JAN 11 1994

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 160854

Station # 12

2. To: (Receiving Organization) Those Listed		3. From: (Originating Organization) Geosciences		4. Related EDT No.: N/A	
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8. Originator Remarks: Please review the attached document. Final figures are being drafted and will be inserted at the time of comment resolution.				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: N/A	
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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-EN-EV-026	N/A	0	Result of the Groundwater Quality Assessment Program at Low-Level Waste Management Area 3 of the Low-Level Burial Grounds	3Q	4/1	1	

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

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)								(G)	(H)		
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
	1	Cog. Eng. R.B. Mercer	<i>R.B. Mercer</i>	12/30/93	H6-06	M.J. Hartman			H6-06	4	
	1	Cog. Mgr. R.L. Jackson	<i>R.L. Jackson</i>	12/30/93	H6-06	EPIC (2)			H6-08	3	
	1	QA W.R. Thackaberry	<i>W.R. Thackaberry</i>	12/29/93	H4-16	IRA (2)			H4-17	3	
		Safety N/A				Central Files (2)			L8-04	3	
		Env. N/A									
	4	G.C. Evans			H6-23						
	4	D.A. Pratt			T4-03						

18. Signature of EDT Originator <i>R.B. Mercer</i> Date: 12/30/93		19. Authorized Representative Date for Receiving Organization <i>R.L. Jackson</i> Date: 12/30/93		20. Cognizant/Project Engineer's Manager <i>R.L. Jackson</i> Date: 12/30/93		21. DOE APPROVAL (if required) Ltr. No. N/A [N/A] Approved [N/A] Approved w/comments [N/A] Disapproved w/comments	
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MASTER

Date Received: 12/29/93 VB		INFORMATION RELEASE REQUEST		Reference: WHC-CM-3-4	
Complete for all Types of Release					
Purpose			ID Number (include revision, volume, etc.) WHC-SD-EN-ER-026, Rev. 0		
☐ Speech or Presentation ☐ Full Paper (Check only one suffix) ☐ Summary ☐ Abstract ☐ Visual Aid ☐ Speakers Bureau ☐ Poster Session ☐ Videotape			List attachments.		
			Date Release Required <div style="text-align: center;">December 13, 1993</div>		
Title: Results of Groundwater Quality Assessment Program at Low-Level Waste Management Area 3 of the Low-Level Burial Grounds			Unclassified Category UC- N/A		Impact Level 3Q
New or novel (patentable) subject matter? ☒ No ☐ Yes If "Yes", has disclosure been submitted by WHC or other company? ☐ No ☐ Yes Disclosure No(s).			Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? ☒ No ☐ Yes (Identify)		
Copyrights? ☒ No ☐ Yes If "Yes", has written permission been granted? ☐ No ☐ Yes (Attach Permission)			Trademarks? ☒ No ☐ Yes (Identify)		
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Title of Conference or Meeting NA			Group or Society Sponsoring		
Date(s) of Conference or Meeting		City/State	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	☐	☒			
Patent - General Counsel	☒	☐	<i>Approval per OGC Memo V.B. 12/29/93</i>		
Legal - General Counsel	☒	☐			
Applied Technology/Export Controlled Information or International Program	☐	☒			
WHC Program/Project	☒	☐	R.R. Thompson	<i>[Signature]</i>	12/27/93
Communications	☐	☒			
RL Program/Project	☒	☐	M.J. Furman	<i>[Signature]</i>	1/4/94
Publication Services	☒	☐	L. Hermann	<i>[Signature]</i>	1/7/94
Other Program/Project	☐	☒			
Information conforms to all applicable requirements. The above information is certified to be correct.					
Yes No References Available to Intended Audience ☒ ☐ Transmit to DOE-HQ/Office of Scientific and Technical Information ☒ ☐ Author/Requestor (Printed/Signature) Date R. B. Mercer <i>[Signature]</i> 2 DEC 93			INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP Stamp is required before release. Release is contingent upon resolution of mandatory comments.
Intended Audience ☐ Internal ☐ Sponsor ☒ External Responsible Manager (Printed/Signature) Date R. L. Jackson <i>[Signature]</i> 12/27/93					
			Date Cancelled		Date Disapproved

SUPPORTING DOCUMENT		1. Total Pages 34
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5. Key Words Groundwater monitoring; potentiometric levels; groundwater chemistry	6. Author Name: R. B. Mercer <i>R B Mercer</i> Signature Organization/Charge Code 81235/R4CEA	
7. Abstract <div style="text-align: center;"> APPROVED FOR PUBLIC RELEASE <i>1/7/94</i> </div> <p>Mercer, R. B., 1993, <i>Results of Groundwater Quality Assessment Program at Low-Level Waste Management Area 3 of the Low-Level Burial Grounds</i>, WHC-SD-EN-EV-026, Rev. 0, Westinghouse Hanford Company, Richland, Washington.</p>		
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9. Impact Level 3Q		

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1.0 INTRODUCTION

Low-Level Waste Management Area 3 (LLWMA-3) is located in the 200 West Area of the Hanford Site. It is regulated under the Resource Conservation and Recovery Act (RCRA) and is currently operating under an interim status groundwater quality assessment program described in Chamness, Jensen, and Last (1990). This assessment program was initiated when well 299-W7-4 exceeded the critical mean established for Total Organic Halogen (TOX) and wells 299-W7-5 and 299-W8-1 exceeded the critical mean for Total Organic Carbon (TOC). The purpose of this report is to present the results of the assessment program. Additional upgradient monitoring wells have been installed and critical mean values for indicator parameters at LLWMA-3 must be recalculated. This assessment concludes that LLWMA-3 should return to a background evaluation program in January 1994.

1.1 FACILITY DESCRIPTION

LLWMA-3 is located in the north central portion of 200 West Area (Figure 1). It includes all of 218-W-3A, 218-W-3AE, and 218-W-5 burial grounds (Figure 2). The areas measure 20.4 ha (50.3 acres), 20.0 ha (49.4 acres), and 34.0 ha (84.0 acres) respectively for a total area of 74.4 ha (183.7 acres).

The uppermost unconfined aquifer beneath LLWMA-3 is contained in the Ringold Formation. In this area the aquifer is primarily sandy gravel and gravelly sand. There are some highly localized caliche zones and silt lenses present. The bottom of the unconfined aquifer is the lower mud sequence of the Ringold Formation. This unit dips to the southwest and thins to the north and east. Below the mud sequence is another gravel unit of the Ringold and the Elephant Mountain Basalt which dips to the southwest. A more complete description of the geology of 200 West Area can be found in Connolly, Ford, and Borghese (1992).

1.2 DESCRIPTION OF GROUNDWATER MONITORING

The RCRA groundwater monitoring program for LLWMA-3 began in 1987 with the installation of eleven RCRA compliant monitoring wells (Figure 2). Groundwater sampling began in 1988. Additional monitoring wells were installed in 1989 (2), 1990 (1), 1991 (2), and 1992 (1). Two monitoring wells are being installed in 1993. Two monitoring wells (one upgradient and one downgradient) are completed at the bottom of the unconfined aquifer (just above the Ringold mud unit). The remainder of the wells monitor the top 4.5 to 6 m (15-20 ft) of the unconfined aquifer. A complete list of monitoring wells for LLWMA-3 is presented in Table 1. As-built drawings for the completed LLWMA-3 monitoring wells are located in Appendix A. The original (unpublished) design of the groundwater monitoring network listed well 299-W7-4 as an upgradient well. However, the burial ground was subsequently expanded to include the area south of 299-W7-4. The expansion resulted in 299-W7-4 being redefined as a downgradient well in the *Revised Ground-Water Monitoring Plan for the 200 Areas Low-Level Burial Grounds* (Last and Bjornstad 1989).

Figure 1. Hanford Site Low-Level Burial Grounds.

Figure 2. Low-Level Waste Management Area 3.

Table 1. Low-Level Waste Management Area 3 Monitoring Wells.

Well Number	Hanford Coordinates		Elevation (ft above msl)		Screened Interval (ft below ground surface)		Screen Length (ft)
	North	West	Brass Cap	Top of Casing			
299-W6-2 ⁸⁷	45571	75302	690.17	692.45	225	245	20
299-W7-1 ⁸⁷	46551	78601	688.55	690.71	224	244	20
299-W7-2 ⁸⁷	46519	77385	673.19	675.59	202	222	20
299-W7-3 ^{87d}	46520	77420	673.71	676.14	449	470	21
299-W7-4 ⁸⁷	45435	77040	669.02	671.69	203	233	30
299-W7-5 ⁸⁷	46509	76816	670.41	673.05	208	228	20
299-W7-6 ⁸⁷	46509	76219	676.25	678.64	209	229	20
299-W7-7 ⁸⁹	46509	76519	671.96	674.94	207	227	20
299-W7-8 ⁸⁹	46510	75880	684.40	687.35	220	240	20
299-W7-9 ⁹⁰	46549	78889	689.11	692.09	221	241	20
299-W7-10 ⁹⁰	45921	75564	686.77	689.66	221	241	20
299-W7-11 ⁹¹	46512	77769	678.03	681.45	212	232	20
299-W7-12 ⁹¹	46514	78246	684.64	687.93	219	241	22
299-W8-1 ⁸⁷	46551	79200	699.45	701.33	236	256	20
299-W9-1 ⁸⁷	44508	79507	735.36	737.73	266	286	20
299-W10-13 ⁸⁷	43137	78297	696.58	699.04	227	247	20
299-W10-14 ^{87d}	43143	78330	697.09	699.43	427	447	20
299-W10-19 ⁹²	44545	77249	680.04	682.99	214	234	20
299-W10-20 ⁹³	NA	NA	NA	NA	NA	NA	NA
299-W10-21 ⁹³	NA	NA	NA	NA	NA	NA	NA

Notes: Superscript denotes year of installation.

Shading denotes upgradient wells.

^d - Well monitors bottom of unconfined aquifer.

NA - Information not available.

Critical mean values for the indicator parameters (TOC, TOX, pH, and conductivity) were established in 1989 using four quarters of data from the upgradient wells (299-W9-1 and 299-W10-13). The critical mean for TOX was exceeded in well 299-W7-4 and for TOC in 299-W7-5 and 299-W8-1 in the September 1989 sampling event. Resampling confirmed the elevated TOX (TOC results were inconclusive) and an interim status groundwater quality assessment program described in Chamness, Jensen, and Last (1990) was initiated. Subsequent sampling for TOC at 299-W7-5 and 299-W8-1 indicates that the September values were erroneous and these wells have not exceeded the critical mean.

