

INTERIM CHANGE NOTICE
(ICN)

A. Document No.: PNNL-12114 Revision No.: September 1999		Effective Date of ICN: 2/28/02
Document Title: RCRA Assessment Plan for Single-Shell Tank Waste Management Area S-SX at the Hanford Site, September 1999		Change Requested By: Ronald M. Smith
Document's Original Author: V. G. Johnson and C. J. Chou		
B. Action: Make changes in the WMA S-SX groundwater quality assessment plan as described in Section D below. Attach this ICN to the front of the document, <i>just before the title page. jlm</i>		
C. Effect of Change: This ICN updates the assessment plan to reflect the current wells in the monitoring system and the current constituent list for WMA S-SX. This ICN supplements all previous ICNs (PNNL-12114-September 1999.1).		
D. Reason for Change/Description of Change: Reason for Change: New wells have been constructed at WMA S-SX and some wells have gone dry because of a falling water table and can no longer be sampled. The constituent list has been modified to reflect constituents actually detected in the groundwater and to drop constituents that have not been detected and provide no additional beneficial information. Description of Change: See attached.		
E. Document Management Decisions: See attached distribution list.		
F. Approval Signatures (Please Sign and Date) Process Quality Department: <i>Thomas G Walker 2/25/02</i> T. G. Walker		Type of Change: (Check one): <input type="checkbox"/> Minor <input checked="" type="checkbox"/> Major
Approval Authority: <i>[Signature]</i> S.P. Luttrell		Date: <i>2/25/02</i>
Other Approvals: <i>Ronald M. Smith</i> R. M. Smith		Date: <i>2/25/02</i>
<i>Mary J. Harman</i> M. J. Harman		Date: <i>25 Feb 02</i>

Description of Changes

This ICN updates the groundwater monitoring network and schedule as they were described in the assessment plan (PNNL-12114) and ICN PNNL-12114-September 1999.1.

The groundwater monitoring network for single-shell tank Waste Management Area S-SX currently has 16 wells. Figure R2.A.2 shows the monitoring wells in the WMA S-SX monitoring network and replaces Figure A.2 (page 4) in ICN PNNL-12114-September 1999.1, which replaced Figure A.2 (page A.7) in the original assessment plan.

Changes to the groundwater monitoring network since ICN PNNL-12114-September 1999.1 became effective include the following:

- groundwater monitoring wells 299-W23-13, 299-W23-14, and 299-W22-39 are removed from the network because they are dry and can no longer be sampled
- monitoring wells 299-W23-20 and 299-W23-21 are added to the network as new upgradient monitoring wells
- monitoring wells 299-W22-80, 299-W22-81, 299-W22-82, 299-W22-83, 299-W22-84, and 299-W22-85 are added to the network as new downgradient monitoring wells.

Upgradient wells 299-W23-13 and 299-W23-14 can no longer be sampled because the water table has fallen below the well-screen interval. New monitoring wells 299-W23-20 and 299-W23-21 replace monitoring wells 299-W23-13 and 299-W23-14, respectively. Wells 299-W23-20 and 299-W23-21 have sample interval depths capable for monitoring the top of the unconfined aquifer. Downgradient well 299-W22-39 can no longer be sampled because the water table has fallen below the well-screen interval. The new downgradient monitoring wells were added to the network to enhance the spatial monitoring coverage.

As-built diagrams and well construction summary reports for new wells 299-W22-80, 299-W22-81, 299-W22-82, 299-W22-83, 299-W22-84, 299-W22-85, 299-W23-20, and 299-W23-21 are attached to this ICN.

The monitoring schedule is shown in Table R2.1. Changes to the monitoring schedule since ICN PNNL-12114-September 1999.1 became effective include:

- removal of gross alpha/beta, strontium-90, and iodine-129 from the quarterly monitoring schedule
- reducing the frequency of monitoring for gamma scan, which includes cesium-137, from quarterly to annual
- removal of total organic carbon (TOC) and laboratory-measured specific conductance from the quarterly monitoring schedule.

Gross alpha/beta are removed from the monitoring schedule because specific analyses for technetium-99 and uranium make routine gross alpha/beta monitoring unnecessary. The only exception to this removal is quarterly gross beta monitoring at well 299-W23-19. Given the groundwater flow rate conditions at WMA S-SX and retardation characteristics of cesium-137, annual monitoring of this constituent, by gamma scan, is adequate. Strontium-90 and iodine-129 are removed from the quarterly schedule because they have not been detected in groundwater. Specific conductance (laboratory method) and TOC analyses are removed from the monitoring schedule because they provide no additional beneficial information.



Figure R2.A.2. Location Map of Existing Wells Around Waste Management Area S-SX

Table R2.1. Assessment Monitoring Network, Constituent List, and Sampling Frequency for WMA S-SX

Well	Alkalinity	Anions	Anions (w/Br ⁻)	Gross Beta	Metals	Gamma	Technetium-99	Tritium	Uranium	Strontium-90	Iodine-129	TOC
299-W22-44	Q	Q	-	-	Q	-	Q	Q	Q	-	-	-
299-W22-45	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-46	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-48	Q	Q	-	-	Q	-	Q	Q	Q	-	-	-
299-W22-49	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-50	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-80	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-81	Q	Q	-	-	Q	-	Q	Q	Q	-	-	-
299-W22-82	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-83	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W22-84	Q	Q	-	Sep/02	Q	Sep/02	Q	Q	Q	Sep/02	Sep/02	Sep/02
299-W22-85	Q	-	Q	Sep/02	Q	Sep/02	Q	Q	Q	Sep/02	Sep/02	Sep/02
299-W23-15	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W23-19	Q	-	Q	Q	Q	A	Q	Q	Q	-	-	-
299-W23-20	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
299-W23-21	Q	-	Q	-	Q	-	Q	Q	Q	-	-	-
<p>Notes:</p> <p>Q = Quarterly; A = Annual; Sep/02 = Analyzed for the last time in September 2002 after four quarters of samples have been collected.</p> <p>- = Indicates that the analysis will not be conducted.</p>												

WELL CONSTRUCTION AND COMPLETION SUMMARY																																																
Drilling Method: Air Rotary Csg. Hammer Drilling Fluid Used: Air Driller's Name: M. Wraspir Drilling Company: RSI Date Started: 01Sep00	Sample Method: Grab/Spill Spoon Additives Used: None WA State Lic Nr: 1909 Company Location: Woodland, Ca. Date Completed: 11Sep00	WELL NUMBER: 299-W22-80 Coordinates: N: Not documented Coordinates: E: Not documented Start Card #: R043398 Elevation Ground Surface:	TEMPORARY C3115 WELL NO: Not Allowed Depth of Surface Seal: 10.2 ft. Type of Surface Seal: 4x4 Concrete Pad																																													
Depth to Water: 205.29 ft. ft 11Sep00 (Ground surface)		Elevation of Reference Point: m																																														
GENERALIZED STRATIGRAPHY Geologist's Log		Height of Reference Point Above Ground Surface:																																														
<div style="border: 1px solid black; height: 600px; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; border-bottom: 1px solid black; height: 20px;"></div> <div style="position: absolute; bottom: 0; left: 0; right: 0; border-top: 1px solid black; height: 20px;"></div> </div>		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Fill</th> <th style="width: 33%;">Casing</th> <th style="width: 33%;">Screen</th> </tr> </thead> <tbody> <tr> <td>0 - 10.2 ft : 9-inch hole</td> <td>0 - 205.03 ft : 4 inch</td> <td></td> </tr> <tr> <td>Cement Surface Seal</td> <td>4" 304 SS Sch 5 csg</td> <td></td> </tr> <tr> <td colspan="3" style="height: 100px;"></td> </tr> <tr> <td>10.2 - 187.1 ft : 9-inch hole</td> <td></td> <td></td> </tr> <tr> <td>Granular Bentonite</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="height: 100px;"></td> </tr> <tr> <td>187.1 - 194.8 ft : 9-inch hole</td> <td></td> <td></td> </tr> <tr> <td>3/8" Bentonite Pellets</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="height: 100px;"></td> </tr> <tr> <td>194.8 - 248.4 ft : 9-inch hole</td> <td></td> <td></td> </tr> <tr> <td>10/20 Silica Sand</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="height: 100px;"></td> </tr> <tr> <td>248.4 - 251 ft : 9-inch hole</td> <td></td> <td></td> </tr> <tr> <td>Slough</td> <td></td> <td></td> </tr> </tbody> </table>		Fill	Casing	Screen	0 - 10.2 ft : 9-inch hole	0 - 205.03 ft : 4 inch		Cement Surface Seal	4" 304 SS Sch 5 csg					10.2 - 187.1 ft : 9-inch hole			Granular Bentonite						187.1 - 194.8 ft : 9-inch hole			3/8" Bentonite Pellets						194.8 - 248.4 ft : 9-inch hole			10/20 Silica Sand						248.4 - 251 ft : 9-inch hole			Slough		
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0 - 12 ft : Slightly Silty SAND 12 - 55 ft : Silty SAND 55 - 72 ft : SAND 72 - 133 ft : Silty SAND 133 - 138 ft : Silty SANDY GRAVEL 138 - 158 ft : SAND 158 - 177 ft : Sandy GRAVEL 177 - 185 ft : Gravelly SAND 185 - 212 ft : Sandy GRAVEL 212 - 237 ft : Silty Sandy GRAVEL 237 - 251 ft : Sandy GRAVEL		205.03 - 240.05 ft : 4 inch 4" SS Wire Wrap .020 Slot Scrm.																																														
251 ft : Borehole drilled depth 0 - 251 ft : 9-in. 8-5/8" CS Temp. Csg. set w/Air Rotary Casing Hammer																																																

Drawing By: JEA

Reference: Hanford Wells

Revision: 0

Revision Date: 25Sep00

Print Date: 25Sep00

Report Form: WELLS Project File: WELLS.GPJ



SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W22-80

WELL DESIGNATION : 299-W22-80
CERCLA UNIT :
RCRA FACILITY :
DEPTH DRILLED (GS) : 251.0 ft
MEASURED DEPTH (GS) : 242.05 11Sep00
AVAILABLE LOGS : Geologist
DATE EVALUATED : Data not available
EVAL RECOMMENDATION : Data not available
LISTED USE : RCRA monitoring/sampling

CURRENT USER : RCRA & Operations

PUMP TYPE : Hydrostar
MAINTENANCE : Data not available
COMMENTS : Air Rotary Casing Hammer 8-5/8" CS csg to 251'

TV SCAN COMMENTS :

