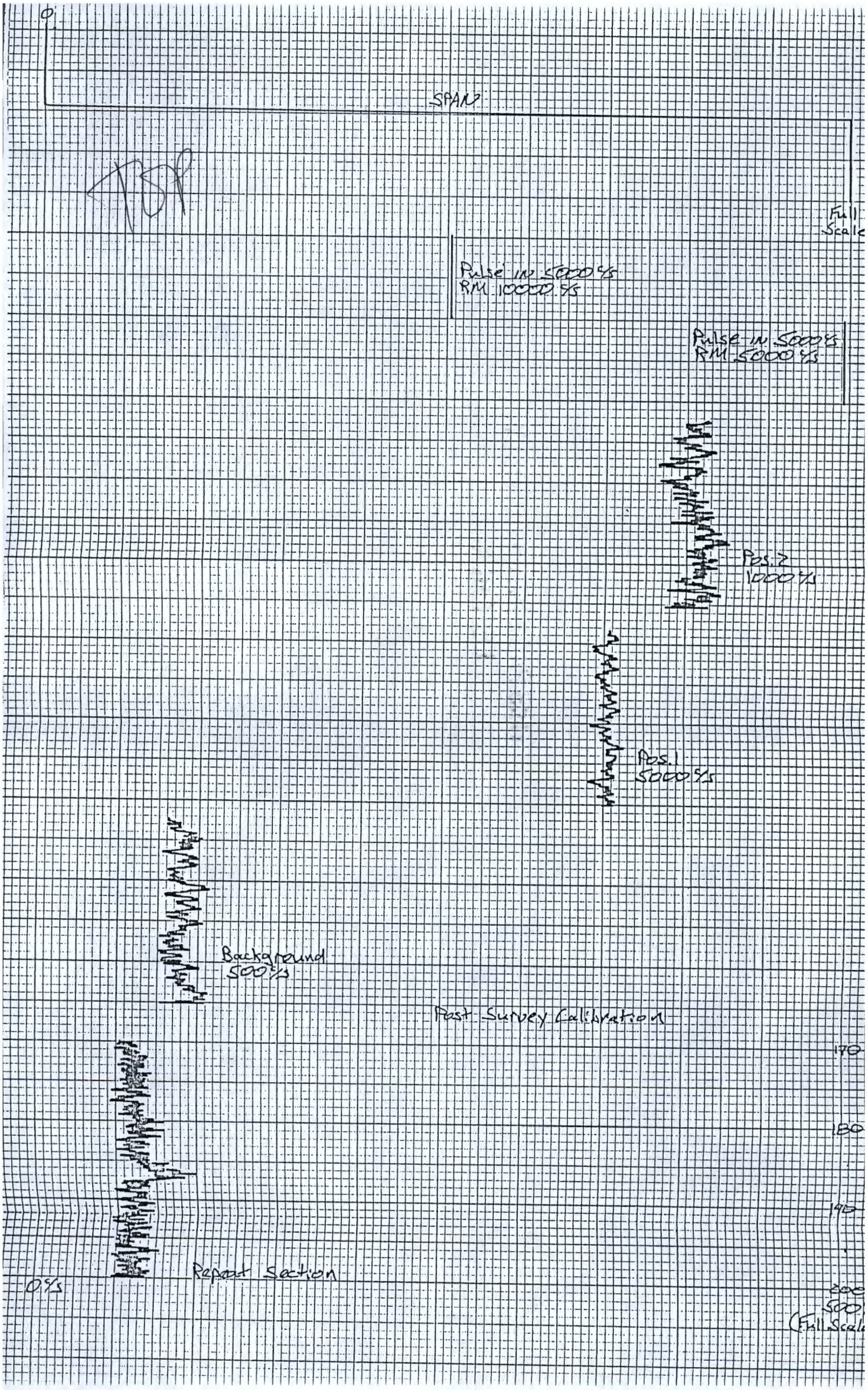
Percent Change: Position 1: 0.8% Position 2: 0.6%

Comments: Return Error = +0.2' high

Centralizer used.

Witnessed and Verified by: (sign and print name) [illegible] Alan Pearson

Date: 5/22/92


SPAN
Full Scale
Pulse IN 5000 %
RM 10000 %
Pulse IN 5000 %
RM 5000 %
Pos. 2
1000 %
Pos. 1
5000 %
Background
500 %
Post Survey Calibration
170
180
190
Report Section
0 %
200
500
(Full Scale

500
(Full Scale)
130
140
150
160
170
180
190
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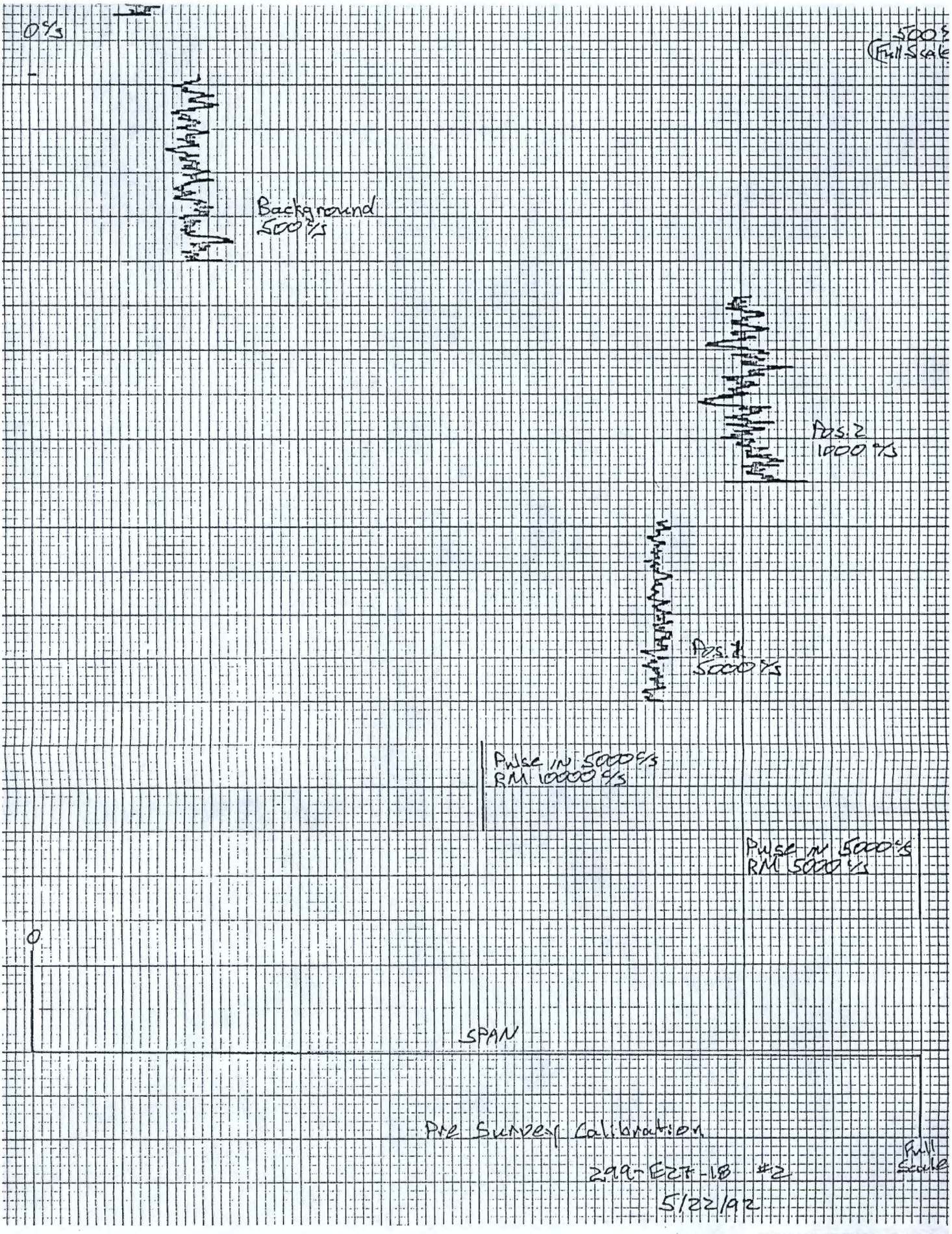
250
260
0%
500
(Full Scale)


0 °/s
500 °/s
Full Scale
Background
500 °/s
Pos. 2
1000 °/s
Pos. 1
5000 °/s
Pulse in 5000 °/s
RM 10000 °/s
Pulse in 5000 °/s
RM 5000 °/s
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SPAN
Pre Survey Calibration
299-E27-18 #2
5/22/92
Full Scale

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WELL 299-E27-19

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WELL CONSTRUCTION REPORT

VALIDATED
KDR 11/13/92
SIGNATURE/DATE

Specification No. WHC-S-014 Rev No. ~~6~~ 7 (KDR 6/14/92)

ECNs 150137, 150138, 127439, 169223, 166757, 150132, 172209, 166752, 119402, 150143

Project RCRA - W017

Location 200 East 216-B-63 Trench

Drilling Company KEH

Driller L. Watkins

Other (Companies) WHC, Ebasco, MCE

Geologist(s) Nancy Ballantyne - Ebasco; RS Edrington WHC
Dennis Anderson - WHC
Ken Lane / Bret Thompson - MCE
Keith J. Swett Ed RAFUSE WHC

Well No. 299-E27-19 Temp. Well No. 6

Coordinates N: 137,103.59 E: 574,355.07

Casing Elev. 650.89 Ground Elev. 647.83

Drilling Method

Verification Method Visual observation

Criteria WHC-S-014 5.2, 5.3, 7.5 EII 6.7 Sec 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D 0-255	H 255-266.8'	DA	5/22/92
Drilling Fluid	N/A	N/A	N/A	N/A
Other (3)	Wellguard (2)	NB	DA	5/11/92

Geophysical Logging

Sondes	Interval	Date
gross gamma	162.1 - 3.5'	5/15/92
gross gamma	266.0' - 13.0	5/22/92
	-	
	-	
	-	

Completion Data

Drilled Depth 266.8' b/s 5/22/92

Completed Depth 262.4'

Date Started 5/11/92

Date Completed 7/8/92 (1)

Static Water Level/Date 245.2' 5/22/92
244.7' 6/3/92

Aquifer Testing

Type Instantaneous Slug test

Flow Meter I.D. No N/A

Cal Due Date N/A

Length of Test 1 hr.

Volume Pumped N/A

Drawdown N/A

Date of Test 7/8/92

Completion Results

Cleaning

Verification Method Visual inspection + document review

Criteria WHC-S-014 4.2.2, 7.6, 7.7 EII 5.4
WHC-CM-7-7-5.4

	Initials	Date
Drilling Tools/Rig	NB	5/11/92
Temporary Materials	NB	5/11/92
Permanent Materials	DJA	6/1/92

Screen

Type	Length	Slot Size
Stainless 304 Sch 5	20.08'	10 slot

Depth(s) 242.05 - 262.4 w/cap
242.05 - 262.13 w/cap

Verification Method steel tape measurements

Criteria WHC-S-014 4.2.3, 4.2.5, 12.2.1, 4.2.1

Initials DJA Date 5/26/92

Material Storage/Packing

Verification Method visual observation

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	DA	5/27/92
Material Packing	DA	5/27/92

Lubricants/Additives

Verification Method visual observation

Criteria WHC-S-014 7.2

	Identify	Initials	Date
Additives	N/A	N/A	N/A
Lubricants	Well guard	NB	5/11/92

Straightness Test

Verification Method visual observation

Criteria WHC-S-014 8.2

Initials DJA Date 5/21/92

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A-6000-436 (09/90)

p. 2 of 4.

WELL CONSTRUCTION REPORT
(continuation sheet) 299-E27-19

Casing (permanent)

Type	Size	Placement
Stainless 304, Sch 5	4"	0 - 262.4
		-
		-
		-

Verification Method: measurement w/steel tape

Criteria: WHC-S-014. 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials: DGA Date: 6/3/92

Well Protection

Verification Method: Visual inspection w/tape

Criteria: WHC-S-014 4.2.10

	Initials	Date
Protective Posts	RJE	7/8/92
Protective Casing	RJE	7/8/92
Site Restored	EGL	10/16/92
Cap, Hasp and Lock	RJE	7/8/92
Surface Pad	RJE	7/8/92

Annular Seal/Filter Pack

Verification Method: measurement w/steel tape Criteria: WHC-S-014 4.2.6, 4.2.7, 4.2.8, 4.2.9

Type	Interval	Volume	Initials	Date
Cement grout Type I & II	2.0 - 8.5	15.4 cuft	DGA	6/3/92
Bentonite crumbles 8-20 msh 190 sks	8.5 - 229.5	134.9 cuft	DGA	6/3/92
Bentonite pellets 3/8" Non-hyd 4 buckets	229.5 - 236.5	2.4 cuft.	DGA	6/1/92
Silica sand 20-40 11 3/4 bags	236.5 - 266.7	13.2 cuft	DGA	6/1/92

Well Survey/Labeling

Verification Method: Review of survey report

Criteria: WHC-S-014

	Initials	Date
Measurement Point/Surveyed	KJS	8-31-92
Protective Casing/Brass Cap Surveyed	KJS	8-31-92
Well Number Stenciled	KJS	8-31-92
Brass Cap Labeled	RJE	7/8/92

Pump Installation

Verification Method: Visual observation

Criteria: WHC-S-014 4.2.11, 4.2.3

	Initials	Date
Pump Decon/Prep	RJE	7/8/92
Installed	RJE	7/8/92
Pump Tested	RJE	7/8/92

Other (initial if performed)

NA Well Abandonment NA Downhole TV Inspection KJS Complete As-Built Diagram, Driller's/Geologist's Logs

RJE 7/8/92 Well Development

Comments/Remarks: ③ Well guard: 5/11/92, 5/18/92, 5/19/92, 5/20/92

① SAMPLE READY ② No water used

Reviewed By (Sign/Print Name): Kent D Reynolds Date: 11/23/92

A-6000-436 (09/90)

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WELL SUMMARY SHEET

Boring or Well No. 299-E27-19

Sheet 1 of 2

Location 200E/216-B-63 Trench

Project RCRA/W017

Elevation 648' (ground surface)

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool-Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/12/02

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 06/04/92

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
12" ϕ temporary carbon steel casing set at 45.03' bls				silty, sandy GRAVEL
		10		sandy SILT
				SAND
cement grout 2'-8.5'				"
		20		"
		30		silty, sandy GRAVEL
				silty SAND
		40		"
				"
		45.03'		"
		50		" 54'-SILT
		60		sandy GRAVEL
				"
		70		SAND 69'-SILT
				"
10" ϕ temporary carbon steel casing set at 159.05' bls		80		"
				"
		90		"
				"
		100		" 97'-GRAVEL
				"
		110		"
				"
		120		"
				"
		130		"
				"
		140		"
				"
		150		sandy GRAVEL
		159.05' 160		SAND
				silty SAND

A-6000-384 (04/90)

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WELL SUMMARY SHEET

Boring or Well No. 299-E27-19

Sheet 2 of 2

Location 200E / 216-B-63 Trench

Project RCRA - W017

Elevation 648' (ground surface).

Drilling Contractor KEH

Driller L. WATKINS

Drilling Method and Equipment Cabletool - Well MASTER

Prepared By [signature] (Sign/Print Name) Date 5/19/92

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 06/04/92

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
		170		SILT
8" temporary carbon steel		175		SAND
casing to 266.7' b/s		180		"
		185		"
		190		"
		195		"
		200		"
		205		"
		210		" very fine grained 213' b/s silt gravel
Bentonite crumbles 8.5' - 229.5'		215		silty sandy GRAVEL
Bentonite Pellets 229.5'-236.5'		220		sandy GRAVEL
		225		" "
top of bentonite pellets @ 229.5'		230		" "
top of sand pack @ 236.5'		235		" "
top of SS Screen @ 242.05'		240		sandy GRAVEL
SWL @ 244.7' b/s 6/3/92	244.7'	245		" "
		250		" "
Sand pack - 20-40 236.5-266.7'		255		" "
		260		slightly silty gravelly SAND
		265		" " " "
Bottom of SS casing @ 262.4'		270		
Bottom of screen @ 262.13'				
Bottom of borehole @ 266.8'				
Slurff 266.7-266.8				
permanent SS casing - 0'-262.4' b/s				
Sch 5 - Type 304 242.05'-262.13'				
10 slot screen				
Screen is SS304 - Sch 5,				
10 slot 242.05'- 262.13'				

A-6000-384 (04/90)

BOREHOLE LOG

VALIDATED 14 KDR 11/13/92 SIGNATURE/DATE

Boring or Well No. 299-E27-19

Sheet 1 of 14

Location 200 East, B-63 Ditch

Project RCRA WO17

Elevation 647.83' Top of Brass Cap

Drilling Contractor Kaiser Engineers Hanford

Driller Louis Watkins

Drilling Method and Equipment Cable Tool - Wellmaster

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/11/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 5/13/92

Depth (0')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	No SAMPLE	D.B.		Sandy GRAVEL - visual observation	
5'	2Lith 1Rad 1moist/ $CaCO_3$	D.B.		5' - silty, sandy GRAVEL 40% GRAVEL (20% vf to m pebbles, 10% c to vc pebbles, 10% > s.cobbles) 35% SAND (15% vf sand, 10% f sand to m sand, 10% > c. sand), 25% SILT. Unconsolidated, moist, v. reactive to 10% HCl. GRAVELS - mostly basalt. Wet - lt. olive brown (2.5Y 5/3), Dry - lt. brownish gray (2.5Y 6/2) SAND - angular, GRAVEL - well rounded	5' sample on 5/11/92 @ 0930
10'	2Lith 1Rad 1moist/ $CaCO_3$	D.B.		10' - sandy SILT 50% sand / 50% SILT (< 5% GRAVEL). Massive, crumbly, v. reactive to 10% HCl, mod. well-consolidated. Wet - olive brown (2.5Y 4/3), Dry - lt. brownish gray (2.5Y 6/2) Sand - angular, GRAVEL - well rounded	10' sample on 5/11/92 @ 1100
15'	2Lith 1Rad 1moist/ $CaCO_3$	D.B.		15' - SAND 90% SAND (mostly f to m sand, 10% f sands) < 10% SILT as coating on sand grains. Dry - dk gray (5Y 4/1), Wet - black (5Y 2.5/1) slightly reactive to 10% HCl. Unconsolidated, well sorted, angular, moist. 75% basalt grains, 25% qtz and felsics. Some Fe staining on all sand grains.	15' sample on 5/11/92 @ 1500

A-6000-382 (04/90)

BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 2 of 14

Location 200 East, B-63 Ditch

Project RCRA W017

Elevation 647.83 Top of Brass cap

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Wellmaster

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/6/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 5/13/92

Depth (20')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	D.B.		20'-SAND (Note: occasional cobble, 2%) Similar to 15' sample. SANDS tend to be coarser (Mostly m. to c. sands) <10% as coatings on sand grains. Silt fraction - reactive to HCl. Unconsolidated, well sorted, moist, angular. 60% basalt, 40% qtz. + feldspars. Noted that some grains cemented (loosely) and Fe staining present interstitially. Dry - grayish brown (2.5Y 5/2) - dry color ~~very~~ salt - pepper appearance. this color reflects overall mixed color. Wet - dark olive gray (5Y 3/2). Color appears more uniform when wet.	20' sample on 5/11/92 @ 1530
25'	2 Lith 1 Rad 1 moist/ $CaCO_3$	D.B.		25'-SAND Same as above - except no gravels, sands grains slightly finer than @ 20'. Mostly m. sands.	25' sample on 5/11/92 @ 1710
30'	2 Lith 1 Rad 1 moist/ $CaCO_3$	D.B.		30' silty, sandy GRAVEL 60% GRAVEL (15% vf pebbles, 15% f pebbles, 15% m pebbles, 15% coarse pebbles ~5% cobbles)) 30% SAND (10% c. sand to v. c. sand, 5% m. sand, 5% < m. sand), 10% SILT. SILT as coatings, slightly reactive to 10% HCl. Unconsolidated, slightly moist. GRAVELS - small cobbles - subangular, larger gravels - well rounded to subrounded. Sands - angular to subangular. No cohesive grains as above (no cemented grains). Wet - v. dk. grayish brown (2.5Y 4/2), Dry - olive gray (2.5Y 5/2)	30' sampled on 5/12/92 @ 1140 Note: increase in basalt content in gravels.
35'	2 Lith 1 Rad 1 moist/ $CaCO_3$	D.B.		35'-SAND, silty same as 20' sample except slight increase in silt. (10-15%). Note: as in 20' sample, some grains are cemented (loosely) and Fe staining present between cemented grains.	35' sampled on 5/12/92 @ 1310

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 3 of 14

Location 200 East, 216-B-63 Trench

Project RCRA W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool, Wellmaster

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/12/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/18/92

Depth (40')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	D.B.		40'-silty SAND -same as 35' SAND	40' sampled on 5/12/92 @ 1420
45'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		45'-silty SAND 90% SAND (80% v.f. to f. sand, 10% m. sand), 10% (or less) silt. Moist, well sorted, unconsolidated, slt. reaction to 10% HCl. Texture similar to 15' sample but more felsic. (50% qtz + felsic), some cementing w/Fe stains interstitially. Subangular to angular. Dry (5Y 6/2) lt. olive gray, wet (2.5Y 5/2) grayish brown.	45' sample 5/12/92 @ 1705
50'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		50'-silty SAND same as above (45' sample) 54'-SILT-see 10' sample for description	50' sample on 5/13/92 @ 0830 @ 54'-10" of SILT
55'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		55'-silty, SAND 75% SAND (25% vf to f. sand, 20% m. sand, 30% c. to v.c. sand), 25% SILT. Moist, v. reactive to 10% HCl. Cohesive, mod. well sorted. Dry (2.5Y 6/2) lt. brownish gray, Wet (2.5Y 4/2) dk. grayish brown. Larger grains-subrounded to subangular, smaller grains (m-v.f. sand) subangular to angular. Silt as coating on all grains. Finer grains tend to be more felsic. Cementing not noted as above, but whole rock is cohesive. Noted less Fe staining.	55' sample on 5/13/92 @ 1115 lithology changes: sands coarsening

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 4 of 14

Location 200 East / 216-B-63 Trench

Project RCRA W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/14/92

Reviewed By Edward C. Rogers (Sign/Print Name) Date 05/18/92

Depth (60')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		60' - sandy GRAVEL 35% GRAVEL (20% vf to f pebbles, 10% m pebbles, 5% ≥ c pebbles, no cobbles). 65% SAND - (30% c to vc sand 20% m sand 15% ≤ f sand), < 10% SILT. (SILT as coating on grains, slightly reactive to 10% HCl). Larger grains - subrounded to angular, smaller grains - angular. Moist, well sorted, unconsolidated, larger grains - mostly basalt, some qtz. Smaller grains - basalt, noted mica (biotite/muscovite). Wet - dk grayish brown (2.5Y 4/2) Dry - grayish brown (2.5Y 5/2)	60' sample @ 0845 5/14/92
65'	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		65' - sandy GRAVEL - same as 60' except gravel decreases to 20% (15% vf to f pebbles, 5% ≥ m pebbles, no cobbles) 80% SAND (50% c to vc sand, 20% m sand, 10% ≤ f sand).	65' sample @ 0910 5/14/92
	1 Moist/ $CaCO_3$	DB		69' - SILT w/ Fe stained horizon (very pronounced) next to a course sand. VERY WET.	(69' - 6" SILT, very wet - took moisture
70'	2 Lith 1 moist/ $CaCO_3$ 1 Rad	DB		70' - SAND (80% m sands, 20% ≤ f sand) <5% GRAVEL (f. pebbles) <5% SILT. Wet - dk. grayish brown (2.5Y 4/2), Dry - lt. brownish gray (2.5Y 6/2). Color difficult to determine because of "salt + pepper" nature. Color represents aggregate color. Very slight rxn to 10% HCL (silt coating), all grains - subangular to subrounded. Note: no mica noted here. minor cementing noted. 50% mafics, 50% felsics (qtz).	70' sample @ 0920 5/14/92
75'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		75' - same as above, slightly finer grains (more f sands).	75' sample @ 0930 5/14/92 Note - finer grains

