INTERIM CHANGE NOTICE (ICN)

A. Document No.: PNNL-13612    Revision No.: 1

Document Title: Groundwater Quality Assessment Plan for Single-Shell Tank Waste Management Area U

Document's Original Author: R. M. Smith, F. N. Hodges, B. A. Williams

Effective Date of ICN: 7/20/03

Change Requested By: R. M. Smith

B. Action:
Make changes in the WMA U groundwater quality assessment plan as described in Section D below. Attach this ICN to the front of the document, just before the title page.

C. Effect of Change:
This ICN updates the assessment plan to reflect the current wells in the monitoring system and the current constituent list and sampling schedule for WMA U.

D. Reason for Change/Description of Change:

Reason for Change:
New wells have been constructed at WMA U and the constituent list has been modified to reflect constituents with a source in the WMA. Constituents present in groundwater beneath the WMA that are part of a regional plume with a source other than the WMA have been removed from the constituent list. These plumes will be monitored within the UP-1 and ZP-1 Operable Units.

Description of Change:
1. Replace page 5 of the original document with the attached page 5 which shows a revised Figure 2.1.
2. Replace page 31 of the original document with the attached page 31 which shows a revised Table 5.2.
3. Add well construction and completion summaries for new wells 299-W18-40, 299-W19-44, and 299-W19-45 to the end of Appendix B.

E. Document Management Decisions:
The original information release form is unavailable, thus, we do not know who approved the original document. For this ICN, Stuart Luttrell and Mary Hartman will sign approval.

The attached distribution list shows the current staff who will receive this ICN as it may vary from the distribution of the original document

F. Approval Signatures
( Please Sign and Date)

Task Manager: [Signature] 7/23/03
Type of Change: (Check one):

Minor  [ ] Major  [x]

Project Quality Engineer: [Signature] Date: 7/28/03

Other Approvals:
R. M. Smith  Date: 7/25/03
Mary J. Hartman  Date: 23 July 03
Figure 2.1. Waste Management Area U and Regulated Structures
Table 5.2. Sampling Frequency and Constituent List

<table>
<thead>
<tr>
<th>Well</th>
<th>Specific Conductance</th>
<th>pH</th>
<th>Temperature</th>
<th>Alkalinity</th>
<th>Anions (chloride, fluoride, nitrate, and sulfate)</th>
<th>Metals (a)</th>
<th>Technetium-99(b)</th>
<th>Gross Alpha/Beta(b)</th>
<th>Low-Level Gamma Scan(b)</th>
<th>Water Level</th>
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<tbody>
<tr>
<td>299-W18-30</td>
<td>Q</td>
<td>Q</td>
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<td>299-W19-45</td>
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<td>A</td>
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</table>

Note: Sampling and analysis frequency is Q for quarterly (February, May, August, and November) and A for annual (February).

(a) Metals include Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, K, Ag, Na, Sr, V, Zn.
(b) These are non-RCRA regulated constituents and are included because they are analyzed to aid in source determination and contaminant movement.

5.4 Groundwater Flow

Groundwater flow direction and rate must be determined regularly. These properties are determined several ways, but the standard method for this WMA has been to measure water levels in surrounding monitoring wells. Water levels will continue to be measured on a quarterly basis in all WMA U monitoring wells. These data will be converted to elevations and evaluated using trend surface analysis and shown as a water table map. Groundwater flow velocity, $v$, will be estimated using the Darcy equation.

Slug tests will be conducted at all new wells to determine hydraulic conductivity. Additional aquifer testing such as vertical flow tracer tests may be conducted in the future if detected contamination increases rapidly or to levels well above the drinking water standard.
WELL CONSTRUCTION AND COMPLETION SUMMARY

Depth to Water: 214.6 ft 27Sep01
(Ground surface)

GENERALIZED STRATIGRAPHY

0 - 10 ft: Fill Material
10 - 17 ft: Silty Sandy Gravel (msG)
17 - 19 ft: Gravelly Sand (Gs)
19 - 23 ft: Sandy Gravel (mdG)
23 - 27 ft: Slightly Silty Sandy Gravel
27 - 30 ft: Silty Sand (ms)
30 - 47 ft: Sand (S)
47 - 53 ft: Silty Sandy Gravel (msG)
53 - 56 ft: Gravelly Sand (gs)
56 - 69.5 ft: Silty Sandy Gravel (msG)
69.5 - 119 ft: Sand (S) w/tilt layer at 81 ft
119 - 132.5 ft: Sandy Silt (Sm)
132.5 - 138 ft: Silty Sandy Gravel with caliche
138 - 144 ft: Silty Sandy Gravel (msG)
144 - 150 ft: Sandy Gravel (G)
180 - 220.5 ft: Silty Sandy Gravel (msG)