Report Form: WELLS Project File: WELLS GP-J

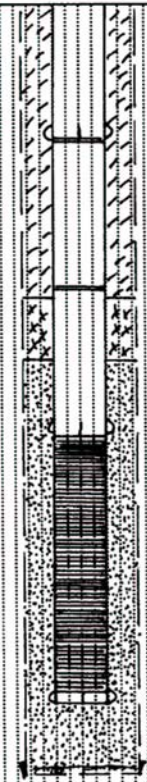

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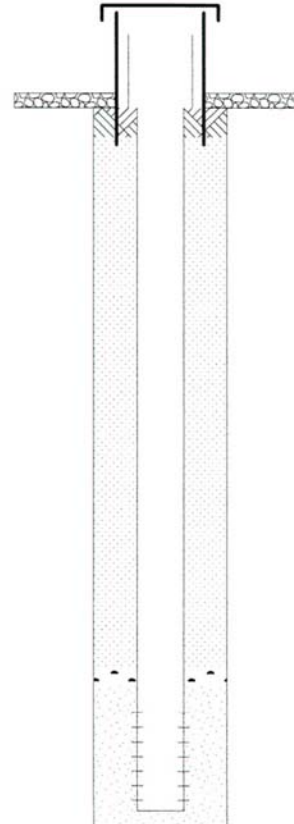
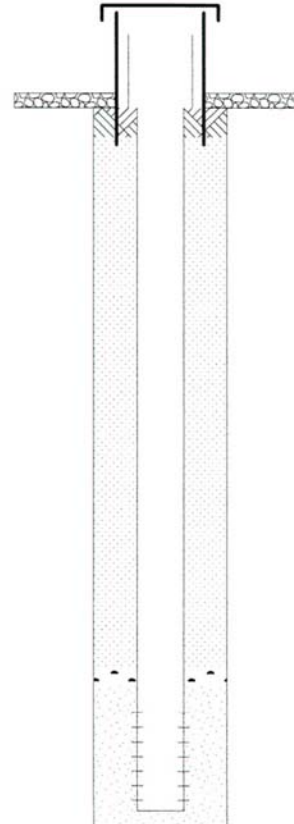
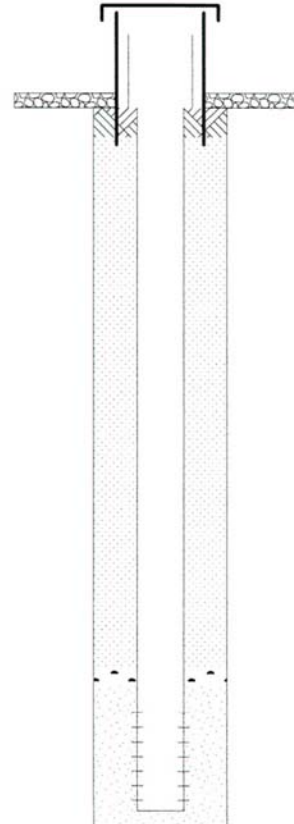

WELL CONSTRUCTION SUMMARY REPORT 0526566						Start Date: 9-1-00	
						Finish Date: 9-11-00	
						Page 1 of 1	
Specification No.:		Rev. No.:		Well Name: 299-W22-80		Temp. Well No.: C3115	
ECNs:				Approximate Location: S. of 241- TX Tank Farm / 200W			
Project: CY 2000 RCRA Drilling				Other Companies: CHI			
Drilling Company: Resonant Sonic Int.				Geologist(s): T. Lee			
Driller: Kelly Cowden				L. Walker			
TEMPORARY CASING AND DRILL DEPTH				DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.		Auger:	Diameter From _____ to _____		
(FJ) Carbon Steel	0' - 250.3	9" / 7.75"		Cable Tool:	Diameter From _____ to _____		
				Air Rotary: <input checked="" type="checkbox"/> 8.5"	Diameter From 0' to 251'		
				A.R. w/Sonic:	Diameter From _____ to _____		
					Diameter From _____ to _____		
					Diameter From _____ to _____		
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design				Diameter From _____ to _____			
				Drilling Fluid:			
Total Drilled Depth: 251'		Hole Dia @ TD: 9"		Total Amt. Of Water Added During Drilling:			
Well Straightness Test Results:				Static Water Level: 205.29'		Date: 9-11-00	
GEOPHYSICAL LOGGING							
Sondes (type)	Interval	Date		Sondes (type)	Interval	Date	
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume	Mesh Size
SS304L / 4" / 4.5" casing	12.2 - 205.03		NA	Portland Cement Grout	0' - 10.2'	7 bags	NA
4" / 4.5" SS304L Screen	205.03 - 240.05		0.020	Bentonite, granular	10.2' - 187.1'	76 bags	
4" / 4.5" SS304L Sump	240.05 - 242.05		NA	Bentonite pellets	187.1' - 194.8'	5 bags	3/8"
				Colorado Silica Sand	194.8' - 248.4'	96 bags	10-20
OTHER ACTIVITIES							
Aquifer Test: Well Development		Date: 9-11-00		Well Abandoned:		Yes:	No: Date:
Description: Monitor drawdown and recovery				Description:			
WELL SURVEY DATA							
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
Vol. Calcs: 10-20 Silica Sand - 0.54 ft ³ /50-lb bag x 96 bags = 51.84 ft ³ ; Bentonite pellets - 0.62 ft ³ /bucket x 5 buckets = 3.1 ft ³ ; Granular bentonite - 0.73 ft ³ /50-lb bag x 76 bags = 55.48 ft ³							
Reported By: L. D. Walker				Reviewed By: J. RUTEN			
Title: Geologist		Date: 9-11-00		Title: Senior Geol. Engr		Date: 9/21/00	
Signature: L. D. Walker				Signature: J. Ruten			

0526575

WELL SUMMARY SHEET			Page <u>1</u> of <u>2</u>	
Well ID: <u>C 3115</u>			Well Name: <u>299-W22-80</u>	
Location: <u>South of 241-TX Tank Farm / 200W</u>			Project: <u>CY 2000 RCRA Drilling</u>	
Prepared By: <u>L.D. Walker</u>		Date: <u>9/11/00</u>	Reviewed By: <u>MC Weekes</u>	
Signature: <u>L.D. Walker</u>		Date: <u>9/11/00</u>	Signature: <u>MC Weekes</u>	
CONSTRUCTION DATA		GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram	Depth in Feet	Graphic Log	Lithologic Description
0' → 10.2': Portland Cement		0		0' → 12': Slightly Silty SAND
6" Protective Casing				12' → 55': Silty SAND
0' → +3.2'				
+2.2' → 205.03 187.1': SS type 304 well casing, 4" ID / 4.5" OD		25		
10.2' → 187.1': Granular Bentonite		50		
				55' → 72': SAND
				72' → 133': Silty SAND
Temporary Casing 8 5/8" OD / 7 5/8" ID		75		
		100		
		125		
				133' → 138': Silty Sandy GRAVEL
All depths in feet below ground surface				
All temp. casing removed.				

WELL SUMMARY SHEET				Page <u>2</u> of <u>2</u>
				Date: <u>9-6-00</u>
Well ID: <u>C3115</u>		Well Name: <u>299-W22-80</u>		
Location: <u>South of 241-TX Tank Farm/200W</u>		Project: <u>CY 2000 RCRA Drilling</u>		
Prepared By: <u>L. D. Walker</u>	Date: <u>9/11/00</u>	Reviewed By: <u>DC Weekes</u>	Date: <u>9/11/00</u>	
Signature: <u>L. D. Walker</u>		Signature: <u>DC Weekes</u>		
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
		150		138' → 158': SAND
187.1' → 194.8': 3/8" Bentonite Pellets				158' → 177': Sandy GRAVEL
194.8' → 248.4': Silica Sand, 10-20 mesh		175		177' → 185': Gravelly SAND
				185' → 212': Sandy GRAVEL
205.03' → 240.05': Well screen, type 304 SS, 0.020-in slot cont. wire-wrap, 4" ID/4.5" OD		200		
				212' → 237': Silty Sandy GRAVEL
240.05' → 242.05': Sump type 304 SS, 4"/4.5"		225		
				237' → 251': Sandy GRAVEL
248.4' → 251.0': SLUFF		250		
Total SS 4"/4 1/2" material is 244.25' (+ 2.2-242.05')				TD = 251 ft.
				W.L. = 205.29' bgs (9-11-00)
All depths in feet below ground surface		275		
All temp. casing removed from the ground				

0532885

WELL CONSTRUCTION AND COMPLETION SUMMARY																								
Drilling Method: Cable Tool Drilling Fluid Used: none Driller's Name: Gary Howell Drilling Company: RSI Date Started: 09Jan01	Sample Method: Grab/Split Spoon Additives Used: water WA State Lic Nr: Not Available Company Location: Woodland, Ca. Date Completed: 31Jan01	WELL NUMBER: 299-W22-81 TEMPORARY WELL NO: Not Allowed Coordinates: N Not documented Coordinates: E Not documented Start Card #: Not Available Elevation Ground Surface:																						
Depth to Water: 225.9 ft. 26Mar01 (Ground surface) GENERALIZED STRATIGRAPHY Geologist's Log		Elevation of Reference Point: m Height of Reference Point Above Ground Surface: Depth of Surface Seal: 11 ft. Type of Surface Seal: 4x4 Concrete Pad																						
0 - 9.5 ft : Silty Sandy GRAVEL 9.5 - 19 ft : Slightly Silty SAND 19 - 34 ft : SAND 34 - 40 ft : Slightly Silty SAND 40 - 45 ft : Slightly Silt Gravelly SAND 45 - 48 ft : Silty Sandy GRAVEL 48 - 70 ft : Slightly Silty SAND 70 - 140 ft : SAND 140 - 163 ft : Silty SAND 163 - 174 ft : Silty Sandy GRAVEL 174 - 178 ft : Silty SAND 178 - 259 ft : Silty Sandy GRAVEL 259 - 270 ft : Sandy GRAVEL		<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Fill</th> <th style="text-align: left; border-bottom: 1px solid black;">Casing</th> <th style="text-align: left; border-bottom: 1px solid black;">Screen</th> </tr> </thead> <tbody> <tr> <td>0 - 11 ft : 11-inch hole Cement Surface Seal</td> <td>0 - 226.75 ft : 4 inch 4" 304L SS sch 5 csg.</td> <td></td> </tr> <tr> <td colspan="3" style="height: 100px;">  </td> </tr> <tr> <td>11 - 209.9 ft : 11-inch hole Granular Bentonite</td> <td></td> <td></td> </tr> <tr> <td>209.9 - 216.7 ft : 11-inch hole 3/8" Bentonite Pellets</td> <td></td> <td>226.75 - 261.72 ft : 4 inch 4" 304 SS .020 Slot Scrn.</td> </tr> <tr> <td>216.7 - 263.72 ft : 11-inch hole 10/20 Silica Sand</td> <td></td> <td></td> </tr> <tr> <td>263.72 - 270 ft : 11-inch hole 10/20 Silica Sand</td> <td>261.72 - 263.72 ft : 4 inch 4" 304L SS sump</td> <td></td> </tr> </tbody> </table>		Fill	Casing	Screen	0 - 11 ft : 11-inch hole Cement Surface Seal	0 - 226.75 ft : 4 inch 4" 304L SS sch 5 csg.					11 - 209.9 ft : 11-inch hole Granular Bentonite			209.9 - 216.7 ft : 11-inch hole 3/8" Bentonite Pellets		226.75 - 261.72 ft : 4 inch 4" 304 SS .020 Slot Scrn.	216.7 - 263.72 ft : 11-inch hole 10/20 Silica Sand			263.72 - 270 ft : 11-inch hole 10/20 Silica Sand	261.72 - 263.72 ft : 4 inch 4" 304L SS sump	
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270 ft : Borehole drilled depth 0 - 270 ft : 11-in. 10-3/4" CS Temporary csg.																								
Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 16Apr01 Print Date: 16Apr01																								