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 5 of 14

Location 200 East / 216-B-63 Trench

Project RCRA W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/14/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/18/92

Depth (80')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2Lith 1Rad 1Moist/ $CaCO_3$	DB		80'- SAND	80' sample @ 1100 5/14/92
				same as above	
85'	2Lith 1Rad 1Moist/ $CaCO_3$	DB		85'- SAND	85' sample @ 1110 5/14/92
				same as 75' sample	
90'	2Lith 1Rad 1Moist/ $CaCO_3$	DB		90'- SAND	90' sample @ 1120 5/14/92
				same as 75% sample, slightly more SILT	
95'	2Lith 1Rad 1Moist/ $CaCO_3$	DB		95'-	95' sample @ 1130 5/14/92
				97'- GRAVEL (large cobbles and boulders) (dry).	97'- drilled through a coarse gravel interval. GRAVELS decrease in size w/depth.
					@ 99+ - return to sand

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 6 of 14

Location 200 East / 216-B-63 Trench

Project RCRA W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Wellmaster

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/14/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/18/92

Depth (100')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		100' - SAND same as 75' sample, except contain <5% large gravels (m. tuve pebbles).	100' sample on 5/14/92 @ 1145
105'	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		105' - SAND same as 75' sample, w/ occassional pebble	105' sample on 5/14/92 @ 1400
110'	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		110' - SAND same as 75' sample, w/ occasional pebbles	110' sample on 5/14/92 @ 1405
115'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		115' - SAND same as 75' sample, w/ occasional pebble	115' sample on 5/14/92 @ 1415

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 7 of 14

Location 200 East 1216-B-63 Trench

Project RCRA / W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/15/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/20/92

Depth (120')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		120' - SAND (40% c to vc sands, 40% m to f sands, 10% ≤ f sands, 5% SILT, 5% GRAVEL (as ~~are~~ mostly v. f to vf pebbles). Moist, subangular. Minor cementing noted (Occ. grains are cemented). Slight rxn in HCl. 50% mafics, 50% felsic ("salt + pepper" appearance). Wet - dk. grayish brown (2.5Y 4/2), Dry - lt. brownish gray (2.5Y 6/2).	120' sample on 5/14/92 @ 1530. Note: sands coarsen
125	2 Lith 1 Rad 1 Moist/ 1 $CaCO_3$	DB		125' - SAND same as 120' sample	125' sampled on 5/14/92 @ 1545
130'	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		130' - SAND same as 120' sample	130' sampled on 5/14/92 @ 1605
135'	2 Lith 1 Rad 1 Moist/ $CaCl_2$	DB		135' - SAND same as 120' sample, somewhat drier in lenses	135' sampled on 5/14/92 @ 1620

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 8 of 14

Location: 200 East / 216-B-63 Trench
Project: RCRA / W017
Elevation: 647.83'
Drilling Contractor: KEH
Driller: L. Watkins
Drilling Method and Equipment: Cable Tool - Well Master
Prepared By: Nancy Ballantyne (Sign/Print Name) Date 5/15/92
Reviewed By: Edward C. Rafuse (Sign/Print Name) Date 05/20/92

Depth (140')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		140'-SAND same as 120' sample, not as dry as 135' sand.	140' sample on 5/15/92 @ 0840
145'	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		145'- SAND same as 120' sample, slightly coarser sands	145' sampled on 5/15/92 @ 0850
150'	2 Lith 1 Rad 1 Moist/ $CaCO_3$	DB		150'- sandy GRAVEL 40% GRAVEL (25% v.f. to f. pebble, 10% m. pebbles, 5% lrg. pebbles, orc. cobbles). 60% sand (30% c. to vc sand, 10% m sand, 20% ≤ f sand, ~5% silt) Moist, unconsolidated, v. slight rxn to 10% HCl. Fine gravels - subangular; Coarser gravels - subrounded to rounded. Sands - subangular to sub. Cementing negligible. Larger grains - mostly basalt, smaller grains qtz + basalt. Wet - dk grayish brown (2.5Y 4/2) Dry - lt. brownish gray (2.5Y 6/2)	150' sampled on 5/15/92 @ 0900
155	1 Rad 2 Lith 1 Moist/ $CaCO_3$	DB			155' sampled on 5/15/92 @ 1115

BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 9 of 14

Location: 200 East / 216-B-63 Trench
Project: RCRA WO17
Elevation: 647.83'
Drilling Contractor: KEH
Driller: L. Watkins
Drilling Method and Equipment: Cable Tool - Well Master
Prepared By: Nancy Ballantyne (Sign/Print Name) Date: 5/15/92
Reviewed By: Edward C. Rafuse (Sign/Print Name) Date: 05/21/92

Depth (160)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		160' - SAND same as 120'	160' sampled on 5/15/92 @ 1145
165'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		165' - SAND, silty (drier than above) (10% c to vc sand, 40% m sand, 40% f to vf sand, 10% silt). Slightly moist, unconsolidated, subangular, reacts to 10% HCl. Some cementing ($CaCO_3$). 50% mafics (basalt) 50% felsics (qtz + fldsp). Continued "salt + pepper" appearance. Wet - dk grayish brown (2.5Y 4/2), Dry - lt. brownish gray (2.5Y 6/2). 169' - SILT - see below	165' sampled on 5/15/92 @ 1600 Note: slight increase in silt and definite increase in finer sands.
170'	2 Lith 1 Rad 1 moist/ 1 $CaCO_3$	DB		170' - SILT massive, consolidated, non-plastic, moist (very). Wet - grayish brown (2.5Y 5/2) Dry - (2.5Y 7/2) - lt. gray. Displays minor bedding. 170.6' - SILT ends 170.6' - SAND - same as 165' sand	170' sampled on 5/15/92 @ 1620
175'	2 Lith 1 Rad 1 moist/ 1 $CaCO_3$	DB		175' - SAND same as 165' sample	175' sampled on 5/15/92 @ 1630

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 10 of 14

Location 200 East/216-B-63 Trench

Project RCRA/W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool/Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/18/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/21/92

Depth (180')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		180'-SAND same as 165' sample	180' sampled on 5/18/92 @ 1645
185'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		185'-SAND same as 165' sample, slightly moister and coarser sands	185' sampled on 5/18/92 @ 1700
190'	2 Lith 1 Rad 1 $CaCO_3$/ moist	DB		190'-SAND same as 165' sample, slightly moister and coarser sands	190' sampled on 5/18/92 @ 1710
195'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		195'-SAND same as 165' sample, finer than above	195' sampled on 5/19/92 @ 0950

A-6000-382 (04/90)

9313091.1576

BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 11 of 14

Location 200 East / 216-B-63 Trench

Project RCRA / W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/19/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 5/21/92

Depth (200')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		200' - SAND same as 165' sample, except slightly coarser w/occ. v.f. to f. pebble (<10%).	200' sampled on 5/19/92 @ 1015
205'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		205' - SAND same as 165' sample, (Note: this sample somewhat finer grained than above, more silt.) 208' - v.f. grained SAND	205' sampled on 5/19/92 @ 1030
210'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		210' - very fine grained SAND Moist, unconsolidated, v. well sorted, med. rxn to 10% HCl. Wet (2.5Y 5/2) lt. olive brown, Dry (2.5Y 7/2) lt. gray. Some mica 212 - gravelly SAND (1') 214' - v.f. grained SAND (214' - 215') 213 - 6" SILT w/occ. gravels	210' sampled on 5/19/92 @ 1155
215'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		215' - silty sandy GRAVEL 50% GRAVEL (10% > s. cobbles, 15% c to vc pebble, 5% m. pebbles, 20% vf to f. pebbles), 25% sand (5% c. to vc sand, 5% m. sand, 15% vf to f. sand), 25% silt. Mod rxn to 10% HCl (fine fraction), v. poorly sorted, dry, unconsolidated. Dry (2.5Y 5/2) grayish brown. GRAVELS - (coarse) → subrounded, (finer) → subrounded to subangular (angular frags. from drilling), mostly basalt. SANDS - subangular, qtz + basalt.	215' sampled on 5/19/92 @ 1315

9313091.1527

BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 12 of 14

Location 200 East / 216-B-63 Trench

Project RCRA / W019

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Well Master

Prepared By Nancy Ballantyne (Sign/Print Name) Date 5/19/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/20/92

Depth (220')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		220' - sandy GRAVEL 50% GRAVEL (10% occ. boulders >/= s. cobbles, 15% c to vc pebbles, 10% m. pebbles, 15% vf to f pebbles). 50% SAND (20% c to vc sand, 10% m sand, 20% f to vf sand, (<10% silt)). Slightly moist, unconsolidated, poorly sorted. mild rxn. to 10% HCl Wet (2.5Y 5/2) grayish brown. Dry - (2.5Y 6/2) lt ~~grayish~~ brownish gray. Mineralogy - sands - qtz + basalt, some Fe staining, subangular. GRAVELS - mostly basalt, subrounded.	220' sampled on 5/19/92 @ 1445 + gravels coarser somewhat, increase in gravels relative to sand (compared to 215')
225'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		225' - sandy GRAVEL 40% GRAVEL (20% s. to lg. cobbles, no boulders, 5% c to vc pebbles, 15% m to vf. cobbles), 60% SAND (20% c to vc sand, 20% m sand, 20% f to vf sand, (<10% SILT)). See above for rest of description	225' sampled on 5/19/92 @ 1515
230'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		230' - sandy GRAVEL 30% GRAVEL (15% m. to vc pebbles, 15% vf to f pebbles, occ. cobble), 70% sand (40% c to vc sand, 10% m sand, 20% f to vf sand). Moist, unconsolidated, "salt + pepper" appearance. Dry - lt. brownish gray (2.5Y 6/2), wet (dk grayish brown) (2.5Y 4/2). larger gravels - mostly basalt, <m sands - qtz and basalt. Sands - subangular, GRAVELS - subrounded. V. slt. rxn to 10% HCl. <10% SILT	230' sampled on 5/19/92 @ 1635 Note: increasing SAND content from 220'.
235'	2 Lith 1 Rad 1 moist/ $CaCO_3$	DB		235' - sandy GRAVEL 70% GRAVEL (15% cobbles, 20% c. to vc pebbles, 15% m pebble, 20% f to vf pebble) 30% sand (10% c to vc sand, 20% m to vf sand). Trace SILT. Very moist, unconsolidated, v. poorly sorted, mild rxn to HCl. Dry - lt. brownish gray (2.5Y 6/2) wet (dk grayish brown, (2.5Y 4/2). Gravels - subrounded to round Sand - subangular.	235' sampled on 5/19/92 @ 1700 Note: large increase in gravels (mostly c to vc pebbles).

BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 13 of 14

Location 200 East / 216-B-63 Trench

Project RCRA / W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment Cable Tool - Wellmaster

Prepared By Dennis Anderson (Sign/Print Name) Date 5/20/92

Reviewed By EDWARD C. RAFUSE Edward C. Rafuse (Sign/Print Name) Date 05/22/92

Depth (240')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 lith 1 rad 1 moist	DB		240' - sandy GRAVEL (75% GRAVEL, 25% sand) 5% fc 20% vcp 15% vcs 35% mfs	240' sample 5/20/92 @ 0945
				5% sc 20% mp 15% cs 5% vfs	
				20% fp 20% ms	
				30% vfp	
				very poor sorting, slightly damp, very weak	
				Rxn to 10% HCl 2.5y 6/2 dk gry brn - wet	
				2.5y 6/2 lt gry brn, gravels sphr - subdisc,	
				rnd - wellrnd, sands are subang - subrnd	
245'	2 lith 1 rad 1 moist	DB		245' - sandy GRAVEL (40% sand 60% GRAVEL) desc same as above except for > in moist to damp	245 sample 5/20/92 @ 1195
250'	2 LITH 1 RAD 1 $CaCO_3$	DB		250' - DB - SANDY GRAVEL	V. MOIST NOT SATURATED
				70% GRAVEL 29% SAND 1% SILT	Probably due to drive barrel
				20% LG 20% GP 30% CS	250 sample 5/20/92 @ 1550
				30% SC 15% MP 60% MS	
				15% SP 10% FS	
				COLOR WET: (SAND) 5Y 4/1 DARK GRAY DRY: 5Y 6/1 LIGHT GRAY / GRAY	
				V. MOIST Poorly Sorted, ANGULAR TO SUB-ROUNDED	
				Sub DECIDUOUS TO ANGULAR 70% BASALT / ANDESITE	
				20% QTZ/FELDSPAR, 5% OTHER NO REACTION TO 10% HCl	
255'	2 lith 1 rad 1 $CaCO_3$	~~DB~~ / HT		255' - DB - SANDY GRAVEL	255' sample 5/20/92 @ 1630
				AS ABOVE, V. MOIST TO SATURATED	
				Switch to HT after 255' SAMPLE	

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BOREHOLE LOG

Boring or Well No. 299-E27-19

Sheet 19 of 14

Location 200 East / 216 B-63 Trench

Project RCRA-W017

Elevation 647.83'

Drilling Contractor KEH

Driller L. Watkins

Drilling Method and Equipment CABLE tool - Well MASTER

Prepared By D. Anderson (Sign/Print Name) Date 5/21/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 05/22/92

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
260'	21ith 1Rad 1CaCO3	HT		slightly silty gravelly SAND (~5% silt ~10% gravel, 85% SAND) gravels undet due to HT	260' sample 5/21/92 @ 1130 Hanford Fm.
				20% vcs - 25% ms 15% vfs	poss. reworked Ringold.
				25% cs 15% fs	
				5y 4.5/2 olive-wet; 5y, 6/1 Holgrey	
				sands are ang-sub ang / sub-discoidal	
				well sorted, No Rxn to 10% HCl	
				60% basalt 25% Otz 10% volcanic/andes. 5%	
				Otz w/ trace gran & musc. Non PLASTIC	
265'				sample sat.	
	21ith 1Rad 1CaCO3	HT		sample same as ABOVE	265' sample 5/21/92 @ 1430
				T.D. 266.8'	

A-6000-382 (04/90)

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p1

VALIDATED 3 pages
KDR 11/13/92
SIGNATURE/DATE

ENVIRONMENTAL RESTORATION HEALTH AND SAFETY

Requested by:			Phone No.	Well No. 299-E27-19		Date:

Sample No. (Depth)	Sample Date	Sample Description	Analysis Date	Lab No.	Results Beta/Gamma (pci/g)	Results Alpha (pci/g)
5'	5-13-92	SOIL	5-13-92	0943-92	15	2
10'	5-13-92		5-13-92	0944-92	19	<D
15'	5-13-92		5-13-92	0945-92	14	<D
20'	5-13-92		5-13-92	0946-92	13	1
25'	5-13-92		5-13-92	0947-92	14	<D
30'	5-13-92		5-13-92	0948-92	14	<D
35'	5-13-92		5-13-92	0949-92	12	1
40'	5-13-92		5-13-92	0950-92-14	14	<D
45'	5-14-92		5-14-92	0957-92-15	13	<D
50'	5-14-92		5-14-92	0958-92-16	12	<D
55'	5-14-92		5-14-92	0959-92-17	16	1
60'	5-14-92		5-15-92	0984-92-42	10	1
65'	5-14-92		5-15-92	0985-92-43	16	<D
70'	5-14-92		5-15-92	0986-92-44	19	<D
75'	5-14-92		5-15-92	0987-92-45	17	<D
80'	5-14-92		5-15-92	0988-92-46	16	<D
85'	5-14-92		5-15-92	0989-92-47	17	1
90'	5-14-92		5-15-92	0990-92-48	17	1
95'	5-14-92		5-15-92	0991-92-49	19	1
100	5-18-92		5-19-92	1014-92-19	16	2
105	5-18-92		5-19-92	1015-92-	15	<D
110	5-18-92		5-19-92	1016-92	13	<D
115	5-18-92		5-19-92	1017-92	13	<D

Performed By: C. Albersio Date: 5-19-92

Supervisor Review: [signature] Date: 6/18/92

Page: 1 of 3

A-6000-829 (10/91)

9313091.1581

ENVIRONMENTAL RESTORATION HEALTH AND SAFETY

Requested by:			Phone No:	Well No. 299-E27-19		Date:

Sample No. (Depth)	Sample Date	Sample Description	Analysis Date	Lab No.	Results Beta/Gamma (pci/g)	Results Alpha (pci/g)
120'	5-18-92	SOIL	5-19-92	1018-92	16	<D
125'	5-18-92		5-19-92	1019-92	14	<D
130'	5-18-92		5-19-92	1020-92	16	<D
135'	5-18-92		5-19-92	1021-92	18	<D
140'	5-18-92		5-19-92	1022-92	15	<D
145'	5-18-92		5-19-92	1023-92	18	<D
150'	5-18-92		5-19-92	1024-92	11	<D
155'	5-18-92		5-19-92	1025-92	14	<D
160'	5-18-92		5-19-92	1026-92	15	<D
165'	5-19-92		5-20-92	1063-92-27	17	<D
170'	5-19-92		5-20-92	1064-92-28	14	1
175'	5-19-92		5-20-92	1065-92-29	15	<D
180'	5-19-92		5-20-92	1066-92-30	15	1
185'	5-19-92		5-20-92	1067-92-31	14	1
190'	5-19-92		5-21-92	1068-92-32	14	<D
195'	5-19-92		5-21-92	1071-92-35	12 ~~13~~	<D
200	5-19-92		5-21-92	1069-92-33	13	2
205'	5-19-92		5-21-92	1070-92-34	11	<D
210'	5-19-92		5-21-92	1072-92-36	38	1
215'	5-19-92		5-21-92	1073-92-37	27	1
220'	5-21-92		5-26-92	1107-92-30	10	<D
225'	5-21-92		5-27-92	1108-92-31	14	<D
230'	5-21-92		5-27-92	1109-92-32	19	1

Performed By: C. J. Allessio Date: 5-27-92

Supervisor Review: [signature] Date: 6/18/92

Page: 2 of 3

A-6000-829 (10/91)

9313091.1502

ENVIRONMENTAL RESTORATION HEALTH AND SAFETY

Requested by:	Phone No:	Well No.	Date:
		299-E27-19	

Sample No. (Depth)	Sample Date	Sample Description	Analysis Date	Lab No.	Results Beta/Gamma (pci/g)	Results Alpha (pci/g)
235'	5-21-92	SOIL	5-27-92	1110-92-33	15	1
240'	5-21-92		5-27-92	1111-92-34	12	1
245'	5-21-92		5-27-92	1112-92-35	10	<D
250'	5-21-92		5-27-92	1118-92-41	14	<D
255'	5-21-92		5-27-92	1119-92-42	13	1
260'	5-21-92		5-27-92	1123-92-46	11	<D
265'	5-22-92		5-27-92	1139-92-11	14	<D

Performed By: C. Allessio

Date: 5-27-92

Supervisor Review: [signature]

Date: 6/18/92

Page: 3 of 3

A-6000-829 (10/91)

9313091.1503

PROJECT NAME / # RCRA -W017

WELL # 299- E27-19

LOCATION 200 East 216- B63 Trench

WELL DRILLING OPERATIONS	WELL COMPLETION OPERATIONS	WELL DEVELOPMENT ACTIVITIES
START DATE 5-11-92	START DATE 5-26-92	AQUIFER TEST DATE 7-8-92
FINISH DATE 5-21-92	FINISH DATE 6-3-92	
TOTAL DAYS 9	TOTAL DAYS 5	DEVELOPMENT DATE 7-8-92
TOTAL DEPTH 266.9	COMPLETION DEPTH 266.7	
AVERAGE RATE 29.7 Ft/Day	SCREENED INTERVAL 242.05 - 262.13	WATER REMOVED (gallons) 886
WATER ADDED (gallons) 0	WATER ADDED (gallons) 0	
DATE / DEPTH TO WATER 5-20-92 245.0 5-21-92 245.0 5-21-92 246.6 5-22-92 245.2	WATER REMOVED (gallons) 40 DATE/DEPTH TO WATER 5-27-92 244.6 6-1-92 244.5 6-3-92 244.7	HYDROSTAR PLACEMENT DATE 7-8-92 DATE / DEPTH TO WATER 7-8-92 *
OTHER	OTHER	OTHER * 248.40 Top of casing 244.85 Ground surface

9313091.1504

KAISER ENGINEERS HANFORD

SURVEY DATA REPORT

Request No. —|9|2|4|—|2|5|7

File No. |2|9|9|—|E|2|7

Project/W.O. No.	Title		
	200E AREA WELL SURVEY		
KEH Job No. CR9696-31-77-20	Prepared By M.F. Harrington	Date 8/12/92	Reviewer [signature] 1 1

DESCRIPTION OF WORK

Horizontal and vertical location of wells 299-E27-18, 299-E27-19.

ACCEPTABILITY (Within Plan Tolerance)

- Yes ☐
- No ☐
- NA ☐
- TBD by Requestor ☐

DISTRIBUTION

Survey File	OR
Field Project File	--
F. Clawson	1
D. Weekes	1
J. Rieger	1

SURVEY RESULTS AND COMMENTS

WELL NO. WELL NO.	COORDINATES ℄ CASING 200E FEET	WCS83S (METERS)	VERT. DATUM	ELEVATIONS TOP OF BRASS CAP	HYDROSTAR PLATE N. SIDE	TOP OUTER CASING N. SIDE	TOP INNER CASING N. SIDE
299-E27-18	N:44,745.6 W:51,150.0	N:137,119.29 E:574,299.61	NGVD'29 FEET	647.14	650.16	650.15	
299-E27-19	N:44,693.6 W:50,968.2	N:137,103.59 E:574,355.07	NGVD'29 FEET	647.83	650.89	650.88	

KEH-159.1 (6-84)

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Westinghouse Hanford Company | LOG HEADER | VALIDATED KDR 11/13/92 SIGNATURE/DATE | Page 1 of 2

Well No. 299-E27-19 Area 200 East Date 5/15/92

Log Run #1 Log Type Gross Gamma

Elevation Datum top of brass cap Elevation 647.83'

Survey Coordinates 137,103.59 N 574,355.07 E

Log Measured From Ground Surface

Location Description B63 Trench

Ground Surface Elevation 647.83'

Surface Temperature NA Weather Clear-Warm

BOREHOLE INFORMATION

Driller Louis Watkins

Drill Rig Type Cable Tool | Bit Type/Diameter Drive Barrel / 10"

Borehole Diameter(s)/Depth 12"/45.0' 10"/163.5'

Depth Driller 163.5' | Depth Logger 162.1'

Liquid Level NA (none) | Liquid Density NA

Temperature NA

CASING RECORD

Type 12" Carbon Steel Sch.40 | Interval +0.5' – 45.03'

Type 10" Carbon Steel Sch.40 | Interval +1.6' – 159.05'

Type | Interval

Type | Interval

Well Screen Interval NA

Comments: Return Error = +0.2' high

Centralizer used.

LOG HEADER

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand MLS | Equipment Type Analog

Tool Type Gamma Ray | Serial No. CG27-A97

Base Calibration Date 5/91 | Calibration Reference PNL-7785 UC-606

Calibration/Probe Factor 8.84x10^-3 eU (1/m²/s) | Base Calibration Datum (eU): Position 1 297.4 eU | Position 2 64.3 eU

Dead Time 11.8 μsec | Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 162.1' | To 3.5'

Rerun(s) 85.0' to 20.0'

Pre Survey Verification: Position 1 301.0 eU | Position 2 64.5 eU | Background 70 c/s

Base Calibration Difference: Position 1 3.6 eU | Position 2 0.2 eU

Logging Speed 5 ft./min. | Rerun Scales, CPS/in. 50 c/s/in

Start Time 1145 | Completion Time 1400

Chart Speed(s), l/in. 10 ft./in.