0 - 11.6 ft: 11-inch hole
Cement Surface Seal

Fill Casing Screen
0 - 11.6 ft: 0 - 215.27 ft:
4 inch 304L SS 8ch 5 cag
11.6 - 202 ft: 11-inch hole
Granular Bentonite

202 - 207.8 ft: 11-inch hole
Bentonite Pellets
210.27 - 253.28 ft
4 inch 304L SS Wire Wrap 20 slot cem
207.8 - 255.28 ft:
11-inch hole
10/20 Silica Sand
255.28 - 260 ft:
11-inch hole
Slough
253.28 - 255.28 ft:
4 inch
304L SS Sump
260 ft: Borehole drilled depth
0 - 260 ft: 11-in. Temp 10-3/4" CS cag
178 w/Air Rotary, Cable Tool, advanced to 260 ft.

B.14
Well ID: C3395
Location: SW corner of 241-4 Tank Farm

CONSTRUCTION DATA

Description | Diagram | Depth in Feet | Graphic Log | Lithologic Description
--- | --- | --- | --- | ---
Portland cement Grout 0'-11.6' | | | | 0'-10' Fill material
Casing: 4" steel 5' | | | | 10'-15' Silty Sandy Gravel (m6)
SS 304L 1.9' to 218.27' | | | | 17'-18' Gravely Sand (c6)
10'-23' Sandy Gravel (c6)  | | | | 18'-27' Slightly Silty Sandy Gravel
Granular Bentonite: 11.6' to 202.0' | | | | 27'-30' Silty Sand (m6)
Bentonite Pellets: 202.0' to 207.8' | | | | 30'-47.0' Sand (c6)
Well screen: SS 304L 0.020" slot cut wire - wrap 218.27' to 253.28'

GEOLOGIC/HYDROLOGIC DATA

Depth in Feet | Graphic Log | Lithologic Description
--- | --- | ---
0 | | 0'-10' Fill material
17'-18' Gravely Sand (c6) | | 10'-15' Silty Sandy Gravel (m6)
18'-23' Sandy Gravel (c6) | | 17'-18' Gravely Sand (c6)
23'-27' Slightly Silty Sandy Gravel | | 18'-23' Sandy Gravel (c6)
27'-30' Silty Sand (m6) | | 23'-27' Slightly Silty Sandy Gravel
30'-47.0' Sand (c6) | | 27'-30' Silty Sand (m6)
33'-52' Silty Sandy Gravel (c6) | | 30'-47.0' Sand (c6)
52'-67' Gravely Sandy Sand (c6) | | 33'-52' Silty Sandy Gravel (c6)
67'-82' Sandy Gravel (c6) | | 52'-67' Gravely Sandy Sand (c6)
82'-119' Sand (c6) | | 67'-82' Sandy Gravel (c6)
119'-132' Sandy Gravel (c6) | | 82'-119' Sand (c6)
132'-144' Silty Sandy Gravel (m6) | | 119'-132' Sandy Gravel (c6)
144'-180' Sandy Gravel (c6) | | 132'-144' Silty Sandy Gravel (m6)
180'-200.5' Sandy Gravel (m6) | | 144'-180' Sandy Gravel (c6)
200.5'-222.5' Cemented Silty sandy gravel | | 180'-200.5' Sandy Gravel (m6)
222.5'-250.0' Sandy Gravel (m6) | | 200.5'-222.5' Cemented Silty sandy gravel

BHI-EE-169 (12/97)
### WELL SUMMARY SHEET

**Well ID:** c3345  
**Well Name:** 299-1012-40  
**Location:** SW Corner of 241-4 Tank Farm  
**Prepared By:** J. D. Wilson  
**Reviewed By:** J. S. Weeks  
**Date:** 07/01/01