Report Form: WELLS Project File: WELLS.GPJ

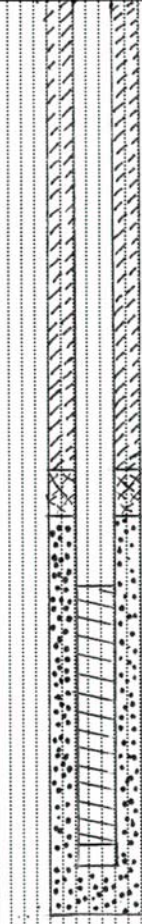

0534114

WELL CONSTRUCTION SUMMARY REPORT						Start Date: 1-9-01	
						Finish Date: 01/31/01	
						Page 1 of 1	
Specification No.: 0200W-SP 20007		Rev. No.: 0		Well Name: 299-W22-81		Temp. Well No.: C3123	
ECNs: N/A				Approximate Location: E. of 241 SX Tank Farm/200 W			
Project: RCRA Drilling CY 2001				Other Companies: BHI, CHI			
Drilling Company: Resnant Sonic International				Geologist(s): L.D. Walker, P. Vellines, S.M. Paurate			
Driller: Gary Howell				S. Wright, J.K. Murray, DCWeekes			
TEMPORARY CASING AND DRILL DEPTH				DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.		Auger:	Diameter From _____ to _____		
Carbon Steel	0 - 269'	11" / 9 5/8"		Cable Tool: 10 5/8" / 9 5/8"	Diameter From 0 to 269'		
10 5/8" / 9 5/8"	-			Air Rotary:	Diameter From _____ to _____		
-	-			A.R. w/Sonic:	Diameter From _____ to _____		
-	-				Diameter From _____ to _____		
-	-				Diameter From _____ to _____		
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design					Diameter From _____ to _____		
				Drilling Fluid:			
Total Drilled Depth: 270'		Hole Dia @ TD: 9"		Total Amt. Of Water Added During Drilling:			
Well Straightness Test Results: Passed				Static Water Level: 225.9' BGS		Date: 3/26/01	
GEOPHYSICAL LOGGING							
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date		
SPECTRAL GAMMA	0 - 263.75'	1/22/01		-			
NEUTRON	0 - 235.71'	1/22/01		-			
	-			-			
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume	Mesh Size
4" ID SS End cap (ump)	261.72' - 263.72'	F480	NA		-		
4" ID SS WW screen	226.75' - 261.72'	F480	20	Portland cement	0 - 11'	4 bags	N/A
4" ID 304 SS casing (schedule 5)	+2' - 226.75'	F480	NA	Granular bentonite	11' - 209.9'	161.5 bags	N/A
	-			Bentonite pellets (3/8")	209.9' - 216.7'	6 bags	3/8"
	-			Silica Sand	216.7' - 270'	63.5 bags	10/20
OTHER ACTIVITIES							
Aquifer Test:		Date:		Well Abandoned:		Yes:	No: Date:
Description:				Description:			
WELL SURVEY DATA							
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
Portland cement in 94# bags, granular bentonite in 50# bags, bentonite pellets in 50# bags, silica sand in 50# bags.							
Reported By: C. TRICE		Date: 4/10/01		Reviewed By: DCWeekes		Date: 4/11/01	
Title: Geo. report				Title: Geologist			
Signature: [Signature]				Signature: [Signature]			

0534139

WELL SUMMARY SHEET				Page <u>1</u> of <u>2</u>
				Date: <u>2/5/01</u>
Well ID: <u>299-C3123</u>		Well Name: <u>299-W22-81</u>		
Location: <u>EAST SIDE 241-5 TANK FARM</u>		Project: <u>RCRA C42001</u>		
Prepared By: <u>JMURRAY/DCWeekes</u>	Date: <u>2/5/01</u>	Reviewed By: <u>DMaurate</u>	Date: <u>02/05/01</u>	
Signature: <u>JMurray / DCWeekes</u>		Signature: <u>DMaurate</u>		
CONSTRUCTION DATA		GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram	Depth in Feet	Graphic Log	Lithologic Description
6-in dia protective ss casing set 1' above the 4-in casing		0		0'-9.5' SILTY SANDY GRAVEL
		25		9.5'-19' SLIGHTLY SILTY SAND
				19'-34' SAND
4-in ID sch 5 ss 304L well casing: +2' -> 226.75'				34'-40' SLIGHTLY SILTY SAND
Portland cement grout: 0' -> 11'				40'-45' SLIGHTLY SILT GRAVELLY SAND
		50		45'-48' SILTY SANDY GRAVEL
Granular bentonite: 11' -> 209.9'				48'-70' SLIGHTLY SILTY SAND
				70'-140' SAND
Temporary Casing: 10 5/8" / 9 5/8" set at TD (264')		75		
		100		
		125		
All depths in feet below ground surface				
All temporary casing removed from the ground				



WELL SUMMARY SHEET				Page <u>2</u> of <u>2</u>	
				Date: <u>2/5/01</u>	
Well ID: <u>C 3123</u>		Well Name: <u>299-W22-81</u>			
Location: <u>East Side 241-S Tank Farm / 200W</u>		Project: <u>RCRA CY 2001</u>			
Prepared By: <u>L. D. Walker</u>	Date: <u>2/5/01</u>	Reviewed By: <u>DC Weekes</u>	Date: <u>2/5/01</u>		
Signature: <u>L. D. Walker</u>		Signature: <u>DC Weekes</u>			
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram		Graphic Log	Lithologic Description	
Bentonite pellets, 3/8"		150		140' → 163': Silty SAND	
209.9' → 216.7'					
Silica sand, 10-20 mesh				163' → 174': Silty Sandy GRAVEL	
216.7' → 270'		175		174' → 178': Silty SAND	
Well Screen:				178' → 259': Silty Sandy GRAVEL	
4-in ID, 0.020-in slot					
cont. wire wrap, ss					
type 304:					
226.75' → 261.72'	200				
Sump:					
4-in ID ss 304					
261.72' → 263.72'	225	WL = 225.5' 1/29/01			
Total 4-in ID ss material					
is 263.72' (+2' → 263.72')					
		250	259' → 270': Sandy GRAVEL		
			TD = 270'		
		275			
All depths in feet below ground surface					
All temp. casing removed from the ground.					



0532884

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable Tool	Sample Method: Grab/Split Spoon	WELL NUMBER: 299-W22-82	TEMPORARY WELL NO: Not Allowed
Drilling Fluid Used: none	Additives Used: water	Coordinates: N Not documented	
Driller's Name: M. Wraspir	WA State Lic Nr: 1909	Coordinates: E Not documented	
Drilling Company: RSI	Company Location: Woodland, Ca.	Start Card #: Not Available	
Date Started: 26Jan01	Date Completed: 23Feb01	Elevation Ground Surface:	


Depth to Water: 226.27 ft 23Feb01 (Ground surface)	Elevation of Reference Point: m
GENERALIZED STRATIGRAPHY	Height of Reference Point Above Ground Surface:
Geologist's Log	Depth of Surface Seal: 10ft.
	Type of Surface Seal: 4x4 Concrete Pad

Fill	Casing	Screen
0 - 10 ft : 11-inch hole	0 - 226.1 ft : 4 inch	
Cement Surface Seal	4" 304 SS sch 5 csg.	
111 - 112 ft : SILT		
112 - 138 ft : Silty SAND		
138 - 147 ft : Gravelly Silty SAND		
147 - 163 ft : Silty Sandy GRAVEL		
163 - 175 ft : Silty SAND		
175 - 179.5 ft : Slightly Silty SAND		
179.5 - 190.5 ft : Silty Sandy GRAVEL		
190.5 - 194 ft : Silty SAND		
194 - 270 ft : Silty Sandy GRAVEL		
209.4 - 215.7 ft : 11-inch hole		
Bentonite Pellets		
215.7 - 263.2 ft : 11-inch hole		
10/20 Silica Sand		
263.2 - 270 ft : 11-inch hole		
10/20 Silica Sand		
261.2 - 263.2 ft : 4 inch		
4" SS Sump		

270 ft : Borehole drilled depth

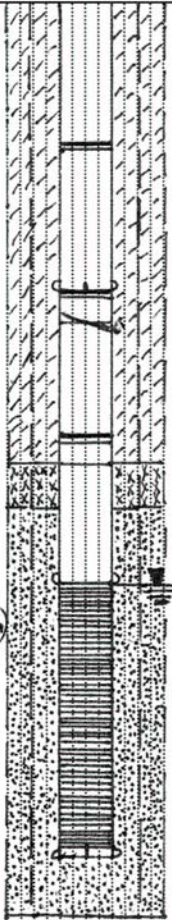
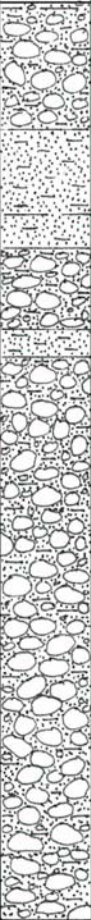
0 - 270 ft : 11-in. 10-3/4" Cs Temp.csg. set w/cable tool

Drawing By: JEA
Reference: Hanford Wells
Revision: 0
Revision Date: 16Apr01
Print Date: 16Apr01