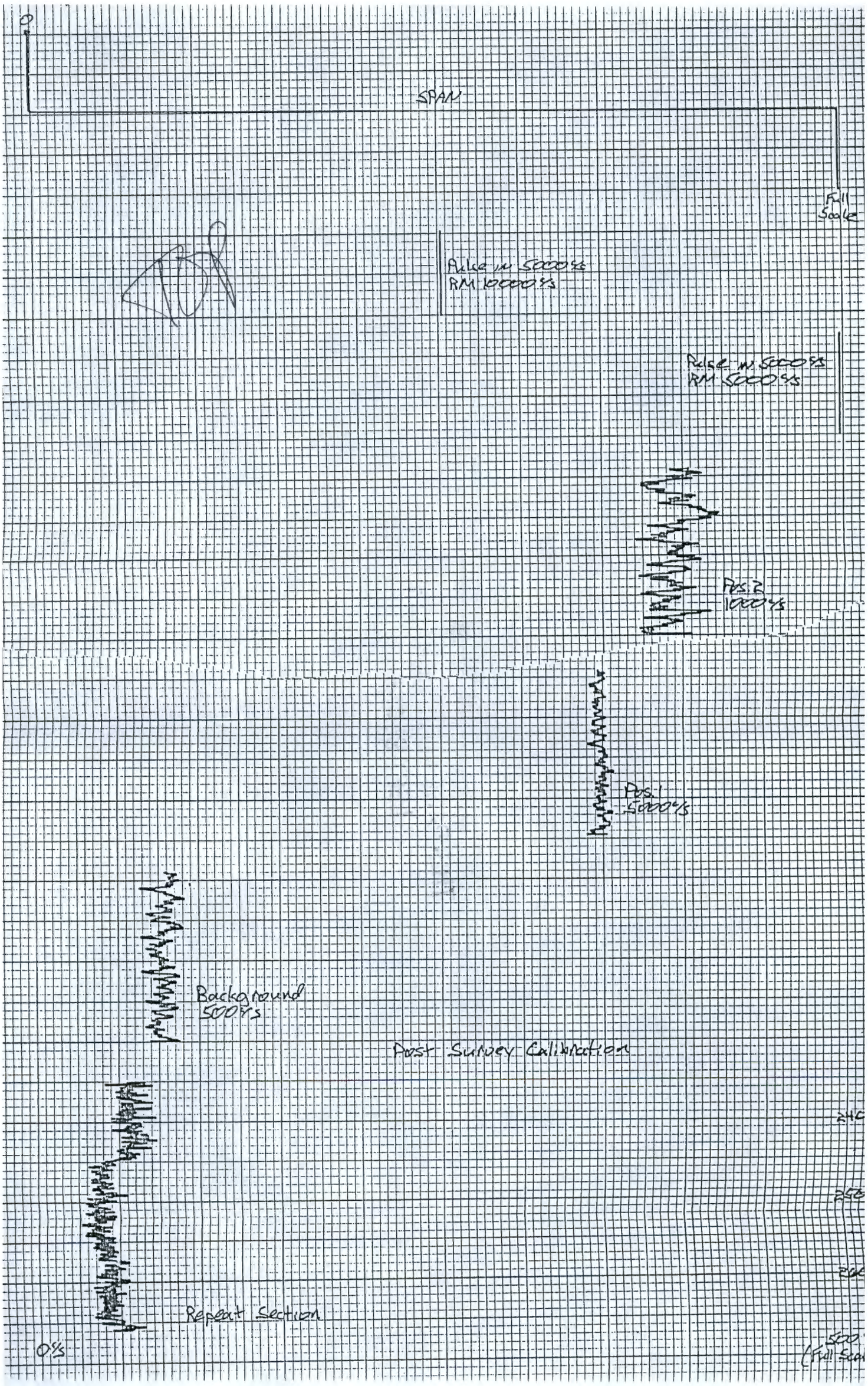
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. | Time Constant(s) TC-1

Post Survey Verification: Position 1 300.9 eU | Position 2 63.5 eU | Background 72 c/s

Percent Change: Position 1 0.1% | Position 2 1.6%

Comments Return Error = +0.2' high
Centralizer used.

Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson Date: 5/15/92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Full Scale
Pulse in 5000°/s
RM 10000°/s
Pulse in 5000°/s
RM 5000°/s
Pos. 2
1000°/s
Pos. 1
-5000°/s
Background
500°/s
Post Survey Calibration
Repeat Section
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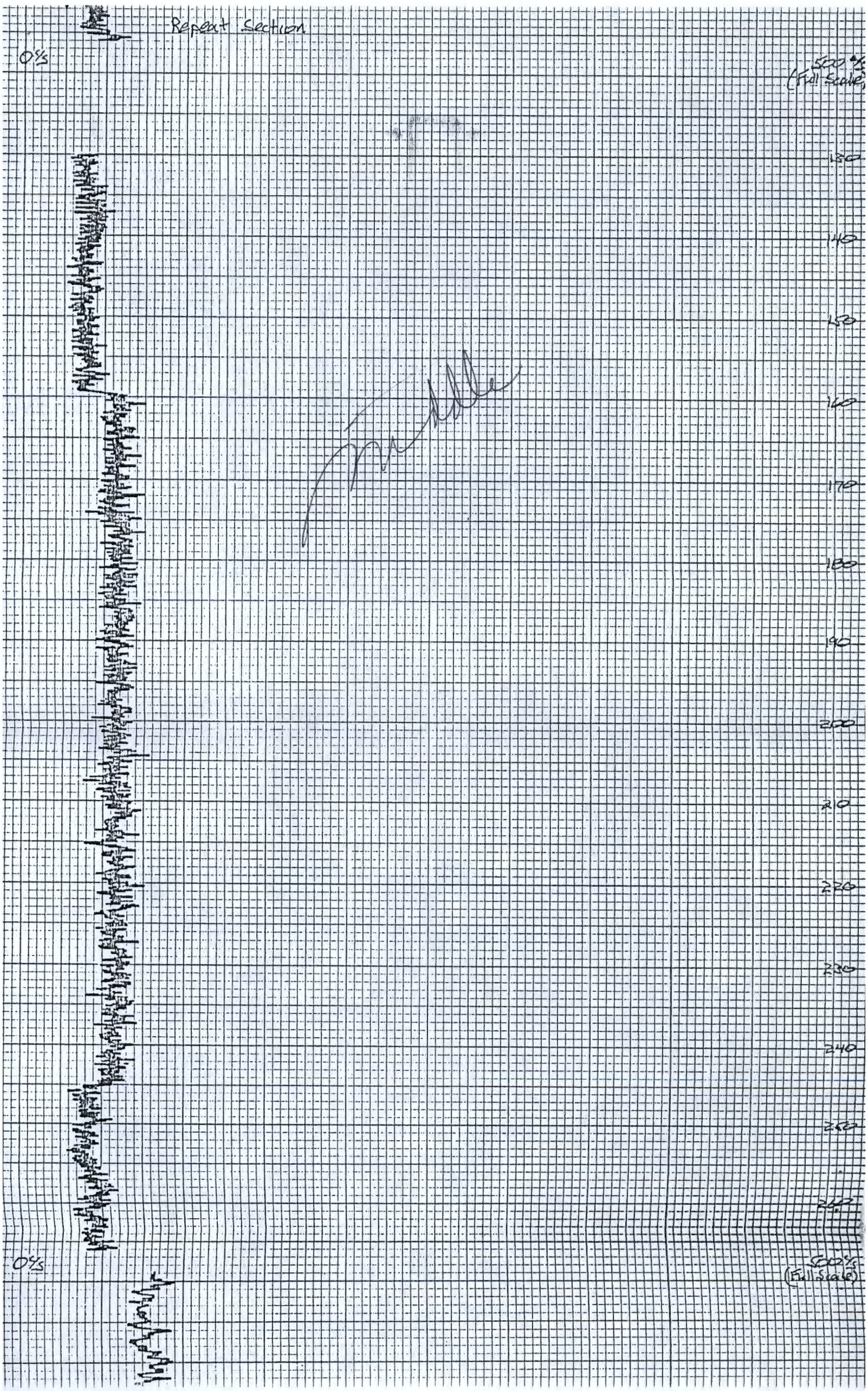
500
(Full Scale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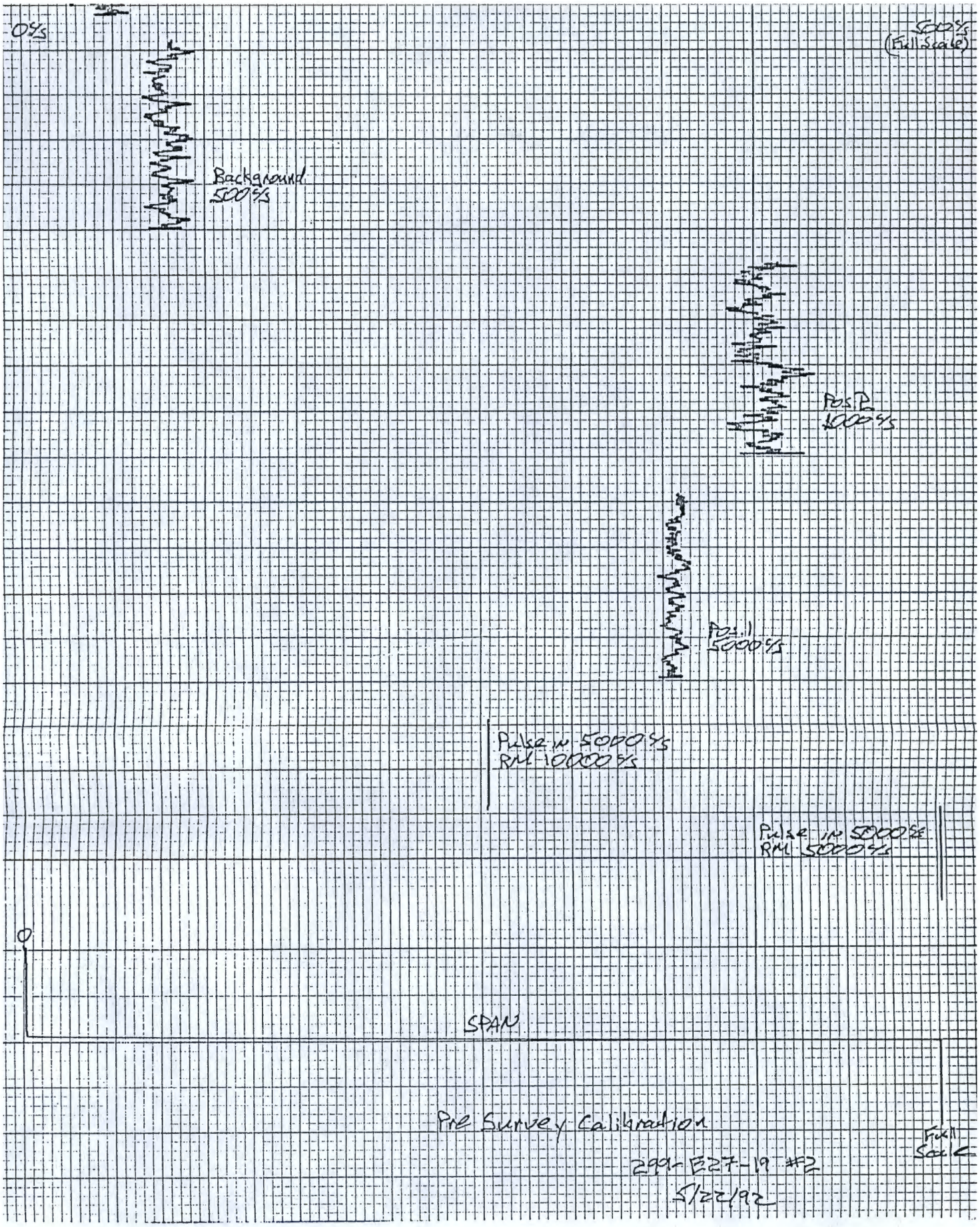
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SPAN
Pre Survey Calibration
299-E27-19 #2
5/22/92
Full
Scale

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KDR 11/13/92
SIGNATURE/DATE

Westinghouse Hanford Company | LOG HEADER | Page 1 of 2

Well No. 299-E27-19 Area 200 East Date 5/22/92

Log Run #2 Log Type Gross Gamma

Elevation Datum top of brass cap Elevation 647.83'

Survey Coordinates 137,103.59 N 574,355.07 E

Log Measured From Ground Surface

Location Description B-63 Trench

Ground Surface Elevation 647.83'

Surface Temperature NA Weather Clear - Warm

BOREHOLE INFORMATION

Driller Louis Watkins

Drill Rig Type Cable Tool | Bit Type/Diameter Button Bit / 8"

Borehole Diameter(s)/Depth 12"/45.0' 10"/159.1' 8"/267.0'

Depth Driller 267.0 | Depth Logger 266.0

Liquid Level ~~245.0'~~ 245.2' | Liquid ~~Density~~ Appearance Turbid

Temperature NA

CASING RECORD

Type 12" Carbon Steel Sch. 40 | Interval +0.5 - 45.03'

Type 10" Carbon Steel Sch. 40 | Interval +1.0 - 159.05

Type 8" Carbon Steel Sch. 40 | Interval +3.5 - 266.7'

Type | Interval

Well Screen Interval NA

Comments: Return Error = +0.2' high
Centralizer used.

LOG HEADER

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand MLS

Equipment Type Analog

Tool Type Gamma Ray

Serial No. CG27-A97

Base Calibration Date 5/91

Calibration Reference PNL-7785 UC-606

Calibration/Probe Factor 8.84x10^-3 eU 1/m/c/s

Base Calibration Datum (eU): Position 1 297.4 eU

Position 2 64.3 eU

Dead Time 11.8 μsec.

Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 266.0'

To 130.0'

Rerun(s) 266.0' to 235.0'

Pre Survey Verification: Position 1 307.9

Position 2 64.7 eU

Background 78 c/s

Base Calibration Difference: Position 1 9.5 eU

Position 2 0.4 eU

Logging Speed 5 ft./min.

Rerun Scales, CPS/in. 50 c/s/in

Start Time 0630

Completion Time 0900

Chart Speed(s), f/in. 10 ft./in.

Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in.

Time Constant(s) TC-1

Post Survey Verification: Position 1 302.5 eU

Position 2 62.9 eU

Background 78 c/s

Percent Change: Position 1 1.4 %

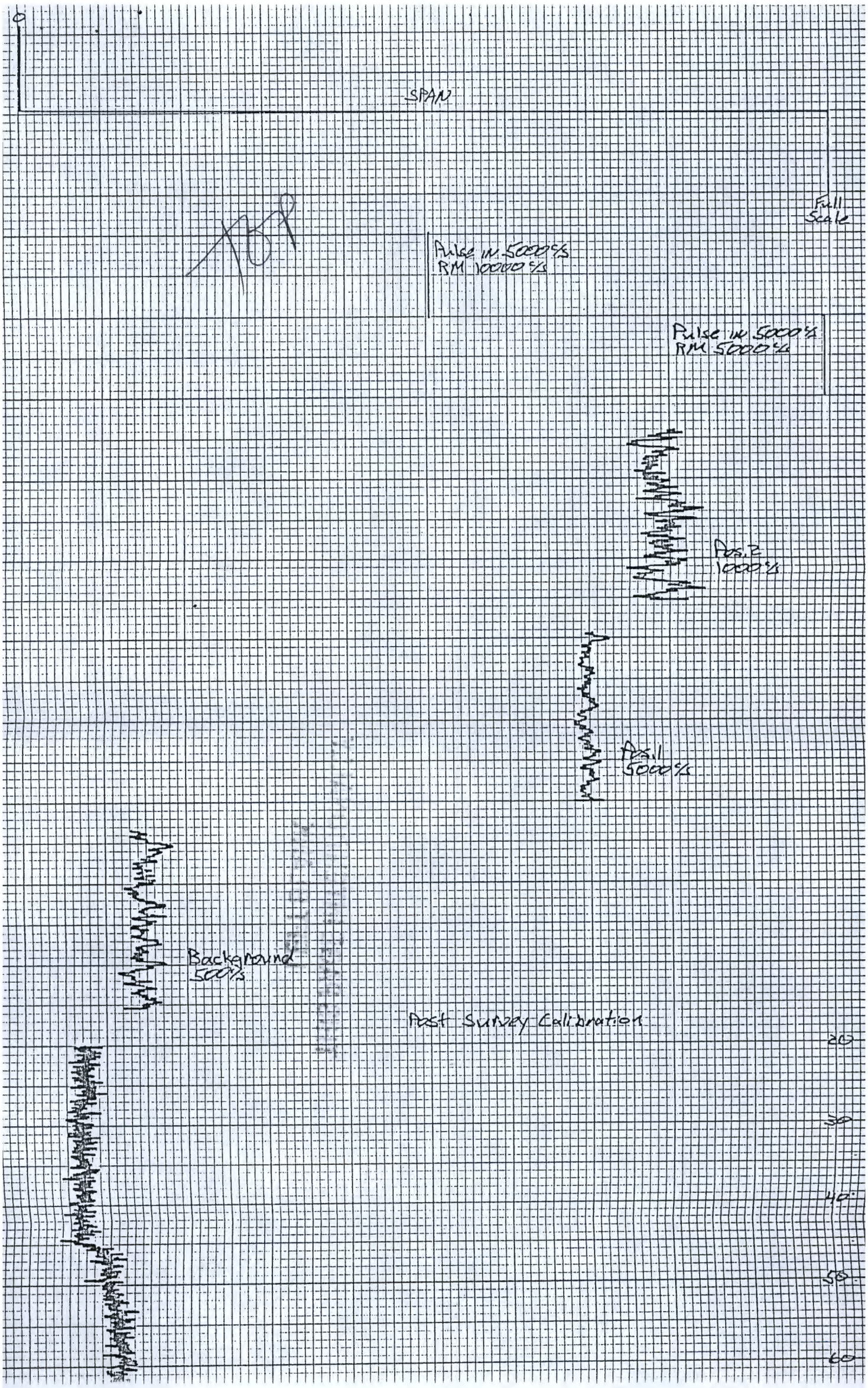
Position 2 2.8 %

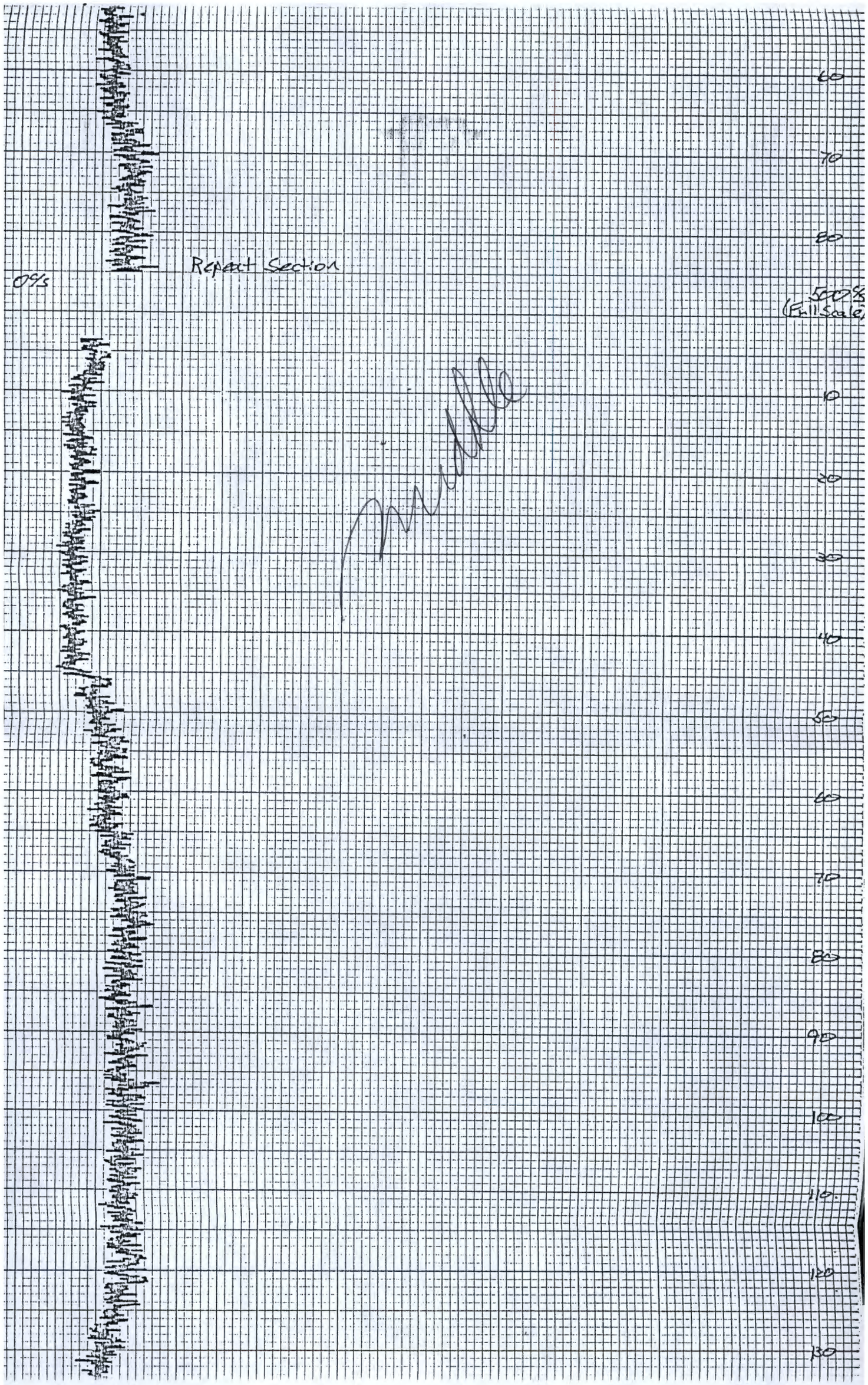
Comments Return Error = +0.2' high

Centralizer used.

Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson

Date: 5/22/92


0
SPAN
Full Scale
Pulse IN 5000 c/s
RM 10000 c/s
Pulse IN 5000 c/s
RM 5000 c/s
Pos. 2
10000 c/s
Pos. 1
5000 c/s
Background
500 c/s
Post Survey Calibration
20
30
40
50
60


Repeat Section
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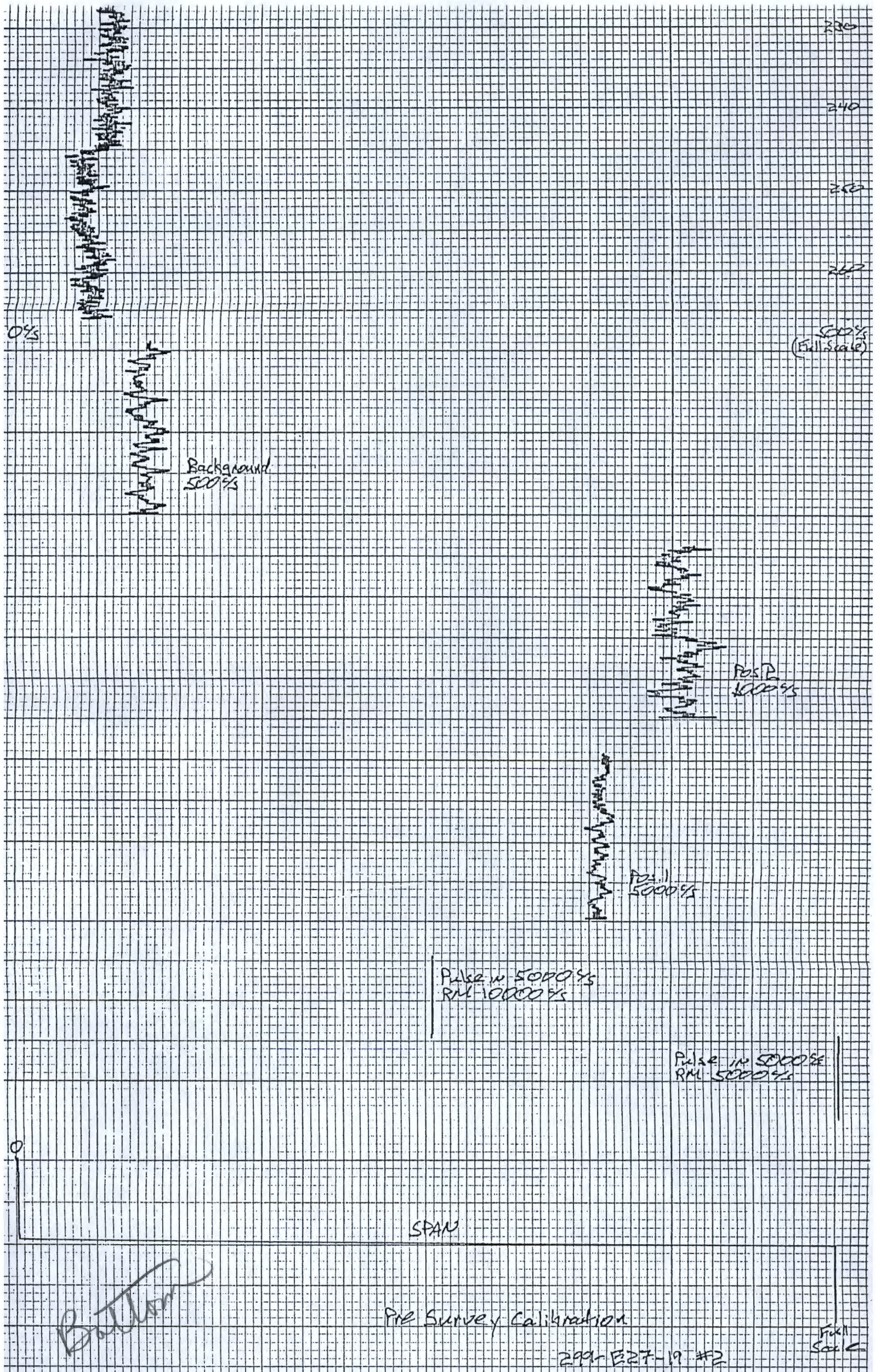
130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(Full Scale)
Background
500%
Pos P
1000%
Pos I
5000%
Pulse in 5000%
RM 10000%
Pulse in 5000%
RM 5000%
0
SPAN
Pre Survey Calibration
299-E27-19 #2
5/22/92
Full
Scale

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APPENDIX B

PHYSICAL/CHEMICAL SAMPLING DATA RESULTS

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FOR INFORMATION ONLY

VALIDATED 208
KDR 11/13/92
SIGNATURE/DATE

JC McGUFFEY
S0-10/3-4590

7/13/92

299-E27-18 TEST RESULTS SUMMARY SHEET

Sample No.	Well No.	Operable Unit	Depth	CC (%)	Mois (%)	Por (%)	Den/D (g/cc)	SpG/F	SpG/C	SpG/Avg	Sat K (cm/s)	Notes
2-2408	299-E27-18	RCRA	5	3.0	9.73	NR	NR	NR	NR	NR	NR	
2-2409	299-E27-18	RCRA	10	0.7	7.81	NR	NR	NR	NR	NR	NR	
2-2410	299-E27-18	RCRA	15	0.7	2.64	NR	NR	NR	NR	NR	NR	
2-2411	299-E27-18	RCRA	20	1.6	5.86	NR	NR	NR	NR	NR	NR	
2-2412	299-E27-18	RCRA	25	1.1	4.08	NR	NR	NR	NR	NR	NR	
2-2413	299-E27-18	RCRA	30	0.9	3.82	NR	NR	NR	NR	NR	NR	
2-2414	299-E27-18	RCRA	35	0.9	4.60	NR	NR	NR	NR	NR	NR	
2-2415	299-E27-18	RCRA	40	0.9	2.63	NR	NR	NR	NR	NR	NR	
2-2416	299-E27-18	RCRA	45	0.9	2.04	NR	NR	NR	NR	NR	NR	
2-2417	299-E27-18	RCRA	50	1.1	2.72	NR	NR	NR	NR	NR	NR	
2-2418	299-E27-18	RCRA	55	0.9	2.23	NR	NR	NR	NR	NR	NR	
2-2419	299-E27-18	RCRA	60	1.4	3.34	NR	NR	NR	NR	NR	NR	
2-2420	299-E27-18	RCRA	65	1.1	2.80	NR	NR	NR	NR	NR	NR	
2-2421	299-E27-18	RCRA	70	1.1	3.95	NR	NR	NR	NR	NR	NR	
2-2422	299-E27-18	RCRA	75	1.1	8.64	NR	NR	NR	NR	NR	NR	
2-2423	299-E27-18	RCRA	80	1.1	2.32	NR	NR	NR	NR	NR	NR	
2-2424	299-E27-18	RCRA	85	1.1	2.70	NR	NR	NR	NR	NR	NR	
2-2425	299-E27-18	RCRA	90	1.4	3.67	NR	NR	NR	NR	NR	NR	
2-2426	299-E27-18	RCRA	95	1.1	3.61	NR	NR	NR	NR	NR	NR	
2-2427	299-E27-18	RCRA	100	1.1	2.71	NR	NR	NR	NR	NR	NR	
2-2428	299-E27-18	RCRA	105	0.9	2.84	NR	NR	NR	NR	NR	NR	
2-2429	299-E27-18	RCRA	110	0.9	3.58	NR	NR	NR	NR	NR	NR	
2-2430	299-E27-18	RCRA	115	1.1	2.87	NR	NR	NR	NR	NR	NR	
2-2431	299-E27-18	RCRA	120	0.9	3.18	NR	NR	NR	NR	NR	NR	
2-2432	299-E27-18	RCRA	125	0.9	3.23	NR	NR	NR	NR	NR	NR	
2-2433	299-E27-18	RCRA	130	0.9	2.89	NR	NR	NR	NR	NR	NR	
2-2434	299-E27-18	RCRA	135	1.1	3.45	NR	NR	NR	NR	NR	NR	
2-2435	299-E27-18	RCRA	140	0.9	3.06	NR	NR	NR	NR	NR	NR	
2-2436	299-E27-18	RCRA	145	0.9	2.98	NR	NR	NR	NR	NR	NR	
2-2437	299-E27-18	RCRA	150	0.9	3.08	NR	NR	NR	NR	NR	NR	

NR = Not Requested
na = not · icable

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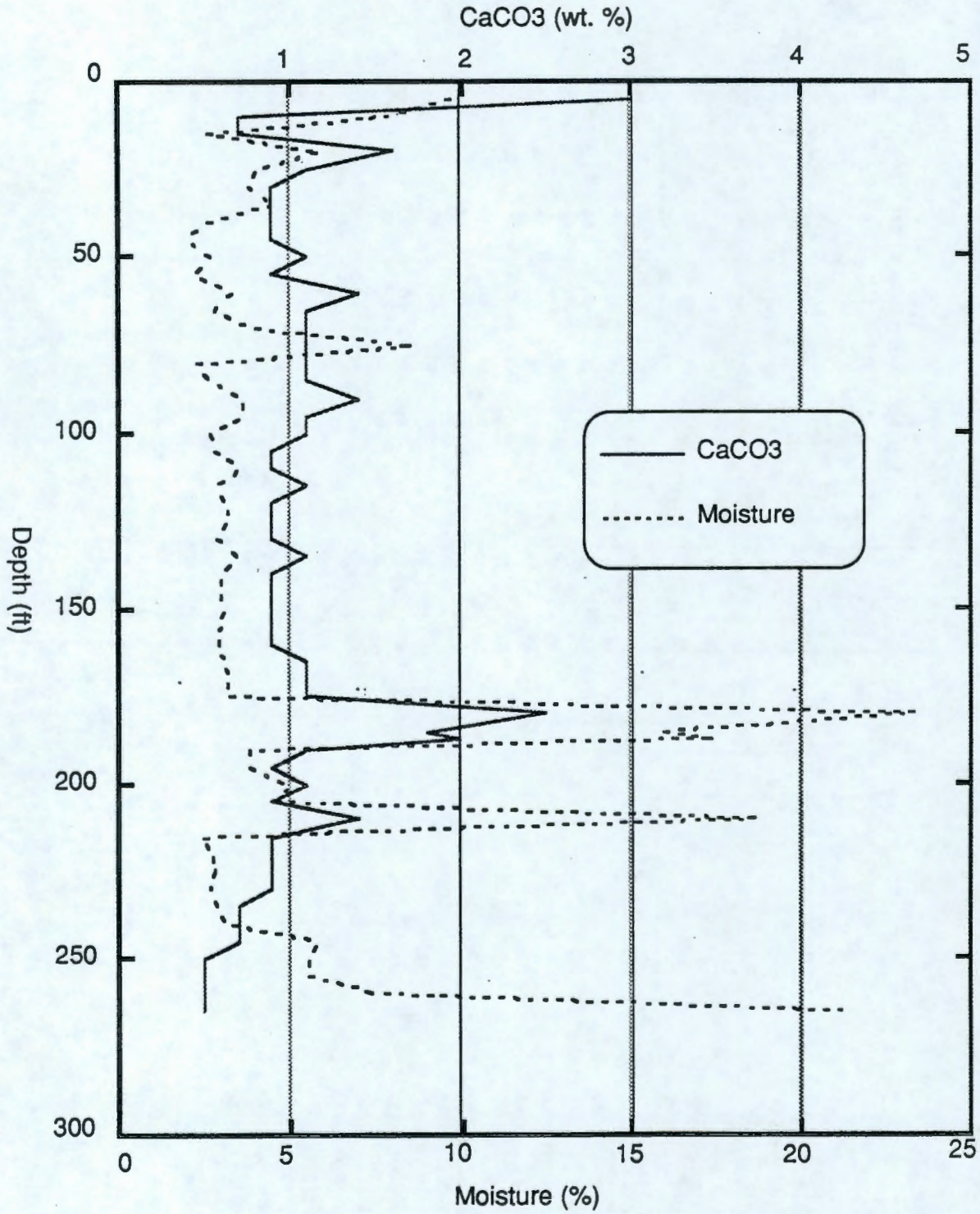
299-E27-18 TEST RESULTS SUMMARY SHEET

Sample No.	Well No.	Operable Unit	Depth	CC (%)	Mois (%)	Por (%)	Den/D (g/cc)	SpG/F	SpG/C	SpG/Avg	Sat K (cm/s)	Notes
2-2438	299-E27-18	RCRA	155	0.9	3.00	NR	NR	NR	NR	NR	NR	
2-2439	299-E27-18	RCRA	160	0.9	2.97	NR	NR	NR	NR	NR	NR	
2-2440	299-E27-18	RCRA	165	1.1	3.08	NR	NR	NR	NR	NR	NR	
2-2441	299-E27-18	RCRA	170	1.1	3.25	NR	NR	NR	NR	NR	NR	
2-2442	299-E27-18	RCRA	175	1.1	3.17	NR	NR	NR	NR	NR	NR	
2-2443	299-E27-18	RCRA	180	2.5	23.32	NR	NR	NR	NR	NR	NR	
2-2444	299-E27-18	RCRA	185	1.8	16.02	NR	NR	NR	NR	NR	NR	
2-2445	299-E27-18	RCRA	187	2.0	17.46	NR	NR	NR	NR	NR	NR	
2-2446	299-E27-18	RCRA	190	1.1	3.81	NR	NR	NR	NR	NR	NR	
2-2447	299-E27-18	RCRA	195	0.9	3.83	NR	NR	NR	NR	NR	NR	
2-2448	299-E27-18	RCRA	200	1.1	4.98	NR	NR	NR	NR	NR	NR	
2-2449	299-E27-18	RCRA	205	0.9	4.59	NR	NR	NR	NR	NR	NR	
2-2450	299-E27-18	RCRA	210	1.4	18.62	NR	NR	NR	NR	NR	NR	
2-2451	299-E27-18	RCRA	215	0.9	2.42	NR	NR	NR	NR	NR	NR	
2-2452	299-E27-18	RCRA	220	0.9	2.75	NR	NR	NR	NR	NR	NR	
2-2453	299-E27-18	RCRA	225	0.9	2.81	NR	NR	NR	NR	NR	NR	
2-2454	299-E27-18	RCRA	230	0.9	2.68	NR	NR	NR	NR	NR	NR	
2-2455	299-E27-18	RCRA	235	0.7	2.86	NR	NR	NR	NR	NR	NR	
2-2456	299-E27-18	RCRA	240	0.7	3.12	NR	NR	NR	NR	NR	NR	
2-2457	299-E27-18	RCRA	245	0.7	5.77	NR	NR	NR	NR	NR	NR	
2-2458	299-E27-18	RCRA	250	0.5	5.56	NR	NR	NR	NR	NR	NR	
2-2459	299-E27-18	RCRA	255	0.5	5.55	NR	NR	NR	NR	NR	NR	
2-2460	299-E27-18	RCRA	260	0.5	7.54	NR	NR	NR	NR	NR	NR	
2-2461	299-E27-18	RCRA	265	0.5	21.17	NR	NR	NR	NR	NR	NR	

NR = Not Requested
na = not applicable

299-E27-18



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WELL 299-E27-19

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SO-10/3-4590

7/08/92

299-E27-19 TEST RESULTS SUMMARY SHEET

FOR INFORMATION ONLY

Sample No.	Well No.	Operable Unit	Depth	CC (%)	Mois (%)	Por (%)	Den/D (g/cc)	SpG/F	SpG/C	SpG/Avg	Sat K (cm/s)	Notes
2-2354	299-E27-19	RCRA	5	1.4	3.88	NR	NR	NR	NR	NR	NR	na
2-2355	299-E27-19	RCRA	10	0.5	14.04	NR	NR	NR	NR	NR	NR	na
2-2356	299-E27-19	RCRA	15	0.5	4.06	NR	NR	NR	NR	NR	NR	na
2-2357	299-E27-19	RCRA	20	0.2*	4.56	NR	NR	NR	NR	NR	NR	na
2-2358	299-E27-19	RCRA	25	0.2*	3.96	NR	NR	NR	NR	NR	NR	na
2-2359	299-E27-19	RCRA	30	0.2*	3.17	NR	NR	NR	NR	NR	NR	na
2-2360	299-E27-19	RCRA	35	0.2*	3.88	NR	NR	NR	NR	NR	NR	na
2-2361	299-E27-19	RCRA	40	0.2*	3.92	NR	NR	NR	NR	NR	NR	na
2-2362	299-E27-19	RCRA	45	0.7	4.37	NR	NR	NR	NR	NR	NR	na
2-2363	299-E27-19	RCRA	50	1.1	5.16	NR	NR	NR	NR	NR	NR	na
2-2364	299-E27-19	RCRA	55	1.1	13.0	NR	NR	NR	NR	NR	NR	na
2-2365	299-E27-19	RCRA	60	0.7	2.96	NR	NR	NR	NR	NR	NR	na
2-2366	299-E27-19	RCRA	65	0.7	3.23	NR	NR	NR	NR	NR	NR	na
2-2367	299-E27-19	RCRA	69	1.1	24.36	NR	NR	NR	NR	NR	NR	na
2-2368	299-E27-19	RCRA	70	0.7	3.04	NR	NR	NR	NR	NR	NR	na
2-2369	299-E27-19	RCRA	75	0.7	3.30	NR	NR	NR	NR	NR	NR	na
2-2370	299-E27-19	RCRA	80	0.7	3.62	NR	NR	NR	NR	NR	NR	na
2-2371	299-E27-19	RCRA	85	0.7	3.45	NR	NR	NR	NR	NR	NR	na
2-2372	299-E27-19	RCRA	90	0.7	3.74	NR	NR	NR	NR	NR	NR	na
2-2373	299-E27-19	RCRA	95	0.9	3.28	NR	NR	NR	NR	NR	NR	na
2-2374	299-E27-19	RCRA	100	0.7	3.22	NR	NR	NR	NR	NR	NR	na
2-2375	299-E27-19	RCRA	105	0.5	3.32	NR	NR	NR	NR	NR	NR	na
2-2376	299-E27-19	RCRA	110	0.7	3.15	NR	NR	NR	NR	NR	NR	na
2-2377	299-E27-19	RCRA	115	0.7	3.26	NR	NR	NR	NR	NR	NR	na
2-2378	299-E27-19	RCRA	120	0.9	3.76	NR	NR	NR	NR	NR	NR	na
2-2379	299-E27-19	RCRA	125	0.7	3.64	NR	NR	NR	NR	NR	NR	na
2-2380	299-E27-19	RCRA	130	0.7	3.55	NR	NR	NR	NR	NR	NR	na
2-2381	299-E27-19	RCRA	135	0.7	4.91	NR	NR	NR	NR	NR	NR	na
2-2382	299-E27-19	RCRA	140	0.7	2.97	NR	NR	NR	NR	NR	NR	na
2-2383	299-E27-19	RCRA	145	0.7	3.20	NR	NR	NR	NR	NR	NR	na

* These sample results have an NCR written against them. The results for CaCO3 only, not moisture content, are suspect.
NR = Not Rec[illegible]ed
na = r[illegible]le

FOR INFORMATION ONLY

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SO-10/3-4590

7/08/92

299-E27-19 TEST RESULTS SUMMARY SHEET

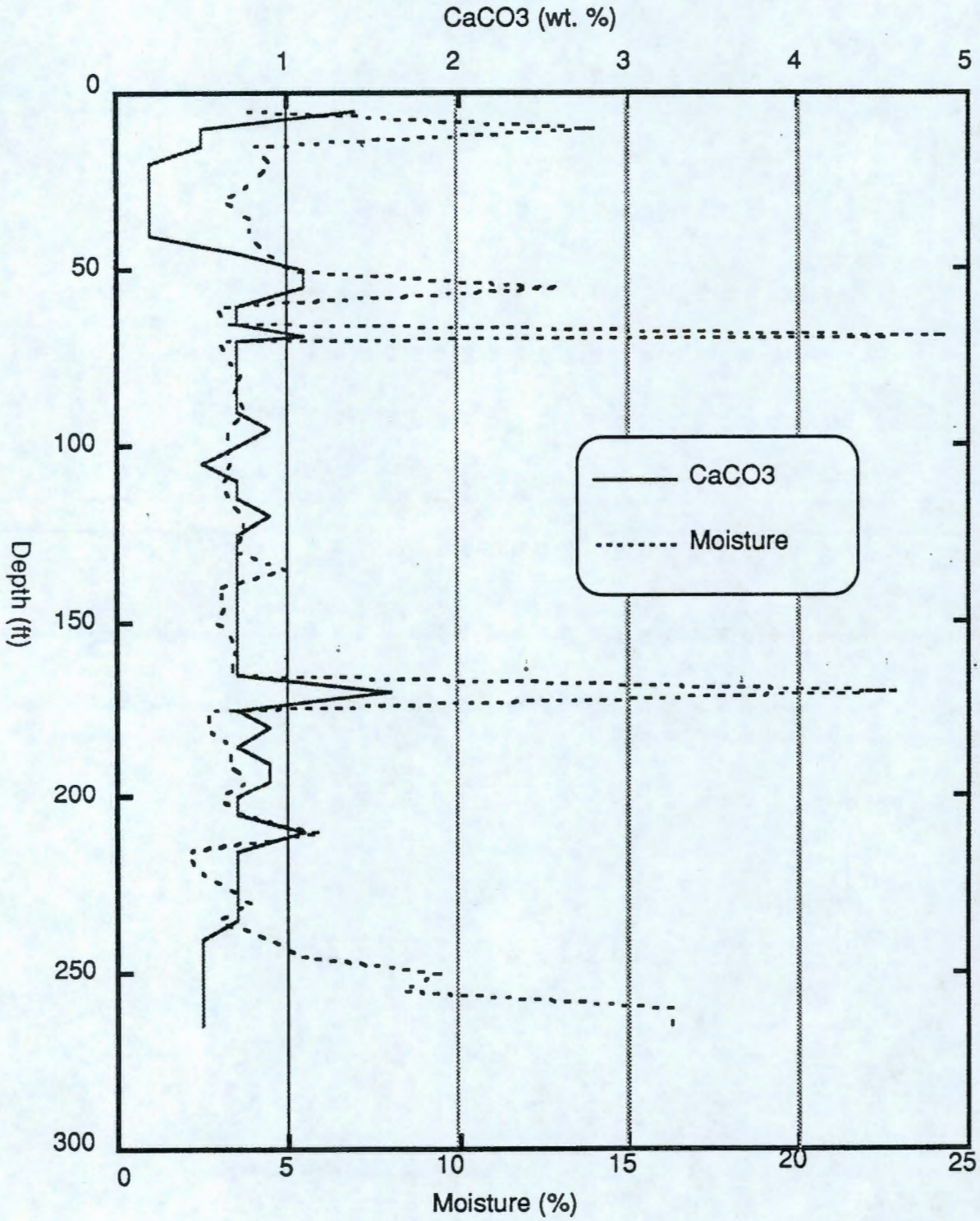
FOR INFORMATION ONLY

Sample No.	Well No.	Operable Unit	Depth	CC (%)	Mois (%)	Por (%)	Den/D (g/cc)	SpG/F	SpG/C	SpG/Avg	Sat K (cm/s)	Notes
2-2384	299-E27-19	RCRA	150	0.7	2.96	NR	NR	NR	NR	NR	NR	na
2-2385	299-E27-19	RCRA	155	0.7	3.40	NR	NR	NR	NR	NR	NR	na
2-2386	299-E27-19	RCRA	160	0.7	3.46	NR	NR	NR	NR	NR	NR	na
2-2387	299-E27-19	RCRA	165	0.7	3.38	NR	NR	NR	NR	NR	NR	na
2-2388	299-E27-19	RCRA	170	1.6	22.82	NR	NR	NR	NR	NR	NR	na
2-2389	299-E27-19	RCRA	175	0.7	2.75	NR	NR	NR	NR	NR	NR	na
2-2390	299-E27-19	RCRA	180	0.9	2.64	NR	NR	NR	NR	NR	NR	na
2-2391	299-E27-19	RCRA	185	0.7	3.32	NR	NR	NR	NR	NR	NR	na
2-2392	299-E27-19	RCRA	190	0.9	3.29	NR	NR	NR	NR	NR	NR	na
2-2393	299-E27-19	RCRA	195	0.9	3.82	NR	NR	NR	NR	NR	NR	na
2-2394	299-E27-19	RCRA	200	0.7	3.02	NR	NR	NR	NR	NR	NR	na
2-2395	299-E27-19	RCRA	205	0.7	3.68	NR	NR	NR	NR	NR	NR	na
2-2396	299-E27-19	RCRA	210	1.1	5.95	NR	NR	NR	NR	NR	NR	na
2-2397	299-E27-19	RCRA	215	0.7	2.05	NR	NR	NR	NR	NR	NR	na
2-2398	299-E27-19	RCRA	220	0.7	2.30	NR	NR	NR	NR	NR	NR	na
2-2399	299-E27-19	RCRA	225	0.7	3.11	NR	NR	NR	NR	NR	NR	na
2-2400	299-E27-19	RCRA	230	0.7	3.91	NR	NR	NR	NR	NR	NR	na
2-2401	299-E27-19	RCRA	235	0.7	3.00	NR	NR	NR	NR	NR	NR	na
2-2402	299-E27-19	RCRA	240	0.5	4.38	NR	NR	NR	NR	NR	NR	na
2-2403	299-E27-19	RCRA	245	0.5	5.36	NR	NR	NR	NR	NR	NR	na
2-2404	299-E27-19	RCRA	250	0.5	9.45	NR	NR	NR	NR	NR	NR	na
2-2405	299-E27-19	RCRA	255	0.5	8.34	NR	NR	NR	NR	NR	NR	na
2-2406	299-E27-19	RCRA	260	0.5	16.29	NR	NR	NR	NR	NR	NR	na
2-2407	299-E27-19	RCRA	265	0.5	16.32	NR	NR	NR	NR	NR	NR	na

FOR INFORMATION ONLY

* These sample results have an NCR written against them. The results for CaCO3 only, not moisture content, are suspect.
NR = Not Requested
na = not a ible

299-E27-19



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APPENDIX C

WELL DEVELOPMENT AND PUMP INSTALLATION

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Well Development Information Checklist

Well No. 299-E27-18 Date: 7/8/92

WELL INFORMATION

A. Outer Casing Diameter 6"

B. Inner Casing Diameter 4"

C. Difference in stick-up 1.98'

D. Stick-up of outer casing 3.00'

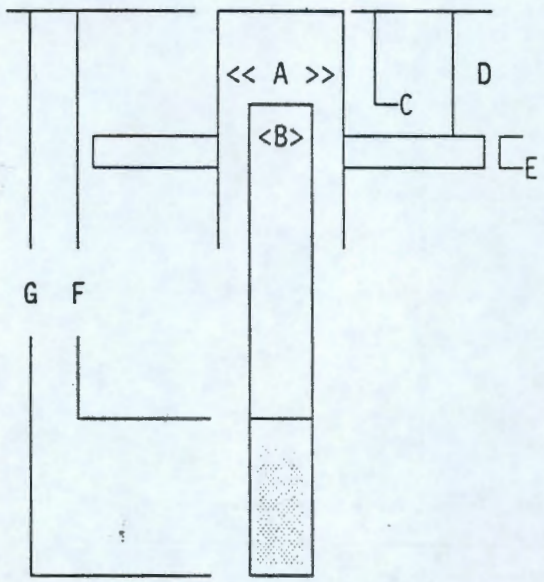
E. Thickness of well pad 0.5'

F. Depth to Water (BTOC) 247.67'

G. Total depth of Hole (BTOC) 265.09'

H. Screened Interval (BTOC) 245.00- 265.09'

I. Screen length 20.09'



DEVELOPMENT INFORMATION

J. Depth of Development pump intake. 263.88' BTOC

K. Depth (below water) of Transducer during drawdown/recovery. 14.18'

L. Depth (below water) of Transducer during slug test. 15.03'

EQUIPMENT INFORMATION

	Serial #	Calibration date
Hermit	1KB-700	N/A
E-Tape	ET-4	1/8/93
Transducer	259198	2/21/93

Slugging Rod dimensions 6' x 2"(0.13 ft^3)

Comments: Pump started 0820 at 14.18 gpm, shut off 0824 after 738.5 gallons were pumped and a final turbidity of 4.0 ntu was reached. Slug Injected 1154 and Withdrawn at 1238.

