

100-HR-3 Groundwater Operable Unit New Well Installation Sampling and Analysis Plan

**Addendum 2: 199-D3-6, 699-97-60, 699-97-61, 199-H1-8, and
199-H4-92**

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

 **CH2MHILL**
Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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APPROVED

By Shauna Adams at 9:27 am, Oct 28, 2013

Release Approval

Date

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199-D3-6, 699-97-60, 699-97-61, 199-H1-8, and 199-H4-92

Briant Charboneau

U.S. Department of Energy, Richland Operations Office


Signature _____ Date 10-24-13

~~Chris Guzzetti~~ N. Menard SUB 11/1/13
U.S. Environmental Protection Agency ~~Wa~~ Dept. of Ecology


Signature _____ Date 11/1/13

~~Nina Menard~~ Chris Guzzetti
~~Washington State Department of Ecology~~ USEPA


Signature _____ Date 11/1/13

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Terms

1

2 bgs below ground surface

3 RUM Ringold Upper Mud

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1 Introduction

Addendum 2 for *100-HR-3 Groundwater Operable Unit Well Installation Sampling and Analysis Plan* (DOE/RL-2013-35) contains site specific field sampling plans for monitoring and extraction wells 199-D3-6, 699-97-60, and 699-97-61 and extraction wells 199-H1-8 and 199-H4-92. The objectives and requirements of these wells are defined in *Recommendations and Technical Justification for New and Replacement Wells and Re-alignment of Existing Wells Associated with interim Remedial Actions at 100-D/H Area* (SGW-54542). Well construction information is found in section 3.2.5 and Figures 3-1 and 3-2 of DOE/RL-2013-35. The following figures and tables are included in this addendum:

- Figure 1. Wells 199-D3-6, 699-97-60, 699-97-61, 199-H1-8, and 199-H4-92 Locations
- Figure 2. Monitoring and Potential Extraction Well 199-D3-6 General Stratigraphy and Split Spoon Sample Collection Intervals
- Figure 3. Monitoring and Potential Extraction Well 699-97-60 General Stratigraphy and Split Spoon Sample Collection Intervals
- Figure 4. Monitoring and Potential Extraction Well 699-97-61 General Stratigraphy and Split Spoon Sample Collection Intervals
- Figure 5. Extraction Well 199-H1-8 General Stratigraphy and Split Spoon Sample Collection Intervals
- Figure 6. Extraction Well 199-H4-92 General Stratigraphy and Split Spoon Sample Collection Intervals
- Table 1. Monitoring and Potential Extraction Well 199-D3-6 Sample Collection
- Table 2. Monitoring and Potential Extraction Well 699-97-60 Sample Collection
- Table 3. Monitoring and Potential Extraction Well 699-97-61 Sample Collection
- Table 4. Extraction Well 199-H1-8 Sample Collection
- Table 5. Extraction Well 199-H4-92 Sample Collection

2 Reference

SGW-54542, 2013, *Recommendations and Technical Justification for New and Replacement Wells and Re-alignment of Existing Wells Associated with Interim Remedial Actions at 100-D/H Area*, Technical Memorandum, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Document can be found at: <http://www2.hanford.gov/arpir/?content=findpage&AKey=0087907>.