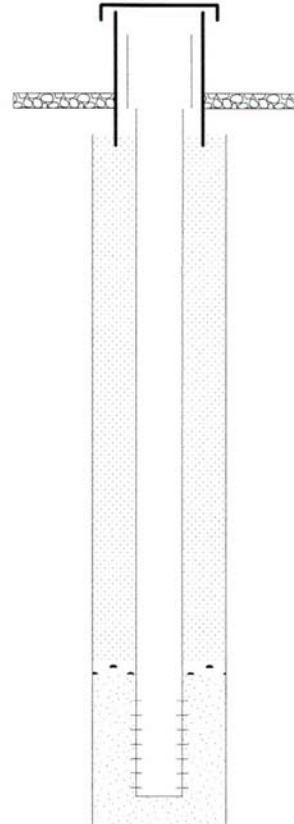

WELL CONSTRUCTION SUMMARY REPORT						Start Date: 1-26-01	
0534116						Finish Date: 02/23/01	
						Page 1 of 1	
Specification No.: 0200W SP. 00007		Rev. No.: 0		Well Name: 299-W22-82		Temp. Well No.: C3124	
ECNs: N/A				Approximate Location: 200m SE of 241-SX Tank Farm/200W			
Project: RCRA Drilling CY2001				Other Companies: BHI, CHI			
Drilling Company: Resonant Sonic Int.				Geologist(s): L. Walker, G.S. Thomas, M. Fawcett, D. Weekes, C. Price			
Driller: M. Wraspir							
TEMPORARY CASING AND DRILL DEPTH				DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.	Auger:	Diameter From _____ to _____			
FJ Carbon Steel	0' - 262.6'	11" / 9 1/4"	Cable Tool: 10 3/4" / 9 1/4"	Diameter From 0' to 270'			
10 3/4" / 9 1/4"	- 262.6'		Air Rotary:	Diameter From _____ to _____			
			A.R. w/Sonic:	Diameter From _____ to _____			
				Diameter From _____ to _____			
				Diameter From _____ to _____			
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design				Diameter From _____ to _____			
				Drilling Fluid: N/A			
Total Drilled Depth: 270'		Hole Dia @ TD: 11.0"		Total Amt. Of Water Added During Drilling:			
Well Straightness Test Results: Passed				Static Water Level: 226.27'		Date: 02/23/01	
GEOPHYSICAL LOGGING							
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date		
SPECTRA Gamma	0' - 262.6'	2/13/01					
Neutron	0' - 224'	2/13/01					
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume	Mesh Size
4" ID Total SS304		FJ	N/A	Colorado Silica Sand	215.7' - 262.6'	63 bags	10-20
4" ID Sump SS304	261.2' - 262.6'	FJ	N/A	Bentonite Pellets	209.4' - 215.7'	8 bags	4"
4" ID Screen SS304	224.1' - 261.2'	FJ	0.020"	Crumbles & Granular Bentonite	10.0' - 209.4'	204 bags	3/8"
4" ID casing SS304	12.0' - 224.1'	FJ	N/A	Portland Cement	0' - 10.0'	13 bags	N/A
				Bentonite Powder	N/A	~1 bag	N/A
OTHER ACTIVITIES							
Aquifer Test:		Date:		Well Abandoned:		Yes:	No: Date:
Description:				Description:			
WELL SURVEY DATA							
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
Vol. Calc: 10-20 Silica Sand, 0.53 ^{ft³} / bag * 63 bags = 33.39 ^{ft³} ; bentonite pellets; 0.62 ^{ft³} / bag * 9 bags = 5.58 ^{ft³} ; bentonite crumbles; 0.71 ^{ft³} / bag * 195 bags = 138.45 ^{ft³} ; Portland Cement; 1.285 ^{ft³} / bag * 13 bags = 16.71 ^{ft³}							
Reported By: Charlene Martinez				Reviewed By: DC Weekes			
Title: Geologist		Date: 03/08/01		Title: Geologist		Date: 4/11/01	
Signature: Charlene Martinez				Signature: DC Weekes			



WELL SUMMARY SHEET				Page <u>2</u> of <u>2</u>	
				Date: <u>2/23/01</u>	
Well ID: <u>C3124</u>		Well Name: <u>299-W22-82</u>			
Location: <u>SE of 241-SX Tank Farm/200W</u>		Project: <u>RCRA FY01 Drilling</u>			
Prepared By: <u>L.D. Walker / CTRICE</u>		Date: <u>2/28/01</u>		Reviewed By: <u>DC Weefes</u> Date: <u>2/28/01</u>	
Signature: <u>[Signature]</u>		Signature: <u>[Signature]</u>			
CONSTRUCTION DATA		GEOLOGIC/HYDROLOGIC DATA			
Description	Diagram	Depth in Feet	Graphic Log	Lithologic Description	
Bentonite Pellets 209.4' → 215.7'		150		147' → 163': Silty Sandy GRAVEL	
Silica Sand, 10-20 mesh, 215.7' → 263.1'				163' → 175': Silty SAND	
Well Screen, 4" ID, 6.020 - -in slot continuous wire- wrap, SS type 304 225.9' → 261.1' 226.1'		175		175' → 179.5': Slightly Silty SAND	
Sump, 4" ID SS type 304, 261.2' → 263.1'				179.5' → 190.5': Silty Sandy GRAVEL	
Total SS 4" ID material (inc. sump) is 220' → 265.1' or (266.86' - 1') or (267.11' TOTAL) or		200		190.5' → 194': Silty SAND	
				194' → 270': Silty Sandy GRAVEL	
		225			
		250			
		275	T.D. = 270'		
All depths in feet below ground surface			Water level 226.27' 2/23/01		
All temp casing removed from ground					



0532886

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: Cable Tool Drilling Fluid Used: none Driller's Name: Gary Howell Drilling Company: RSI Date Started: 22Feb01	Sample Method: Grab/Split Spoon Additives Used: water WA State Lic Nr: Not Available Company Location: Woodland, Ca. Date Completed: 14Mar01	WELL NUMBER: 299-W22-83 TEMPORARY WELL NO: C3126 Not Allowed Coordinates: N Not documented Coordinates: E Not documented Start Card #: Not Available Elevation Ground Surface:	
Depth to Water: 227.05 ft 14Mar01 (Ground surface) GENERALIZED STRATIGRAPHY Geologist's Log		Elevation of Reference Point: m Height of Reference Point Above Ground Surface: Depth of Surface Seal: 10 ft Type of Surface Seal: 4x4 Concrete Pad	
0 - 0.5 ft : Gravel Basalt Rich 0.5 - 12 ft : Sandy gravel 12 - 19 ft : Sand trace of Gravel 19 - 30.5 ft : Sand trace of Gravel 30.5 - 32 ft : Gravelly Sand (silt stringer at 32 ft) 32.5 - 45 ft : Sand 46 - 51.5 ft : Silty Sand 51.5 - 57.5 ft : Cobble Gravel 57.5 - 65.5 ft : Gravelly Sand 65.5 - 72 ft : Sand 72 - 128 ft : Slightly Silty Sand 129 - 134 ft : Sand 134 - 137 ft : Sandy Silt 137 - 141 ft : Sand with caliche 141 - 145 ft : Sandy Silt trace of gravel 146 - 170 ft : Sandy Gravelly Silt 170 - 175 ft : Sand 175 - 185 ft : Silty Sand 185 - 195 ft : Sandy Gravelly Silt 195 - 236 ft : Silty Sandy Gravel - 232/234 Split Spoon sandy gravel w/cobbles.		<div style="text-align: center;">  </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Fill 0 - 226.3 ft : 4 inch 4" 304 SS sch 5 csg </div> <div style="width: 45%;"> Casing 10 - 211.3 ft : 11-inch hole Granular Bentonite 211.3 - 216.3 ft : 11-inch hole 1/4" Bentonite Pellets 216.3 - 263.3 ft : 11-inch hole 10/20 Silica Sand 263.3 - 275 ft : 11-inch hole 10/20 Silica Sand </div> <div style="width: 45%;"> Screen 226.3 - 261.3 ft : 4 inch 4" 304 SS Wirewrap .020 slot scrn 261.3 - 263.3 ft : 4 inch 4" SS Sump </div> </div>	
275 ft : Borehole drilled depth 0 - 275 ft : 11-in. 10-3/4" CS Temp. setw/ cable tool			
Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 16Apr01 Print Date: 16Apr01			

Report Form: WELLS Project File: WELLS.GPJ

WELL CONSTRUCTION SUMMARY REPORT

0534118

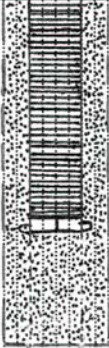

Specification No.: 0200W-3P 0007		Rev. No.: 0	Well Name: 279-W22-83	Start Date: 2/22/01	Finish Date: 3/14/01	Page: 1 of 1
C.Ns: NA		Drilling Company: RS1	Approximate Location: EAST SIDE of SX Tank Farm	Temp Well No.: C3126		
Project: C400 RCRA Drilling		Other Companies: CH1				
Driller: Gary Howell		Geologist(s): DC Weekes, C Martinez, C Trice				
TEMPORARY CASING AND DRILL DEPTH			DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.	Auger:	Diameter From _____ to _____		
Carbon Steel	0 - 275'	11" / 10" LT	Cable Tool: (9")	Diameter From 0 to 275'		
10 3/4" / 10 1/2" 9 1/2"	-	10 3/8" / 9 1/4"	Air Rotary:	Diameter From _____ to _____		
-	-	-	A.R. w/Sonic:	Diameter From _____ to _____		
-	-	-		Diameter From _____ to _____		
-	-	-		Diameter From _____ to _____		
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design				Diameter From _____ to _____		
			Drilling Fluid: H ₂ O			
Total Drilled Depth: 275'	Hole Dia @ TD: 9"	Total Amt. Of Water Added During Drilling: 223 gallons				
Well Straightness Test Results: PASSED 3/8/01		Static Water Level: 227.05' Date: 3/14/01				
GEOPHYSICAL LOGGING						
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date	
SPECTRAL Gamma	0 - 275'	3/7/01		-		
Neutron	0 - 275'	3/7/01		-		
COMPLETED WELL						
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume Mesh Size
4" ID endcap, SS304	261.3 - 263.3	F480	NA	Colorado Silica Sand	216.3 - 263.3	58 bags 10-20
4" ID screen, SS3	226.3 - 261.3	F480	0.020"	Bentonite Pellets 1/4"	211.3 - 216.3	5 buc. 1/4"
4" ID CASING,	12.0 - 226.3	F480	NA	Bentonite Crumbles	10' - 211.3	149 bags 1/2"
	-			Portland Cement	0' - 10'	8 bags
	-			(Cement)	-	
OTHER ACTIVITIES						
Aquifer Test:	Date:	Well Abandoned:	Yes:	No:	Date:	
Description:	Description:					
WELL SURVEY DATA						
Date:	Protective Casing Elevation:					
Washington State Plane Coordinates:	Brass Cap Elevation:					
COMMENTS/REMARKS						
Vol calcs: 10-20 Silica Sand: 0.535 ft ³ /bag X 58 bags = 31.03 ft ³ ; BENTONITE PELLETS 0.62 ft ³ /bucket X 5 buckets = 3.14 ft ³ ; Bentonite crumbles 0.71 ft ³ /bag X 149 bags = 105.79 ft ³ ; Portland Cement: 1.285 ft ³ /bag X 8 bags = 10.28 ft ³						
Reported By: C. TRICE	Reported By: JMFaurde					
Title: Geologist	Date: 3/14/01	Title: Geologist	Date: 4/10/01			
Signature: C. Trice	Signature: JMFaurde					

0534140

WELL SUMMARY SHEET				Page <u>1</u> of <u>3</u>			
				Date: <u>02/28/01</u>			
Well ID: <u>C 3121</u>			Well Name: <u>299-W22-83</u>				
Location: <u>East of SX Tank Farm</u>			Project: <u>RCRA F401 Drilling</u>				
Prepared By: <u>Charlene Martinez</u>		Date: <u>02/28/01</u>	Reviewed By: <u>DC Weekes</u>		Date: <u>4/3/01</u>		
Signature: <u>Charlene Martinez</u>			Signature: <u>DC Weekes</u>				
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA				
Description	Diagram		Graphic Log	Lithologic Description			
6" DIA. PROTECTIVE CASING 1.0' above the 4" casing		0'		0'-0.5' Gravel, basalt rich			
4.5" OD / 4" ID WELL CASING, SS TYPE 304		A-B sand + gravel					
+2.0' → 226.3'		0.5'-12' Sands (s), 95% - 100%, gravel 0-5%					
Portland Cement Grout		12'-19' sands (s) or gravel (6-10%)					
0' → 10.0'		19'-30.5' sand (s) 100% sand, trace gravel					
		30.5'-32' Gravely sand					
		32' Silt stringer					
		32.5'-45' sand (s) bn-gr, m-f mod sorted					
		46'-51.5' Coarse gr stringer of sand, thin knuses of silt					
		51.5'-57.5' gravel stringer @ 51.5' poorly sorted, large cobbles					
		57.5'-65.5' Gravely sand					
		65.5'-72.0' Sand (s)					
		72.0' slightly silty sand (m)s					
		83' minor silt lens detected					
All depths in Feet below ground surface.							
All temp casing removed from ground.							