BTOC = Below Top Of Casing. BLS = Below Land Surface

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WELL DEVELOPMENT FORM

Well Designation 299-E27-18 Well Depth 265.09' BTOC

Screened Interval 245.00 - 265.09' BTOC Date Well Development is Performed 7/8/92

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block N/A Dimension of Surge Block N/A

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE
		N/A				
					N/A	

AIRLIFT

Depth of Eductor Pipe N/A Airlift Start Time N/A

Flow Rate N/A Accumulated Flow N/A Airlift Stop Time N/A

Turbidity N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A

N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A

MECHANICAL PUMPING

Pumping Technique Consistent Discharge Pump Depth 263.88' BTOC Pump Start Time 0820

Flow Rate 14.18 gpm Accumulated Flow 738.5 gallons Pump Stop Time 0924

Turbidity 8.4 NTU, 7.5 NTU, 4.0 NTU, ___, ___, ___, ___, ___

___, ___, ___, ___, ___, ___, ___, ___

Comments btoc - below top of casing

Signature of Recorder R. S. Edrington [signature] Date 7/17/92

Sign and Print Name

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 For Information Only

SAMPLING PUMP INSTALLATION ~~FORM~~

Project: W-017 Well Number: 299-E27-18

Pump Type: Hydrostar Pump Model: 8001

Date Installed: 7/14/92 Installed By: B. Strode

Depth to Water: 247.67 Ft BTOC* Depth to Bottom: 265.09 Ft BTOC

Reported Depth of water: ----

Screened Interval: 245.00-265.09 Ft BTOC

Pump/Riser Pipe Description:

Pipe: 3/4" Stainless steel
Pump Length: 4.34'
Pump Screen Length: 1.91'
Material Cleaning: Manufacturer
Distance pump off bottom: 1.67'

Comments: Pump Tested; produced 4.21 gpm at 47.1 strokes per min.

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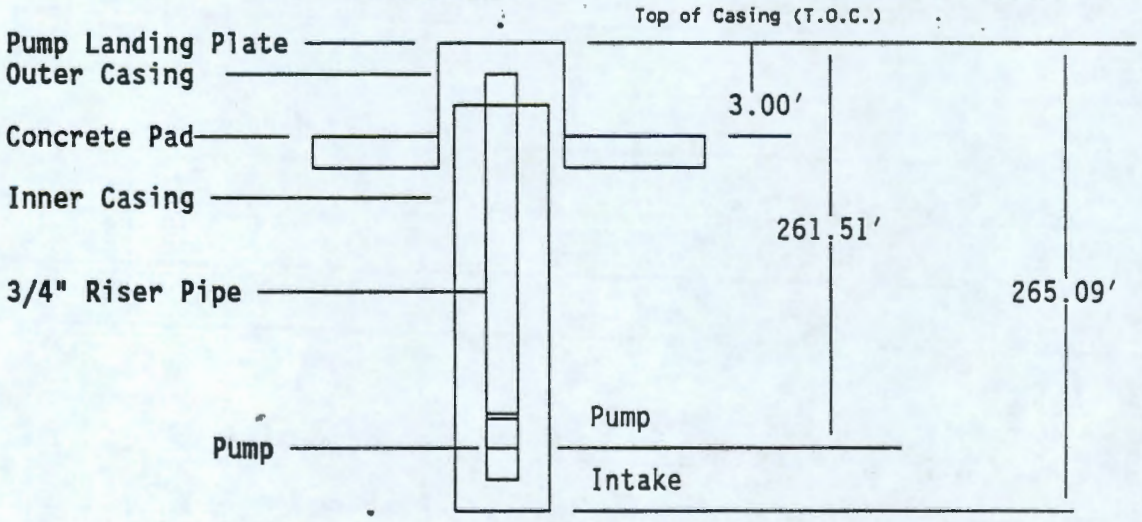
PUMP INSTALLATION SKETCH

Total Material Length: 263.42 Ft Depth to Pump intake: 261.51 Ft BTOC



Completed By: RS Edrington Date: 7/14/92

* BTOC - Below Top Of Casing

WELL CHECK LIST

Well Number: 299 E27-18 Location: B-63 Ditch

Date: 10/16/92

	Yes	No
Hasp on protective casing	✓	
Lock	✓	
Proper cap fit	✓	
Well ID number on brass cap	✓	
Protective post painted	✓	
Well ID number stenciled on post	✓	
Well ID number stenciled on protective casing	✓	
Survey mark on casing		✓
Stock tank		✓
Site neat	✓	

Comments:

Signature: E. C. Rafbee Date: 10/16/92

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WELL 299-E27-19

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Well Development Information Checklist

Well No. 299-E27-19

Date: 7/8/92

WELL INFORMATION

A. Outer Casing Diameter 6"

B. Inner Casing Diameter 4"

C. Difference in stick-up 2.05'

D. Stick-up of outer casing 3.05'

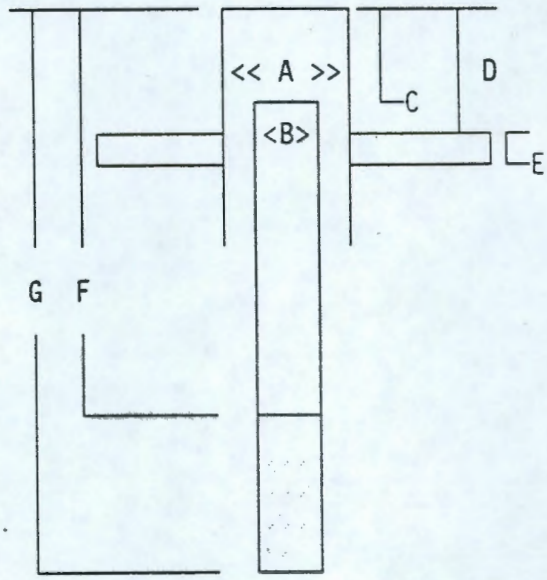
E. Thickness of well pad 0.5'

F. Depth to Water (BTOC) 248.40'

G. Total depth of Hole (BTOC) 265.99'

H. Screened Interval (BTOC) 245.91- 265.99'

I. Screen length 20.08'



DEVELOPMENT INFORMATION

J. Depth of Development pump intake. 264.78 BTOC

K. Depth (below water) of Transducer during drawdown/recovery. 13.03'

L. Depth (below water) of Transducer during slug test. 12.06'

EQUIPMENT INFORMATION

	Serial #	Calibration date
Hermit	1KB-700	N/A
E-Tape	ET-4	1/8/93
Transducer	1920	2/20/93

Slugging Rod dimensions 6' x 2"(0.13 ft^3)

Comments: Pump started 1009 at 12.36 gpm, shut off ~~09~~10 19 and pump rate re-adjusted. Pump re-started 1026 at 13.03 gpm and shut off 1116 after a final turbidity of 1.2 ntu was reached. 651.5 gallons were pumped during the drawdown and a total of 886 gallons were pumped during development. Slug Injected 1246 and Withdrawn at 1319.

BTOC = Below Top Of Casing.

BLS = Below Land Surface

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WELL DEVELOPMENT FORM

VALIDATED 10 pgs
KDR 11/13/92
SIGNATURE/DATE

Page 1 of 1

Well Designation 299-E27-19 Well Depth 265.99' BTOC

Screened Interval 245.91' - 265.99' btoc Date Well Development is Performed 7/8/92

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 264.78' Pump Start Time 1026

Flow Rate 13.03 gpm Accumulated Flow 886 gallons Pump Stop Time 1116

Turbidity 1.2, —, —, —, —, —, —, —

—, —, —, —, —, —, —, —

Comments Pump originally started at 1009 at 12.36 gpm, shut off at 0919 and the pump rate was adjusted to increase discharge rate to 13.03.

btoc - below top of casing

Signature of Recorder R. S. Edrington Date 7/20/92
Sign and Print Name

A-6000-393 (03/90)

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SAMPLING PUMP INSTALLATION FORM

VALIDATED
KDR 11/13/92
SIGNATURE/DATE

Project: W-017 Well Number: 299-E27-19

Pump Type: Hydrostar Pump Model: 8001

Date Installed: 7/8/92 Installed By: B. Strode

Depth to Water: 248.40 Ft BTOC* Depth to Bottom: 265.99 Ft BTOC

Reported Depth of water: ----

Screened Interval: 245.91-265.99 Ft BTOC

Pump/Riser Pipe Description:
- Pipe: 3/4" Stainless steel
- Pump Length: 4.33'
- Pump Screen Length: 1.91'
- Material Cleaning: Manufacturer
- Distance pump off bottom: 0.49'

Comments: Pump Tested; produced 3.84 gpm at 46.8 strokes per min.

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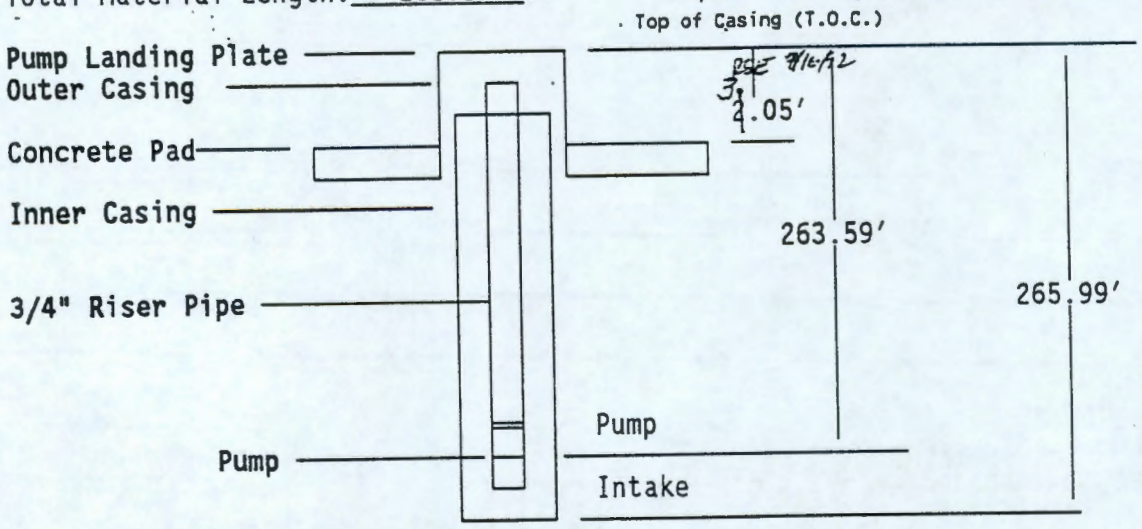
PUMP INSTALLATION SKETCH

Total Material Length: 261.17 Ft Depth to Pump intake: 263.59 Ft BTOC



Completed By: RS Edrington Date: 7/16/92

* BTOC - Below Top Of Casing

WELL CHECK LIST

Well Number: 299 E27-19 Location: B-63 Ditch - 200 E.

Date: 10/16/92

	Yes	No
Hasp on protective casing	✓	
Lock	✓	
Proper cap fit	✓	
Well ID number on brass cap	✓	
Protective post painted	✓	
Well ID number stenciled on post	✓	
Well ID number stenciled on protective casing	✓	
Survey mark on casing		✓
Stock tank		✓
Site neat	✓	

Comments:

Signature: E. C. Rafkin Date: 10/16/92

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APPENDIX D

AQUIFER TESTING ACTIVITIES
216-B-63 TRENCH

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INTRODUCTION

This appendix includes descriptions and discussions of aquifer tests and well development activities conducted in well 299-E27-18 and 299-E27-19 during 1992. The type of aquifer tests performed were slug injection/withdrawal tests.

Aquifer tests and development activities were conducted in completed wells. Both wells are screened approximately 17 ft into the top of the uppermost aquifer system. The lithology of the screened intervals consists of silty sandy gravel for well 299-E27-18 and sandy gravel for well 299-E27-19 and is considered to be part of the lower gravel sequence of the Hanford formation. The aquifer at this location is about 18 to 20 ft thick and exhibits water table conditions.

WELL DEVELOPMENT ACTIVITIES

Following well completion, each well was developed by installing a submersible pump and pumping at a steady rate until the turbidity of the formation water reached levels below 5 NTU. Water level drawdown and recovery were measured during well development with an in situ pressure transducer and recorded on a data logger. These data are contained in this appendix.

Water level data during development showed little change from the static water level. Because of the lack of drawdown, determination of aquifer properties was not attempted for either well.

SLUG INJECTION AND WITHDRAWAL TESTS

A 0.13-ft^3 rod was used to perform slug injection and withdrawal tests following well development. Water level changes during injection and withdrawal of the slug rod were measured with an in situ pressure transducer and the data were collected with a data logger. These data are contained in this appendix.

The slug withdrawal test results are interpreted to be more representative than the slug injection tests. The withdrawal tests consistently have less water level fluctuations (i.e., reduced disturbance) and are, therefore, expected to be more representative of the aquifer than the injection tests.

The data collected during testing from well 299-E27-18 were not interpretable. The response was very small (<10% of the theoretical head change) and returned to the static water table in <4 s.

The data collected during slug withdrawal testing from well 299-E27-19 were interpretable. A data acquisition problem occurred during data collection for the slug injection test (the recorded water levels were 2.5 ft about static after slug injection). The slug withdrawal data were evaluated using the Bouwer and Rice method (Bouwer 1976). The calculations assume a fully or

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partially penetrated, unconfined aquifer. Slug tests stress a relatively small portion of the aquifer immediately around the borehole. For this reason, results only apply to the tested interval. Also, the drawdown response may be affected by near borehole drilling/completion disturbances, and localized heterogeneities.

SUMMARY OF AQUIFER TEST RESULTS

Slug withdrawal data for well 299-E27-19 were analyzed by the Bouwer (1976) method, which is applicable to unconfined aquifers. An estimate of hydraulic conductivity was determined to be approximately 420 ft/day (14×10^{-2}cm/s). Values of aquifer properties were not determined from development data for either well or slug injection and withdrawal tests from well 299-E27-18.

REFERENCES

Bouwer, H., and R. C. Rice, 1976, *A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifer with Completely or Partially Penetrating Wells*, Water Resources Research, v. 12, no. 3, pp. 423-428.

Graham, M. J., M. D. Hall, S. R. Strait, and W. R. Brown, 1981, *Hydrology of the Separations Area*, RHO-ST-42, Rockwell Hanford Operations, Richland, Washington.

WHC, 1992, *Hydrogeologic Model for the 200 East Groundwater Aggregate Area*, WHC-SD-EN-TI-019, Rev. 0, prepared by M. P. Connelly, B. H. Ford, J. W. Lindberg, S. J. Trent and C. D. Delaney, Westinghouse Hanford Company, Richland, Washington, and J. V. Borghese, Pacific Northwest Laboratory for Westinghouse Hanford Company, Richland, Washington.

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WELL 299-E27-18

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Well 299-E27-18, Aquifer Testing Activities

Well Configuration

Screen Length: 20 ft (245.00 to 265.09 ft below top of casing (btc))

Screen Diameter: 4 in Screen Slot Size: 10 slot (.010 in)

Borehole Diameter: 8 in, at screen Filter Pack: 20-40 silica sand

Well Development

Purpose: Primary purpose is to develop filter pack and reduce turbidity of pumped water to levels below 5 NTU. Secondary purpose is to estimate aquifer properties from drawdown data.

Methodology: N/A

Test Interval: Water table to bottom of screened interval, 247.67 ft btc to 265.09 ft btc, respectively. Total saturated screened interval thickness is 17.42 ft.

Aquifer Thickness: Uppermost aquifer thickness is about 20 ft

Geologic Interval Tested: Lower gravel sequence of the Hanford formation.

Development Date: July 8, 1992 Pump Rate: 14.18 gpm

Pumping Time: 64 min Recovery Monitored: 64 min

Maximum Drawdown: 0.07 ft

Aquifer Transmissivity: N/A

Remarks: Insufficient drawdown to determine aquifer transmissivity.

Slug Injection/Withdrawal Tests

Test Date: July 14, 1992

Theoretical Water Level Change: 0.85 ft (assuming sandpack porosity of 25%)

Actual Water Level Change: 0.11 ft (test #4, slug injection), 0.17 ft (slug withdrawal, test #6)

Recovery Time: 1.2 secs (test #4, slug injection), about 4 secs (slug withdrawal, test #6)

Methodology: N/A Aquifer Properties: N/A

Remarks: Data not interpretable

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VALIDATED 10 pgs KDR 11/13/92 SIGNATURE/DATE

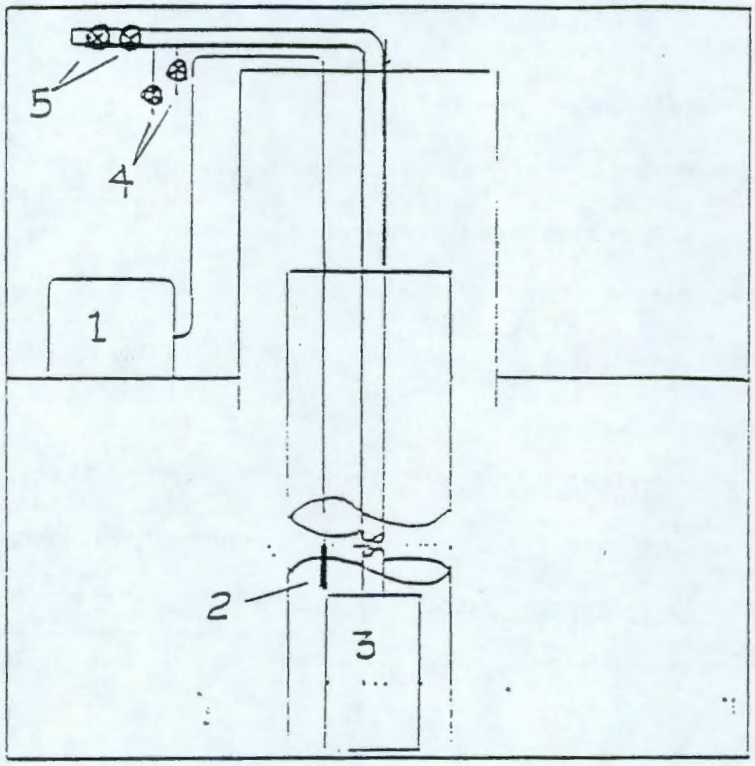
EQUIPMENT CONFIGURATION AND WELL HEAD DIAGRAM

Well Designation 299-E27-18 Depth 265.09' BTOC

Equipment Configuration

Item	Description
1	HERMIT DATA LOG. SN-1K13-700
2	TRANSDUCER SN-259198
3	PUMP (1½ HP GRUNDFOS)
4	SAMPLING PORTS
5	SHUT OFF VALVES

Diagram

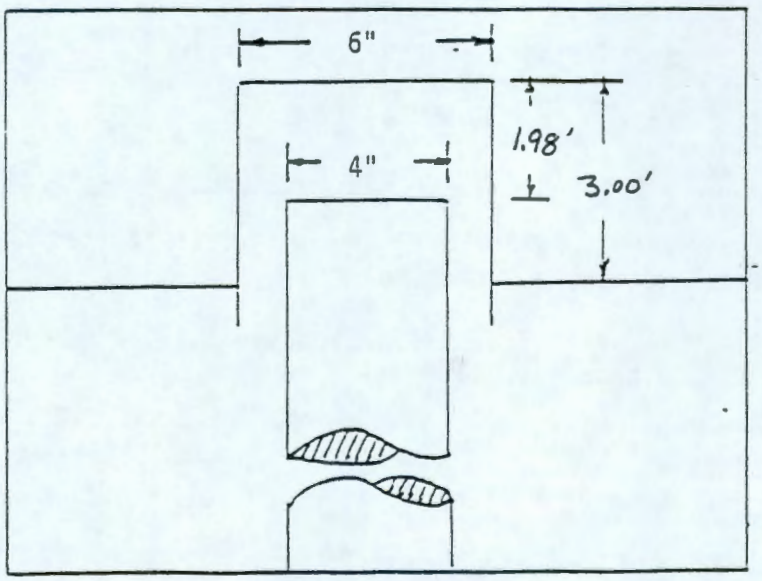


Well Head

Comments

BTOC - below top of casing

Diagram



Signature of Recorder Robert S. Edrington Date 7/17/92

A-6000-417 (08/89)

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DRAWDOWN/RECOVERY

Well Designation 299-E27-18 Date 7/8/92

Well Depth 265.09' btoc Screened Interval 245.00 - 265.09' btoc

Pumping Method Mechanical 1.5 Hp Grundfos

Equipment Used to Measure Water Level E-Tape/Transducer S. N. ET-~~4~~/259198 Calibation Due 1/8/93 | 2/21/93

Equipment Used to Measure Flow N/A S. N. N/A Calibation Due N/A

Measuring Point Top Of Casing T.O.C. Pump Start Time 0820 Pump Stop Time 0924

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit: 14.18 gpm Bucket Method btoc - below top of casing
		See Attached	See Attached	

Signature of Recorder Robert S. Edrington Date 7/17/92

Sign and Print Name D-9

A-6000-402 (03/90)

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299-E27-18 Baseline for Drawdown

Unit# 00700 Test# 0

INPUT 1: Level (F) TOC
Baseline for Drawdown
SWL 247.67' BTOC
Scale factor 9.99
Step# 0 07/14 08:00

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.00	0.000	247.81	-247.81
1.00	0.017	247.81	-247.81
2.00	0.033	247.81	-247.81
3.00	0.050	247.80	-247.80
4.00	0.067	247.80	-247.80
5.00	0.083	247.80	-247.80
6.00	0.100	247.80	-247.80
7.00	0.117	247.79	-247.79
8.00	0.133	247.79	-247.79
9.00	0.150	247.79	-247.79
10.00	0.167	247.79	-247.79
11.00	0.183	247.79	-247.79
12.00	0.200	247.79	-247.79
13.00	0.217	247.79	-247.79
14.00	0.233	247.79	-247.79
15.00	0.250	247.79	-247.79
16.00	0.267	247.79	-247.79
17.00	0.283	247.79	-247.79
18.00	0.300	247.78	-247.78
19.00	0.317	247.78	-247.78