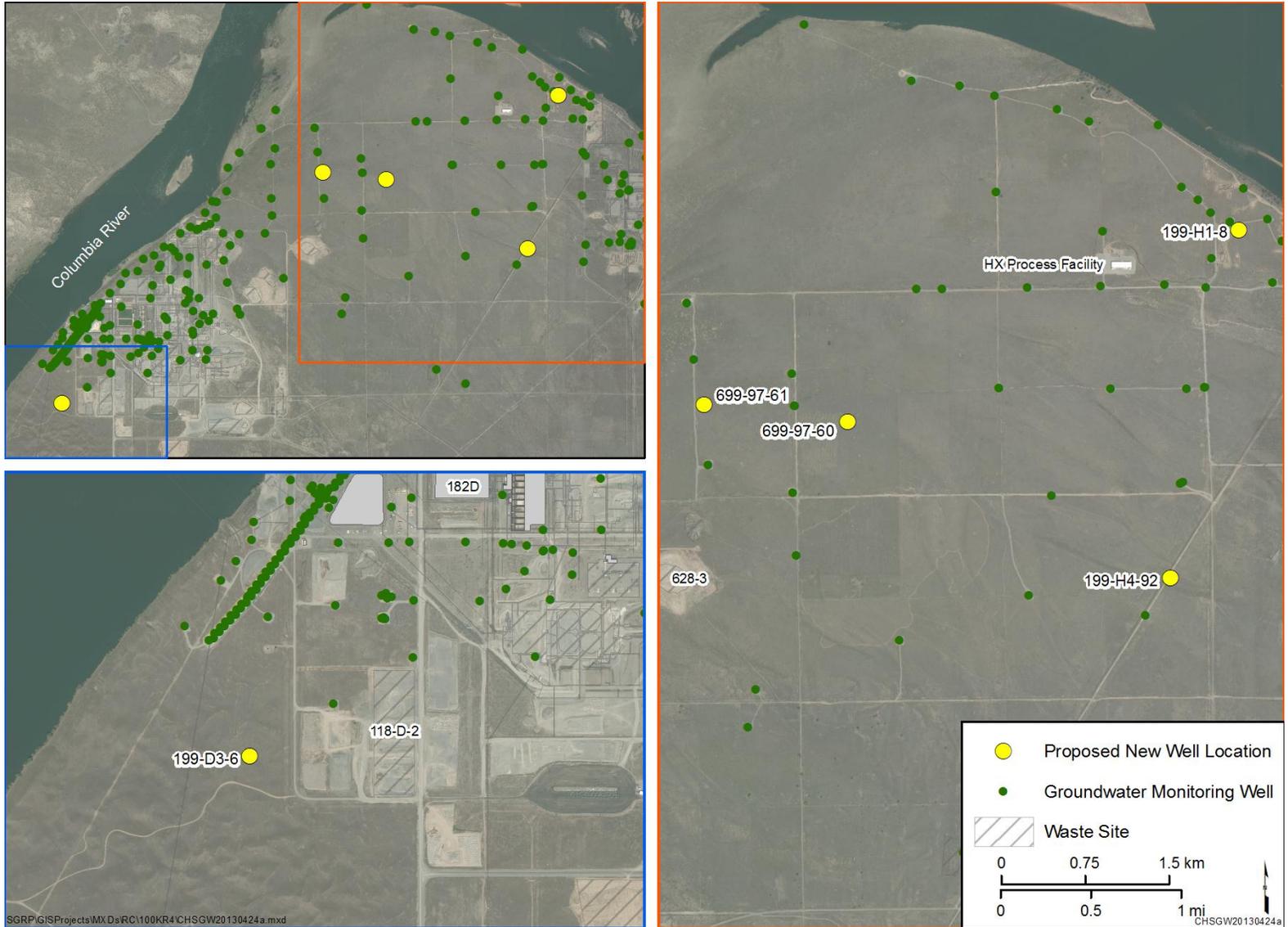


Figure 1. Wells 199-D3-6, 699-97-60, 699-97-61, 199-H1-8, and 199-H4-92 Locations