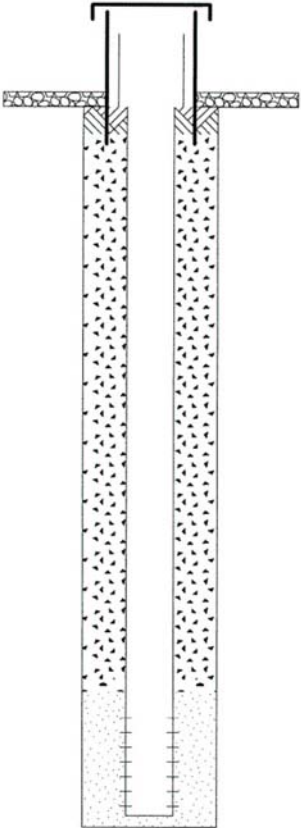



WELL SUMMARY SHEET			Page <u>2</u> of <u>3</u>		
			Date: <u>03/01/01</u>		
Well ID: <u>C3126</u>		Well Name: <u>299-W22-83</u>			
Location: <u>East of SX Tank Farm</u>		Project: <u>RCRA FY01 Drilling</u>			
Prepared By: <u>Charlene Martinez</u>	Date: <u>03/01/01</u>	Reviewed By: <u>DC Weekes</u>	Date: <u>4/3/01</u>		
Signature: <u>Charlene Martinez</u>		Signature: <u>DC Weekes</u>			
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram	Graphic Log	Lithologic Description		
all depth inject below ground surface.		120	120' → 128.0' slightly silty sand(s)		
All temp. casing removed from ground.			129' very thin silty silt		
			129' → 134' sand(s) (micaceous)		
			134' → 137' sandy silt (sm)		
			137' → 141' calcareous sandy silt (sm) + gravel		
			141' → 145' sandy silt (sm) + gravel		
			145' → 170' sandy gravelly silt (sm)		
			160		
				170' → 175' sand (s)	
			180	175' → 185' silty sand (ms)	
			185' → 195' sandy gravelly silt (sm)		
		200	195' → 236' silty sandy gravel		
		220	WATER DEPTH 227.05' bgs 3/14/01		
			232' → 234' silty split spoon sandy gravel w/ cobbles		
Granular Bentonite 10.0' → 211.3'					
Bentonite Pellets 1/4"					
211.3' → 216.3'					
Silica Sand, 10-20 mesh					
216.3' → 275'					

WELL SUMMARY SHEET				Page <u>3</u> of <u>3</u>	
				Date: <u>03/06/01</u>	
Well ID: <u>C3126</u>			Well Name: <u>299-W22-83</u>		
Location: <u>East of SX Tank Farm</u>			Project: <u>RCRA FY01 Drilling</u>		
Prepared By: <u>Charlene Martinez</u>		Date: <u>03/06/01</u>	Reviewed By: <u>DC Weekes</u>		Date: <u>4/3/01</u>
Signature: <u>Charlene Martinez</u>			Signature: <u>DC Weekes</u>		
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram	Graphic Log	Lithologic Description		
Well Screen, 4" ID, 0.020- in slot continuous wire-wrap SS type 304, 226.3' → 261.3'			236' → 275' silty sandy gravel		
Sump, 4" ID SS Type 304 261.3' → 263.3'			247' → 249' split spoon silty sandy gravel w/ cobbles.		
TOTAL SS 4" ID material is 265.30' (±2.0' → 263.3')					
I.D. = 275'					
All depths in feet below ground surface.					
All temp casing removed from ground.					



0540440

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: Cable Tool Drilling Fluid Used: None Driller's Name: Gary Howell Drilling Company: RSI Date Started: 01Oct01	Sample Method: Grab/Spit Spoon Additives Used: none WA State Lic Nr: 1930 Company Location: Woodland, Ca. Date Completed: 01Nov01	WELL NUMBER: 299-W22-84 TEMPORARY WELL NO: C3398 Not Allowed Coordinates: N Not documented Coordinates: E Not documented Start Card #: R037815 Elevation Ground Surface:	
Depth to Water: 232.36 ft 02Nov01 (Ground surface) GENERALIZED STRATIGRAPHY Geologist's Log		Elevation of Reference Point: m Height of Reference Point Above Ground Surface: Depth of Surface Seal: 10.3 ft Type of Surface Seal: 4x4 Concrete Pad	
<div style="display: flex;"> <div style="flex: 1;"> 0 - 10 ft : Fill Material 10 - 25.3 ft : Gravelly Sand 25.3 - 39 ft : Sand 39 - 54.8 ft : Gravelly Sand 54.8 - 60 ft : Sand 60 - 70 ft : Slightly Silty Gravelly Sand 70 - 130 ft : Silty Sand w/clay lens 94 to 94.5 ft 130 - 148 ft : Sand 148 - 156 ft : Silt w/trace of sand 156 - 157 ft : Gravelly Sandy Silt 157 - 158 ft : Silty Sand 158 - 161 ft : Sand 161 - 180 ft : Silty Sand 180 - 250 ft : Silty Sandy Gravel 250 - 255 ft : Sandy Silt 255 - 265 ft : Silty Gravelly Sand 265 - 273.5 ft : Sandy Gravel </div> <div style="flex: 1; text-align: center;">  </div> <div style="flex: 1;"> Fill 0 - 10.3 ft : 11-inch hole Cement Surface Seal 10.3 - 217.4 ft : 11-inch hole Bentonite Crumbles 217.4 - 222 ft : 11-inch hole 1/4" Bentonite Pellets 222 - 269.1 ft : 11-inch hole 10/20 Silica Sand 269.1 - 273.5 ft : 11-inch hole 10/20 Silica Sand </div> <div style="flex: 1;"> Casing 0 - 232 ft : 4 inch 304/304L SS sch 5 csg 267 - 269.1 ft : 4 inch 304/304L SS Sump </div> <div style="flex: 1;"> Screen 232 - 267 ft : 4 inch 304/304L SS Wire Wrap .020 slot scrn </div> </div>		<p style="text-align: center;">273.5 ft : Borehole drilled depth</p> <p style="text-align: center;">0 - 273.5 ft : 11-in. Cable Tool 10-3/4" CS Temp csg to 273.5 ft</p>	
Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 13Nov01 Print Date: 13Nov01			

Report Form: WELLS Project File: WELLS.GPJ

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-W22-84

WELL DESIGNATION : 299-W22-84
CERCLA UNIT :
RCRA FACILITY :
DEPTH DRILLED (GS) : 273.5 ft
MEASURED DEPTH (GS) : 269.1 02Nov01
AVAILABLE LOGS : Geologist & Geophysical
DATE EVALUATED : Data not available
EVAL RECOMMENDATION : Data not available
LISTED USE : RCRA Monitoring

CURRENT USER : RCRA & Operations

PUMP TYPE : Not Documented
MAINTENANCE : Data not available
COMMENTS : Cable Tool 10-3/4" CS csg to 273.5 ft

TV SCAN COMMENTS :

Report Form: WELLS Project File: WELLS.GPJ

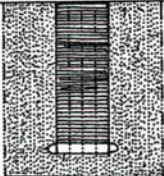




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Reference: Hanford Wells
Revision: 0
Revision Date: 13Nov01
Print Date: 13Nov01



WELL CONSTRUCTION SUMMARY REPORT						0541446	
Start card # R037815						Start Date: 10/01/01	
Specification No.: 0200X-SP- V0004						Rev. No.: 0	
ECNs: NA						Well Name: 299-W22-84	
Project: C Y01 RCRA Drilling						Approximate Location: East of 241-54 Tank Farm	
Drilling Company: Resonant Sonic Inc. (RSI)						Other Companies: CHI, BHI	
Driller: Gary Howell ("Howie") Lic. # 1930						Geologist(s): C. Trice, J. Hocking, C. Martinez, G. Thomas	
TEMPORARY CASING AND DRILL DEPTH				DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.	Auger:	Diameter From _____ to _____			
Carbon Steel (FS)	0' - 273.5'	10 5/8" / 9 3/8"	Cable Tool: X 10 3/4" O.D.	Diameter From 0' to 273.5'			
			Air Rotary:	Diameter From _____ to _____			
			A.R. w/Sonic:	Diameter From _____ to _____			
				Diameter From _____ to _____			
				Diameter From _____ to _____			
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design				Diameter From _____ to _____			
				Drilling Fluid: N/A			
Total Drilled Depth: 273.5'		Hole Dia @ TD: 11"		Total Amt. Of Water Added During Drilling: N/A			
Well Straightness Test Results: Passed DIA 10/1		20.4" long 3.5" O.D.		Static Water Level: 232.36 bgs		Date: 11/2/01	
GEOPHYSICAL LOGGING							
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date		
Spectral Gamma	1340' - 274.0'	10/22/01					
Spectral Gamma	0' - 133.0'	10/23/01					
Neutron Moisture	0' - 236.25'	10/19/01					
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	*Volume	Mech Size
4" SS 304/304L Sump	269.1 - 267.0			Colorado Silica Sand	273.5 - 222.0	52.0 ft ³	10-20
4" SS 304/304L SCH 40.55"	267.0 - 232.0		0.020"	1/4" Bentonite Pellets	222.0 - 217.4	3.52 ft ³	1/4"
4" SS 304/304L Riser	232.0 - 2.00			Granular Bentonite Crumbles	217.4 - 10.3	116.7 ft ³	
6" SS Manifold	0.00 - 2.00			Portland Cement	10.3 - 0	3.82 ft ³	N/A
OTHER ACTIVITIES							
Aquifer Test: Drawdown/Recovery		Date: 11/2/01		Well Abandoned:		Yes:	No: Date:
Description: Well development pumping, drawdown monitored with transducer.				Description:			
WELL SURVEY DATA							
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
* vol. calc. => 0.5454 ft ³ / (0.535 ft ³ /bag) = .ft ³ [Ex: 0.5454 ft ³ / (0.535 ft ³ /51 bags) = 51.99 ft ³]							
Reported By: C. Trice / Jess Hocking				Reviewed By: DC Weekes			
Title: Geologist		Date: 10/19/01		Title: Geologist		Date: 11/30/01	
Signature: C. Trice		Signature: Jess Hocking		Signature: DC Weekes			

WELL SUMMARY SHEET		0541445		Page <u>1</u> of <u>2</u>	
				Date: 10/12/01	
Well ID: <u>C3398</u>		Well Name: <u>299-W22-84</u>			
Location: <u>East of 241-Sx Tank Farm/200-W</u>		Project: <u>C401 RCRA Drilling</u>			
Prepared By: <u>Jess Hocking</u>	Date: <u>11/5/01</u>	Reviewed By: <u>DCakekes</u>	Date: <u>11/6/01</u>		
Signature: <u>Jess Hocking</u>		Signature: <u>DCakekes</u>			
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram		Graphic Log	Lithologic Description	
6" ID SS 304 Protective casing above		0		0'-1.0' Fill material	
4" ID SS 304/304L Riser [Sch 40S]				1.0'-25.3' gravelly SAND (gs)	
+2.00' → 232'				25.3'-39.0' SAND (S)	
SS 304/304L 0.020" CONT.				39.0'-54.8' gravelly SAND (gs)	
4" ID Wire wrap screen [Sch 40S]				54.8'-60.0' SAND (S)	
232' → 267'				60.0'-70.0' slightly silty gravelly SAND	
4" ID SS 304/304L Sump [Sch 40S]				70.0'-130.0' silty SAND (ms)	
(10-80) Colorado Silica Sand				94.0'-94.5' clay lens	
273.5' → 222.0'					
1/4" Bentonite Pellets					
222.0' → 217.4'					
Granular Bentonite Crumbles					
217.4' → 10.3'					
Portland Cement					
10.3' → 0.00'					
All Temp. Casing removed from ground.					
Depths below ground surface					
NOT TO SCALE					