<table>
<thead>
<tr>
<th>CONSTRUCTION DATA</th>
<th>GEOLOGIC/HYDROLOGIC DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td><strong>Depth in Feet</strong></td>
</tr>
<tr>
<td>Sandpack</td>
<td>240</td>
</tr>
</tbody>
</table>
| 10-20 mesh silica | 250.0' - 252.5' 6" cementatty  
| 207.8' - 257.8'   | sandy gravel             |
| Tailpipe with welded end cap | 253.28' - 255.28'  
| 280.5' to 260.5'  | 252.5' - 260.5' 6" silica sand gravel (SUS)  
|                      | TD = 260.5' BD  
|                      | WL = 214.6' 9/27/01     |

All temporary casing removed from ground  
All depths are in feet below ground surface

BHI-EE-189 (12/97)
## WELL CONSTRUCTION SUMMARY REPORT

### PNNL-13612-ICN-1

**Start Date:** 8-13-01  
**Finish Date:** 9-28-01

### Specifications
- **Specification No.:** 00005-SP-0004  
- **Rev. No.:** 0  
- **ECNs:** NA

### Project
- **Project:** C391 REA Drilling  
- **Drilling Company:** Resonant Sonic Inc

### Geology
- **Geologist(s):** L. Walker, C. Martinez

### Temporary Casing and Drill Depth
<table>
<thead>
<tr>
<th>Size/Grade/Lbs. Per Ft.</th>
<th>Interval</th>
<th>Shoe D.D./I.D.</th>
<th>Auger</th>
<th>Diameter From to</th>
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<tbody>
<tr>
<td>10 3/4&quot; / 9 5/8&quot;, FT</td>
<td>0-252&quot;</td>
<td>11&quot; / 9 5/8&quot;</td>
<td></td>
<td>Diameter From 0 to 147</td>
</tr>
<tr>
<td>Carbon Steel</td>
<td></td>
<td></td>
<td>Cable Tool: X 3&quot; OD</td>
<td>Diameter From 147' to 178'</td>
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<td></td>
<td></td>
<td></td>
<td>Air Rotary: 3&quot; Sonic Bit</td>
<td>Diameter From to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A.R. w/Sonic:</td>
<td>Diameter From to</td>
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</table>

### Drilling Method/Hole Diameter
- **Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design**
- **Cable Tool:** Diameter From 178' to 260'

### Drilling Fluid
- **Drilling Fluid:** None for cable; Air for rotary

### Total Drilled Depth
- **Total Drilled Depth:** 260'
- **Total Amt. Of Water Added During Drilling:** 0

### Well Straightness Test Results
- **Well Straightness Test Results:** Passed 9/27/01

### Static Water Level
- **Static Water Level:** 214.6'

### Geophysical Logging

### Completed Well

### Other Activities
- **Aquifer Test:** Date:  
- **Well Abandoned:** Yes: No: Date: 

### Well Survey Data
- **Date:**  
- **Protective Casing Elevation:**  
- **Brass Cap Elevation:**  

### Comments/Remarks
- **Start Card #** 0037815: vol. sales: 91, bbl age 9x55 fps 31.8'-60' beam width 6.5' well 4.9% hole 102.4' 55 bu 2457.70 12.29 fr. 102.79 ft. to cond 38690

### Reported By
- **Reported By:** D. Webster C. Martinez

### Reviewed By
- **Reviewed By:** Jess Hacking

### Title/Geologist
- **Title/Geologist:** J. Webster

### Signature
- **Signature:**
### WELL CONSTRUCTION AND COMPLETION SUMMARY

**Drilling Method:** Cable Tool  
**Sample Method:** Grab/Split Spoon

**WELL NO.:** 299-W19-44  
**G3393**  
**Temporary WELL NO.:** Not Allowed

**Driller's Name:** K. Olson  
**Lic No:** Data not available

**Drilling Fluid Used:** None  
**Additives Used:** raw water

**Company:** RSI  
**Location:** Woodland, Ca.

**Date Started:** 05Sep01  
**Date Completed:** 13Sep01

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**Depth to Water:** 230.9 ft  
**Ground Surface:** 05Sep01