2.0 WASTE CHARACTERISTICS

Disposal activities at LLWMA-3 began in 1970 and continue to the present. Materials placed in this burial ground include low-level, low-level mixed, mixed, and transuranic wastes. Examples of the wastes are ion-exchange resins, failed equipment, disposable supplies, and lead bricks and shielding. A list of mixed wastes is contained in *Low-Level Burial Grounds Dangerous Waste Permit Application* (DOE-RL 1989). Wastes are placed in unlined trenches of various lengths and widths. Trenches are generally 4.5 to 6 m (15 to 20 ft) deep. Remote-handled transuranic waste is also stored at LLWMA-3 in trenches designated as retrievable storage units. These are plywood bottomed trenches where containers are covered with plywood and a layer of heavy plastic before being backfilled.

3.0 RESULTS OF GROUNDWATER QUALITY ASSESSMENT

3.1 POTENTIOMETRIC LEVELS

The pre-Hanford flow direction beneath LLWMA-3 was generally from west to east. Disposal practices in 200 West Area have altered the natural flow direction and the flow is now from south to the north-north east (Figure 3). The groundwater gradient in this area is approximately 0.002. Water levels have been measured at least quarterly at the RCRA monitoring network since December 1987.

3.2 GROUNDWATER CHEMISTRY

The groundwater monitoring network for LLWMA-3 has been sampled quarterly since 1988, except for the period between June 1990 and June 1991 when laboratory services were unavailable. Analytical results have been reported in the RCRA quarterly reports. The chemistry of the groundwater beneath LLWMA-3 is highly influenced by past disposal practices at other facilities in 200 West Area. Several contaminant plumes are present as described by Johnson (1993). The carbon tetrachloride plume (Figure 4), originating from the Z Plant disposal facilities (south of LLWMA-3), is the major contaminant plume in this area. Nitrate contamination (Figure 5) is also present beneath LLWMA-3.

Figure 3. Water Table Map for 200 West Area, June 1992.

RCRA-AR\122192A1

Figure 5. 200 West Area Nitrate Plume Map.

Groundwater chemistry data from well 299-W7-4 indicate elevated levels of carbon tetrachloride as well as TOX. Monitoring well 299-W10-19 has only had two quarters of data. However, the values for both carbon tetrachloride and TOX in 299-W10-19 are higher than in 299-W7-4 (Figure 6).

The primary contribution to TOX in well 299-W7-4 is from the carbon tetrachloride plume in 200 West Area (Figure 4). Other contaminants contributing to elevated TOX in 200 West Area are chloroform (Figure 7), and trichloroethylene (TCE) (Figure 8).

4.0 CONCLUSIONS

The assessment program at this facility was triggered by elevated TOX in downgradient well 299-W7-4. The carbon tetrachloride plume does not impact the upgradient wells (299-W9-1 and 299-W10-13) at levels that accurately represent the upgradient conditions found at the eastern portion of LLWMA-3 (Figures 2 and 4).

5.0 RECOMMENDATIONS

Results of the assessment program indicate that Low-Level Waste Management Area 3 has not contributed to the groundwater contamination. The statistical evaluation of contamination indicator parameters for LLWMA-3 will be re-calculated using samples from the upgradient wells listed in Table 1. This site will begin background monitoring for indicator parameters at the shallow upgradient wells per 40 CFR 265.92(c)(2) in January 1994. Downgradient wells will be sampled semiannually during this period.

Figure 6. Carbon Tetrachloride and TOX Plot
for 299-W7-4 and 299-W10-19.

H9309016.10

Figure 7. 200 West Area Chloroform Plume Map.

Figure 8. 200 West Area Trichloroethylene Plume Map.

6.0 REFERENCES

- Chamness, M. A., E. J. Jensen, and G. V. Last, 1990, *Interim-Status Ground-Water Quality Assessment Plan for Waste Management Area 3 of the 200 Areas Low-Level Burial Grounds*, WHC-SD-EN-AP-022, Rev. 0, prepared by Pacific Northwest Laboratory for Westinghouse Hanford Company, Richland, Washington.
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- Johnson, V. G., 1993, *Westinghouse Hanford Company Operational Groundwater Status Report, 1990-1992*, WHC-EP-0595, Westinghouse Hanford Company, Richland, Washington.
- Last, G. V., and B. N. Bjornstad, 1989, *Revised Groundwater Monitoring Plan for 200 Areas Low Level Burial Grounds*, WHC-SD-EN-AP-015, Rev 0, Westinghouse Hanford Company, Richland, Washington.
- Last, G. V., B. N. Bjornstad, M. P. Bergeron, D. W. Wallace, D. R. Newcomer, J. A. Schramke, M. A. Chamness, C. S. Cline, S. P. Airhart, and J. S. Wilber, 1989, *Hydrogeology for the 200 Areas Low-Level Burial Grounds - An Interim Report*, PNL-6820, Pacific Northwest Laboratory, Richland, Washington.