WELL SUMMARY SHEET				Page <u>2</u> of <u>2</u>	
				Date: 10/17/01	
Well ID: <u>C 3398</u>			Well Name: <u>299-W 22-84</u>		
Location: <u>East of 241-S A Tank Farm 200 W</u>			Project: <u>CY 01 RCRA DRILLING</u>		
Prepared By: <u>C Martinez</u>		Date: <u>10/18/01</u>	Reviewed By: <u>DC Weekes</u>		Date: <u>11/6/01</u>
Signature: <u>C Martinez</u>			Signature: <u>DC Weekes</u>		
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram		Graphic Log	Lithologic Description	
		240			
				250' - 255.0' sandy SILT (sm)	
				255.0' - 265.0' silty gravelly SAND (mg)	
				265.0' - 273.5' sandy GRAVEL (sg)	
				TD @ 273.5' 10/19/01	
				Static water level at	
				232.36' (11/2/01)	
			280		
Depths below Grand surface.					
All Temp. Casing removed from ground.					
NOT TO SCALE.					

0540438

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable Tool	Sample Method: Grab/Spit Spoon	WELL NUMBER: 2799-W22-85	TEMPORARY C3399WELL NO: Not Allowed
Drilling Fluid Used: None	Additives Used: None Documented	Coordinates: N	Not documented
Driller's Name: K. Olson	WA State Lic Nr: 1217	Coordinates: E	Not documented
Drilling Company: RSI	Company Location: Woodland, Ca.	Start Card #: R037815	
Date Started: 21Sep01	Date Completed: 26Oct01	Elevation Ground Surface:	

Depth to Water: 218.42 ft 26Oct01
(Ground surface)

Elevation of Reference Point: m

GENERALIZED STRATIGRAPHY Geologist's Log

Height of Reference Point Above Ground Surface:
Depth of Surface Seal: 10.1 ft
Type of Surface Seal: 4x4 Concrete Pad

0 - 5 ft : Backfill material
5 - 17 ft : Sand (silt lens @ 16 ft)
17 - 25 ft : Sandy Silt
25 - 32 ft : Sand
32 - 45 ft : Silty Sand w/silt lens @ 35 ft
45 - 47 ft : Sandy Gravel
47 - 54 ft : Silty Sandy Grvel
54 - 57 ft : Sand
57 - 65 ft : Silty Sand w/silt lens @ 60 ft
65 - 70 ft : Sand w/silt lens @ 66 ft.
70 - 100 ft : Silty Sand w/silt lenses @ 85 and 86 ft.

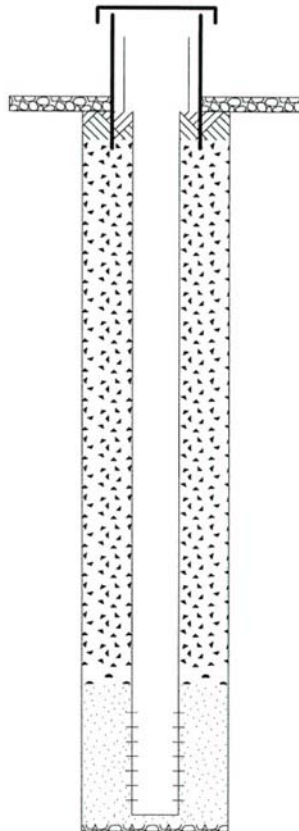
100 - 104 ft : Sand
104 - 130 ft : Silty Sand

130 - 140 ft : Silt

140 - 143 ft : Sandy Silt
143 - 149 ft : Silt
149 - 151 ft : Sandy Silt
151 - 153 ft : Silt
153 - 155 ft : Caliche
155 - 162 ft : Silty Sandy Gravel
162 - 168 ft : Silty Gravelly Sand
168 - 174 ft : Sand
174 - 180 ft : Sandy Gravel
180 - 235 ft : Silty Sandy Gravel

235 - 255 ft : Gravelly Silty Sand

255 - 260.1 ft : Silty Sandy Gravel



Fill	Casing	Screen
0 - 10.1 ft : 12-inch hole Cement Surface Seal	0 - 217.12 ft : 4 inch 304L SS sch 5 csg	

10.1 - 202.1 ft :
12-inch hole
Bentonite
crumbles

202.1 - 206.8 ft :
12-inch hole
1/4" Bentonite
Pellets
206.8 - 254.13 ft :
12-inch hole
10/20 Silica Sand

254.13 - 257.5 ft : 252.03 - 254.13 ft
12-inch hole
10/20 Silica Sand
4 inch
304L SS Sump

257.5 - 260.1 ft :
12-inch hole
Slough


217.12 - 252.03 ft
:
4 inch
304L SS Wire
Wrap .020 slot
scrm

260.1 ft : Borehole drilled depth

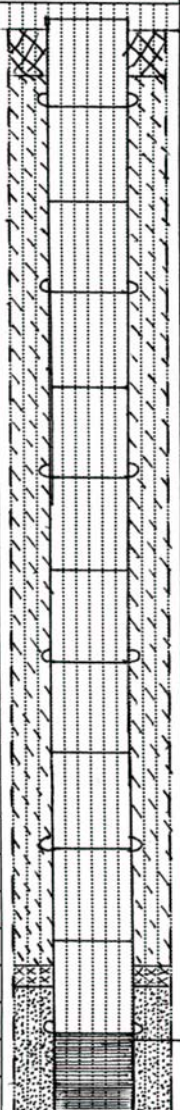
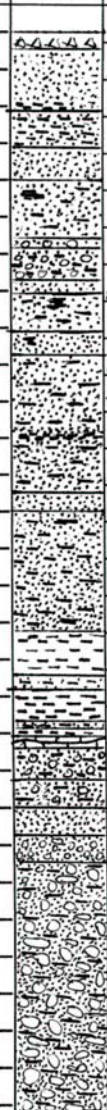
0 - 260.1 ft : 12-in. Cable Tool 11-3/4"
CS Temp csg

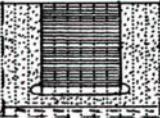

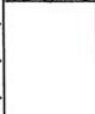
Drawing By: JEA
Reference: Hanford Wells
Revision: 0
Revision Date: 08Nov01
Print Date: 08Nov01



SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS RESOURCE PROTECTION WELL - 2399-W22-85	
WELL DESIGNATION	: 2399-W22-85
CERCLA UNIT	:
RCRA FACILITY	:
DEPTH DRILLED (GS)	: 260.1 ft
MEASURED DEPTH (GS)	: 254.13 26Oct01
AVAILABLE LOGS	: Geologist & Geophysical
DATE EVALUATED	: Data not available
EVAL RECOMMENDATION	: Data not available
LISTED USE	: RCRA Monitoring
CURRENT USER	: RCRA & Operations
PUMP TYPE	: Not Documented
MAINTENANCE	: Data not available
COMMENTS	: Cable Tool 11-3/4" CS Temp csg to 260.1 ft.
TV SCAN COMMENTS	:
<div>Report Form: WELLS Project File: WELLS.GPJ</div> <div><div>Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 08Nov01 Print Date: 08Nov01</div><div></div></div>	

WELL CONSTRUCTION SUMMARY REPORT						Start Date: 09/21/01	
0540431						Finish Date: 10/26/01	
Page 1 of 1						Temp Well No.: C3399	
Specification No.: 0200X-SF-0004		Rev. No.: 0		Well Name: 299-022-85		Temp Well No.: C3399	
ECNs: NA R037815 start card				Approximate Location: SE side of S-SX Tank Farm			
Project: C401 RCRA Drilling				Other Companies: RWE, CWT, RSE			
Drilling Company: Resonant Sonic Inc.				Geologist(s): C. Martinez, D.S. Watson, J. W. Smith, G. Thomas, C. Trice, D. Weekes			
Driller: Kelly Olson / Gary Howell ("Howie")							
TEMPORARY CASING AND DRILL DEPTH				DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.	Auger:	Diameter From _____ to _____			
Carbon steel FS 1 1/4" / 10.75"	0' - 258.9'	12 1/4" / 11"	Cable Tool: 1 1/4" O.D.	Diameter From 0' to 260.1'			
			Air Rotary:	Diameter From _____ to _____			
			A.R. w/Sonic:	Diameter From _____ to _____			
				Diameter From _____ to _____			
				Diameter From _____ to _____			
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design			Diameter From _____ to _____				
			Bit = drive barrel w/ 9 1/4" O.D. 0' - 176' bgs				
			Hard tool 176' - 260' bgs				
			Drilling Fluid: n/a				
Total Drilled Depth: 260.1'		Hole Dia @ TD: 12"		Total Amt. Of Water Added During Drilling: _____			
Well Straightness Test Results: Passed using 20.4' x 8.5" OD				Static Water Level: 218.42' Date: 10/26/01			
Straightness Tool: 10119101				GEOPHYSICAL LOGGING			
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date		
Spectral Gamma	2' - 260'	10/01/01					
Neutron Moisture	0' - 222.75'	10/01/01					
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume	Mesh Size
4" ID 553046 slump	252.02' - 254.12'	F480	N/A	Colorado Silica Sand (50#)	252.02' - 254.12'	102.5 bags	10-20
4" ID 553046 screen	217.12' - 252.02'	"	0.020"	Bentonite Pellets (50#)	202.1' - 206.2'	5 buckets	1/4"
4" ID 553046 casing	220.0' - 217.12'	"	N/A	Bentonite Crumbles (50#)	10.1' - 202.1'	195 bags	N/A
				Portland Cement (94#)	0' - 10.1'	95 bags	N/A
OTHER ACTIVITIES							
Aquifer Test: well development		Date: 10/29/01		Well Abandoned:		Yes: No: Date:	
Description: Used 3 HP submersible pump w/ intake strainer				Description:			
250.53 bgs. withdrew H2O for 57 min. @ 30 gpm + draw							
down of 11.56', and test 68 min. w/ drawdown 11.314', 30 gpm							
10/30/01: Intake @ 234.53' bgs. withdrew H2O for 36 min. @ 30 gpm. drawdown 9.344'				WELL SURVEY DATA			
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
val. calc: silica sand, 102.5 bags * 0.535 ^{ft³} /bag = 54.84 ft³; bent. pellets, 5 buckets * 0.62 ^{ft³} /bucket = 3.1 ft³; bent. crumbles, 195 bags * 0.71 ^{ft³} /bag = 138.45 ft³; portland cement 95 bags * 1.285 ^{ft³} /bag = 122.08 ft³							
Reported By: Charlene Martinez				Reviewed By: Jess Hocking			
Title: Geologist		Date: 10/26/01		Title: Geologist		Date: 11/5/01	
Signature: Charlene Martinez				Signature: Jess Hocking			