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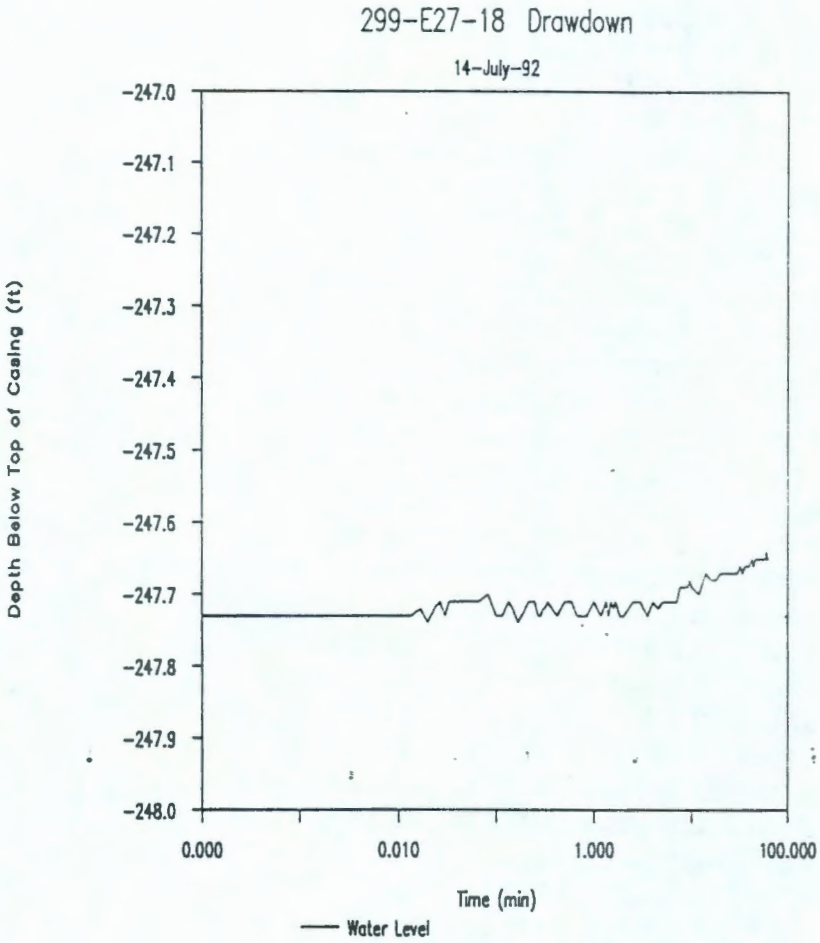
99-E27-18 Drawdown

Unit# 00700 Test# 1

INPUT 1: Level (F) TOC
Drawdown
SWL 247.67' BTOC
Scale factor 9.99
Pump Rate 11.54 gpm
Step# 0 07/14 08:19

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	247.73	-247.73
0.003	0.00006	247.73	-247.73
0.007	0.00011	247.73	-247.73
0.010	0.00017	247.73	-247.73
0.013	0.00022	247.73	-247.73
0.017	0.00028	247.72	-247.72
0.020	0.00033	247.74	-247.74
0.023	0.00039	247.72	-247.72
0.027	0.00044	247.71	-247.71
0.030	0.00050	247.73	-247.73
0.033	0.00056	247.71	-247.71
0.050	0.00083	247.71	-247.71
0.067	0.00111	247.71	-247.71
0.083	0.00139	247.70	-247.70
0.100	0.00167	247.73	-247.73
0.117	0.00194	247.73	-247.73
0.133	0.00222	247.71	-247.71
0.150	0.00250	247.72	-247.72
0.167	0.00278	247.74	-247.74
0.183	0.00306	247.73	-247.73
0.200	0.00333	247.72	-247.72
0.217	0.00361	247.71	-247.71
0.233	0.00389	247.71	-247.71
0.250	0.00417	247.71	-247.71
0.267	0.00444	247.73	-247.73
0.283	0.00472	247.73	-247.73
0.300	0.00500	247.72	-247.72
0.317	0.00528	247.72	-247.72
0.333	0.00556	247.71	-247.71
0.417	0.00695	247.73	-247.73
0.500	0.00833	247.71	-247.71
0.583	0.00972	247.71	-247.71
0.667	0.01111	247.73	-247.73
0.750	0.01250	247.73	-247.73



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'99-E27-18 Drawdown

0.833	0.01389	247.73	-247.73
0.917	0.01528	247.72	-247.72
1.000	0.01667	247.71	-247.71
1.083	0.01805	247.72	-247.72
1.167	0.01945	247.73	-247.73
1.250	0.02083	247.72	-247.72
1.333	0.02222	247.71	-247.71
1.417	0.02361	247.73	-247.73
1.500	0.02500	247.71	-247.71
1.583	0.02639	247.72	-247.72
1.667	0.02778	247.71	-247.71
1.750	0.02917	247.72	-247.72
1.833	0.03056	247.73	-247.73
1.917	0.03195	247.73	-247.73
2.000	0.03333	247.73	-247.73
2.500	0.04167	247.71	-247.71
3.000	0.05000	247.71	-247.71
3.500	0.05833	247.73	-247.73
4.000	0.06667	247.71	-247.71
4.500	0.07500	247.72	-247.72
5.000	0.08333	247.71	-247.71
5.500	0.09167	247.71	-247.71
6.000	0.10000	247.71	-247.71
6.500	0.10833	247.71	-247.71
7.000	0.11667	247.71	-247.71
7.500	0.12500	247.69	-247.69
8.000	0.13333	247.69	-247.69
8.500	0.14167	247.69	-247.69
9.000	0.15000	247.69	-247.69
9.500	0.15833	247.68	-247.68
10.000	0.16667	247.69	-247.69
12.000	0.20000	247.70	-247.70
14.000	0.23333	247.67	-247.67
16.000	0.26667	247.68	-247.68
18.000	0.30000	247.68	-247.68
20.000	0.33333	247.67	-247.67
22.000	0.36667	247.67	-247.67
24.000	0.40000	247.67	-247.67
26.000	0.43333	247.67	-247.67
28.000	0.46667	247.67	-247.67
30.000	0.50000	247.67	-247.67
32.000	0.53333	247.66	-247.66
34.000	0.56667	247.67	-247.67
36.000	0.60000	247.66	-247.66
38.000	0.63333	247.66	-247.66

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'99-E27-18 Drawdown

40.000	0.66667	247.66	-247.66
42.000	0.70000	247.65	-247.65
44.000	0.73333	247.66	-247.66
46.000	0.76667	247.65	-247.65
48.000	0.80000	247.65	-247.65
50.000	0.83333	247.65	-247.65
52.000	0.86667	247.65	-247.65
54.000	0.90000	247.65	-247.65
56.000	0.93333	247.65	-247.65
58.000	0.96667	247.65	-247.65
60.000	1.00000	247.64	-247.64
62.000	1.03333	247.65	-247.65

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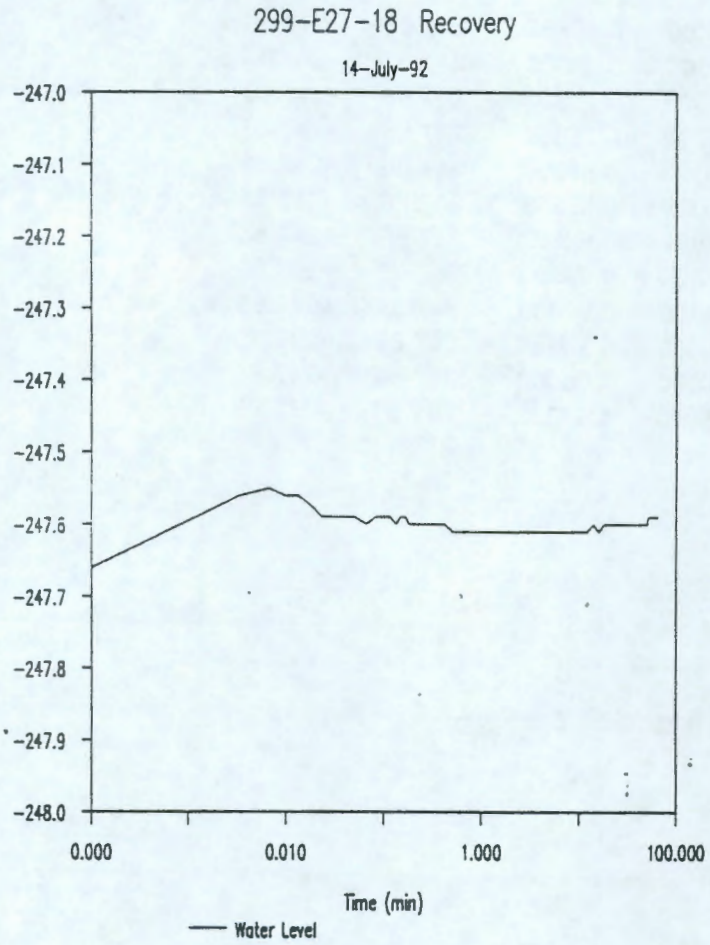
`9-E27-18 Recovery

Unit# 00700 Test# 2

INPUT 1: Level (F) TOC
Recovery
SWL 247.67' BTOC
Scale factor 9.99
Step# 0 07/14 09:22

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	247.66	-247.66
0.003	0.00006	247.56	-247.56
0.007	0.00011	247.55	-247.55
0.010	0.00017	247.56	-247.56
0.013	0.00022	247.56	-247.56
0.017	0.00028	247.57	-247.57
0.020	0.00033	247.58	-247.58
0.023	0.00039	247.59	-247.59
0.027	0.00044	247.59	-247.59
0.030	0.00050	247.59	-247.59
0.033	0.00056	247.59	-247.59
0.050	0.00083	247.59	-247.59
0.067	0.00111	247.60	-247.60
0.083	0.00139	247.59	-247.59
0.100	0.00167	247.59	-247.59
0.117	0.00194	247.59	-247.59
0.133	0.00222	247.60	-247.60
0.150	0.00250	247.59	-247.59
0.167	0.00278	247.59	-247.59
0.183	0.00306	247.60	-247.60
0.200	0.00333	247.60	-247.60
0.217	0.00361	247.60	-247.60
0.233	0.00389	247.60	-247.60
0.250	0.00417	247.60	-247.60
0.267	0.00444	247.60	-247.60
0.283	0.00472	247.60	-247.60
0.300	0.00500	247.60	-247.60
0.317	0.00528	247.60	-247.60
0.333	0.00556	247.60	-247.60
0.417	0.00695	247.60	-247.60
0.500	0.00833	247.61	-247.61
0.583	0.00972	247.61	-247.61
0.667	0.01111	247.61	-247.61
0.750	0.01250	247.61	-247.61
0.833	0.01389	247.61	-247.61



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99-E27-18 Recovery

0.917	0.01528	247.61	-247.61
1.000	0.01667	247.61	-247.61
1.083	0.01805	247.61	-247.61
1.167	0.01945	247.61	-247.61
1.250	0.02083	247.61	-247.61
1.333	0.02222	247.61	-247.61
1.417	0.02361	247.61	-247.61
1.500	0.02500	247.61	-247.61
1.583	0.02639	247.61	-247.61
1.667	0.02778	247.61	-247.61
1.750	0.02917	247.61	-247.61
1.833	0.03056	247.61	-247.61
1.917	0.03195	247.61	-247.61
2.000	0.03333	247.61	-247.61
2.500	0.04167	247.61	-247.61
3.000	0.05000	247.61	-247.61
3.500	0.05833	247.61	-247.61
4.000	0.06667	247.61	-247.61
4.500	0.07500	247.61	-247.61
5.000	0.08333	247.61	-247.61
5.500	0.09167	247.61	-247.61
6.000	0.10000	247.61	-247.61
6.500	0.10833	247.61	-247.61
7.000	0.11667	247.61	-247.61
7.500	0.12500	247.61	-247.61
8.000	0.13333	247.61	-247.61
8.500	0.14167	247.61	-247.61
9.000	0.15000	247.61	-247.61
9.500	0.15833	247.61	-247.61
10.000	0.16667	247.61	-247.61
12.000	0.20000	247.61	-247.61
14.000	0.23333	247.60	-247.60
16.000	0.26667	247.61	-247.61
18.000	0.30000	247.60	-247.60
20.000	0.33333	247.60	-247.60
22.000	0.36667	247.60	-247.60
24.000	0.40000	247.60	-247.60
26.000	0.43333	247.60	-247.60
28.000	0.46667	247.60	-247.60
30.000	0.50000	247.60	-247.60
32.000	0.53333	247.60	-247.60
34.000	0.56667	247.60	-247.60
36.000	0.60000	247.60	-247.60
38.000	0.63333	247.60	-247.60
40.000	0.66667	247.60	-247.60

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9-E27-18 Recovery

42.000	0.70000	247.60	-247.60
44.000	0.73333	247.60	-247.60
46.000	0.76667	247.60	-247.60
48.000	0.80000	247.60	-247.60
50.000	0.83333	247.60	-247.60
52.000	0.86667	247.59	-247.59
54.000	0.90000	247.59	-247.59
56.000	0.93333	247.59	-247.59
58.000	0.96667	247.59	-247.59
60.000	1.00000	247.59	-247.59
62.000	1.03333	247.59	-247.59
64.000	1.06667	247.59	-247.59

9313091.1630

VALIDATED KDR 11/13/92 SIGNATURE/DATE

p. 1 of 10

BOREHOLE TEST INFORMATION

Borehole 299-E27-18 Borehole Diameter 4 inches Hanford Coordinates N/A

Interval Tested 245.00 - 265.09' btoc Depth Interval 245.00 - 265.09' btoc

Test Type Instantaneous Slug test Borehole Depth 265.09' btoc

Instruction Used WHC-CM-7-7 EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOLINST SN-ET-4
DATA LOGGER	IN SITU INC. SN-1KB-700
PRESSURE TRANSDUCER	IN SITU Inc. SN-259198
SLUGGING ROD	6'x 2" (0.13 ft^3)
STEEL MEASURING TAPE	GRADUATED STEEL TAPE (~~500'~~ 300' ESE)

MEASUREMENT DATUM

Control Datum Top of 6" Casing (T.O.C.)
btoc - below top of casing

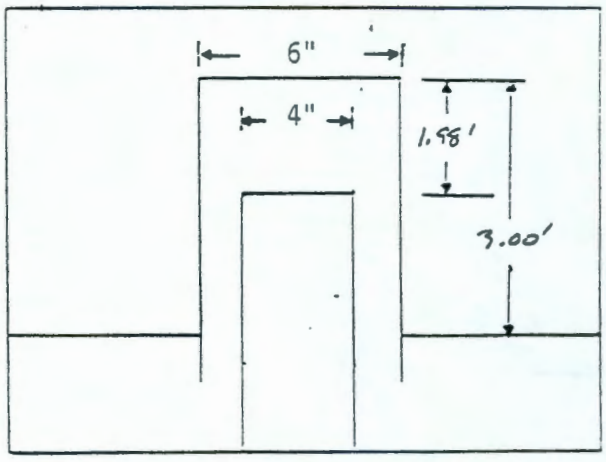
Elevation N/A

Electric Sounder T.O.C.

Steel Tape T.O.C.

Pressure Transducer T.O.C.

WELL HEAD DIAGRAM



COMMENTS

Recorded by: Robert S. Edrington (Sign and Print Name) 7/17/92 (Date)

BD-6000-295 (05/89)

9313091.1631

INSTANTANEOUS SLUG TEST DATA SHEET -- INJECTION

Well Hole 299-E27-18

Time 1154

Interval Tested 245.00 - 265.09'

Transducer Measurement Units Feet

Depth to Water* (Below Top of Casing) 247.67'

Depth to Transducer (Below water) 15.03'

Date 7/8/92

Initial Pressure (P_i) 247.67' BTOC*

Measured by Robert S. Edrington

Slug Level or Pressure (P_{max}) 247.56' BTOC*

Slug Volume 0.13ft³ Barometer Reading (Beginning) N/A (End) N/A

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

9413191.1632

Recorded by Robert S. Edrington (Sign and Print Name) 7/17/92 (Date)

BD-6000-293 (07/90)

2 of 5

p. 7 of 10

299-E27-18 Baseline for Slug Injection

Unit# 00700 Test # 3

INPUT 1: Level (F) TOC
Baseline for Slug Injection
SWL 247.67' BTOC
Scale factor 9.99
Step# 0 07/14 11:11

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.00	0.000	247.67	-247.67
1.00	0.017	247.71	-247.71
2.00	0.033	247.73	-247.73
3.00	0.050	247.74	-247.74
4.00	0.067	247.75	-247.75
5.00	0.083	247.76	-247.76
6.00	0.100	247.76	-247.76
7.00	0.117	247.77	-247.77
8.00	0.133	247.77	-247.77
9.00	0.150	247.78	-247.78
10.00	0.167	247.78	-247.78
11.00	0.183	247.78	-247.78
12.00	0.200	247.78	-247.78
13.00	0.217	247.78	-247.78
14.00	0.233	247.78	-247.78
15.00	0.250	247.78	-247.78
16.00	0.267	247.78	-247.78
17.00	0.283	247.78	-247.78
18.00	0.300	247.78	-247.78
19.00	0.317	247.78	-247.78
20.00	0.333	247.78	-247.78
21.00	0.350	247.78	-247.78
22.00	0.367	247.78	-247.78
23.00	0.383	247.78	-247.78
24.00	0.400	247.78	-247.78
25.00	0.417	247.78	-247.78
26.00	0.433	247.78	-247.78
27.00	0.450	247.78	-247.78
28.00	0.467	247.78	-247.78
29.00	0.483	247.78	-247.78
30.00	0.500	247.78	-247.78
31.00	0.517	247.78	-247.78
32.00	0.533	247.78	-247.78
33.00	0.550	247.78	-247.78
34.00	0.567	247.77	-247.77

9313091.1633

3 of 5
p. 8 of 10

299-E27-18 Baseline for Slug Injection

35.00	0.583	247.77	-247.77
36.00	0.600	247.77	-247.77
37.00	0.617	247.77	-247.77
38.00	0.633	247.77	-247.77
39.00	0.650	247.77	-247.77

9313091.1634

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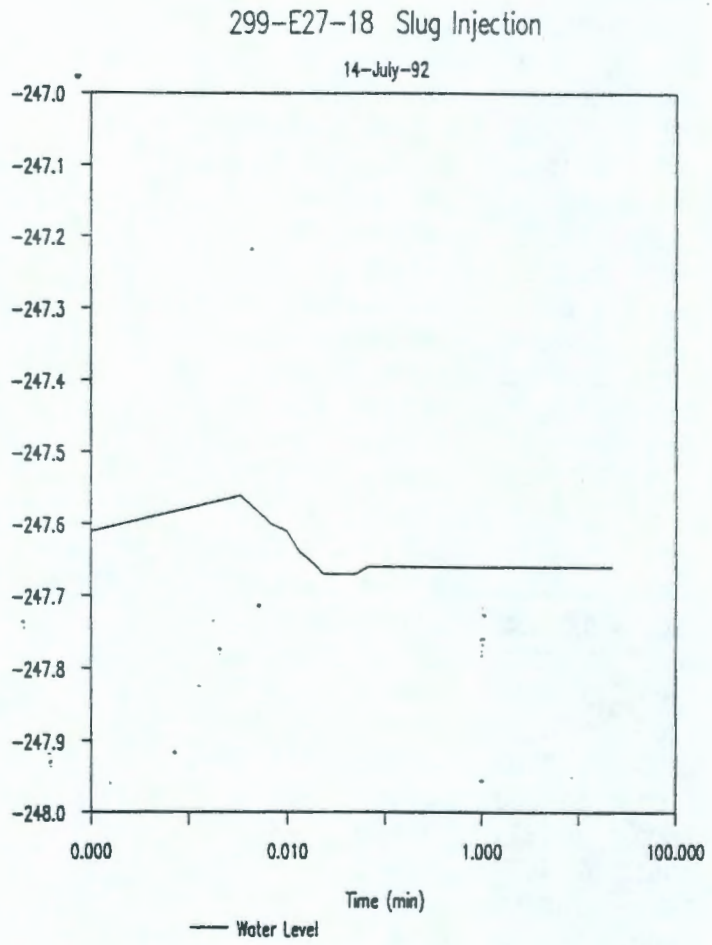
p. 9 of 10

299-E27-18 Slug Injection

Unit# 00700 Test# 4

INPUT 1: Level (F) TOC
Slug Injection
SWL 247.67' BTOC
Scale factor 9.99
Slug Volume 0.13 Cu ft
Step# 0 07/14 11:52

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	247.61	-247.61
0.003	0.00006	247.56	-247.56
0.007	0.00011	247.60	-247.60
0.010	0.00017	247.61	-247.61
0.013	0.00022	247.64	-247.64
0.017	0.00028	247.65	-247.65
0.020	0.00033	247.66	-247.66
0.023	0.00039	247.67	-247.67
0.027	0.00044	247.67	-247.67
0.030	0.00050	247.67	-247.67
0.033	0.00056	247.67	-247.67
0.050	0.00083	247.67	-247.67
0.067	0.00111	247.66	-247.66
0.083	0.00139	247.66	-247.66
0.100	0.00167	247.66	-247.66
0.117	0.00194	247.66	-247.66
0.133	0.00222	247.66	-247.66
0.150	0.00250	247.66	-247.66
0.167	0.00278	247.66	-247.66
0.183	0.00306	247.66	-247.66
0.200	0.00333	247.66	-247.66
0.217	0.00361	247.66	-247.66
0.233	0.00389	247.66	-247.66
0.250	0.00417	247.66	-247.66
0.267	0.00444	247.66	-247.66
0.283	0.00472	247.66	-247.66
0.300	0.00500	247.66	-247.66
0.317	0.00528	247.66	-247.66
0.333	0.00556	247.66	-247.66
0.417	0.00695	247.66	-247.66
0.500	0.00833	247.66	-247.66
0.583	0.00972	247.66	-247.66
0.667	0.01111	247.66	-247.66
0.750	0.01250	247.66	-247.66



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p. 10 of 10

^99-E27-18 Slug Injection

0.833	0.01389	247.66	-247.66
0.917	0.01528	247.66	-247.66
1.000	0.01667	247.66	-247.66
1.083	0.01805	247.66	-247.66
1.167	0.01945	247.66	-247.66
1.250	0.02083	247.66	-247.66
1.333	0.02222	247.66	-247.66
1.417	0.02361	247.66	-247.66
1.500	0.02500	247.66	-247.66
1.583	0.02639	247.66	-247.66
1.667	0.02778	247.66	-247.66
1.750	0.02917	247.66	-247.66
1.833	0.03056	247.66	-247.66
1.917	0.03195	247.66	-247.66
2.000	0.03333	247.66	-247.66
2.500	0.04167	247.66	-247.66
3.000	0.05000	247.66	-247.66
3.500	0.05833	247.66	-247.66
4.000	0.06667	247.66	-247.66
4.500	0.07500	247.66	-247.66
5.000	0.08333	247.66	-247.66
5.500	0.09167	247.66	-247.66
6.000	0.10000	247.66	-247.66
6.500	0.10833	247.66	-247.66
7.000	0.11667	247.66	-247.66
7.500	0.12500	247.66	-247.66
8.000	0.13333	247.66	-247.66
8.500	0.14167	247.66	-247.66
9.000	0.15000	247.66	-247.66
9.500	0.15833	247.66	-247.66
10.000	0.16667	247.66	-247.66
12.000	0.20000	247.66	-247.66
14.000	0.23333	247.66	-247.66
16.000	0.26667	247.66	-247.66
18.000	0.30000	247.66	-247.66
20.000	0.33333	247.66	-247.66
22.000	0.36667	247.66	-247.66

9313091.1636

INSTANTANEOUS SLUG TEST DATA SHEET -- WITHDRAWAL

Page 1 of 4

Borehole 299-E27-18

Time 1236

Interval Tested 245.00' - 265.09'

Transducer Measurement Units Feet

Depth to Water* (Below Top of Casing) 247.67'

Depth to Transducer (Below water) 15.03'

Date 7/14/92

Initial Pressure (P_i) 247.67' BTOC*

Measured by Robert S. Edrington

Slug Level or Pressure (P_{max}) 247.85' BTOC*

Slug Volume 0.13ft³ Barometer Reading (Beginning) N/A (End) N/A

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by Robert S. Edrington (Sign and Print Name) Robert S. Edrington 7/17/92 (Date)