**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

---

**Stratigraphy**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
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<tbody>
<tr>
<td>0 - 2.5</td>
<td>Sandy Gravel (Sg)</td>
</tr>
<tr>
<td>2.5 - 7</td>
<td>gravelly Sand (gs)</td>
</tr>
<tr>
<td>7 - 11.5</td>
<td>sandy Gravel (sG)</td>
</tr>
<tr>
<td>11.5 - 19</td>
<td>gravelly Sand (gs)</td>
</tr>
<tr>
<td>19 - 31</td>
<td>silty sandy Gravel (MSG)</td>
</tr>
<tr>
<td>31 - 38.5</td>
<td>sandy Gravel (sG)</td>
</tr>
<tr>
<td>38.5 - 44</td>
<td>gravelly Sand (gs)</td>
</tr>
<tr>
<td>44 - 45.5</td>
<td>sandy Gravel (Gs)</td>
</tr>
<tr>
<td>45.5 - 60</td>
<td>cemented silty Gravel</td>
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<tr>
<td>50 - 52</td>
<td>gravelly Sand (gs)</td>
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<tr>
<td>52 - 58</td>
<td>Sand (S)</td>
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<td>58 - 59.2</td>
<td>Silt (m)</td>
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<td>Sand (S)</td>
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<td>67 - 67.5</td>
<td>sandy Silt (Sm)</td>
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<td>67.5 - 68</td>
<td>Silt (m)</td>
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<td>68 - 69</td>
<td>Sand (S)</td>
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<td>69 - 70.9</td>
<td>Silt (m)</td>
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<td>silty Sand (ms)</td>
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<td>97.5 - 103</td>
<td>Sand (S)</td>
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<td>103 - 131.8</td>
<td>silty Sand (ms)</td>
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<td>131.8 - 144.5</td>
<td>Silt (m)</td>
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<tr>
<td>144.5 - 150</td>
<td>Caliche</td>
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<tr>
<td>150.5 - 165</td>
<td>slightly silty gravelly sand</td>
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<tr>
<td>155 - 233</td>
<td>silty sandy Gravel</td>
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</table>

**233 - 234.45 ft:** cemented silty sandy gravel  
**234.5 - 267.5 ft:** silty sandy Gravel (msg)

**267.5 - 269.5 ft:** cemented silty sandy gravel  
**269.5 - 272 ft:** silty sandy Gravel (msg)

---

**272 ft:** Borehole drilled depth

**0 - 61 ft:** 12-inch Cable Tool 11-3/4" CS  
**Temp csg**

**61 - 272 ft:** 9-in Cable Tool 8-5/8" CS  
**Temp csg**

---

**Drawing By:** JSA  
**Reference:** Hanford Wells

**Revision Date:** 08Oct01

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**Refer to WELL File W3111-000 for additional information.**
<table>
<thead>
<tr>
<th>WELL DESIGNATION</th>
<th>299-W19-44</th>
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<tr>
<td>CERCLA UNIT</td>
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<tr>
<td>RCRA FACILITY</td>
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<tr>
<td>DEPTH DRILLED (GS)</td>
<td>272.0 ft</td>
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<tr>
<td>MEASURED DEPTH (GS)</td>
<td>266.9 13Sep91</td>
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<td>AVAILABLE LOGS</td>
<td>Geologist &amp; Geophysical</td>
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<td>COMMENTS</td>
<td>Cable Tool 11-3/4&quot; Temp CS csg to 61 ft, 8-5/8&quot; temp Cs csg to 272 ft</td>
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**TV SCAN COMMENTS:**

Report Form: WELS  Project File: WELS-QP-J

Drawing By: JEA
Reference: Hanford Wells
Revision: 0
Revision Date: 18Oct01
Print Date: 24Oct01
## WELL SUMMARY SHEET

**Well ID:** G 3393  
**Location:** Base of U-Tank Farm  
**Prepared By:** Maxime D. Herring  
**Reviewed By:** RC Weeks  
**Date:** 08/22/01