WELL SUMMARY SHEET			0540424		Page <u>1</u> of <u>2</u>
					Date: 09/27/01
Well ID: C 3399			Well Name: 299- W22-85		
Location: SE side of S-SX Tank Farm 1200 W			Project: C401 RCRA Drilling		
Prepared By: C. Martinez		Date: 09/27/01	Reviewed By: Jess Hocking		Date: 11/5/01
Signature: C. Martinez 10/22/01			Signature: Jess Hocking		
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram		Graphic Log	Lithologic Description	
6" ID dia. protective casing set 1.00' above stainless casing		0		0'-5' Backfill material	
4" ID 553046 casing: +2.00' → 217.12'				5'-17' sand (s) (silt lens @ 16')	
Portland Cement grout: 0' → 10.1'				17'-25' sandy SILT (sm)	
Bentonite crumbs: 10.1' → 202.1'				25'-30' SAND (s)	
3/4" Bentonite pellets: 202.1' → 204.8'				32'-45' silty SAND (ms) (silt lens @ 35')	
4" ID 553046 0.020-in. slot cont. wire-wrap well screen: 217.12' → 252.03'				45'-47' sandy GRAVEL (sG)	
10-20 mesh silica sand: 204.8' → 257.5'				47'-54' silty sandy GRAVEL (msG)	
4" ID 553046 tailpipe: 252.03' → 254.13'				54'-57' SAND (s)	
muddy backfill: 257.5' → 260.1'				57'-65' silty (SAND) (s) (silt lens @ 60')	
All temporary casing removed;				65'-70' SAND (s) (silt lens @ 66')	
All depths are in feet below ground surface.				70'-80' silty SAND (s) (silt lens @ 86')	
				100'-104' SAND (s)	
				104'-130' silty SAND (ms)	
				130'-140' SILT (m)	
				140'-143' sandy SILT (sm)	
		143'-149' SILT (m)			
		149'-151' sandy SILT (sm)			
		151'-153' SILT (m)			
		153'-155' CALICHE			
		155'-162' silty sandy GRAVEL (msG)			
		162'-168' silty gravelly SAND (msS)			
		168'-174' SAND (s)			
		174'-180' sandy GRAVEL (sG)			
		180'-235' silty sandy GRAVEL (msG)			

WELL SUMMARY SHEET				Page <u>2</u> of <u>2</u>	
				Date: <u>10/08/01</u>	
Well ID: <u>C 3349</u>			Well Name: <u>299-W22-85</u>		
Location: <u>SE Side of S-SX Tank Farm 200 W</u>			Project: <u>CYOL RCRA Drilling</u>		
Prepared By: <u>C. Martinez</u>		Date: <u>10/08/01</u>	Reviewed By: <u>Jess Hocking</u>		Date: <u>11/5/01</u>
Signature: <u>C. Martinez</u>			Signature: <u>Jess Hocking</u>		
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA		
Description	Diagram		Graphic Log	Lithologic Description	
		240		235'-255' gravelly silty SAND (gms)	
				255'-260.1' silty sandy GRAVEL (ms)	
		280		TD = 260.1' bgs	
				Static water level = 218.42' bgs (10/26/01)	
		320			
All temporary casing removed:					
All depths are in feet below ground surface.					

0526561

WELL CONSTRUCTION AND COMPLETION SUMMARY			
Drilling Method: Air Rotary Csg. Hammer Drilling Fluid Used: Air Driller's Name: M. Wraspir Drilling Company: RSI Date Started: 27Jul00	Sample Method: Grab/Spill Spoon Additives Used: None WA State Lic Nr: 1909 Company Location: Woodland, Ca. Date Completed: 21Aug00	WELL NUMBER: 299-W23-20 Coordinates: N Not documented Coordinates: E Not documented Start Card #: R043398 Elevation Ground Surface:	TEMPORARY C3112 WELL NO: Not Allowed Elevation of Reference Point: m Height of Reference Point Above Ground Surface: Depth of Surface Seal: Type of Surface Seal: 4x4 Concrete Pad
Depth to Water: 214.29 ft 15Aug00 GENERALIZED STRATIGRAPHY Geologist's Log			
<p>260 ft : Borehole drilled depth</p> <p>0 - 206.5 ft : 9-in. 8-5/8" CS csg. set with Air Rotary csg hammer</p>			
Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 22Sep00 Print Date: 22Sep00			

Report Form: WELLS Project File: WELLS.GPJ

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS RESOURCE PROTECTION WELL - 299-W23-20	
WELL DESIGNATION	: 299-W23-20
CERCLA UNIT	:
RCRA FACILITY	:
DEPTH DRILLED (GS)	: 260.0 ft
MEASURED DEPTH (GS)	: 260.5 15Aug00
AVAILABLE LOGS	: Geologist
DATE EVALUATED	: Data not available
EVAL RECOMMENDATION	: Data not available
LISTED USE	: RCRA monitoring/sampling
CURRENT USER	: RCRA & Operations
PUMP TYPE	: Hydrostar
MAINTENANCE	: Data not available
COMMENTS	: 8-5/8" CS Temp. csg set w/Air Rotary Csg. Hammer
TV SCAN COMMENTS	:
<div>Report Form: WELLS Project File: WELLS.GPJ</div> <div><div>Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 22Sep00 Print Date: 22Sep00</div><div></div></div>	

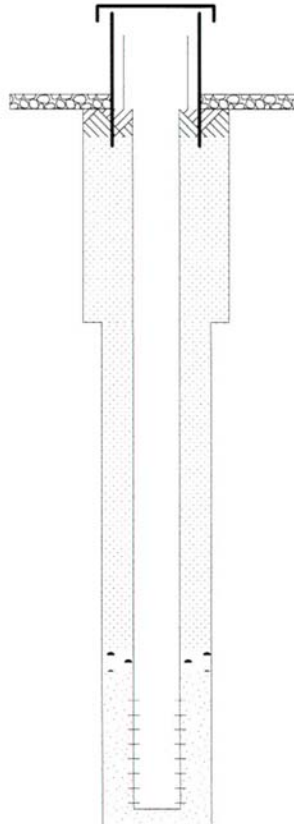

WELL CONSTRUCTION SUMMARY REPORT 0526564						Start Date: 7-27-00	
						Finish Date: 8/21/00	
						Page 1 of 1	
Specification No.:		Rev. No.:		Well Name: 299-W23-20		Temp. Well No.: C 3112	
ECNs:				Approximate Location: W. Fence 241-S Tank Farm/200W			
Project: CY2000 RCRA Drilling				Other Companies: Resonant BHI, CHZ			
Drilling Company: Resonant Sonic International				Geologist(s): L.D. Walker, JKM MURRAY			
Driller: Kelly Cowden, MOWRASAR							
TEMPORARY CASING AND DRILL DEPTH				DRILLING METHOD/HOLE DIAMETER			
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.		Auger:	Diameter From _____ to _____		
FJ 8 5/8" CS	0 - 260	8 5/8" / 7 7/8"		Cable Tool:	Diameter From _____ to _____		
				Air Rotary: 8 5/8"	Diameter From 0' to 260'		
				A.R. w/Sonic:	Diameter From _____ to _____		
					Diameter From _____ to _____		
					Diameter From _____ to _____		
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design				Diameter From _____ to _____			
				Drilling Fluid:			
Total Drilled Depth: 260'		Hole Dia @ TD: 8 5/8"		Total Amt. Of Water Added During Drilling:			
Well Straightness Test Results: STRAIGHT				Static Water Level: 214.45		Date: 8/10/00	
GEOPHYSICAL LOGGING							
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date		
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume	Mesh Size
SS304L CASING 4" ID	2' - 215.5		NA	Colorado Silica Sand	205' - 260.5'	96 bags	10-20
SS304L SCREEN	215.5 - 250.5		0.020	BENTONITE PELLETS	200.1' - 205'	3 bck	3/8"
SS316L SUMP	250.5 - 252.5		NA	BENTONITE CRUMBLES	10' - 200.1'	90 bags	
				PORTLAND CEMENT GROUT	0 - 10'	10 bags	NA
				2 PREMIUM GEL	0 - 10'	1/5 bag	NA
OTHER ACTIVITIES							
Aquifer Test: WELL DEVELOPMENT		Date: 8/21/00		Well Abandoned:		Yes:	No: Date:
Description: MONITOR DRAWDOWN AND RECOVERY				Description:			
WELL SURVEY DATA							
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
Vol. Calcs: 10-20 silica sand - 0.54 ft ³ /50lb bag x 96 bag = 51.84 ft ³ ; Bentonite pellets - 0.62 ft ³ /bucket x 3 buckets = 1.86 ft ³ ; Granular bentonite - 0.73 ft ³ /bag x 90 bag = 65.70 ft ³							
Reported By: JILL MURRAY				Reviewed By: J. Austin / AUTON			
Title: GEOLOGIST		Date: 7/12/01		Title: Sr. Design Engr.		Date: 7/21/00	
Signature: Jill K. Murray				Signature: J. Austin			

0526573

WELL SUMMARY SHEET				Page <u>1</u> of <u>2</u>			
				Date: <u>8/15/00</u>			
Well ID: <u>C3112</u>		Well Name: <u>299-W23-20</u>					
Location: <u>W. Fence of 241-S Tank Farm/200 W</u>		Project: <u>CY 2000 RCRA Drilling</u>					
Prepared By: <u>L.D. Walker JKMURRAY</u>		Date: <u>8/15/00</u>		Reviewed By: <u>DC Weekes</u>			
Signature: <u>[Signature]</u>		Date: <u>8/25/00</u>		Signature: <u>[Signature]</u>			
CONSTRUCTION DATA		GEOLOGIC/HYDROLOGIC DATA					
Description	Diagram	Depth in Feet	Graphic Log	Lithologic Description			
		0		0' → 6': Silty Sandy GRAVEL			
0'-10' PORTLAND CEMENT TYPE I+II GROUT		6		6' → 19': Sandy GRAVEL			
STAINLESS STEEL CASING 304L +2' → 215.5' 4" ID, 4.5" OD		19		19' → 34': Gravelly SAND			
10' - 200.1' BENTONITE CRUMBLES		34		34' → 36': Sandy GRAVEL			
		36		36' → 55': SAND			
PERMANENT OUTER CASING EMPLACED WITH A 3' STICKUP		50		55' → 83': SAND			
TEMP. CASING 8 5/8" OD, 7 5/8" ID		75		83' → 87': Gravelly SAND			
		87		87' → 94': SAND			
		94		94' → 102': Gravelly SAND			
		102		102' → 117': SAND			
		117		117' → 139': Slightly Silty SAND			
		125		139' → 148': No Returns			
All depths below ground surface All temp. casing removed.							