APPENDIX A
AS-BUILT DRAWINGS
FOR LOW-LEVEL WASTE MANAGEMENT AREA 3

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: _____ Name: <u>K. Olson</u> Drilling: _____ Company: <u>Onwego Drilling Co</u> Date: _____ Started: <u>30Sep87</u>	Sample Method: <u>Hard tool</u> Additives: _____ Used: <u>Not documented</u> WA State: _____ Lic Nr: <u>Not documented</u> Company: _____ Location: <u>Kennewick, WA</u> Date: _____ Complete: <u>13Nov87</u>	WELL NUMBER: <u>299-W6-2</u> Hanford Coordinates: N/S <u>N 45,571</u> E/W <u>W 75,302</u> State: _____ Coordinates: N <u>451,651</u> E <u>2,216,605</u> Start: _____ Card #: <u>Not documented</u> T _____ R _____ S _____ Elevation: _____ Ground surface (ft): <u>690.17 (Brass cap)</u>	
TEMPORARY WELL NO: <u>None</u>		Depth to water: <u>227.8-ft Oct87</u> (Ground surface) <u>231.4-ft Mar92</u> GENERALIZED Geologist's STRATIGRAPHY Log	
0-5: ROCKY (Backhoe to 10-ft) 5-20: Slightly silty GRAVEL 20-60: Sandy GRAVEL 60-65: Clayey sandy GRAVEL 65-70: Sandy CLAY 70-71: Clayey SAND 71-90: SAND 90-95: Silty SAND 95-96: Slightly gravelly silty SAND 96-105: Silty sandy GRAVEL 105-115: Sandy GRAVEL (3-ft of water in hole after 110-ft possible perched water zone. Sample negative. Drilling resumed.) 115-120: Slightly silty gravelly SAND 120-125: Silty sandy GRAVEL 125-130: Sandy GRAVEL 130-160: Silty sandy GRAVEL 160-165: Gravelly SAND 165-195: Silty sandy GRAVEL 195-205: Silty/clayey sandy GRAVEL 205-248: Silty sandy GRAVEL 248 : Silty gravelly SAND		<div style="position: absolute; top: 240px; left: 580px;"> Elevation of reference point: <u>[692.45-ft]</u> (top of casing) Height of reference point above <u>[2.28-ft]</u> ground surface Depth of surface seal <u>[0-20-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 3.5-ft</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 3.5-20-ft</u> Bentonite slurry, 20-47-ft I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-20.0-ft, 17-in nominal 20.0-40.5-ft, 13-in nominal 40.5-148.2-ft, 11-in nominal 148.2-248.0-ft, 9-in nominal Type of filler, 47-217-ft <u>Bentonite slurry</u> Depth top of seal: <u>[217.0-ft]</u> Type of seal: <u>Volclay pellets</u> Depth top of sand pack: <u>10-20-mesh silica sand</u> <u>[220-ft]</u> Depth top of screen: <u>[224.0-ft]</u> <u>4-in, #10-slot, continuous wrap</u> <u>304 stainless steel</u> Depth bottom of screen: <u>[245.0-ft]</u> Telescoping screen, 238-248-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u> Depth to bottom of borehole: <u>[248.0-ft]</u> </div>	
Drawing By: <u>RKL/2W06-02.ASB</u> Date: <u>07Dec92</u> Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's Name: <u>W. Moomaw</u> Drilling Company: <u>Onwego Drilling Co.</u> Date Started: <u>01Jun87</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives Used: <u>Not documented</u> WA State Lic Nr: <u>Not documented</u> Company Location: <u>Kennewick, WA</u> Date Complete: <u>30Jul87</u>	WELL NUMBER: <u>299-W7-1</u> Hanford Coordinates: N/S <u>N 46,551</u> E/W <u>W 78,601</u> State Coordinates: N <u>451,622</u> E <u>2,217,821</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>688.55 (Brass cap)</u>	
GENERALIZED Geologist's STRATIGRAPHY Log			
Depth to water: <u>226.0-ft Jul87</u> (Ground surface) <u>229.0-ft Mar92</u> 5-6: Slightly silty gravelly SAND 10-11: Slightly silty sandy GRAVEL 14-30: Silty sandy GRAVEL 30-64: Sandy GRAVEL 64-73: Silty SAND 73-79: Sandy silty CALICHE 79-82: CALICHE and SAND 82-99: Silty SAND 99-130: Coarse SAND 130-135: Slightly gravelly SAND 135-139: SAND w/calcareous MUDSTONE and CLAY layers 139-142: SAND 142-190: Silty sandy GRAVEL 190-194: Gravelly SAND 194-244: Silty sandy GRAVEL 244-245: Gravelly silty SAND		<div style="margin-top: 10px;"> Elevation of reference point: <u>[690.71-ft]</u> (top of casing) Height of reference point above <u>[2.16-ft]</u> ground surface Depth of surface seal <u>[0-20-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 3.0-ft</u> <u>4 equidistant protective posts</u> <u>Volclay grout 3-212-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-10-ft, 17-in nominal 10-63.4-ft, 13-in nominal 63.4-157.1-ft, 11-in nominal 157.1-245-ft, 9-in nominal Type of filler, 3-217-ft <u>Volclay grout</u> Depth top of seal: <u>[212.0-ft]</u> Type of seal: <u>Volclay pellets</u> Depth top of sand pack: <u>[217-ft]</u> <u>20-30-mesh silica sand</u> Depth top of screen: <u>[224.0-ft]</u> <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u> Telescoping screen, 233-243-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u> Depth bottom of screen: <u>[245.0-ft]</u> Depth bottom of borehole: </div>	
Drawing By: <u>RKL/2W07-01.ASB</u> Date: <u>12Nov92</u> Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's Name: <u>H. Joy</u> Drilling Company: <u>Onwego Drilling Co</u> Date Started: <u>04Aug87</u>	Sample Method: <u>Hard tool</u> Additives Used: <u>Not documented</u> WA State Lic Nr: <u>Not documented</u> Company Location: <u>Kennewick, WA</u> Date Complete: <u>30Sep87</u>	WELL NUMBER: <u>299-W7-2</u> Hanford Coordinates: N/S <u>N 46,519</u> E/W <u>W 77,385</u> State Coordinates: N <u>451,622</u> E <u>2,217,821</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>673.19 (Brass cap)</u>	
Depth to water: <u>217.8-ft Sep87</u> (Ground surface) <u>215.3-ft Oct92</u> GENERALIZED Geologist's STRATIGRAPHY Log			
0~10: (Backhoe) 10~20: Silty sandy GRAVEL 20~25: Sandy GRAVEL 25~30: Silty sandy GRAVEL 30~35: Gravelly SAND 35~40: Slightly sandy GRAVEL 40~45: SILT 45~50: Gravelly sandy SILT 50~70: Silty sandy GRAVEL 70~80: Silty gravelly SAND 80~94: Silty SAND 94~100: Silty sandy GRAVEL 100~105: Gravelly silty SAND 105~147: Silty sandy GRAVEL 147~149: SILT 149~154: Gravelly SAND 154~160: Slightly silty gravelly SAND 160~185: Silty sandy GRAVEL 185~190: Silty gravelly SAND 190~195: Gravelly SAND 195~205: Silty gravelly SAND, trace CLAY 205~210: Sandy GRAVEL 210~215: Silty gravelly SAND 215~220: Slightly gravelly SAND 220~225: Sandy GRAVEL 225~230: Gravelly SAND 230~235: GRAVEL 235~236: Silty gravelly SAND			
			Elevation of reference point: <u>[675.59-ft]</u> (top of casing) Height of reference point above <u>[2.4-ft]</u> ground surface Depth of surface seal <u>[0~194-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 4.0-ft</u> <u>4 equidistant protective posts</u> <u>Envirogel bentonite grout 4~194.3-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~10-ft, 17-in nominal 10~63.1-ft, 13-in nominal 63.1~154.0-ft, 11-in nominal 154.0~236-ft, 9-in nominal Type of filler, 4~194.3-ft <u>Envirogel bentonite grout</u> Depth top of seal: <u>[194.3-ft]</u> Type of seal: <u>Volclay pellets</u> Depth top of sand pack: <u>[198.3-ft]</u> <u>10~20-mesh silica sand</u> Depth top of screen: <u>[202.0-ft]</u> <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u> Depth bottom of screen: <u>[222.0-ft]</u> Telescoping screen, ~212~222-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u> Depth to bottom of borehole: <u>[236.0-ft]</u>
Drawing By: <u>RKL/2W07-02.ASB</u> Date: <u>12Nov92</u> Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: _____ Name: <u>W. Moomaw</u> Drilling Company: <u>Onwego Drilling Co</u> Date Started: <u>27Jul87</u>	Sample Method: <u>Hard tool</u> Additives: _____ Used: <u>Not documented</u> WA State: _____ Lic Nr: <u>Not documented</u> Company: _____ Location: <u>Kennewick, WA</u> Date Complete: <u>23Nov87</u>	WELL NUMBER: <u>299-W7-3</u> Hanford Coordinates: N/S <u>N 46,520</u> E/W <u>W 77,420</u> State: _____ Coordinates: N <u>451,623</u> E <u>2,217,786</u> Start Card #: <u>Not documented</u> T _____ R _____ S _____ Elevation: _____ Ground surface (ft): <u>673.71 (Brass cap)</u>	
TEMPORARY WELL NO: <u>None</u>			
Depth to water: <u>211.7-ft Sep87</u> (Ground surface) <u>216.9-ft Oct92</u>			
GENERALIZED Geologist's STRATIGRAPHY Log			
0~5: GRAVEL (Backhoe to 8-ft) 10~35: Silty sandy GRAVEL 35~40: Gravelly silty CLAY 40~45: Silty sandy GRAVEL 45~50: Gravelly sandy SILT 50~65: Silty sandy GRAVEL 65~85: Gravelly silty SAND 85~95: Gravelly SAND 95~100: SAND 100~110: Gravelly SAND 110~120: Silty sandy GRAVEL 120~125: Silty gravelly SAND 125~145: Silty sandy-sandy GRAVEL 145~140: Silty gravelly SAND 140~175: Silty sandy GRAVEL 175~180: Silty gravelly SAND 180~185: Sandy GRAVEL 185~195: Gravelly SAND 195~205: Sandy GRAVEL 205~220: Silty gravelly SAND 220~235: Sandy GRAVEL 235~255: Slightly silty~slightly gravelly SAND 255~262: SAND w/CLAY 259~261-ft 262~280: Sandy GRAVEL 280~285: Gravelly SAND 285~310: Sandy GRAVEL~GRAVEL 315~320: Gravelly SAND 320~325: GRAVEL 325~345: Silty sandy-sandy GRAVEL 345~350: Gravelly SAND 350~355: Silty sandy GRAVEL 355~370: Gravelly silty-gravelly SAND 370~380: SAND 380~390: Silty sandy GRAVEL 390~400: Gravelly SAND 400~405: Sandy GRAVEL 405~410: Gravelly silty SAND 410~415: Silty sandy GRAVEL 415~420: Gravelly silty SAND 420~435: Sandy GRAVEL 435~445: Gravelly-gravelly silty SAND 445~465: Silty sandy-sandy GRAVEL 465~473: SAND~sandy GRAVEL 473~476.7: BASALT		Elevation of reference point: <u>[676.14-ft]</u> (top of casing) Height of reference point above <u>[2.43-ft]</u> ground surface Depth of surface seal <u>[0~20-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 5.0-ft</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 5~20-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~48-ft, 21-in nominal 48~147-ft, 17-in nominal 147~230-ft, 13-in nominal 230~350-ft, 11-in nominal 350~476.7-ft, 9-in nominal Type of filler, 20~196-ft <u>Bentonite slurry</u> Depth top of seal: <u>[196.0-ft]</u> Type of seal: <u>Volclay grout</u> Depth top of sand pack: <u>[427.0-ft]</u> <u>20~30-mesh silica sand</u> Depth top of screen: <u>[449.0-ft]</u> <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u> Depth bottom of screen: <u>[470.0-ft]</u> Telescoping screen, ~470~476.7-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel (damaged)</u> Depth to bottom of borehole: <u>[476.7-ft]</u>	
Drawing By: <u>RKL/2W07-03.ASB</u> Date: <u>13Nov92</u>			
Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: _____ Name: <u>R. Vance</u> Drilling: _____ Company: <u>Onwego Drilling Co</u> Date: _____ Started: <u>29Sep87</u>	Sample Method: <u>Hard tool</u> Additives: _____ Used: <u>Not documented</u> WA State: _____ Lic Nr: <u>Not documented</u> Company: _____ Location: <u>Kennewick, WA</u> Date: _____ Complete: <u>19Nov87</u>	WELL NUMBER: <u>299-W7-4</u> Hanford Coordinates: N/S <u>N 45,435</u> E/W <u>W 77,040</u> State: _____ Coordinates: N <u>448,140</u> E <u>2,219,238</u> Start Card #: <u>Not documented</u> T _____ R _____ S _____ Elevation Ground surface (ft): <u>669.02 (Brass cap)</u>	
TEMPORARY WELL NO: <u>None</u>			
Depth to water: <u>205-ft Nov87</u> (Ground surface) <u>209.4-ft Oct92</u>			
GENERALIZED Geologist's STRATIGRAPHY Log			
5: Slightly silty GRAVEL 10: Sandy GRAVEL 15: GRAVEL 19-20: Sandy GRAVEL 25,30: GRAVEL 35-50: Sandy GRAVEL 55: Silty sandy GRAVEL 80-85: Gravelly SAND 60: Gravelly SILT/CLAY 65: Gravelly sandy SILT 70: Gravelly silty SAND 75: Gravelly SAND 80-100: SAND 105,110: Gravelly SAND 115,120: Sandy GRAVEL 125: Silty sandy GRAVEL 130-140: Sandy GRAVEL 145-160: Silty sandy GRAVEL 165: Sandy GRAVEL 170: Silty sandy GRAVEL 175: Clayey sandy GRAVEL 180-205: Silty sandy GRAVEL 210,215: Silty gravelly SAND 220: Slightly silty gravelly SAND 225-235: Silty sandy GRAVEL	<div style="position: absolute; top: 240px; right: 50px; width: 300px;"> Elevation of reference point: <u>[671.69-ft]</u> (top of casing) Height of reference point above <u>[2.67-ft]</u> ground surface Depth of surface seal <u>[0-12-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 3-12-ft</u> </div> <div style="position: absolute; top: 390px; right: 50px; width: 300px;"> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> </div> <div style="position: absolute; top: 430px; right: 50px; width: 300px;"> Diameter of borehole, 0-20.0-ft, 17-in nominal 20.0-50.7-ft, 13-in nominal 50.7-150.3-ft, 11-in nominal 150.3-238.0-ft, 9-in nominal </div> <div style="position: absolute; top: 500px; right: 50px; width: 300px;"> Type of filler, 12-190-ft <u>Bentonite slurry</u> </div> <div style="position: absolute; top: 530px; right: 50px; width: 300px;"> Depth top of seal: <u>[190.0-ft]</u> Type of seal: <u>Volclay pellets</u> </div> <div style="position: absolute; top: 560px; right: 50px; width: 300px;"> Depth top of sand pack: <u>[194-ft]</u> <u>10-20-mesh silica sand</u> </div> <div style="position: absolute; top: 600px; right: 50px; width: 300px;"> Depth top of screen: <u>[203.0-ft]</u> <u>4-in, #10-slot</u> <u>stainless steel</u> </div> <div style="position: absolute; top: 650px; right: 50px; width: 300px;"> Telescoping screen, 223-233-ft <u>8-in stainless steel, #30 slot</u> </div> <div style="position: absolute; top: 680px; right: 50px; width: 300px;"> Depth bottom of screen <u>[233.0-ft]</u> </div> <div style="position: absolute; top: 700px; right: 50px; width: 300px;"> Fill 233-235-ft </div> <div style="position: absolute; top: 730px; right: 50px; width: 300px;"> Total depth to bottom of borehole: <u>[235.0-ft]</u> </div>		
Drawing By: <u>RKL/2W07-04.ASB</u> Date: <u>13Nov92</u>			
Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: _____ Name: <u>H. Joy/D. Garcia</u> Drilling Company: <u>Onwego Drilling Co</u> Date Started: <u>30Sep87</u>	Sample Method: <u>Hard tool</u> Additives: _____ Used: <u>Not documented</u> WA State: _____ Lic Nr: <u>Not documented</u> Company: _____ Location: <u>Kennewick, WA</u> Date Complete: <u>19Nov87</u>	WELL NUMBER: <u>299-W7-5</u> Hanford Coordinates: N/S <u>N 46,509</u> E/W <u>W 76,816</u> State: _____ Coordinates: N <u>445,614</u> E <u>2,218,405</u> Start Card #: <u>Not documented</u> T _____ R _____ S _____ Elevation _____ Ground surface (ft): <u>670.41 (Brass cap)</u>	
TEMPORARY WELL NO: <u>None</u>			
Depth to water: <u>211-ft Nov87</u> (Ground surface) <u>213.0-ft Oct92</u>			
GENERALIZED Geologist's STRATIGRAPHY Log			
5,10: GRAVEL 10: Sandy GRAVEL 15-25: Sandy GRAVEL 30-45: Silty sandy GRAVEL 50,55: Silty gravelly SAND 60: Gravelly silty SAND 65-75: Silty gravelly SAND 80-105: Sandy GRAVEL 110-125: Silty sandy GRAVEL 130-150: Sandy GRAVEL 155-185: Silty sandy GRAVEL 190-200: silty gravelly SAND 205: Silty sandy GRAVEL 210: Silty gravelly SAND 215: Gravelly SAND 220: Sandy GRAVEL 225: Silty/clayey SAND		<div style="margin-top: 10px;"> Elevation of reference point: <u>[673.05-ft]</u> (top of casing) Height of reference point above <u>[2.64-ft]</u> ground surface Depth of surface seal <u>[0-5-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 2-5-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-10.0-ft, 17-in nominal 10.0-50.8-ft, 13-in nominal 50.8-154.6-ft, 11-in nominal 154.6-229.0-ft, 9-in nominal Type of filler, 5-190-ft <u>Bentonite slurry</u> Depth top of seal: <u>[190.0-ft]</u> Type of seal: <u>Dry bentonite, 190-197-ft</u> <u>Volclay pellets, 197-200-ft</u> Depth top of sand pack: <u>[200-ft]</u> <u>10-20-mesh silica sand</u> Depth top of screen: <u>[207.0-ft]</u> <u>4-in, #20-slot</u> <u>stainless steel</u> Depth bottom of screen <u>[227.7-ft]</u> Depth to bottom of borehole: <u>[229.0-ft]</u> </div>	
Drawing By: <u>RKL/2W07-05.ASB</u> Date: <u>07Dec92</u>			
Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling 200 W Water Fluid Used: <u>Supply</u> Driller's Name: <u>B. Boley</u> Drilling Company: <u>Onwego Drilling Co</u> Date Started: <u>02Sep87</u>	Sample Method: <u>Hard tool</u> Additives Used: <u>Not documented</u> WA State Lic Nr: <u>Not documented</u> Company Location: <u>Kennewick, WA</u> Date Complete: <u>02Nov87</u>	WELL NUMBER: <u>299-W7-6</u> Hanford Coordinates: N/S <u>N 46,509</u> E/W <u>W 76,219</u> State Coordinates: N <u>451,615</u> E <u>2,218,987</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>676.25 (Brass cap)</u>	
Depth to water: <u>218.0-ft Sep87</u> (Ground surface) <u>219.0-ft Oct92</u> GENERALIZED Geologist's STRATIGRAPHY Log
0~5: Not documented 5~10: Sandy GRAVEL 10~15: Gravelly SAND 15~20: Sandy GRAVEL 20~35: Silty sandy GRAVEL 35~45: Slightly silty gravelly SAND 45~55: Gravelly SAND 55~75: Slightly gravelly SAND 75~80: Gravelly SAND 80~100: Gravelly silty SAND 100~105: Silty gravelly SAND 105~110: Gravelly silty SAND 110~175: Sandy GRAVEL 175~190: Silty sandy GRAVEL 190~195: Silty gravelly SAND 195~205: Silty sandy GRAVEL 205~210: Sandy GRAVEL 210~215: Silty sandy GRAVEL 215~230: Sandy GRAVEL 230~235: Silty gravelly SAND 235~242.8: Silty sandy GRAVEL		Elevation of reference point: <u>(678.64-ft)</u> (top of casing) Height of reference point above <u>(2.39-ft)</u> ground surface Depth of surface seal <u>(0~200-ft)</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2.0-ft</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 2~3-ft</u> <u>Bentonite slurry 3~200.5-ft</u> I.D. of riser pipe: <u>(4-in)</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~51.2-ft, 13-in nominal 51.2~152-ft, 11-in nominal 152~242.8-ft, 9-in nominal Type of filler, 3~200.5-ft <u>Bentonite slurry</u> Depth top of seal: <u>(200.5-ft)</u> Type of seal: <u>Volclay pellets</u> Depth top of sand pack: <u>(205.5-ft)</u> <u>10~20-mesh silica sand</u> Depth top of screen: <u>(209.0-ft)</u> <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u> Depth bottom of screen: <u>(229.0-ft)</u> Telescoping screen, 231~241-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u> Depth to bottom of borehole: <u>(242.8-ft)</u>	
Drawing By: <u>RKL/2W07-06.ASB</u> Date: <u>13Nov92</u> Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY					
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: <u>L. Cordon</u> Name: <u>L. Cordon</u> Drilling: <u>Company: Basin & Range Drill</u> Date: <u>Started: 23Oct89</u> Date: <u>Complete: 27Nov89</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives: <u>Used: Not documented</u> WA State: <u>Lic Nr: Not documented</u> Company: <u>Location: Not documented</u> Date: <u>Complete: 27Nov89</u>	WELL NUMBER: <u>299-W7-7</u> Hanford Coordinates: N/S <u>N 46,509.3</u> E/W <u>W 76,518.7</u> State NAD83 <u>137,636.3m</u> <u>566,567.1m</u> Coordinates: N <u>451,615</u> E <u>2,218,687</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>671.96 (Brass cap)</u>			
Depth to water: <u>211.8-ft Nov89</u> (Ground surface) <u>214.5-ft Oct92</u>					
GENERALIZED Geologist's STRATIGRAPHY Log Sl=slightly					
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; border: none;"> 0~30: Muddy sandy GRAVEL 30~35: Gravelly sandy MUD 35~45: Gravelly muddy SAND 45~50: Muddy sandy GRAVEL 50~55: Sl gravelly sl muddy SAND 55~60: SAND 60~65: Sl gravelly SAND 65~70: Sl gravelly sl muddy SAND 70~75: Gravelly SAND 75~90: Sandy GRAVEL 90~105: Muddy sandy GRAVEL 105~110: Sl muddy gravelly SAND 110~135: Sandy GRAVEL 135~145: Muddy sandy GRAVEL 145~155: Sandy GRAVEL 155~230: Muddy sandy GRAVEL </td> <td style="width: 50%; vertical-align: top; border: none;"> <div style="border-left: 1px solid black; padding-left: 10px;"> Elevation of reference point: <u>(674.94-ft)</u> (top of casing) Height of reference point above <u>(2.98-ft)</u> ground surface Depth of surface seal <u>(2~17.4-ft)</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>with gypsum, 2.0~17.4-ft</u> I.D. of riser pipe: <u>(4-in)</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~20.2-ft, 13-in nominal 20.2~227.8-ft, 9-in nominal Type of filler, 17.4~198-ft <u>Bentonite crumbles</u> Depth top of seal: <u>(198.0-ft)</u> Type of seal: <u>3/8-in Volclay pellets</u> Depth top of sand pack: <u>(202.7-ft)</u> <u>20~40-mesh silica sand</u> Depth top of screen: <u>(207.1-ft)</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>(227.8-ft)</u> Fill 229.6~230.8-ft Depth to bottom of borehole: <u>(230.8-ft)</u> </div> </td> </tr> </table>				0~30: Muddy sandy GRAVEL 30~35: Gravelly sandy MUD 35~45: Gravelly muddy SAND 45~50: Muddy sandy GRAVEL 50~55: Sl gravelly sl muddy SAND 55~60: SAND 60~65: Sl gravelly SAND 65~70: Sl gravelly sl muddy SAND 70~75: Gravelly SAND 75~90: Sandy GRAVEL 90~105: Muddy sandy GRAVEL 105~110: Sl muddy gravelly SAND 110~135: Sandy GRAVEL 135~145: Muddy sandy GRAVEL 145~155: Sandy GRAVEL 155~230: Muddy sandy GRAVEL	<div style="border-left: 1px solid black; padding-left: 10px;"> Elevation of reference point: <u>(674.94-ft)</u> (top of casing) Height of reference point above <u>(2.98-ft)</u> ground surface Depth of surface seal <u>(2~17.4-ft)</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>with gypsum, 2.0~17.4-ft</u> I.D. of riser pipe: <u>(4-in)</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~20.2-ft, 13-in nominal 20.2~227.8-ft, 9-in nominal Type of filler, 17.4~198-ft <u>Bentonite crumbles</u> Depth top of seal: <u>(198.0-ft)</u> Type of seal: <u>3/8-in Volclay pellets</u> Depth top of sand pack: <u>(202.7-ft)</u> <u>20~40-mesh silica sand</u> Depth top of screen: <u>(207.1-ft)</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>(227.8-ft)</u> Fill 229.6~230.8-ft Depth to bottom of borehole: <u>(230.8-ft)</u> </div>
0~30: Muddy sandy GRAVEL 30~35: Gravelly sandy MUD 35~45: Gravelly muddy SAND 45~50: Muddy sandy GRAVEL 50~55: Sl gravelly sl muddy SAND 55~60: SAND 60~65: Sl gravelly SAND 65~70: Sl gravelly sl muddy SAND 70~75: Gravelly SAND 75~90: Sandy GRAVEL 90~105: Muddy sandy GRAVEL 105~110: Sl muddy gravelly SAND 110~135: Sandy GRAVEL 135~145: Muddy sandy GRAVEL 145~155: Sandy GRAVEL 155~230: Muddy sandy GRAVEL	<div style="border-left: 1px solid black; padding-left: 10px;"> Elevation of reference point: <u>(674.94-ft)</u> (top of casing) Height of reference point above <u>(2.98-ft)</u> ground surface Depth of surface seal <u>(2~17.4-ft)</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>with gypsum, 2.0~17.4-ft</u> I.D. of riser pipe: <u>(4-in)</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~20.2-ft, 13-in nominal 20.2~227.8-ft, 9-in nominal Type of filler, 17.4~198-ft <u>Bentonite crumbles</u> Depth top of seal: <u>(198.0-ft)</u> Type of seal: <u>3/8-in Volclay pellets</u> Depth top of sand pack: <u>(202.7-ft)</u> <u>20~40-mesh silica sand</u> Depth top of screen: <u>(207.1-ft)</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>(227.8-ft)</u> Fill 229.6~230.8-ft Depth to bottom of borehole: <u>(230.8-ft)</u> </div>				
Drawing By: <u>RKL/2W07-07.ASB</u> Date: <u>07Dec92</u> Reference: <u>WHC-MR-0204</u>					