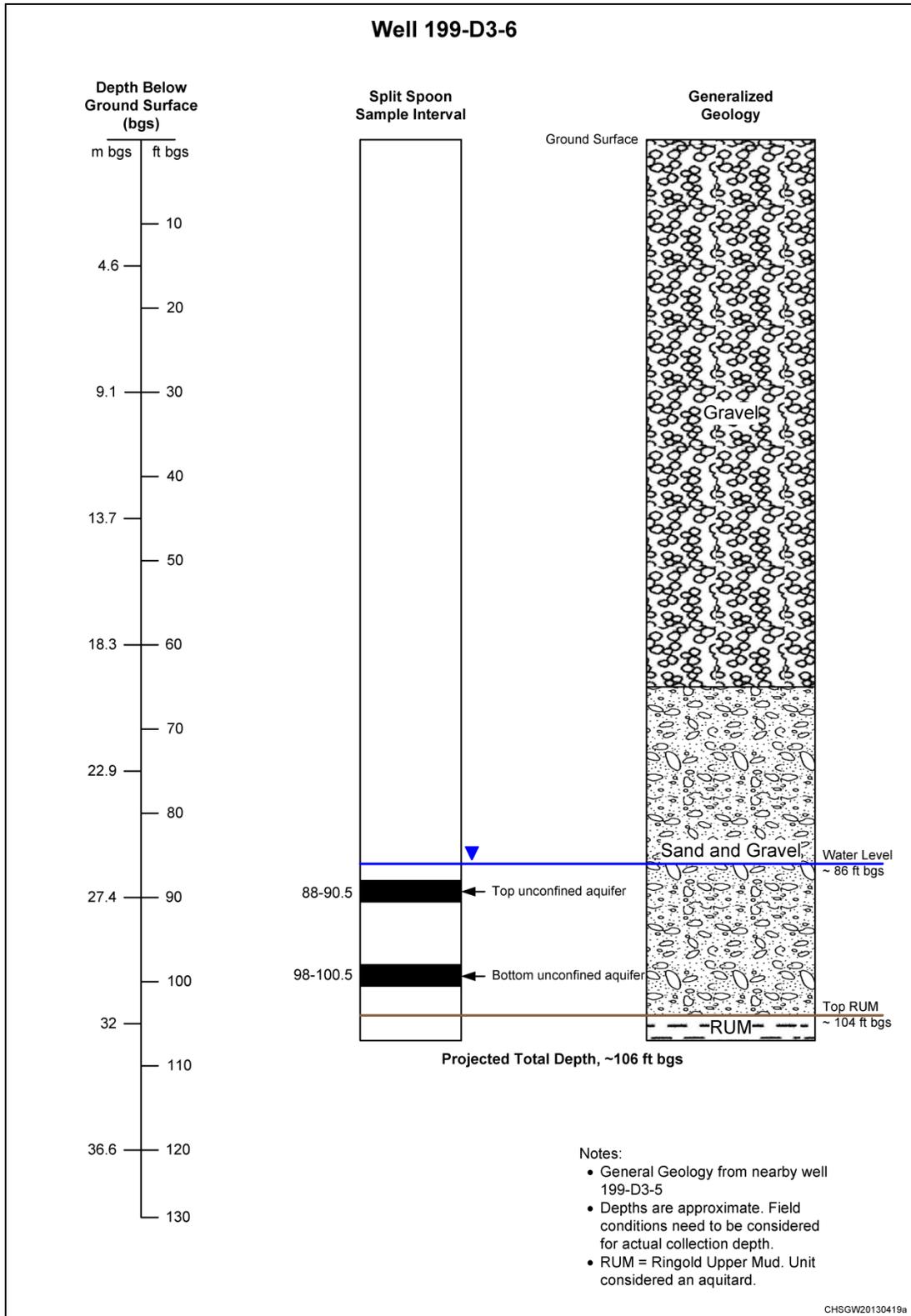


Figure 2. Monitoring and Potential Extraction Well 199-D3-6 General Stratigraphy and Split Spoon Sample Collection Intervals

Table 1. Monitoring and Potential Extraction Well 199-D3-6 Sample Collection

Sample Location	199-D3-6			
Estimated Depth to Water	86 ft			
Projected Total Depth	106 ft below ground surface, or the base of the unconfined plus 2 ft, whichever is deepest			
Media	Sample Type	Comments	Estimated Depth (ft)	Analytes
Geologic	Grab	Archival Purposes	Every 5 ft and at lithologic changes	None
		Screen Selection	Every 5 ft of screened interval	Grain Size (Field Measurement)
	Split Spoon	Top of Unconfined Aquifer	88.0 to 90.5	Hydraulic Conductivity
		Bottom of Unconfined Aquifer	98 to 100.5	
Water	During Drilling	Top of Unconfined Aquifer	88.0	Hexavalent Chromium (Field Measurement)
		Bottom of Unconfined Aquifer	98.0	
	Pumped	After Well Development	Screened Interval	Bicarbonate, Carbonate, Calcium, Hexavalent Chromium, Total Chromium, Magnesium, Nitrate, Potassium, Strontium-90, Sulfate, and Tritium