### CONSTRUCTION DATA

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<th>Description</th>
<th>Diagram</th>
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<tr>
<td>6&quot; ID SS 304L Protective casing 3/4&quot;</td>
<td>![Diagram 1]</td>
</tr>
<tr>
<td>4&quot; ID SS 304L RISER</td>
<td>![Diagram 2]</td>
</tr>
<tr>
<td>+200' -&gt; 224.9'lys</td>
<td>![Diagram 3]</td>
</tr>
<tr>
<td>4&quot; ID SS 304L 0.070&quot; Cold Wire wrapping</td>
<td>![Diagram 4]</td>
</tr>
<tr>
<td>Wrap Screen</td>
<td>![Diagram 5]</td>
</tr>
<tr>
<td>224.9'lys -&gt; 264.9'lys</td>
<td>![Diagram 6]</td>
</tr>
<tr>
<td>4&quot; ID SS 304L 24&quot; Scap</td>
<td>![Diagram 7]</td>
</tr>
<tr>
<td>264.9'lys -&gt; 266.9'lys</td>
<td>![Diagram 8]</td>
</tr>
<tr>
<td>Colorado Silica Sand 10-30 mesh</td>
<td>![Diagram 9]</td>
</tr>
<tr>
<td>218.9'lys -&gt; 272.0'lys</td>
<td>![Diagram 10]</td>
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<tr>
<td>1/4&quot; Bentonite Pellets</td>
<td>![Diagram 11]</td>
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<tr>
<td>213.03'lys -&gt; 218.9'lys</td>
<td>![Diagram 12]</td>
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<tr>
<td>Bentonite Crumbles</td>
<td>![Diagram 13]</td>
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<td>10.3'lys -&gt; 213.03'lys</td>
<td>![Diagram 14]</td>
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<td>Portland Cement Grout</td>
<td>![Diagram 15]</td>
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<td>0' -&gt; 10.8'lys</td>
<td>![Diagram 16]</td>
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### GEOLOGIC/HYDROLOGIC DATA

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<th>Graphic Log</th>
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<td>0.0-2.5' gravel, sand, silt (89)</td>
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<td>2.6-10.0' gravelly sand (89)</td>
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<td>11.0-17.0' sand, gravel (89)</td>
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<td>11.0-15.0'</td>
<td>15.0-19.0' gravelly sand (89)</td>
<td>15.0-19.0' gravelly sand (89)</td>
</tr>
<tr>
<td>15.0-31.0'</td>
<td>31.0-35.0' sandy gravel (89)</td>
<td>31.0-35.0' sandy gravel (89)</td>
</tr>
<tr>
<td>31.0-44.0'</td>
<td>44.0-45.0' gravelly sand (89)</td>
<td>44.0-45.0' gravelly sand (89)</td>
</tr>
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<td>44.0-45.0'</td>
<td>45.0-53.0' sandy gravel (89)</td>
<td>45.0-53.0' sandy gravel (89)</td>
</tr>
<tr>
<td>53.0-58.0'</td>
<td>58.0-60.0' sand (89)</td>
<td>58.0-60.0' sand (89)</td>
</tr>
<tr>
<td>58.0-62.0'</td>
<td>62.0-62.0' silt (10)</td>
<td>62.0-62.0' silt (10)</td>
</tr>
<tr>
<td>62.0-68.0'</td>
<td>68.0-68.0' sand, silt (10)</td>
<td>68.0-68.0' sand, silt (10)</td>
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</tr>
<tr>
<td>70.0-75.0'</td>
<td>75.0-80.0' sand (10)</td>
<td>75.0-80.0' sand (10)</td>
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<tr>
<td>80.0-85.0'</td>
<td>85.0-90.0' sand (10)</td>
<td>85.0-90.0' sand (10)</td>
</tr>
<tr>
<td>90.0-95.0'</td>
<td>95.0-100.0' sand (10)</td>
<td>95.0-100.0' sand (10)</td>
</tr>
<tr>
<td>100.0-105.0'</td>
<td>105.0-110.0' sand (10)</td>
<td>105.0-110.0' sand (10)</td>
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<tr>
<td>110.0-115.0'</td>
<td>115.0-115.0' sand (10)</td>
<td>115.0-115.0' sand (10)</td>
</tr>
<tr>
<td>115.0-120.0'</td>
<td>120.0-120.0' sand (10)</td>
<td>120.0-120.0' sand (10)</td>
</tr>
<tr>
<td>120.0-125.0'</td>
<td>125.0-125.0' sand (10)</td>
<td>125.0-125.0' sand (10)</td>
</tr>
<tr>
<td>125.0-130.0'</td>
<td>130.0-130.0' sand (10)</td>
<td>130.0-130.0' sand (10)</td>
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<tr>
<td>130.0-135.0'</td>
<td>135.0-135.0' sand (10)</td>
<td>135.0-135.0' sand (10)</td>
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<td>135.0-140.0'</td>
<td>140.0-140.0' sand (10)</td>
<td>140.0-140.0' sand (10)</td>
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<tr>
<td>140.0-145.0'</td>
<td>145.0-145.0' sand (10)</td>
<td>145.0-145.0' sand (10)</td>
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<td>145.0-150.0'</td>
<td>150.0-150.0' sand (10)</td>
<td>150.0-150.0' sand (10)</td>
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<tr>
<td>150.0-155.0'</td>
<td>155.0-155.0' sand (10)</td>
<td>155.0-155.0' sand (10)</td>
</tr>
<tr>
<td>155.0-233.0'</td>
<td>233.0-233.0' clay, silt, sand (10)</td>
<td>233.0-233.0' clay, silt, sand (10)</td>
</tr>
</tbody>
</table>