BHI-EE-189 (12/97)

0532877

WELL CONSTRUCTION AND COMPLETION SUMMARY																								
Drilling Method: Cable Tool Drilling Fluid Used: none Driller's Name: M. Wraspir Drilling Company: RSI Date Started: 26Sep00	Sample Method: Grab/Split Spoon Additives Used: None WA State Lic Nr: 1909 Company Location: Woodland, Ca. Date Completed: 07Nov00	WELL NUMBER: 299-W23-21 TEMPORARY WELL NO: C3113 Not Allowed Coordinates: N Not documented Coordinates: E Not documented Start Card #: Not Available Elevation Ground Surface:																						
Depth to Water: 212.88 ft 03Nov00 (Ground surface) GENERALIZED STRATIGRAPHY Geologist's Log		Elevation of Reference Point: m Height of Reference Point Above Ground Surface: Depth of Surface Seal: 10.1 ft. Type of Surface Seal: 4x4 Concrete Pad																						
0 - 0.5 ft : Gravel 0.5 - 8.5 ft : Sand 8.5 - 20 ft : Sand to Slightly Silty Sand 20 - 36.8 ft : Sandy GRAVEL 36.8 - 38.5 ft : Silty SAND 38.5 - 40 ft : Slightly Gravelly SAND 40 - 80 ft : SAND 80 - 83 ft : Gravelly SAND 83 - 88 ft : Silty SAND 88 - 99 ft : Gravelly SAND 99 - 120.5 ft : SAND 120.5 - 130.5 ft : Silty SAND 130.5 - 131.5 ft : Sandy SILT 131.5 - 139 ft : Silty SAND 139 - 141.5 ft : Slightly Silty SAND 141.5 - 143.5 ft : Silty SAND 143.5 - 147 ft : Slightly Silty SAND 147 - 153 ft : Sandy Silt 153 - 158 ft : Slightly Silty Gravelly SAND 158 - 168 ft : SAND 168 - 189 ft : Sandy GRAVEL 189 - 193 ft : Slightly Silty Gravelly SAND 193 - 197.5 ft : Gravelly Silty SAND 197.5 - 204 ft : Gravelly Sandy SILT 204 - 214 ft : Silty Sandy GRAVEL 214 - 219 ft : Gravelly Sandy SILT 219 - 240 ft : Silty Sandy GRAVEL 240 - 255 ft : Sandy GRAVEL 255 - 259 ft : Gravelly Silty SAND		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Fill</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Screen</th> </tr> </thead> <tbody> <tr> <td>0 - 10.1 ft : 12-inch hole Cement Surface Seal</td> <td>0 - 212.58 ft : 4 inch 4" 304L SS csg</td> <td></td> </tr> <tr> <td>10.1 - 76.41 ft : 12-inch hole Granular Bentonite</td> <td></td> <td></td> </tr> <tr> <td>76.41 - 193.7 ft : 9-inch hole Granular Bentonite</td> <td></td> <td></td> </tr> <tr> <td>193.7 - 202 ft : 9-inch hole Bentonite pellets</td> <td></td> <td>212.58 - 249.69 ft</td> </tr> <tr> <td>202 - 251.87 ft : 9-inch hole 10/20 Silica Sand</td> <td></td> <td>4 inch 4" 304 SS Wire Wrap .020 slot scrn.</td> </tr> <tr> <td>251.87 - 259 ft : 9-inch hole 10/20 Silica Sand</td> <td>249.69 - 251.87 ft</td> <td>4 inch 4" SS Sump</td> </tr> </tbody> </table>		Fill	Casing	Screen	0 - 10.1 ft : 12-inch hole Cement Surface Seal	0 - 212.58 ft : 4 inch 4" 304L SS csg		10.1 - 76.41 ft : 12-inch hole Granular Bentonite			76.41 - 193.7 ft : 9-inch hole Granular Bentonite			193.7 - 202 ft : 9-inch hole Bentonite pellets		212.58 - 249.69 ft	202 - 251.87 ft : 9-inch hole 10/20 Silica Sand		4 inch 4" 304 SS Wire Wrap .020 slot scrn.	251.87 - 259 ft : 9-inch hole 10/20 Silica Sand	249.69 - 251.87 ft	4 inch 4" SS Sump
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259 ft : Borehole drilled depth 0 - 76.41 ft : 12-in. 11-3/4" CS Temp csg set w/Cable Tool 76.41 - 2529 ft : 9-in. 8-5/8" CS Temp csg set w/Cable Tool																								
Drawing By: JEA Reference: Hanford Wells Revision: 0 Revision Date: 20Mar01 Print Date: 20Mar01																								

Report Form: WELLS Project File: WELLS.GPJ

0532879

WELL CONSTRUCTION SUMMARY REPORT				Start Date: 9/26/00			
				Finish Date: 11/7/00			
				Page 1 of 1			
Specification No.: 0200W-SP-C0007		Rev. No.: 0		Well Name: 299-W23-21			
ECNs: NA		Approximate Location: West side of 241st Task Farm					
Project: RCRA FY 2000 Drilling		Other Companies: BHI & CHI					
Drilling Company: Resonant Sonic International		Geologist(s): J.M. Faurote & G.S. Thomas					
Driller: Mo Waspie							
TEMPORARY CASING AND DRILL DEPTH			DRILLING METHOD/HOLE DIAMETER				
*Size/Grade/Lbs. Per Ft.	Interval	Shoe O.D./I.D.	Auger:	Diameter From _____ to _____			
1 3/4" OD Carbon Steel	0 - 76.41		Cable Tool:	Diameter From 65 to 259'			
8 5/8" OD Carbon Steel	0 - 253.5	9" / 7 3/8"	Air Rotary:	Diameter From _____ to _____			
			A.R. w/Sonic:	Diameter From _____ to _____			
				Diameter From _____ to _____			
				Diameter From _____ to _____			
*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design			Diameter From _____ to _____				
Thread design casing							
			Drilling Fluid: H ₂ O				
Total Drilled Depth: 259'	Hole Dia @ TD: 8.5"	Total Amt. Of Water Added During Drilling: 500 gallons					
Well Straightness Test Results: 20.2' L x 6 1/2" OD Touched bottom		Static Water Level: 212.88		Date: 11/3/00			
GEOPHYSICAL LOGGING							
Sondes (type)	Interval	Date	Sondes (type)	Interval	Date		
Spectral gamma	0' - 257'	10/31/00 (4.5)					
RLS Neutron-Neutron	0' - 213'	10/31/00 (Top of casing)					
COMPLETED WELL							
Size/Wt./Material	Depth	Thread	Slot Size	Type	Interval Annual Seal/Filter Pack	Volume	Mesh Size
SS 304 L Casing 4" ID	72.10 - 212.58		NA	Colorado Silica Sand	202.0 - 257.5	36.5 bags	10-20
SS 304 L Screen 4" ID	212.58 - 249.69		0.020	Bentonite Pellets	193.7 - 202.0	4 buckets	
SS 316 L Sump 4" ID	249.69 - 251.87		NA	Bentonite Crumbles	10.1 - 193.7	132 bags	
				Portland Cement Grout	65 - 10.1	10 bags	
OTHER ACTIVITIES							
Aquifer Test:		Date:		Well Abandoned:		Yes:	No:
Description:				Description:			
WELL SURVEY DATA							
Date:				Protective Casing Elevation:			
Washington State Plane Coordinates:				Brass Cap Elevation:			
COMMENTS/REMARKS							
Vol Calcs: 10-20 silica sand - 0.54 ft ³ /50lb-bag X 36.5 bags = 19.71 ft ³ . Bentonite Pellets - 0.62 ft ³ /bucket X 4 buckets = 2.48 ft ³ . Granular Bentonite - 0.73 ft ³ /bag X 132 bags = 96.36 ft ³							
Reported By: G.S. Thomas / DCWeekes				Reported By: J. AUTEN			
Title: Scientist		Date: 11/7/00		Title: SR. DRUG ENG'R.		Date: 2/30/01	
Signature: Greg Thomas / DCWeekes				Signature: J. Auten			

MAR 15 2001



0532793

WELL SUMMARY SHEET				Page <u>1</u> of <u>2</u>
				Date: <u>11/7/00</u>
Well ID: <u>C 3113</u>		Well Name: <u>299-W23-21</u>		
Location: <u>West of 241 SX Tank Farm</u>		Project: <u>RCRA FY 2000 Drilling</u>		
Prepared By: <u>G.S. Thomas</u>	Date: <u>11/7/00</u>	Reviewed By: <u>DC Weekes</u>	Date: <u>12/20/00</u>	
Signature: <u>[Signature]</u>		Signature: <u>[Signature]</u>		
CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
6-in diameter protective ss casing set 1.0' above the 4-in casing		0		0-0.5': Gravel
				0.5'-8.5': Sand
				8.5'-20.0': Sand to slightly Silty Sand
4-in ID sched. 5, ss 3046 well casing:		25		20.0'-36.8': Sandy Gravel
+2.10' → 212.58' bgs				36.8'-38.5': Silty Sand
Portland Cement Grout:				38.5'-40.0': slightly Gravelly Sand
0' → 10.1'		50		40.0'-80.0': Sand
Granular Bentonite				
10.1' → 193.7'		75		80.0'-83.0': Gravelly Sand
Temporary Casing:				83.0'-88.0': Silty Sand
11 3/4" / 10 3/4" set at 76.41'				88.0'-99.0': Gravelly Sand
8 5/8" / 7 5/8" to 253.5'		100		99.0'-120.5': Sand
		125		120.5'-130.5': Silty Sand
				130.5'-131.5': Sandy Silt
				131.5'-139.0': Silty Sand
				139.0'-141.5': slightly Silty Sand
				141.5'-143.5': Silty Sand
				143.5'-147.0': slightly Silty Sand
All depths in feet below ground surface				
All temp. casing removed from the ground.				

WELL SUMMARY SHEET				Page <u>2</u> of <u>2</u>	
				Date: <u>11/7/00</u>	
Well ID: <u>C 3113</u>		Well Name: <u>299-W23-21</u>			
Location: <u>West side of 241 SX Tank Farm</u>		Project: <u>RCRA FY 2000 Drilling</u>			
Prepared By: <u>G.S. Thomas</u>		Date: <u>11/7/00</u>		Reviewed By: <u>DC Weekes</u>	
Signature: <u>G.S. Thomas</u>		Signature: <u>DC Weekes</u>			
CONSTRUCTION DATA		GEOLOGIC/HYDROLOGIC DATA			
Description	Diagram	Depth in Feet	Graphic Log	Lithologic Description	
Bentonite Pellets:		150		147'-153': Sandy Silt	
193.7' - 202.0'				153' - 158': Slightly Silty Gravelly Sand	
Silica Sand: 10-20 mesh				158' - 168': Sand	
202.0' - 257.5'				168' - 189': Sandy Gravel	
Well Screen				189' - 193': Slightly Silty Gravelly Sand	
4-in ID, 0.020-in. slot				193' - 197.5': Gravelly Silty Sand	
Cont. wire-wrap, SS type				197.5' - 204': Gravelly Sandy Silt	
304:				W.L. = 212.88' bgs (11/3/00)	
212.58' → 249.69'				204' - 214': Silty Sandy Gravel	
Sump:				214' - 219': Gravelly Sandy Silt	
4 in ID SS 304 L				219' - 240': Silty Sandy Gravel	
249.69' → 251.87'				240' - 255': Sandy Gravel	
Total 4 in ID SS material				255' - 259': Gravelly Silty Sand	
is 253.97' (+2.10' + 251.87')				TD 259'	
All depths in feet below ground surface					
All temp. casing removed from the ground					



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