Note: Depths are approximate. Field conditions need to be considered for actual collection depth.

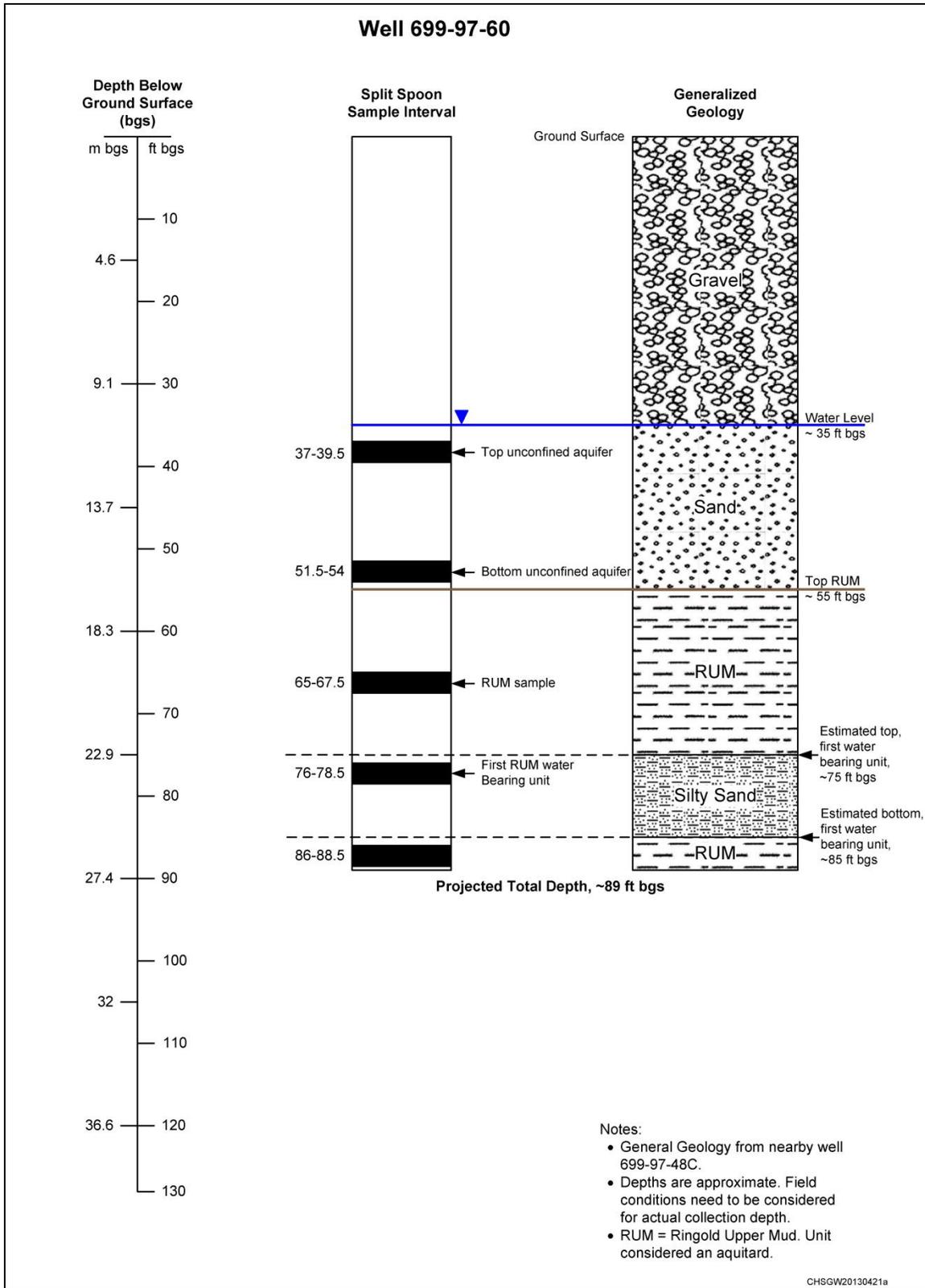


Figure 3. Monitoring and Potential Extraction Well 699-97-60 General Stratigraphy and Split Spoon Sample Collection Intervals

Table 2. Monitoring and Potential Extraction Well 699-97-60 Sample Collection

Sample Location	699-97-60			
Estimated Depth to Water	35 ft			
Projected Total Depth	89 ft below ground surface, or the base of the first water bearing RUM Unit plus 4 ft, whichever is deepest			
Media	Sample Type	Comments	Estimated Depth (ft)	Analytes
Geologic	Grab	Archival Purposes	Every 5 ft and at lithologic changes	None
		Screen Selection	Every 5 ft of screened interval	Grain Size (Field Measurement)
	Split Spoon	Top of Unconfined Aquifer	37.0 to 39.5	Hydraulic Conductivity
		Bottom of Unconfined Aquifer	51.5 to 54	
		In the RUM	65.0 to 67.5	Permeability
		Within the RUM Semiconfined or Confined Aquifer	76.0 to 78.5	Hydraulic Conductivity
		RUM below Semiconfined or Confined Aquifer	86.0 to 88.5	Hexavalent Chromium
Water	During Drilling	Top of Unconfined Aquifer	37.0	Hexavalent Chromium (Field Measurement)
		Bottom of Unconfined Aquifer	53.0	
		First Water Bearing Unit of the RUM	76.0	
	Pumped	After Well Development	Screened Interval	Bicarbonate, Carbonate, Calcium, Hexavalent Chromium, Total Chromium, Magnesium, Nitrate, Potassium, Strontium-90, Sulfate, and Tritium

Note: Depths are approximate. Field conditions need to be considered for actual collection depth.