All depths are in feet below ground surface.

All temp. casing removed from ground.
## WELL SUMMARY SHEET

**Well ID:** 03393  
**Well Name:** 299-2214-44  
**Location:** EUC of 241-4 Tank Farm  
**Project:** CVGC ECGA Drilling  
**Prepared By:** C. Martin  
**Date:** 06/20/01  
**Reviewed By:** DC Weekes  
**Date:** 07/20/01

### CONSTRUCTION DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>Diagram</th>
<th>Depth in Feet</th>
<th>Graphic Log</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>240</td>
<td></td>
<td>2320'-2348' cemented silty sandy gravel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>280</td>
<td></td>
<td>2675'-2690' cemented silty sandy gravel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2695'-2710' silty sandy gravel (m=6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>320</td>
<td></td>
<td>Td = 2720' bgs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Swh = 230.9' bgs [9/30/01]</td>
</tr>
</tbody>
</table>

---

**ALL TEMP. CASING REMOVED FROM GROUND.**  
**All depths from ground surface**
**WELL CONSTRUCTION SUMMARY REPORT**

<table>
<thead>
<tr>
<th>Specification No.</th>
<th>03002-SP</th>
<th>Rev. No.</th>
<th>O</th>
<th>Well Name: 299-41-H-44</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECNo.</td>
<td>NA</td>
<td></td>
<td></td>
<td>Approximate Location:  East Side of 241-4</td>
</tr>
<tr>
<td>Project</td>
<td>e401 ECA Drilling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drilling Company</td>
<td>Response Service, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driller</td>
<td>Holly Olson</td>
<td>1217</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TEMPORARY CASING AND DRILL DEPTH**

<table>
<thead>
<tr>
<th>Size/Grade/Lbs. Per Ft.</th>
<th>Interval</th>
<th>Shoe O.D./I.D.</th>
<th>Auger</th>
<th>Diameter From to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threaded Carbon Steel</td>
<td>0.610</td>
<td>11 1/16&quot; / 10 1/4&quot;</td>
<td>Cable Tool: X</td>
<td>12 1/2&quot; Old</td>
</tr>
<tr>
<td>Threaded Carbon Steel 8&quot;</td>
<td>240.0</td>
<td>272.0&quot;</td>
<td>8 1/8&quot; / 8 1/8&quot;</td>
<td>Air Rotary:</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indicate Welded (W) - Flush Joint (FJ) Coupled (C) & Thread Design

**Well Straightness Test Results:** Passed using 304.5°, 8.0"

**COMPLETED WELL**

<table>
<thead>
<tr>
<th>Size/Well/Material</th>
<th>Depth</th>
<th>Thread</th>
<th>Slot Size</th>
<th>Type</th>
<th>Interval</th>
<th>Annual Seal/Filter Pack</th>
<th>Volume</th>
<th>Mesh Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; IP 304L Riser</td>
<td>12.00</td>
<td>NPT</td>
<td>5/8&quot;</td>
<td>Colorado</td>
<td>210.4 / 210.9</td>
<td>10.5</td>
<td>0.020</td>
<td></td>
</tr>
<tr>
<td>2&quot; 304L Bentonite</td>
<td>12.00</td>
<td>NPT</td>
<td>5/8&quot;</td>
<td>Bentonite Pellets</td>
<td>210.4 / 210.9</td>
<td>10.5</td>
<td>0.020</td>
<td></td>
</tr>
<tr>
<td>2&quot; 304L Empire</td>
<td>200.4</td>
<td>NPT</td>
<td>5/8&quot;</td>
<td>Bentonite Cements</td>
<td>210.4 / 210.9</td>
<td>10.5</td>
<td>0.020</td>
<td></td>
</tr>
</tbody>
</table>

**OTHER ACTIVITIES**

Aquifer Test: Well Development

Date: 9/4/01

Description: Used submersible pump to extract description:

3 gal with 14:32 drawdown with pump intake

Set at 263.0’ bgs.