9313091.1632

99-E27-18 Baseline for Slug Withdrawal

Unit# 00700 Test# 5

INPUT 1: Level (F) TOC
Baseline for Withdrawal of Slug
SWL 247.67' BTOC
Scale factor 9.99
Step# 0 07/14 12:15

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.00	0.000	247.67	-247.67
1.00	0.017	247.67	-247.67
2.00	0.033	247.67	-247.67
3.00	0.050	247.67	-247.67
4.00	0.067	247.67	-247.67
5.00	0.083	247.67	-247.67
6.00	0.100	247.67	-247.67
7.00	0.117	247.66	-247.66
8.00	0.133	247.66	-247.66
9.00	0.150	247.66	-247.66
10.00	0.167	247.66	-247.66
11.00	0.183	247.66	-247.66
12.00	0.200	247.66	-247.66
13.00	0.217	247.66	-247.66
14.00	0.233	247.66	-247.66
15.00	0.250	247.66	-247.66
16.00	0.267	247.66	-247.66
17.00	0.283	247.66	-247.66
18.00	0.300	247.66	-247.66
19.00	0.317	247.66	-247.66
20.00	0.333	247.66	-247.66

9313091.1638

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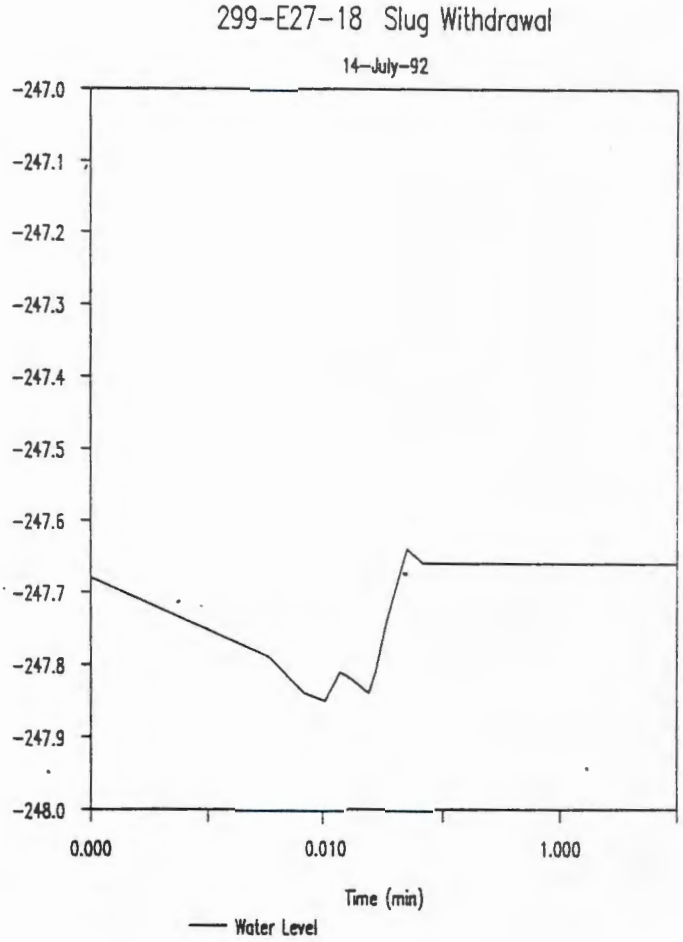
p. 4 of 10

299-E27-18 Withdrawal of Slug

Unit# 00700 Test# 6

INPUT 1: Level (F) TOC
Slug Withdrawal
SWL 247.67' BTOC
Scale factor 9.99
Slug Volume 0.13 Cu ft
Step# 0 07/14 12:36

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	247.68	-247.68
0.003	0.00006	247.79	-247.79
0.007	0.00011	247.84	-247.84
0.010	0.00017	247.85	-247.85
0.013	0.00022	247.81	-247.81
0.017	0.00028	247.82	-247.82
0.020	0.00033	247.83	-247.83
0.023	0.00039	247.84	-247.84
0.027	0.00044	247.81	-247.81
0.030	0.00050	247.77	-247.77
0.033	0.00056	247.74	-247.74
0.050	0.00083	247.64	-247.64
0.067	0.00111	247.66	-247.66
0.083	0.00139	247.66	-247.66
0.100	0.00167	247.66	-247.66
0.117	0.00194	247.66	-247.66
0.133	0.00222	247.66	-247.66
0.150	0.00250	247.66	-247.66
0.167	0.00278	247.66	-247.66
0.183	0.00306	247.66	-247.66
0.200	0.00333	247.66	-247.66
0.217	0.00361	247.66	-247.66
0.233	0.00389	247.66	-247.66
0.250	0.00417	247.66	-247.66
0.267	0.00444	247.66	-247.66
0.283	0.00472	247.66	-247.66
0.300	0.00500	247.66	-247.66
0.317	0.00528	247.66	-247.66
0.333	0.00556	247.66	-247.66
0.417	0.00695	247.66	-247.66
0.500	0.00833	247.66	-247.66
0.583	0.00972	247.66	-247.66
0.667	0.01111	247.66	-247.66
0.750	0.01250	247.66	-247.66



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09-E27-18 Withdrawal of Slug

0.833	0.01389	247.66	-247.66
0.917	0.01528	247.66	-247.66
1.000	0.01667	247.66	-247.66
1.083	0.01805	247.66	-247.66
1.167	0.01945	247.66	-247.66
1.250	0.02083	247.66	-247.66
1.333	0.02222	247.66	-247.66
1.417	0.02361	247.66	-247.66
1.500	0.02500	247.66	-247.66
1.583	0.02639	247.66	-247.66
1.667	0.02778	247.66	-247.66
1.750	0.02917	247.66	-247.66
1.833	0.03056	247.66	-247.66
1.917	0.03195	247.66	-247.66
2.000	0.03333	247.66	-247.66
2.500	0.04167	247.66	-247.66
3.000	0.05000	247.66	-247.66
3.500	0.05833	247.66	-247.66
4.000	0.06667	247.66	-247.66
4.500	0.07500	247.66	-247.66
5.000	0.08333	247.66	-247.66
5.500	0.09167	247.66	-247.66
6.000	0.10000	247.66	-247.66
6.500	0.10833	247.66	-247.66
7.000	0.11667	247.66	-247.66
7.500	0.12500	247.66	-247.66
8.000	0.13333	247.66	-247.66
8.500	0.14167	247.66	-247.66
9.000	0.15000	247.66	-247.66
9.500	0.15833	247.66	-247.66
10.000	0.16667	247.66	-247.66

9313091.1640

WELL 299-E27-19

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9313091.1642

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Well 299-E27-19, Aquifer Testing Activities

Well Configuration

Screen Length: 20 ft (245.91 to 265.99 ft below top of casing (btc))

Screen Diameter: 4 in Screen Slot Size: 10 slot (.010 in)

Borehole Diameter: 8 in, at screen Filter Pack: 20-40 silica sand

Well Development

Purpose: Primary purpose is to develop filter pack and reduce turbidity of pumped water to levels below 5 NTU. Secondary purpose is to estimate aquifer properties from drawdown data.

Methodology: N/A

Test Interval: Water table to bottom of screened interval, 248.40 ft btc to 265.99 ft btc, respectively. Total saturated screened interval thickness is 17.59 ft.

Aquifer Thickness: Uppermost aquifer thickness is about 20 ft

Geologic Interval Tested: Lower gravel sequence of the Hanford formation.

Development Date: July 8, 1992 Pump Rate: 13.03 gpm

Pumping Time: 50 min Recovery Monitored: 10 min

Maximum Drawdown: 0.08 ft

Aquifer Transmissivity: N/A

Remarks: Insufficient drawdown to determine aquifer transmissivity.

Slug Injection/Withdrawal Tests

Test Date: July 8, 1992

Theoretical Water Level Change: 0.85 ft (assuming sandpack porosity of 25%)

Actual Water Level Change: 0.76 ft (test #4, slug injection), about 0.58 ft (slug withdrawal, test #6 Initial head change was not recorded)

Recovery Time: about 3 secs (test #4, slug injection), about 40 secs (slug withdrawal, test #6 Initial head change was not recorded)

Methodology: Bouwer-Rice Aquifer Properties: K = 400 ft/day

Remarks: Estimate of K determined from slug withdrawal test (test #6)

9313091.1643

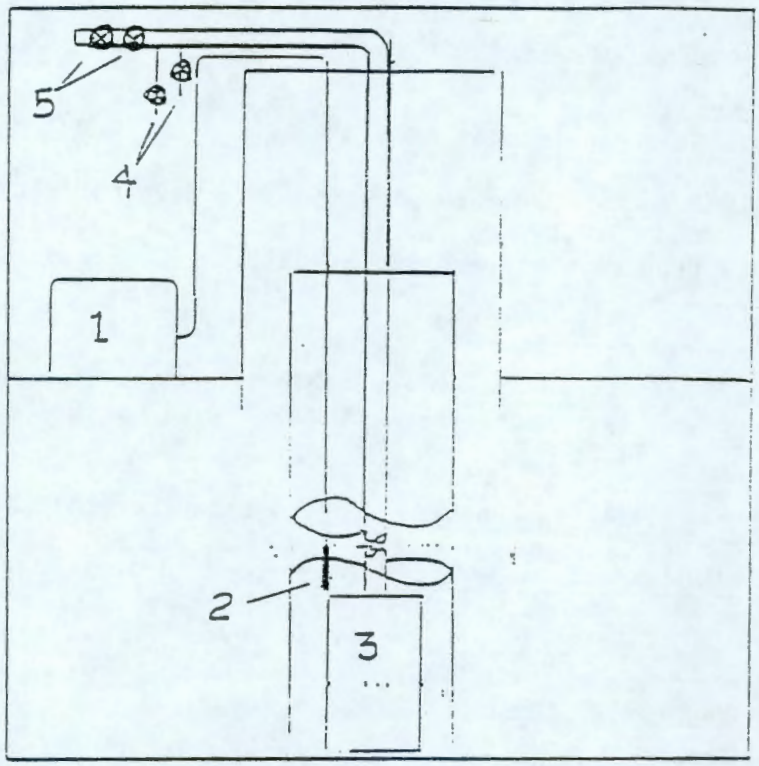
EQUIPMENT CONFIGURATION AND WELL HEAD DIAGRAM

Well Designation 299-E27-19 Depth 265.99' BTOC

Equipment Configuration

Item	Description
1	HERMIT DATA LOG. SN-1KB-700
2	TRANSDUCER SN-1920
3	PUMP (1 1/2 HP)
4	SAMPLING PORTS
5	SHUT OFF VALVES

Diagram

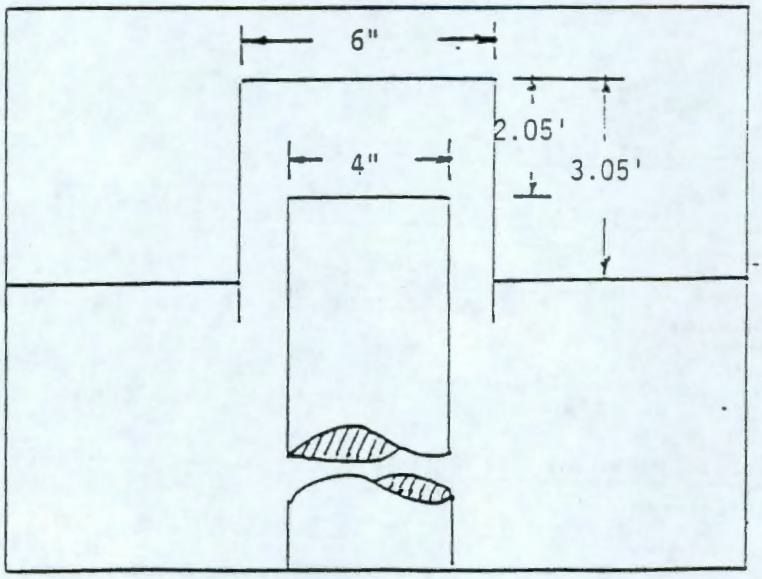


Well Head

Comments

Initial pump rate was adjusted due to lack of drawdown. BTOC - below top of casing

Diagram



Signature of Recorder Robert S. Edrington Robert S. Edrington Date 7/20/92

A-6000-417 (08/89)

9313091.1694

DRAWDOWN/RECOVERY

Well Designation 299-E27-19 Date 7/8/92

Well Depth 265.99' BTOC Screened Interval 245.91 - 265.99' BTOC

Pumping Method Mechanical 1.5 Hp Grundfos Constant discharge

Equipment Used to Measure Water Level E-Tape/Transducer S. N. ET-4/1920 Calibation Due 1/8/93-- 2/20/93

Equipment Used to Measure Flow N/A S. N. N/A Calibation Due N/A

Measuring Point Top Of Casing T.O.C. Pump Start Time 1026 Pump Stop Time 1116

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit: 13.03 gpm
				Bucket Method
				BTOC - below top of casing
		See Attached		
			See Attached	

Signature of Recorder Robert S. Edrington Date 7/20/92
Sign and Print Name

A-6000-402 (03/90)

9313091.1646

299-E27-19 Slug Withdrawal Test July 8, 1992

****

THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.

****

****

RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.

****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2194	.3300	17.5900	17.5900	20.0000

****

Le/Rw = 53.3030300
A= 3.1869620
B= 5.220909E-001
C= 2.8209920
SANDPACK POROSITY= 2.500000E-001
t (min)= 2.300000E-002
1/t= 43.4782600
Yo= (ft) 5.500000E-001
Yt= (ft) 9.600000E-002
1/t ln(Yo/Yt)= 75.8943500
ln[(H-Lw)/Rw]= 1.9882890
ln(Re/Rw)= 2.8095820

****

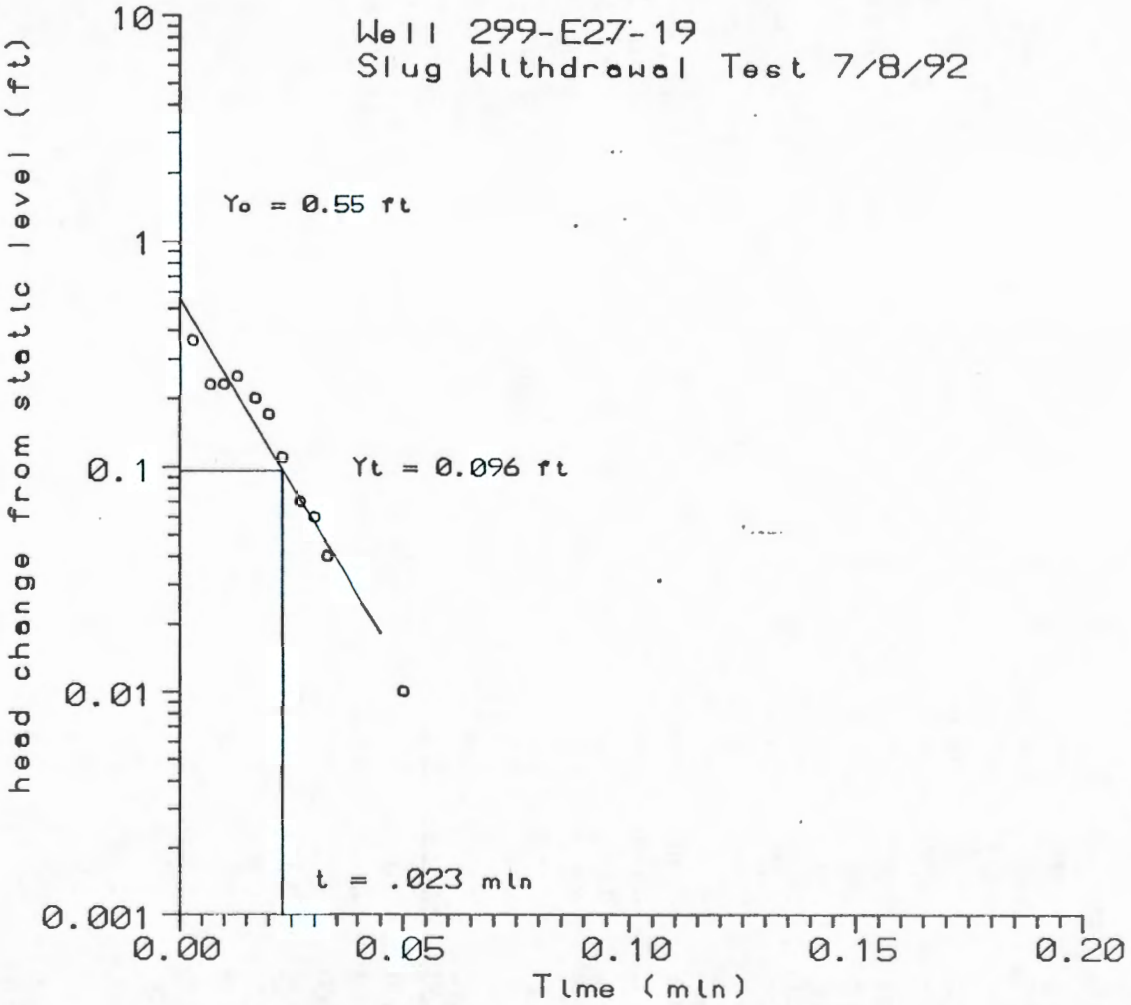
K (ft/day) = 420.1842000

****

T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 7391.0410000

****

9313091.1646


Well 299-E27-19
Slug Withdrawal Test 7/8/92
Yo = 0.55 ft
Yt = 0.096 ft
t = .023 min
head change from static level (ft)
10
1
0.1
0.01
0.001
0.00
0.05
0.10
0.15
0.20
Time (min)

299-E27-19 Baseline for Drawdown

Unit# 00700 Test# 0

INPUT 1: Level (F) TOC
Baseline for Drawdown
SWL 248.40' BTOC
Scale factor 50.20
Step# 0 07/08 09:20

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.00	0.000	248.38	-248.38
1.00	0.017	248.40	-248.40
2.00	0.033	248.40	-248.40
3.00	0.050	248.38	-248.38
4.00	0.067	248.38	-248.38
5.00	0.083	248.38	-248.38
6.00	0.100	248.38	-248.38
7.00	0.117	248.38	-248.38
8.00	0.133	248.38	-248.38
9.00	0.150	248.36	-248.36
10.00	0.167	248.36	-248.36
11.00	0.183	248.36	-248.36
12.00	0.200	248.36	-248.36
13.00	0.217	248.36	-248.36
14.00	0.233	248.36	-248.36
15.00	0.250	248.36	-248.36
16.00	0.267	248.36	-248.36
17.00	0.283	248.36	-248.36
18.00	0.300	248.35	-248.35
19.00	0.317	248.35	-248.35
20.00	0.333	248.35	-248.35
21.00	0.350	248.35	-248.35
22.00	0.367	248.35	-248.35
23.00	0.383	248.35	-248.35
24.00	0.400	248.35	-248.35
25.00	0.417	248.35	-248.35
26.00	0.433	248.35	-248.35
27.00	0.450	248.35	-248.35
28.00	0.467	248.33	-248.33
29.00	0.483	248.33	-248.33
30.00	0.500	248.35	-248.35
31.00	0.517	248.33	-248.33
32.00	0.533	248.33	-248.33
33.00	0.550	248.33	-248.33
34.00	0.567	248.33	-248.33

9313091.1648

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299-E27-19 Baseline for Drawdown

35.00	0.583	248.33	-248.33
36.00	0.600	248.33	-248.33
37.00	0.617	248.33	-248.33
38.00	0.633	248.33	-248.33
39.00	0.650	248.33	-248.33
40.00	0.667	248.33	-248.33
41.00	0.683	248.33	-248.33
42.00	0.700	248.33	-248.33
43.00	0.717	248.33	-248.33
44.00	0.733	248.33	-248.33
45.00	0.750	248.32	-248.32
46.00	0.767	248.33	-248.33

9313091.1649

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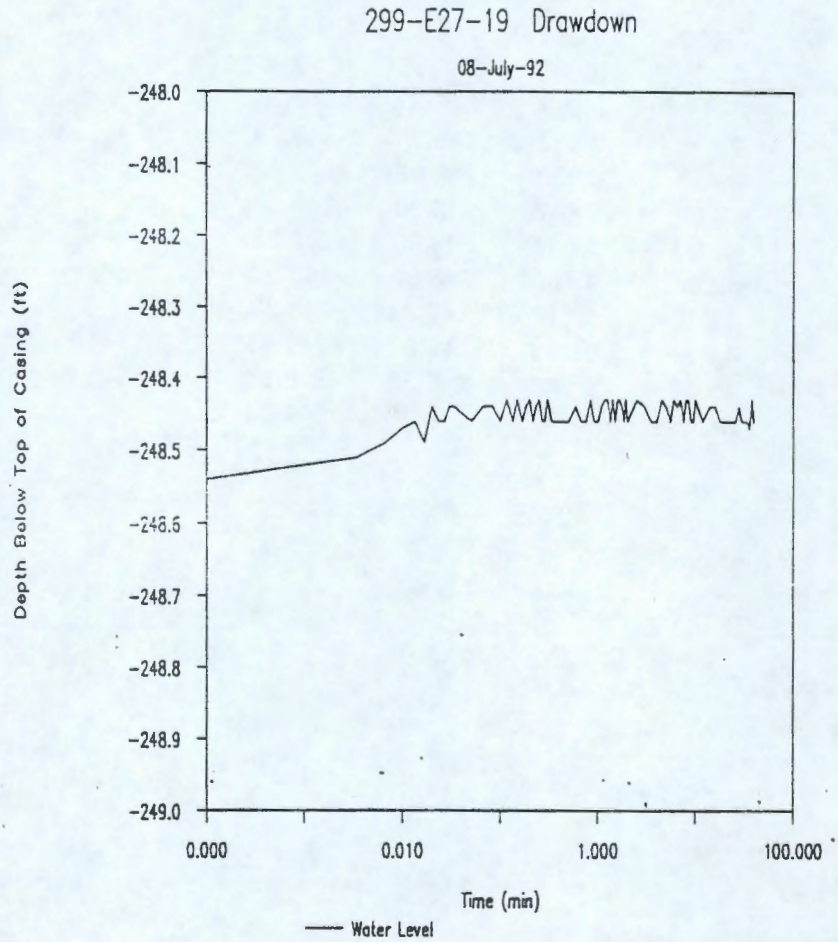
299-E27-19 Drawdown

Unit# 00700 Test# 1

INPUT 1: Level (F) TOC
Drawdown
SWL 248.40' BTOC
Scale factor 50.20
Pump Rate 12.36 gpm
Step# 0 07/08 10:25

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	248.54	-248.54
0.003	0.00006	248.51	-248.51
0.007	0.00011	248.49	-248.49
0.010	0.00017	248.47	-248.47
0.013	0.00022	248.46	-248.46
0.017	0.00028	248.49	-248.49
0.020	0.00033	248.44	-248.44
0.023	0.00039	248.46	-248.46
0.027	0.00044	248.46	-248.46
0.030	0.00050	248.44	-248.44
0.033	0.00056	248.44	-248.44
0.050	0.00083	248.46	-248.46
0.067	0.00111	248.44	-248.44
0.083	0.00139	248.44	-248.44
0.100	0.00167	248.46	-248.46
0.117	0.00194	248.43	-248.43
0.133	0.00222	248.46	-248.46
0.150	0.00250	248.43	-248.43
0.167	0.00278	248.46	-248.46
0.183	0.00306	248.44	-248.44
0.200	0.00333	248.43	-248.43
0.217	0.00361	248.46	-248.46
0.233	0.00389	248.44	-248.44
0.250	0.00417	248.43	-248.43
0.267	0.00444	248.46	-248.46
0.283	0.00472	248.46	-248.46
0.300	0.00500	248.43	-248.43
0.317	0.00528	248.44	-248.44
0.333	0.00556	248.46	-248.46
0.417	0.00695	248.46	-248.46
0.500	0.00833	248.46	-248.46
0.583	0.00972	248.44	-248.44
0.667	0.01111	248.46	-248.46
0.750	0.01250	248.46	-248.46