WELL CONSTRUCTION AND COMPLETION SUMMARY						
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: <u>L. Cordon</u> Name: <u>L. Cordon</u> Drilling: <u>Company</u> Company: <u>Basin & Range Drill</u> Date: <u>19Oct89</u> Started: <u>19Oct89</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives: <u>Not documented</u> Used: <u>Not documented</u> WA State: <u>Not documented</u> Lic Nr: <u>Not documented</u> Company: <u>Not documented</u> Location: <u>Not documented</u> Date: <u>13Dec89</u> Complete: <u>13Dec89</u>	WELL NUMBER: <u>299-W7-8</u> Hanford Coordinates: N/S <u>N 46,509.8</u> E/W <u>W 76,880.1</u> State NAD83 <u>137,637.0m</u> <u>566,761.7m</u> Coordinates: N <u>451,614</u> E <u>2,218,326</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>684.40 (Brass cap)</u>				
Depth to water: <u>229.2-ft Nov89</u> (Ground surface) <u>228.4-ft Oct92</u>						
GENERALIZED Geologist's STRATIGRAPHY Log SI=slightly						
<table style="width: 100%; border: none;"> <tr> <td style="width: 45%; vertical-align: top; border: none;"> 0~20: Sandy GRAVEL (trace COBBLES) 20~28.5: Muddy sandy GRAVEL 28.5~35: Sandy MUD 35~39.5: Muddy SAND (trace CALICHE) 39.5~48: Sandy GRAVEL (fines 47~48-ft) 48~51: Sl gravelly SAND 51~57: Muddy sandy GRAVEL 57~59: Gravelly SAND 59~78: SAND 78~85: Gravelly SAND 85~110: Sandy GRAVEL (trace COBBLES) 110~120: SAND 120~130: Sandy GRAVEL 130~235: Muddy sandy GRAVEL 235~240: Sl muddy gravelly SAND 240~244.5: Muddy sandy GRAVEL </td> <td style="width: 5%; text-align: center; vertical-align: middle; border: none;"> </td> <td style="width: 50%; vertical-align: top; border: none;"> Elevation of reference point: <u>[687.35-ft]</u> (top of casing) Height of reference point above <u>[2.95-ft]</u> ground surface Depth of surface seal <u>[2~18.7-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>with gypsum, 2.0~18.7-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~18.7-ft, 13-in nominal 18.7~244.5-ft, 9-in nominal Type of filler, 18.7~215-ft <u>8~20 mesh bentonite</u> Depth top of seal: <u>[215.0-ft]</u> Type of seal: <u>1/4-in Volclay tablets</u> Depth top of sand pack: <u>[217.3-ft]</u> <u>20~40-mesh silica sand</u> Depth top of screen: <u>[219.8-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[240.6-ft]</u> Fill 243.4~244.5-ft Depth to bottom of borehole: <u>[240.6-ft]</u> </td> </tr> </table>				0~20: Sandy GRAVEL (trace COBBLES) 20~28.5: Muddy sandy GRAVEL 28.5~35: Sandy MUD 35~39.5: Muddy SAND (trace CALICHE) 39.5~48: Sandy GRAVEL (fines 47~48-ft) 48~51: Sl gravelly SAND 51~57: Muddy sandy GRAVEL 57~59: Gravelly SAND 59~78: SAND 78~85: Gravelly SAND 85~110: Sandy GRAVEL (trace COBBLES) 110~120: SAND 120~130: Sandy GRAVEL 130~235: Muddy sandy GRAVEL 235~240: Sl muddy gravelly SAND 240~244.5: Muddy sandy GRAVEL		Elevation of reference point: <u>[687.35-ft]</u> (top of casing) Height of reference point above <u>[2.95-ft]</u> ground surface Depth of surface seal <u>[2~18.7-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>with gypsum, 2.0~18.7-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~18.7-ft, 13-in nominal 18.7~244.5-ft, 9-in nominal Type of filler, 18.7~215-ft <u>8~20 mesh bentonite</u> Depth top of seal: <u>[215.0-ft]</u> Type of seal: <u>1/4-in Volclay tablets</u> Depth top of sand pack: <u>[217.3-ft]</u> <u>20~40-mesh silica sand</u> Depth top of screen: <u>[219.8-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[240.6-ft]</u> Fill 243.4~244.5-ft Depth to bottom of borehole: <u>[240.6-ft]</u>
0~20: Sandy GRAVEL (trace COBBLES) 20~28.5: Muddy sandy GRAVEL 28.5~35: Sandy MUD 35~39.5: Muddy SAND (trace CALICHE) 39.5~48: Sandy GRAVEL (fines 47~48-ft) 48~51: Sl gravelly SAND 51~57: Muddy sandy GRAVEL 57~59: Gravelly SAND 59~78: SAND 78~85: Gravelly SAND 85~110: Sandy GRAVEL (trace COBBLES) 110~120: SAND 120~130: Sandy GRAVEL 130~235: Muddy sandy GRAVEL 235~240: Sl muddy gravelly SAND 240~244.5: Muddy sandy GRAVEL		Elevation of reference point: <u>[687.35-ft]</u> (top of casing) Height of reference point above <u>[2.95-ft]</u> ground surface Depth of surface seal <u>[2~18.7-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>with gypsum, 2.0~18.7-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~18.7-ft, 13-in nominal 18.7~244.5-ft, 9-in nominal Type of filler, 18.7~215-ft <u>8~20 mesh bentonite</u> Depth top of seal: <u>[215.0-ft]</u> Type of seal: <u>1/4-in Volclay tablets</u> Depth top of sand pack: <u>[217.3-ft]</u> <u>20~40-mesh silica sand</u> Depth top of screen: <u>[219.8-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[240.6-ft]</u> Fill 243.4~244.5-ft Depth to bottom of borehole: <u>[240.6-ft]</u>				
Drawing By: <u>RKL/2W07-08.ASB</u> Date: <u>07Dec92</u> Reference: <u>WHC-MR-0204</u>						