**WELL SURVEY DATA**

Date:

Washington State Plane Coordinates:

Brass Cap Elevation:

**COMMENTS/REMARKS**

---

**REPORTED BY:**

Jess Hocking

Reviewed By: D Weeks

Title: Geologist

Date: 9/13/01

Signature: D Weeks
<table>
<thead>
<tr>
<th>WELL DESIGNATION</th>
<th>299-W19-45</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERCLA UNIT</td>
<td></td>
</tr>
<tr>
<td>RCRA FACILITY</td>
<td></td>
</tr>
<tr>
<td>DEPTH DRILLED (GS)</td>
<td>266.1 ft</td>
</tr>
<tr>
<td>MEASURED DEPTH (GS)</td>
<td>261.15 24Aug01</td>
</tr>
<tr>
<td>AVAILABLE LOGS</td>
<td>Geologist &amp; Geophysical</td>
</tr>
<tr>
<td>DATE EVALUATED</td>
<td>Data not available</td>
</tr>
<tr>
<td>EVAL RECOMMENDATION</td>
<td>Data not available</td>
</tr>
<tr>
<td>LISTED USE</td>
<td>RCRA Monitoring</td>
</tr>
<tr>
<td>CURRENT USER</td>
<td>RCRA &amp; Operations</td>
</tr>
<tr>
<td>PUMP TYPE</td>
<td>Not Documented</td>
</tr>
<tr>
<td>MAINTENANCE</td>
<td>Data not available</td>
</tr>
<tr>
<td>COMMENTS</td>
<td>Cable Tool 10-3/4&quot; CS Temp csg to 30 ft advance 10-3/4&quot; csg to 266.1 ft w/ Air Rotary</td>
</tr>
</tbody>
</table>

TV SCAN COMMENTS :
## WELL SUMMARY SHEET

**Well ID:** C-3594  
**Date:** 08/15/01

**Location:** East Side of 241-U

**Prepared By:**  
**Reviewed By:**

**Signature:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Diagram</th>
<th>Depth in Feet</th>
<th>Graphic Log</th>
<th>Lithologic Description</th>
</tr>
</thead>
</table>
| 6" Dia. protective casing set  
1.0' above stainless casing | | | | |
| 9" to 88.804 casing | | | | |
| Portland Cement Grout: | 0' → 19.5' | | | |
| Bentonite: | 9.5' → 20.7' | | | |
| Bentonite Pellets: | 2073' → 2134' | | | |
| 4" ID 58.834 0.030-in slot  
conc. wire-wrap wellscreen: | 2411' → 259.0' | | | |
| 10-32 mesh silica sand | 2124' → 346.1' | | | |
| 9" ID 58.304 Tuftpipe (temp): | 2133' → 2641.3' | | | |

*All temporary casing removed.  
All depths are in feet below ground surface.
**WELL SUMMARY SHEET**

<table>
<thead>
<tr>
<th>Well ID: C-3394</th>
<th>Well Name: 299-W19-45</th>
</tr>
</thead>
</table>

**Location:** Front of 291-L Tank Farm  
**Project:** E-701 R.C.R.A. Drilling

**Prepared By:** Charlene Martinco  
**Date:** 05/13/01

**Reviewed By:**  
**Date:** 07/20/01

**Signature:**  
**Date:** 08/31/01

### CONSTRUCTION DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>Diagram</th>
<th>Depth in Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>All temporary casing removed.</td>
<td></td>
<td>240</td>
</tr>
<tr>
<td>All depths are in feet below ground surface</td>
<td></td>
<td>260</td>
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### GEOLOGIC/HYDROLOGIC DATA

<table>
<thead>
<tr>
<th>Graphic Log</th>
<th>Lithologic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All depths are in feet below ground surface</td>
<td></td>
</tr>
</tbody>
</table>