9313091.1650

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99-E27-19 Drawdown

0.833	0.01389	248.43	-248.43
0.917	0.01528	248.46	-248.46
1.000	0.01667	248.46	-248.46
1.083	0.01805	248.44	-248.44
1.167	0.01945	248.43	-248.43
1.250	0.02083	248.43	-248.43
1.333	0.02222	248.46	-248.46
1.417	0.02361	248.43	-248.43
1.500	0.02500	248.46	-248.46
1.583	0.02639	248.43	-248.43
1.667	0.02778	248.43	-248.43
1.750	0.02917	248.44	-248.44
1.833	0.03056	248.46	-248.46
1.917	0.03195	248.43	-248.43
2.000	0.03333	248.46	-248.46
2.500	0.04167	248.43	-248.43
3.000	0.05000	248.44	-248.44
3.500	0.05833	248.46	-248.46
4.000	0.06667	248.46	-248.46
4.500	0.07500	248.43	-248.43
5.000	0.08333	248.44	-248.44
5.500	0.09167	248.46	-248.46
6.000	0.10000	248.43	-248.43
6.500	0.10833	248.44	-248.44
7.000	0.11667	248.43	-248.43
7.500	0.12500	248.46	-248.46
8.000	0.13333	248.43	-248.43
8.500	0.14167	248.43	-248.43
9.000	0.15000	248.46	-248.46
9.500	0.15833	248.46	-248.46
10.000	0.16667	248.43	-248.43
12.000	0.20000	248.46	-248.46
14.000	0.23333	248.44	-248.44
16.000	0.26667	248.44	-248.44
18.000	0.30000	248.46	-248.46
20.000	0.33333	248.46	-248.46
22.000	0.36667	248.46	-248.46
24.000	0.40000	248.46	-248.46
26.000	0.43333	248.46	-248.46
28.000	0.46667	248.44	-248.44
30.000	0.50000	248.46	-248.46
32.000	0.53333	248.46	-248.46
34.000	0.56667	248.46	-248.46
36.000	0.60000	248.47	-248.47
38.000	0.63333	248.43	-248.43

9313091.1651

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299-E27-19 Drawdown

40.000	0.66667	248.46	-248.46

9313091.1652

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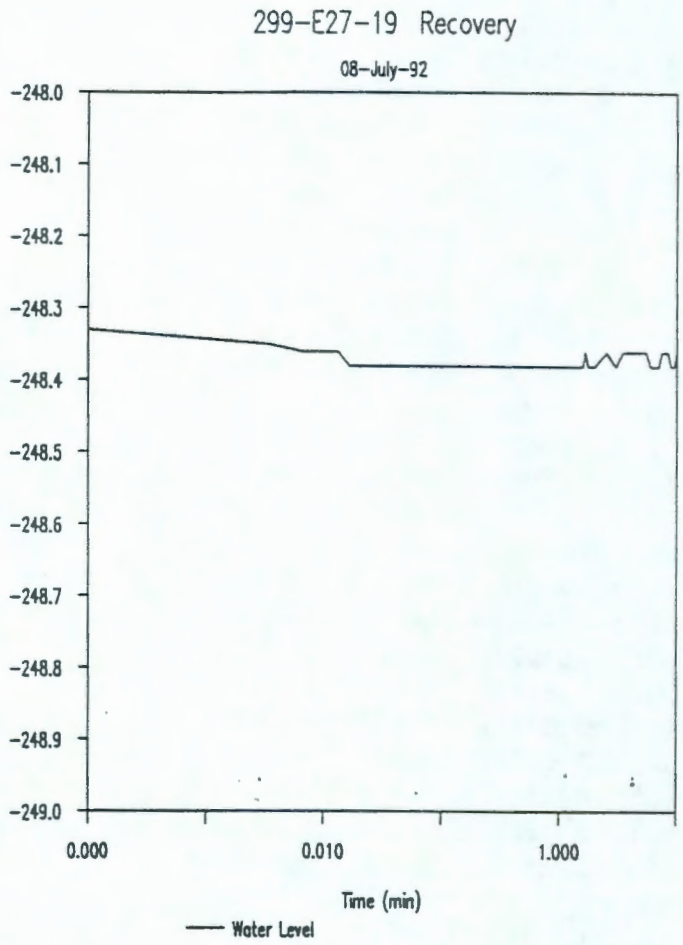
299-E27-92 Recovery

Unit# 00700 Test# 2

INPUT 1: Level (F) TOC
Recovery
SWL 248.40' BTOC
Scale factor 50.20
Step# 0 07/08 11:06

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	248.33	-248.33
0.003	0.00006	248.35	-248.35
0.007	0.00011	248.36	-248.36
0.010	0.00017	248.36	-248.36
0.013	0.00022	248.36	-248.36
0.017	0.00028	248.38	-248.38
0.020	0.00033	248.38	-248.38
0.023	0.00039	248.38	-248.38
0.027	0.00044	248.38	-248.38
0.030	0.00050	248.38	-248.38
0.033	0.00056	248.38	-248.38
0.050	0.00083	248.38	-248.38
0.067	0.00111	248.38	-248.38
0.083	0.00139	248.38	-248.38
0.100	0.00167	248.38	-248.38
0.117	0.00194	248.38	-248.38
0.133	0.00222	248.38	-248.38
0.150	0.00250	248.38	-248.38
0.167	0.00278	248.38	-248.38
0.183	0.00306	248.38	-248.38
0.200	0.00333	248.38	-248.38
0.217	0.00361	248.38	-248.38
0.233	0.00389	248.38	-248.38
0.250	0.00417	248.38	-248.38
0.267	0.00444	248.38	-248.38
0.283	0.00472	248.38	-248.38
0.300	0.00500	248.38	-248.38
0.317	0.00528	248.38	-248.38
0.333	0.00556	248.38	-248.38
0.417	0.00695	248.38	-248.38
0.500	0.00833	248.38	-248.38
0.583	0.00972	248.38	-248.38
0.667	0.01111	248.38	-248.38
0.750	0.01250	248.38	-248.38
0.833	0.01389	248.38	-248.38



9313091.1653

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^99-E27-92 Recovery

0.917	0.01528	248.38	-248.38
1.000	0.01667	248.38	-248.38
1.083	0.01805	248.38	-248.38
1.167	0.01945	248.38	-248.38
1.250	0.02083	248.38	-248.38
1.333	0.02222	248.38	-248.38
1.417	0.02361	248.38	-248.38
1.500	0.02500	248.38	-248.38
1.583	0.02639	248.38	-248.38
1.667	0.02778	248.36	-248.36
1.750	0.02917	248.38	-248.38
1.833	0.03056	248.38	-248.38
1.917	0.03195	248.38	-248.38
2.000	0.03333	248.38	-248.38
2.500	0.04167	248.36	-248.36
3.000	0.05000	248.38	-248.38
3.500	0.05833	248.36	-248.36
4.000	0.06667	248.36	-248.36
4.500	0.07500	248.36	-248.36
5.000	0.08333	248.36	-248.36
5.500	0.09167	248.36	-248.36
6.000	0.10000	248.38	-248.38
6.500	0.10833	248.38	-248.38
7.000	0.11667	248.38	-248.38
7.500	0.12500	248.36	-248.36
8.000	0.13333	248.36	-248.36
8.500	0.14167	248.36	-248.36
9.000	0.15000	248.38	-248.38
9.500	0.15833	248.38	-248.38
10.000	0.16667	248.36	-248.36

9313091.1654

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VALIDATED KDR 11/13/92 SIGNATURE/DATE

BOREHOLE TEST INFORMATION

Borehole 299-E27-19 Borehole Diameter 4 inches Hanford Coordinates N/A

Interval Tested 245.91 - 265.99 BTOC Depth Interval 245.91 - 265.99'

Test Type Instantaneous Slug test Borehole Depth 265.99'

Instruction Used WHC-CM-7-7 EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOLINST SN-ET-4
DATA LOGGER	IN_SITU INC. SN-1KB-700
PRESSURE TRANSDUCER	IN_SITU Inc. SN- 1920
SLUGGING ROD	6'x 2" (0.13 ft^3)
STEEL MEASURING TAPE	GRADUATED STEEL TAPE (~~500'~~ 300') RSE

MEASUREMENT DATUM

Control Datum Top of 6" Casing (T.O.C.)

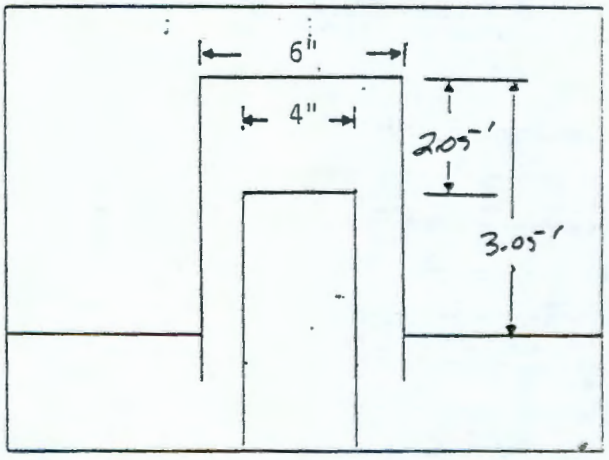
Elevation N/A

Electric Sounder T.O.C.

Steel Tape T.O.C.

Pressure Transducer T.O.C.

WELL HEAD DIAGRAM



COMMENTS

BTOC - below top of casing

Recorded by: Robert S. Edrington (Sign and Print Name) Robert S. Edrington 7/20/92 (Date)

BD-6000-295 (05/89)

9313091.1655

INSTANTANEOUS SLUG TEST DATA SHEET -- INJECTION

E hole 299-E27-19

Interval Tested 245.91 - 265.99' BTOC*

Depth to Water (Below Top of Casing) 248.40'

Date 7/8/92

Measured by Robert S. Edrington

Slug Volume 0.13ft³ Barometer Reading (Beginning) N/A (End) N/A

Time 1246

Transducer Measurement Units Feet

Depth to Transducer (Below water) 12.06

Initial Pressure (P_i) 248.40' BTOC*

Slug Level or Pressure (P_{max}) 245.38' BTOC*

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
								*BTOC - below top of casing
		SEE ATTACHED						
					SEE ATTACHED			

Recorded by Robert S. Edrington (Sign and Print Name) Robert S. Edrington 7/20/92 (Date)

SD-6000-293 (07/90)

9231091.1656
0313091.1656

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299-E27-19 Baseline for Slug Injection

Unit# 00700 Test# 3

INPUT 1: Level (F) TOC
Baseline for Slug Injection
SWL 248.40' BTOC
Scale factor 50.20
Step# 0 07/08 12:27

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.00	0.000	248.40	-248.40
1.00	0.017	248.43	-248.43
2.00	0.033	248.44	-248.44
3.00	0.050	248.44	-248.44
4.00	0.067	248.44	-248.44
5.00	0.083	248.44	-248.44
6.00	0.100	248.44	-248.44
7.00	0.117	248.44	-248.44
8.00	0.133	248.44	-248.44
9.00	0.150	248.44	-248.44
10.00	0.167	248.44	-248.44
11.00	0.183	248.44	-248.44
12.00	0.200	248.44	-248.44
13.00	0.217	248.44	-248.44
14.00	0.233	248.44	-248.44
15.00	0.250	248.43	-248.43
16.00	0.267	248.43	-248.43
17.00	0.283	248.43	-248.43

9313091.1657

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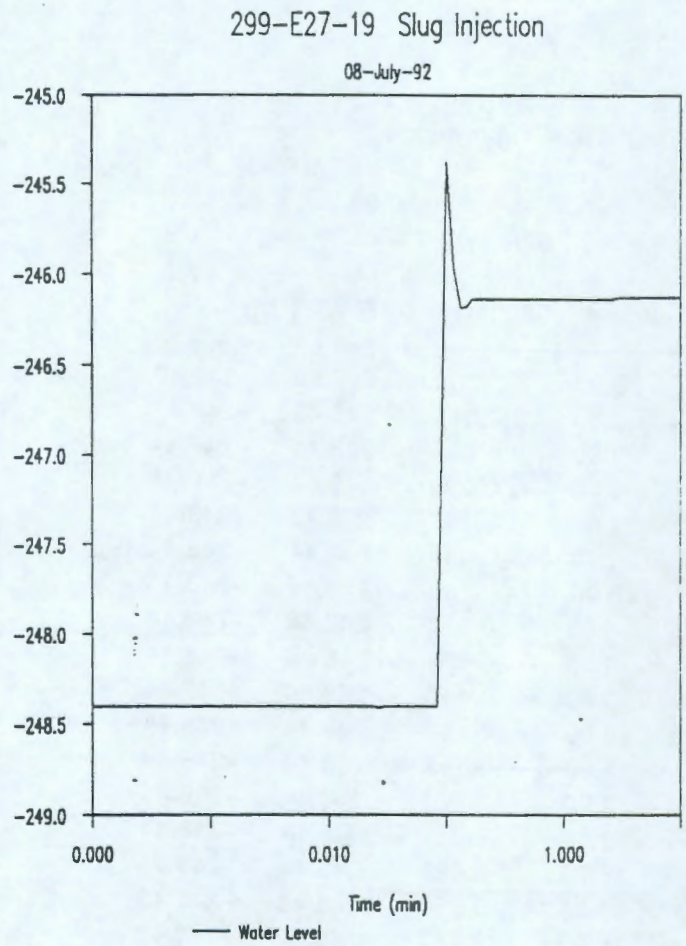
299-E27-19 Slug Injection

Unit# 00700 Test# 4

INPUT 1: Level (F) TOC
Slug Injection
SWL 248.40' BTOC
Scale factor 50.20
Step# 0 07/08 12:45

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	248.40	-248.40
0.003	0.00006	248.40	-248.40
0.007	0.00011	248.40	-248.40
0.010	0.00017	248.40	-248.40
0.013	0.00022	248.40	-248.40
0.017	0.00028	248.40	-248.40
0.020	0.00033	248.40	-248.40
0.023	0.00039	248.40	-248.40
0.027	0.00044	248.41	-248.41
0.030	0.00050	248.40	-248.40
0.033	0.00056	248.40	-248.40
0.050	0.00083	248.40	-248.40
0.067	0.00111	248.40	-248.40
0.083	0.00139	248.40	-248.40
0.100	0.00167	245.38	-245.38
0.117	0.00194	245.97	-245.97
0.133	0.00222	246.19	-246.19
0.150	0.00250	246.18	-246.18
0.167	0.00278	246.14	-246.14
0.183	0.00306	246.14	-246.14
0.200	0.00333	246.14	-246.14
0.217	0.00361	246.14	-246.14
0.233	0.00389	246.14	-246.14
0.250	0.00417	246.14	-246.14
0.267	0.00444	246.14	-246.14
0.283	0.00472	246.14	-246.14
0.300	0.00500	246.14	-246.14
0.317	0.00528	246.14	-246.14
0.333	0.00556	246.14	-246.14
0.417	0.00695	246.14	-246.14
0.500	0.00833	246.14	-246.14
0.583	0.00972	246.14	-246.14
0.667	0.01111	246.14	-246.14
0.750	0.01250	246.14	-246.14
0.833	0.01389	246.14	-246.14



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?99-E27-19 Slug Injection

0.917	0.01528	246.14	-246.14
1.000	0.01667	246.14	-246.14
1.083	0.01805	246.14	-246.14
1.167	0.01945	246.14	-246.14
1.250	0.02083	246.14	-246.14
1.333	0.02222	246.14	-246.14
1.417	0.02361	246.14	-246.14
1.500	0.02500	246.14	-246.14
1.583	0.02639	246.14	-246.14
1.667	0.02778	246.14	-246.14
1.750	0.02917	246.14	-246.14
1.833	0.03056	246.14	-246.14
1.917	0.03195	246.14	-246.14
2.000	0.03333	246.14	-246.14
2.500	0.04167	246.14	-246.14
3.000	0.05000	246.13	-246.13
3.500	0.05833	246.13	-246.13
4.000	0.06667	246.13	-246.13
4.500	0.07500	246.13	-246.13
5.000	0.08333	246.13	-246.13
5.500	0.09167	246.13	-246.13
6.000	0.10000	246.13	-246.13
6.500	0.10833	246.13	-246.13
7.000	0.11667	246.13	-246.13
7.500	0.12500	246.13	-246.13
8.000	0.13333	246.13	-246.13
8.500	0.14167	246.13	-246.13
9.000	0.15000	246.13	-246.13
9.500	0.15833	246.13	-246.13
10.000	0.16667	246.13	-246.13

9313091.1659

INSTANTANEOUS SLUG TEST DATA SHEET -- WITHDRAWAL

Well hole 299-E27-19

Interval Tested 245.91 - 265.99' BTOC*

Depth to Water (Below Top of Casing)* 248.40'

Date 7/8/92

Measured by Robert S. Edrington

Slug Volume 0.13ft³ Barometer Reading (Beginning) N/A (End) N/A

Time 1319

Transducer Measurement Units Feet

Depth to Transducer (Below water) 12.06'

Initial Pressure (P_i) 248.40' BTOC*

Slug Level or Pressure (P_{max}) 248.98 BTOC*

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by Robert S. Edrington (Sign and Print Name) 7/20/92 (Date)

BD-6000-293 (07/90)

9318091.1630

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299-E27-19 Baseline for Slug Withdrawal

Unit# 00700 Test# 5

INPUT 1: Level (F) TOC
Baseline for Slug Withdrawal
SWL 248.40' BTOC
Scale factor 50.20
Step# 0 07/08 12:58

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.00	0.000	248.40	-248.40
1.00	0.017	248.41	-248.41
2.00	0.033	248.41	-248.41
3.00	0.050	248.41	-248.41
4.00	0.067	248.41	-248.41
5.00	0.083	248.40	-248.40
6.00	0.100	248.40	-248.40
7.00	0.117	248.40	-248.40
8.00	0.133	248.41	-248.41
9.00	0.150	248.41	-248.41
10.00	0.167	248.41	-248.41
11.00	0.183	248.40	-248.40
12.00	0.200	248.41	-248.41
13.00	0.217	248.41	-248.41

9313091.1661

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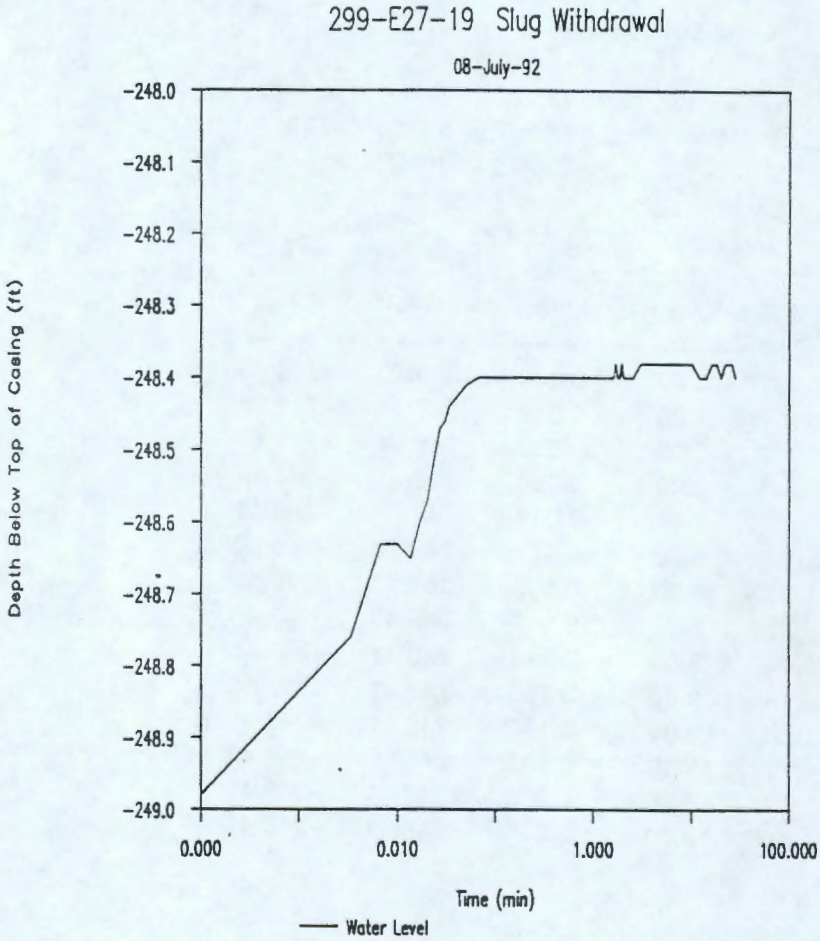
^99-E27-19 Slug Withdrawal

Unit# 00700 Test# 6

INPUT 1: Level (F) TOC
Slug Withdrawal
SWL 248.40' BTOC
Scale factor 50.20
Slug Volume 0.13 Cu. ft
Step# 0 07/08 13:13

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	248.98	-248.98
0.003	0.00006	248.76	-248.76
0.007	0.00011	248.63	-248.63
0.010	0.00017	248.63	-248.63
0.013	0.00022	248.65	-248.65
0.017	0.00028	248.60	-248.60
0.020	0.00033	248.57	-248.57
0.023	0.00039	248.51	-248.51
0.027	0.00044	248.47	-248.47
0.030	0.00050	248.46	-248.46
0.033	0.00056	248.44	-248.44
0.050	0.00083	248.41	-248.41
0.067	0.00111	248.40	-248.40
0.083	0.00139	248.40	-248.40
0.100	0.00167	248.40	-248.40
0.117	0.00194	248.40	-248.40
0.133	0.00222	248.40	-248.40
0.150	0.00250	248.40	-248.40
0.167	0.00278	248.40	-248.40
0.183	0.00306	248.40	-248.40
0.200	0.00333	248.40	-248.40
0.217	0.00361	248.40	-248.40
0.233	0.00389	248.40	-248.40
0.250	0.00417	248.40	-248.40
0.267	0.00444	248.40	-248.40
0.283	0.00472	248.40	-248.40
0.300	0.00500	248.40	-248.40
0.317	0.00528	248.40	-248.40
0.333	0.00556	248.40	-248.40
0.417	0.00695	248.40	-248.40
0.500	0.00833	248.40	-248.40
0.583	0.00972	248.40	-248.40
0.667	0.01111	248.40	-248.40
0.750	0.01250	248.40	-248.40



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'99-E27-19 Slug Withdrawal

0.833	0.01389	248.40	-248.40
0.917	0.01528	248.40	-248.40
1.000	0.01667	248.40	-248.40
1.083	0.01805	248.40	-248.40
1.167	0.01945	248.40	-248.40
1.250	0.02083	248.40	-248.40
1.333	0.02222	248.40	-248.40
1.417	0.02361	248.40	-248.40
1.500	0.02500	248.40	-248.40
1.583	0.02639	248.40	-248.40
1.667	0.02778	248.38	-248.38
1.750	0.02917	248.40	-248.40
1.833	0.03056	248.40	-248.40
1.917	0.03195	248.38	-248.38
2.000	0.03333	248.40	-248.40
2.500	0.04167	248.40	-248.40
3.000	0.05000	248.38	-248.38
3.500	0.05833	248.38	-248.38
4.000	0.06667	248.38	-248.38
4.500	0.07500	248.38	-248.38
5.000	0.08333	248.38	-248.38
5.500	0.09167	248.38	-248.38
6.000	0.10000	248.38	-248.38
6.500	0.10833	248.38	-248.38
7.000	0.11667	248.38	-248.38
7.500	0.12500	248.38	-248.38
8.000	0.13333	248.38	-248.38
8.500	0.14167	248.38	-248.38
9.000	0.15000	248.38	-248.38
9.500	0.15833	248.38	-248.38
10.000	0.16667	248.38	-248.38
12.000	0.20000	248.40	-248.40
14.000	0.23333	248.40	-248.40
16.000	0.26667	248.38	-248.38
18.000	0.30000	248.38	-248.38
20.000	0.33333	248.40	-248.40
22.000	0.36667	248.38	-248.38
24.000	0.40000	248.38	-248.38
26.000	0.43333	248.38	-248.38
28.000	0.46667	248.40	-248.40

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