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: <u>R. Thorsen</u> Name: <u>R. Thorsen</u> Drilling: <u>Kaiser Engineers</u> Company: <u>Kaiser Engineers</u> Date: <u>03Oct89</u> Started: <u>03Oct89</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives: <u>Used: Not documented</u> WA State: <u>Lic Nr: Not documented</u> Company: <u>Location: Hanford</u> Date: <u>Complete: 11Apr90</u>	WELL NUMBER: <u>299-W7-9</u> Hanford Coordinates: N/S <u>N 46,549.3</u> E/W <u>W 78,888.9</u> State <u>NAD83</u> <u>137,646.59m</u> E <u>565,844.83m</u> Coordinates: N <u>451,649</u> E <u>2,216,317</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>689.11 (Brass cap)</u>	
Depth to water: 227.0-ft Nov89 (Ground surface) 229.7-ft Oct92 GENERALIZED Geologist's STRATIGRAPHY Log SI=slightly			
0~10: Gravelly muddy SAND 10~20: Muddy sandy GRAVEL 20~25: Sandy GRAVEL 25~65: Muddy sandy GRAVEL 65~70: SI gravelly sl muddy SAND 70~75: Muddy SAND 75~82: Muddy sandy GRAVEL 82~86: SAND 86~90: Gravelly SAND 95~104: SI gravelly sl muddy SAND 104~138: SAND 138~144: SI muddy SAND 144~155: Sandy GRAVEL 155~160: Gravelly SAND 160~205: Sandy GRAVEL 205~245: Muddy sandy GRAVEL 245~252.2: Not documented, no samples		<div style="margin-top: 10px;"> Elevation of reference point: <u>[692.09-ft]</u> (top of casing) Height of reference point above <u>[2.98-ft]</u> ground surface Depth of surface seal <u>[2~19.0-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 2-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout-Portland Cement</u> <u>Type I & II, 2.5~20.2-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~143.5-ft, 11-in nominal 143.5~252.2-ft, 9-in nominal Type of filler, 20.2~209.8-ft <u>8~20 mesh bentonite crumbles</u> Depth top of seal: <u>[209.8-ft]</u> Type of seal: <u>1/4-in Volclay tablets</u> Depth top of sand pack: <u>20~40-mesh silica sand</u> <u>[214.3-ft]</u> Depth top of screen: <u>[220.3-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[241.1-ft]</u> Volclay tablets, 242.8~248.4-ft Fill 248.4~252.2-ft Depth to bottom of borehole: <u>[252.2-ft]</u> </div>	
Drawing By: <u>RKL/2W07-09.ASB</u> Date: <u>07Dec92</u> Reference: <u>WHC-MR-0205</u>			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: Cable tool Drilling 200 W Water Fluid Used: Supply Driller's Name: L. Cordon Drilling Company: Basin and Range Drill Location: Not documented Date Started: 18Dec89	Sample Drive barrel Method: Hard tool Additives Used: Not documented WA State Lic Nr: Not documented Company Location: Not documented Date Complete: 17Apr90	WELL NUMBER: 299-W7-10 Hanford Coordinates: N/S N 45,921.1 E/W W 75,564.0 State NAD83 N 137,457.69m E 566,858.55m Coordinates: N 451,029 E 2,219,643 Start Card #: Not documented T R S Elevation Ground surface (ft): 686.77 (Brass cap)	TEMPORARY WELL NO: W3-MW4 Coordinates: N/S N 45,921.1 E/W W 75,564.0 State NAD83 N 137,457.69m E 566,858.55m Coordinates: N 451,029 E 2,219,643 Start Card #: Not documented T R S Elevation Ground surface (ft): 686.77 (Brass cap)
Depth to water: 225.4-ft Feb90 (Ground surface) 229.3-ft Oct92 GENERALIZED Geologist's STRATIGRAPHY Log Sl=slightly		<div style="position: absolute; top: 250px; right: 50px; width: 300px;"> Elevation of reference point: [689.66-ft] (top of casing) Height of reference point above [2.89-ft] ground surface Depth of surface seal [2.4-18.5-ft] Type of surface seal: Pre-mix concrete 4x4-ft x 6-in surface pad to 2-ft 4 equidistant protective posts Cement grout, 2.4-18.5-ft I.D. of riser pipe: [4-in] Type of riser pipe: Stainless steel Diameter of borehole, 0-20.3-ft, 13-in nominal 20.3-143.0-ft, 11-in nominal 143.0-244.2-ft, 9-in nominal Type of filler, 18.5-214.1-ft 8-20 mesh bentonite crumbles Depth top of seal: [214.1-ft] Type of seal: 3/8-in Volclay tablets Depth top of sand pack: [217.2-ft] 20-40-mesh silica sand Depth top of screen: [220.5-ft] 4-in, #10-slot, stainless steel with channel pack Depth bottom of screen [240.9-ft] Fill 244.1-244.2-ft Depth to bottom of borehole: [244.2-ft] </div>	
0-15: Muddy sandy GRAVEL 15-20: Sandy GRAVEL 20-25: GRAVEL 25-30: Sandy GRAVEL 30-40: Muddy sandy GRAVEL 40-55: Sandy GRAVEL 55-60: Muddy GRAVEL 60-65: Muddy SAND 65-95: Sl muddy SAND 95-110: Sandy GRAVEL 110-120: Muddy sandy GRAVEL 120-130: Sandy GRAVEL 130-135: Muddy sandy GRAVEL 135-145: Sandy GRAVEL 145-165: Muddy sandy GRAVEL 165-170: Sandy GRAVEL 170-190: Muddy sandy GRAVEL 190-195: Sandy GRAVEL 195-205: Muddy sandy GRAVEL 205-244.2: Sandy GRAVEL			
Drawing By: RKL/2W07-10.ASB Date: 07Dec92 Reference: WHC-MR-0205			