**TD = 240.1' bgs**  
**Static water level 1 = 224.4'**  
on 8/24/01 PM

BHI-EE-189 (12/07)
**WELL CONSTRUCTION SUMMARY REPORT**

**Specification No.: 299-03-45**
**Rev. No.: 0**
**Well Name: 299-03-45**
**Temp. Well No.: 299-03-45**

**EDNs: NA**
**Approximate Location: EAST SIDE OF 291-4**

**Project: CVQ1 RQRA Drilling**
**Other Companies: C.H.3**

**Drilling Company: Resolute Sonic Inc.**
**Geologist(s): C. Martinez, C. Trice, C. Thomas, D.C. Weeks**

**MIKE GOMEZ**

**TEMPORARY CASING AND DRILL DEPTH**

<table>
<thead>
<tr>
<th>Size/Grade/Lbs. Per Ft.</th>
<th>Interval</th>
<th>Shoe O.D./I.D.</th>
<th>Auger</th>
<th>Diameter From</th>
<th>Diameter To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Steel (5&quot;)</td>
<td>10'-9&quot;</td>
<td>10'-10&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10'-10&quot;</td>
<td>10'-1&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INDICATE WELDED (W) - FLUSH JOINT (FJ) COUPLED (C) & THREAD DESIGN**

**Drilling Fluid:** 

**Total Drilled Depth:** 291'-0"  
**Hole Dia @ TD:** 12"  
**Total Amt. Of Water Added During Drilling:** \( \Delta W \)

**Well Straightness Test Results:**  
**Sonde 08/15/01**

<table>
<thead>
<tr>
<th>Logs</th>
<th>Interval</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral Gamma</td>
<td>0'-115'</td>
<td>8/15/01</td>
</tr>
<tr>
<td>Spectral Gamma</td>
<td>115'-206'</td>
<td>8/16/01</td>
</tr>
<tr>
<td>Neutron moisture</td>
<td>0'-225'</td>
<td>8/16/01</td>
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</table>

**GEOPHYSICAL LOGGING**

<table>
<thead>
<tr>
<th>Logs</th>
<th>Interval</th>
<th>Date</th>
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</table>

**COMPLETED WELL**

<table>
<thead>
<tr>
<th>Size/WL./Material</th>
<th>Depth</th>
<th>Thread</th>
<th>Slot Size</th>
<th>Type</th>
<th>Interval</th>
<th>Annual Seal/Filter Pack</th>
<th>Volume</th>
<th>Mesh Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; ID SS Screen</td>
<td>30'-275'</td>
<td>0.14&quot;</td>
<td>0.25&quot;</td>
<td>24&quot;</td>
<td>24&quot;</td>
<td>Portland Cement</td>
<td>0.5&quot;</td>
<td>30&quot;</td>
</tr>
<tr>
<td>4&quot; ID SS Collar</td>
<td>275'-325'</td>
<td>0.14&quot;</td>
<td>0.25&quot;</td>
<td>24&quot;</td>
<td>24&quot;</td>
<td>Portland Cement</td>
<td>0.5&quot;</td>
<td>30&quot;</td>
</tr>
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</table>

**OTHER ACTIVITIES**

<table>
<thead>
<tr>
<th>Aquifer Test</th>
<th>Date</th>
<th>Well Abandoned:</th>
<th>Yes:</th>
<th>No:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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**WELL SURVEY DATA**

<table>
<thead>
<tr>
<th>Date</th>
<th>Protective Casing Elevation:</th>
<th>Washington State Plane Coordinates:</th>
<th>Brass Cap Elevation:</th>
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<tbody>
<tr>
<td></td>
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**COMMENTS/REMARKS**

**Date:**  

<table>
<thead>
<tr>
<th>Val. Color</th>
<th>Silica sand</th>
<th>5% cement</th>
<th>5% cement</th>
<th>5% cement</th>
<th>5% cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Strength</td>
<td>Lint (in)</td>
<td>10'-12&quot;</td>
<td>10'-12&quot;</td>
<td>10'-12&quot;</td>
<td>10'-12&quot;</td>
</tr>
<tr>
<td>Portland cement</td>
<td>4 bags</td>
<td>130#</td>
<td>130#</td>
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</tr>
</tbody>
</table>

**Reported By:** C. Martinez  
**Reviewed By:** D.C. Weeks  
**Title:** Geologist  
**Date:** 8/20/03  
**Signature:** C. Martinez  

[Signature]

B.26
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<td>A. J. Knepp</td>
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<tr>
<td></td>
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<td>D. A. Myers</td>
</tr>
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