WELL CONSTRUCTION AND COMPLETION SUMMARY						
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: <u>G. Thomas</u> Drilling: <u>Kaiser Engineers</u> Date: <u>10Apr91</u> Started: <u>10Apr91</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives: <u>Not documented</u> WA State: <u>Lic Nr: 0867</u> Company: <u>Location: Hanford</u> Date: <u>Complete: 24May91</u>	WELL NUMBER: <u>299-W7-11</u> Hanford Coordinates: N/S <u>N 46,512</u> E/W <u>W 77,769</u> State NAD83 <u>137,636.0m</u> <u>566,186.2m</u> Coordinates: N <u>451,614</u> E <u>2,217,437</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>678.03 (Brass cap)</u>				
Depth to water: <u>215.1-ft May91</u> (Ground surface) <u>219.3-ft Oct92</u>						
GENERALIZED Geologist's STRATIGRAPHY Log SI=slightly						
<table style="width: 100%; border: none;"> <tr> <td style="width: 45%; vertical-align: top; border: none;"> 0-25: Sandy GRAVEL 25-30: Sl silty sandy GRAVEL 25-42: Sandy GRAVEL 42-50: SILT 50-55: Silty sandy GRAVEL w/caliche 55-60: Gravelly SAND 60-65: SAND 65-70: Gravelly silty SAND 70-75: Sl gravelly silty SAND 75-80: Silty SAND 80-85: Sl silty SAND 85-120: SAND 120-140: Sandy GRAVEL 140-155: Silty sandy GRAVEL 155-160: Sandy GRAVEL 160-165: Silty gravelly SAND 165-170: Silty sandy GRAVEL 170-175: Silty GRAVEL 175-185: Silty sandy GRAVEL 185-195: Sandy GRAVEL 195-200: Silty sandy GRAVEL 200-230: Sandy GRAVEL 230-234.5: Silty sandy GRAVEL </td> <td style="width: 10%; text-align: center; vertical-align: middle; border: none;"> </td> <td style="width: 45%; vertical-align: top; border: none;"> Elevation of reference point: <u>[681.45-ft]</u> (top of casing) Height of reference point above <u>[3.42-ft]</u> ground surface Depth of surface seal <u>[1.9-20.0-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 1.9-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout, 1.9-20.0-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-19.8-ft, 13-in nominal 19.8-165.2-ft, 11-in nominal 165.2-234.5-ft, 9-in nominal Type of filler, 20.0-203.9-ft <u>8-20 mesh bentonite crumbles</u> Depth top of seal: <u>[203.9-ft]</u> Type of seal: <u>1/4-3/8-in Volclay tablets</u> Depth top of sand pack: <u>[207.9-ft]</u> <u>20-40-mesh silica sand</u> Depth top of screen: <u>[211.5-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[232.0-ft]</u> Depth to bottom of borehole: <u>[234.5-ft]</u> </td> </tr> </table>				0-25: Sandy GRAVEL 25-30: Sl silty sandy GRAVEL 25-42: Sandy GRAVEL 42-50: SILT 50-55: Silty sandy GRAVEL w/caliche 55-60: Gravelly SAND 60-65: SAND 65-70: Gravelly silty SAND 70-75: Sl gravelly silty SAND 75-80: Silty SAND 80-85: Sl silty SAND 85-120: SAND 120-140: Sandy GRAVEL 140-155: Silty sandy GRAVEL 155-160: Sandy GRAVEL 160-165: Silty gravelly SAND 165-170: Silty sandy GRAVEL 170-175: Silty GRAVEL 175-185: Silty sandy GRAVEL 185-195: Sandy GRAVEL 195-200: Silty sandy GRAVEL 200-230: Sandy GRAVEL 230-234.5: Silty sandy GRAVEL		Elevation of reference point: <u>[681.45-ft]</u> (top of casing) Height of reference point above <u>[3.42-ft]</u> ground surface Depth of surface seal <u>[1.9-20.0-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 1.9-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout, 1.9-20.0-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-19.8-ft, 13-in nominal 19.8-165.2-ft, 11-in nominal 165.2-234.5-ft, 9-in nominal Type of filler, 20.0-203.9-ft <u>8-20 mesh bentonite crumbles</u> Depth top of seal: <u>[203.9-ft]</u> Type of seal: <u>1/4-3/8-in Volclay tablets</u> Depth top of sand pack: <u>[207.9-ft]</u> <u>20-40-mesh silica sand</u> Depth top of screen: <u>[211.5-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[232.0-ft]</u> Depth to bottom of borehole: <u>[234.5-ft]</u>
0-25: Sandy GRAVEL 25-30: Sl silty sandy GRAVEL 25-42: Sandy GRAVEL 42-50: SILT 50-55: Silty sandy GRAVEL w/caliche 55-60: Gravelly SAND 60-65: SAND 65-70: Gravelly silty SAND 70-75: Sl gravelly silty SAND 75-80: Silty SAND 80-85: Sl silty SAND 85-120: SAND 120-140: Sandy GRAVEL 140-155: Silty sandy GRAVEL 155-160: Sandy GRAVEL 160-165: Silty gravelly SAND 165-170: Silty sandy GRAVEL 170-175: Silty GRAVEL 175-185: Silty sandy GRAVEL 185-195: Sandy GRAVEL 195-200: Silty sandy GRAVEL 200-230: Sandy GRAVEL 230-234.5: Silty sandy GRAVEL		Elevation of reference point: <u>[681.45-ft]</u> (top of casing) Height of reference point above <u>[3.42-ft]</u> ground surface Depth of surface seal <u>[1.9-20.0-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 1.9-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout, 1.9-20.0-ft</u> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-19.8-ft, 13-in nominal 19.8-165.2-ft, 11-in nominal 165.2-234.5-ft, 9-in nominal Type of filler, 20.0-203.9-ft <u>8-20 mesh bentonite crumbles</u> Depth top of seal: <u>[203.9-ft]</u> Type of seal: <u>1/4-3/8-in Volclay tablets</u> Depth top of sand pack: <u>[207.9-ft]</u> <u>20-40-mesh silica sand</u> Depth top of screen: <u>[211.5-ft]</u> <u>4-in, #10-slot, stainless steel</u> <u>with channel pack</u> Depth bottom of screen <u>[232.0-ft]</u> Depth to bottom of borehole: <u>[234.5-ft]</u>				
Drawing By: <u>RKL/2W07-11.ASB</u> Date: <u>13Nov92</u> Reference: _____						

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: _____ Name: <u>T. Gifford</u> Drilling: _____ Company: <u>Kaiser Engineers</u> Date: _____ Started: <u>10Apr91</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives: _____ Used: <u>Not documented</u> WA State: _____ Lic Nr: <u>0867</u> Company: _____ Location: <u>Hanford</u> Date: _____ Complete: <u>28May91</u>	WELL NUMBER: <u>299-W7-12</u> Hanford Coordinates: N/S <u>N 46,514</u> E/W <u>W 78,246</u> State <u>NAD83</u> N <u>137,636.3m</u> E <u>566,040.8m</u> Coordinates: N <u>451,615</u> E <u>2,216,960</u> Start: _____ Card #: <u>Not documented</u> T _____ R _____ S _____ Elevation: _____ Ground surface (ft): <u>684.64 (Brass cap)</u>	
Depth to water: 224.0-ft Jun91 (Ground surface) 225.6-ft Oct92 GENERALIZED Geologist's STRATIGRAPHY Log Sl=slightly			
0~5: Sandy GRAVEL 5~10: Gravelly SAND 10~30: Silty sandy GRAVEL 30~35: Sl silty sandy GRAVEL 35~50: Silty sandy GRAVEL 50~56: Sl silty sandy GRAVEL 56~60: Silty SAND 60~63: Sandy SILT 63~65: Cemented silty, sandy GRAVEL 65~75: Silty SAND 75~80: Sl silty sandy GRAVEL 80~110: Sl gravelly silty SAND 110~115: Sl silty, sl gravelly SAND 115~120: Sl gravelly SAND 120~125: Sl silty gravelly SAND 125~135: Silty gravelly SAND 135~140: Sl silty gravelly SAND 140~160: Sl sandy silty GRAVEL 160~190: Silty GRAVEL 190~225: Sandy GRAVEL 225~230: Gravelly SAND 230~245: Sandy GRAVEL			
	Elevation of reference point: <u>(687.93-ft)</u> (top of casing) Height of reference point above <u>(3.29-ft)</u> ground surface Depth of surface seal <u>(1.9~22.1-ft)</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 1.9-ft</u> <u>4 equidistant protective posts</u> <u>Cement grout, 1.9~22.1-ft</u> I.D. of riser pipe: <u>(4-in)</u> Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0~21.4-ft, 13-in nominal 21.4~164.5-ft, 11-in nominal 164.5~245.0-ft, 9-in nominal Type of filler, 22.1~207.8-ft <u>8~20 mesh bentonite crumbles</u> Depth top of seal: <u>(207.8-ft)</u> Type of seal: <u>1/4~3/8-in Volclay pellets</u> Depth top of sand pack: <u>(214.6-ft)</u> <u>10~20-mesh silica sand</u> Depth top of screen: <u>(219.3-ft)</u> <u>4-in, #20-slot,</u> <u>1304 stainless steel</u> Depth bottom of screen <u>(240.0-ft)</u> Fill, 240.5~245.0-ft Depth to bottom of borehole: <u>(245.0-ft)</u>		
Drawing By: <u>RKL/2W07-12.ASB</u> Date: <u>07Dec92</u> Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: _____ Name: <u>L. Bultena</u> Drilling: _____ Company: <u>Onwego Drilling Co</u> Date: _____ Started: <u>09Jun87</u>	Sample Method: <u>Hard tool</u> Additives: _____ Used: <u>Not documented</u> WA State: _____ Lic Nr: <u>Not documented</u> Company: _____ Location: <u>Kennebec, WA</u> Date: _____ Complete: <u>23Jul87</u>	WELL NUMBER: <u>299-W8-1</u> Hanford Coordinates: N/S <u>N 46,551</u> E/W <u>W 79,200</u> State: _____ Coordinates: N <u>451,650</u> E <u>2,248,987</u> Start: _____ Card #: <u>Not documented</u> T _____ R _____ S _____ Elevation: _____ Ground surface (ft): <u>699.45 (Brass cap)</u>	
Depth to water: <u>239.6-ft Sep88</u> (Ground surface) <u>239.9-ft Oct92</u>			
GENERALIZED Geologist's STRATIGRAPHY Log			
0-5: Backfill 5-65: Sandy GRAVEL 65-80: Gravelly SAND 80-90: Gravelly sandy SILT 90-95: Silty sandy GRAVEL 95-105: Sandy GRAVEL 105-110: Slightly silty gravelly SAND 110-115: Slightly gravelly SAND 115-135: Slightly gravelly silty SAND 135-145: Silty SAND 145-155: Slightly gravelly silty SAND 155-165: Silty gravelly SAND 165-180: Sandy sandy GRAVEL 180-195: Sandy GRAVEL 195-200: Silty sandy GRAVEL 200-205: Silty/clayey GRAVEL 205-210: Gravelly silty SAND 210-270.5: Silty sandy GRAVEL		<div style="position: absolute; right: 0; top: 0; width: 100%; height: 100%; pointer-events: none;"> <div style="position: absolute; top: 0; right: 0;">Elevation of reference point: [701.33-ft] (top of casing) Height of reference point above [1.88-ft] ground surface</div> <div style="position: absolute; top: 10%; right: 0;">Depth of surface seal [0-206-ft] Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 3.0-ft</u> <u>4 equidistant protective posts</u> <u>Volclay bentonite grout 3-206-ft</u></div> <div style="position: absolute; top: 35%; right: 0;">I.D. of riser pipe: [4-in] Type of riser pipe: <u>Stainless steel</u></div> <div style="position: absolute; top: 45%; right: 0;">Diameter of borehole, 0-62.7-ft, 13-in nominal 62.7-156.8-ft, 11-in nominal 156.8-270.5-ft, 9-in nominal</div> <div style="position: absolute; top: 55%; right: 0;">Type of filler, 3-206-ft <u>Volclay bentonite grout</u></div> <div style="position: absolute; top: 60%; right: 0;">Depth top of seal: [206.0-ft] Type of seal: <u>Volclay pellets</u></div> <div style="position: absolute; top: 65%; right: 0;">Depth top of sand pack: [210.5-ft] <u>20-30-mesh silica sand</u></div> <div style="position: absolute; top: 70%; right: 0;">Depth top of screen: [236.2-ft] <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u></div> <div style="position: absolute; top: 75%; right: 0;">Depth bottom of screen: [256.5-ft]</div> <div style="position: absolute; top: 80%; right: 0;">Telescoping screen, 257-267.7-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u></div> <div style="position: absolute; top: 85%; right: 0;">Depth to bottom of borehole: [270.5-ft]</div> </div>	
Drawing By: <u>RKL/2W08-01.ASB</u> Date: <u>07Dec92</u>			
Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's Name: <u>D. Ludtke</u> Drilling Company: <u>Onwego Drilling Co</u> Date Started: <u>03Sep87</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives Used: <u>Not documented</u> WA State Lic Nr: <u>Not documented</u> Company Location: <u>Kennewick, WA</u> Date Complete: <u>22Oct87</u>	WELL NUMBER: <u>299-W9-1</u> Hanford Coordinates: N/S <u>N 44,508</u> E/W <u>W 79,507</u> State Coordinates: N <u>449,606</u> E <u>2,215,704</u> Start Card #: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Elevation Ground surface (ft): <u>735.36 (Brass cap)</u>	
TEMPORARY WELL NO: <u>None</u>			
Depth to water: <u>269.2-ft Oct87</u> (Ground surface) <u>273.4-ft Oct92</u>			
GENERALIZED Geologist's STRATIGRAPHY Log			
0-10: SAND (Backhoe to 10-ft) 10-20: Silty SAND 20-30: Gravelly SAND 30-40: SAND 40-45: Silty SAND 45-55: SAND 55-60: Gravelly SAND 60-85: Silty gravelly SAND 85-90: Silty SAND 90-95: Silty gravelly SAND 95-105: SAND 105-110: Gravelly SAND 110-130: SAND 130-135: Gravelly SAND 135-155: Sandy GRAVEL 155-160: Silty sandy GRAVEL 160-180: Slightly gravelly silty SAND 180-195: SAND 195-200: Slightly silty gravelly SAND 200-205: Slightly silty sandy GRAVEL 205-210: Slightly silty gravelly SAND 210-225: Sandy GRAVEL 225-230: Gravelly SAND 230-235: GRAVEL 235-245: Sandy GRAVEL Ringold CLAY/SILT ~238-ft 245-250: Gravelly SAND 250-255: Silty/clayey sandy GRAVEL 255-260: Silty gravelly SAND 260-270: Sandy GRAVEL 270-275: Gravelly SAND 275-280: Silty gravelly SAND, trace CLAY 280-290: Sandy GRAVEL 290-295: Gravelly SAND 295 : Sandy GRAVEL	<div style="position: absolute; left: 580px; top: 240px; width: 300px;"> Elevation of reference point: [<u>737.73-ft</u>] (top of casing) Height of reference point above [<u>2.37-ft</u>] ground surface Depth of surface seal [<u>0-70-ft</u>] Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 3.5-ft</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 3.5-70-ft</u> I.D. of riser pipe: [<u>4-in</u>] Type of riser pipe: <u>Stainless steel</u> Diameter of borehole, 0-15-ft, 17-in nominal 15-51-ft, 13-in nominal 51-151.2-ft, 11-in nominal 151.2-286-ft, 9-in nominal Type of filler, 70-259.5-ft <u>Bentonite grout</u> Depth top of seal: [<u>259.5-ft</u>] Type of seal: <u>Volclay pellets</u> Depth top of sand pack: [<u>263.5-ft</u>] <u>10-20-mesh silica sand</u> Depth top of screen: [<u>266.0-ft</u>] <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u> Depth bottom of screen: [<u>286.0-ft</u>] Telescoping screen, 282-292-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u> Fill, 292-295-ft Depth to bottom of borehole: [<u>295.0-ft</u>] </div>		
Drawing By: <u>RKL/2W09-01.ASB</u> Date: <u>07Dec92</u>			
Reference: _____			

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: <u>Cable tool</u>	Sample Drive barrel Method: <u>Hard tool</u>	WELL NUMBER: <u>299-W10-13</u>	TEMPORARY WELL NO: <u>None</u>
Drilling <u>200 W Water</u>	Additives	Hanford	
Fluid Used: <u>Supply</u>	Used: <u>Not documented</u>	Coordinates: N/S <u>N 43,137</u>	E/W <u>W 78,297</u>
Driller's	WA State	State	
Name: <u>R. Vance</u>	Lic Nr: <u>Not documented</u>	Coordinates: N <u>448,238</u>	E <u>2,216,918</u>
Drilling	Company	Start	
Company: <u>Onwego Drilling Co</u>	Location: <u>Kennewick, WA</u>	Card #: <u>Not documented</u>	T <u> </u> R <u> </u> S <u> </u>
Date	Date	Elevation	
Started: <u>11Aug87</u>	Complete: <u>25Sep87</u>	Ground surface (ft): <u>696.58 (Brass cap)</u>	

Depth to water: 227.9-ft Sep87
(Ground surface) 233.5-ft Oct92

GENERALIZED Geologist's
STRATIGRAPHY Log
sl = slightly

0~20: SAND (Backhoe to 15-ft)
20~35: Gravelly-silty gravelly SAND
35~70: SAND
70~80: Gravelly SAND
80~85: Sandy GRAVEL
85~90: Gravelly SAND
90~100: Silty gravelly SAND
100~110: Silty sandy GRAVEL
110~125: Silty gravelly-silty SAND
125~140: Sandy SILT
140~150: Silty sandy GRAVEL
150~160: Gravelly SAND
160~165: Sandy GRAVEL
165~190: Gravelly SAND
190~195: Silty gravelly SAND
195~200: Silty sandy GRAVEL
200~210: Sandy GRAVEL
210~240: Silty gravelly SAND
240~250: SAND

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| Elevation of reference point: [699.04-ft]
| (top of casing)
| Height of reference point above[ 2.46-ft ]
| ground surface
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Depth of surface seal [0-217.5-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 6.0-ft
4 equidistant protective posts
Envirogel grout 6-217.5-ft

I.D. of riser pipe: [4-in]

Type of riser pipe:
Stainless steel

Diameter of borehole,
0-42.5-ft, 13-in nominal
42.5-147.5-ft, 11-in nominal
147.5-250-ft, 9-in nominal

1 Type of filler, 6-217.5-ft
Envirogel grout

Depth top of seal: [217.5-ft]
Type of seal: Volclay pellets

Depth top of sand pack: [220.5-ft]
10-20-mesh silica sand

Depth top of screen: [227.0-ft]
4-in. #30-slot, continuous wrap
304 stainless steel

Depth bottom of screen: [247.0-ft]

Telescoping screen, 227.5~247.5-ft
6-in, blank 222.2~227.5-ft
6-in, #10-slot 227.5~237.5-ft
6-in, #10-slot 237.5~247.5-ft
 All 304 stainless steel

Depth to bottom of borehole: [250.0-ft]

Drawing By: RKL/2W10-13.ASB Date: 13Nov92

Reference: _____

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: <u>Cable tool</u> Drilling: <u>200 W Water</u> Fluid Used: <u>Supply</u> Driller's: <u>R. Boley</u> Name: <u>R. Boley</u> Drilling: <u>Onwego Drilling Co</u> Company: <u>Onwego Drilling Co</u> Date: <u>29Jul87</u> Started: <u>29Jul87</u>	Sample Drive barrel Method: <u>Hard tool</u> Additives: <u>Not documented</u> Used: <u>Not documented</u> WA State: <u>Not documented</u> Lic Nr: <u>Not documented</u> Company: <u>Kennewick, WA</u> Location: <u>Kennewick, WA</u> Date: <u>18Nov87</u> Complete: <u>18Nov87</u>	WELL NUMBER: <u>299-W10-14</u> TEMPORARY WELL NO: <u>None</u> Hanford Coordinates: N/S <u>N 43,143</u> E/W <u>W 78,330</u> State: <u>WA</u> Coordinates: N <u>448,244</u> E <u>2,216,884</u> Start: <u>Not documented</u> T <u> </u> R <u> </u> S <u> </u> Card #: <u>Not documented</u> Elevation: <u>697.09 (Brass cap)</u> Ground surface (ft): <u>697.09 (Brass cap)</u>	
Depth to water: <u>229.5-ft Aug87</u> (Ground surface) <u>234.5-ft Oct92</u>			
GENERALIZED Geologist's STRATIGRAPHY Log Sl = slightly			
0~20: SAND (Backhoe to 20-ft) 20~25: Gravelly SAND 25~80: SAND 80~85: Sl gravelly SAND 85~100: Silty sandy GRAVEL 100~105: Sandy GRAVEL 105~115: Silty sandy GRAVEL 115~120: Gravelly SAND 120~130: Sl gravelly sl silty SAND 130~137: Silty SAND 137~145: Sl gravelly SAND w/CALICHE 145~150: Sandy GRAVEL 150~155: Gravelly SAND 154~155: Silty SAND 155~164: Sandy GRAVEL 164~165: Silty SAND 165~185: Sandy-silty sandy GRAVEL 185~205: Silty gravelly SAND Chloritized zone, Ringold ~195-ft 205~210: Gravelly SAND 210~220: Sandy GRAVEL 220~230: Gravelly SAND 230~245: Silty gravelly-silty SAND 245~255: Silty sandy GRAVEL 255~270: Gravelly-silty gravelly SAND 270~280: Silty sandy GRAVEL 280~305: SAND, gravelly @300-ft 305~310: Silty sandy GRAVEL 310~325: Sandy GRAVEL 325~330: SAND 330~340: Silty gravelly SAND 340~355: Gravelly SAND 355~365: SAND-gravelly SAND 365~371: SAND-silty SAND 371~385: Clayey SAND, CLAY layer @371-ft 385~410: SAND 410~420: Gravelly SAND, CLAY @ 415-ft 420~425: SAND 425~440: Clayey gravelly-gravelly SAND 440~448: SAND-silty gravelly SAND 448~455: Clayey gravelly SAND 455~460: Sandy CLAY 460~462: CLAY	<div style="position: absolute; top: 250px; right: 50px; width: 300px;"> Elevation of reference point: <u>[699.43-ft]</u> (top of casing) Height of reference point above <u>[2.34-ft]</u> ground surface Depth of surface seal <u>[0~210-ft]</u> Type of surface seal: <u>Pre-mix concrete</u> <u>4x4-ft x 6-in surface pad to 3.0-ft</u> <u>4 equidistant protective posts</u> <u>Dry bentonite 3~6-ft</u> <u>Bentonite slurry 6~210-ft</u> </div> <div style="position: absolute; top: 400px; right: 50px; width: 200px;"> I.D. of riser pipe: <u>[4-in]</u> Type of riser pipe: <u>Stainless steel</u> </div> <div style="position: absolute; top: 440px; right: 50px; width: 250px;"> Diameter of borehole, 0~50-ft, 21-in nominal 50~147.5-ft, 17-in nominal 147.5~244-ft, 13-in nominal 244~351-ft, 11-in nominal 351~462-ft, 9-in nominal </div> <div style="position: absolute; top: 510px; right: 50px; width: 150px;"> Type of filler, 6~210-ft <u>Bentonite slurry</u> </div> <div style="position: absolute; top: 540px; right: 50px; width: 150px;"> Depth top of seal: <u>[210.0-ft]</u> Type of seal: <u>Volclay grout</u> </div> <div style="position: absolute; top: 620px; right: 50px; width: 150px;"> Depth top of sand pack: <u>[416.0-ft]</u> <u>20~30-mesh silica sand</u> </div> <div style="position: absolute; top: 660px; right: 50px; width: 150px;"> Depth top of screen: <u>[427.0-ft]</u> <u>4-in, #20-slot, continuous wrap</u> <u>304 stainless steel</u> </div> <div style="position: absolute; top: 690px; right: 50px; width: 150px;"> Depth bottom of screen: <u>[447.0-ft]</u> </div> <div style="position: absolute; top: 720px; right: 50px; width: 200px;"> Telescoping screen, 437~447-ft <u>8-in, #30-slot, continuous wrap</u> <u>304 stainless steel</u> </div> <div style="position: absolute; top: 760px; right: 50px; width: 150px;"> Depth to bottom of borehole: <u>[462.0-ft]</u> </div>		
Drawing By: <u>RKL/2W10-14.ASB</u> Date: <u>07Dec92</u> Reference: <u>HANFORD WELLS</u>			

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: <u>Cable tool</u>	Sample Drive barrel Method: <u>Hard tool</u>	WELL NUMBER: <u>299-W10-19</u>	TEMPORARY WELL NO: <u>None</u>
Drilling Fluid Used: <u>Raw water</u>	Additives Used: <u>None</u>	Hanford	
Driller's Name: <u>M. Baker</u>	WA State Lic Nr: <u>Not documented</u>	Coordinates: N/S <u>N 44,545.4</u>	E/W <u>W 77,248.7</u>
Drilling Company: <u>Kaiser Engineers</u>	Company Location: <u>Hanford</u>	State NAD83 N <u>137,037.14m</u>	E <u>566,346.19m</u>
Date Started: <u>15Jan92</u>	Date Complete: <u>24Jul92</u>	Coordinates: N <u>449,649</u>	E <u>2,217,962</u>
		Start Card #: <u>Not documented</u>	T <u> </u> R <u> </u> S <u> </u>
		Elevation	
		Ground surface (ft): <u>680.04 Brass cap</u>	

Depth to water: 217.9-ft 03Jun92
(Ground surface) _____

GENERALIZED Geologist's
STRATIGRAPHY Log
Sl=slightly

0-9: SAND
9-10.5: Silty SAND
10.5-40: SANDY GRAVEL
40-55: GRAVEL
55-75: Silty sandy GRAVEL
75-77.5: GRAVEL
77.5-83: Gravelly SAND
83-87.5: SILT
87.5-97: Silty SAND
(CALICHE nodules 90-97-ft)
97-110: Sl gravelly SAND
110-117: SAND
117-120: Silty sandy GRAVEL
120-130: Sandy GRAVEL
130-140: Silty sandy GRAVEL
(BOULDER @ 137-ft)
140-170: Sandy GRAVEL
170-175: Gravelly SAND
175-195: Sandy GRAVEL
195-200: Gravelly SAND
200-205: Sandy GRAVEL
205-210: Silty sandy GRAVEL
210-215: Gravelly SAND
215-225: Silty sandy GRAVEL
225-238.3: Gravelly SAND

Elevation of reference point: [682.99-ft]
(top of casing)
Height of reference point above [2.95-ft]
ground surface

Depth of surface seal [2.0-9.8-ft]

Type of surface seal: Pre-mix concrete
4x4-ft x 6-in surface pad to 2.0-ft
4 equidistant protective posts
Cement grout, 2.0-9.8-ft

13-in nominal hole to 20.2-ft

I.D. of riser pipe: [4-in]

Type of riser pipe:
Stainless steel

Diameter of borehole,
20.2-127.7-ft, 11-in nominal
127.7-238.3-ft, 9-in nominal

Type of filler, 9.8-206.0-ft
8-20 mesh bentonite crumbles

Depth top of seal: [206.0-ft]

Type of seal:
¾-in bentonite pellets

Depth top of sand pack: [210.5-ft]
20-40-mesh silica sand

Depth top of screen: [214.4-ft]

4-in. #10-slot, continuous wrap
T-304 stainless steel,
with 0.3-ft end cap

Depth bottom of screen [234.5-ft]

Depth to bottom of borehole: [238.3-ft]

Drawing By: RKL/2W10-19.ASB Date: 30Jun93

Reference: WHC-SD-EN-DP-049

END

DATE

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