RUM = Ringold Upper Mud

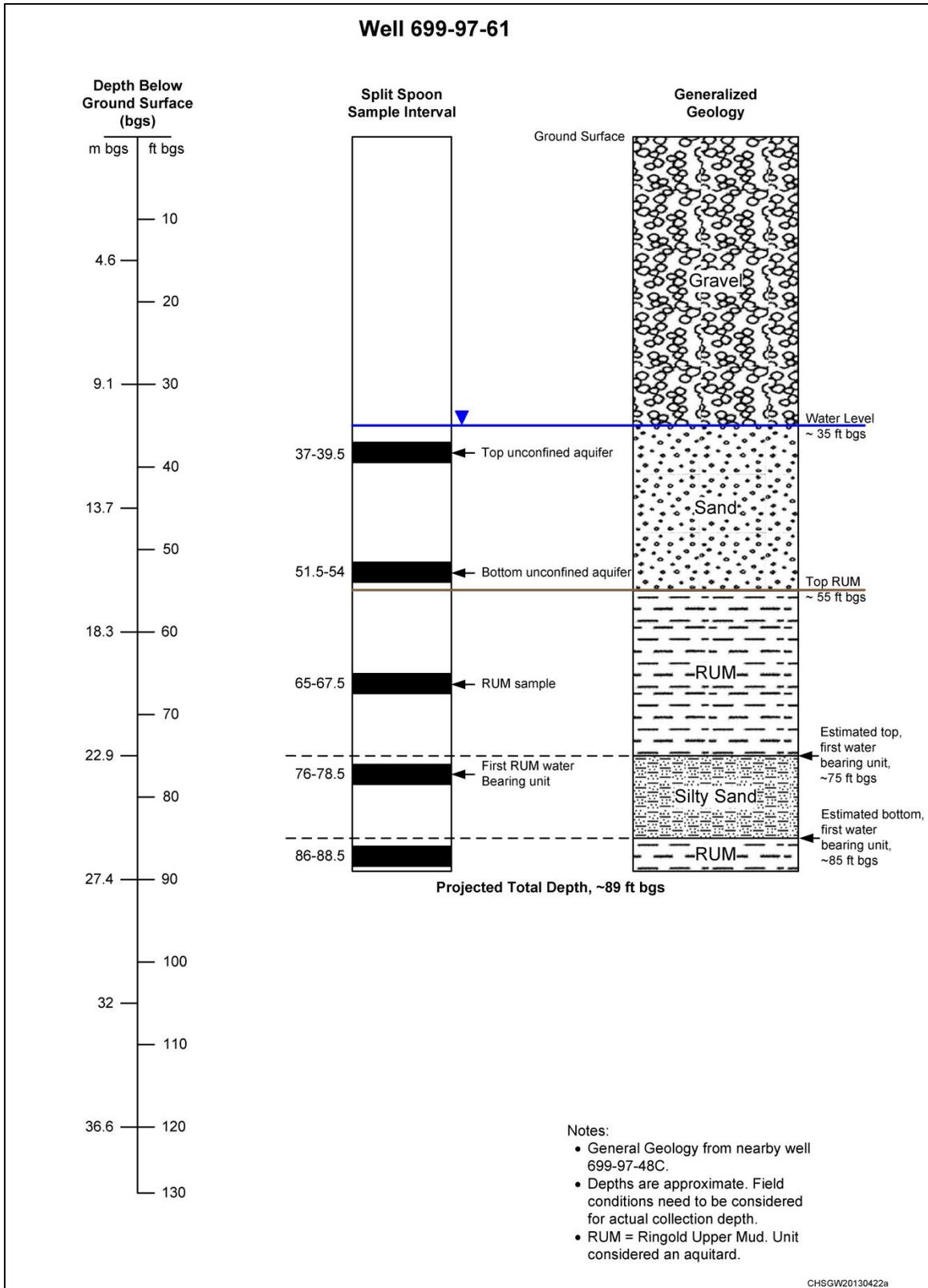


Figure 4. Monitoring and Potential Extraction Well 699-97-61 General Stratigraphy and Split Spoon Sample Collection Intervals

Table 3. Monitoring and Potential Extraction Well 699-97-61 Sample Collection

Sample Location	699-97-61			
Estimated Depth to Water	35 ft			
Projected Total Depth	89 ft below ground surface, or the base of the first water bearing RUM Unit plus 4 ft, whichever is deepest			
Media	Sample Type	Comments	Estimated Depth (ft)	Analytes
Geologic	Grab	Archival Purposes	Every 5 ft and at lithologic changes	None
		Screen Selection	Every 5 ft of screened interval	Grain Size (Field Measurement)
	Split Spoon	Top of Unconfined Aquifer	37.0 to 39.5	Hydraulic Conductivity
		Bottom of Unconfined Aquifer	51.5 to 54	
		In the RUM	65.0 to 67.5	Permeability
		Within the RUM Semiconfined or Confined Aquifer	76.0 to 78.5	Hydraulic Conductivity
		RUM below Semiconfined or Confined Aquifer	86.0 to 88.5	Hexavalent Chromium
Water	During Drilling	Top of Unconfined Aquifer	37.0	Hexavalent Chromium (Field Measurement)
		Bottom of Unconfined Aquifer	53.0	
		First Water Bearing Unit of the RUM	76.0	
	Pumped	After Well Development	Screened Interval	Bicarbonate, Carbonate, Calcium, Hexavalent Chromium, Total Chromium, Magnesium, Nitrate, Potassium, Strontium-90, Sulfate, and Tritium

Note: Depths are approximate. Field conditions need to be considered for actual collection depth.

RUM = Ringold Upper Mud

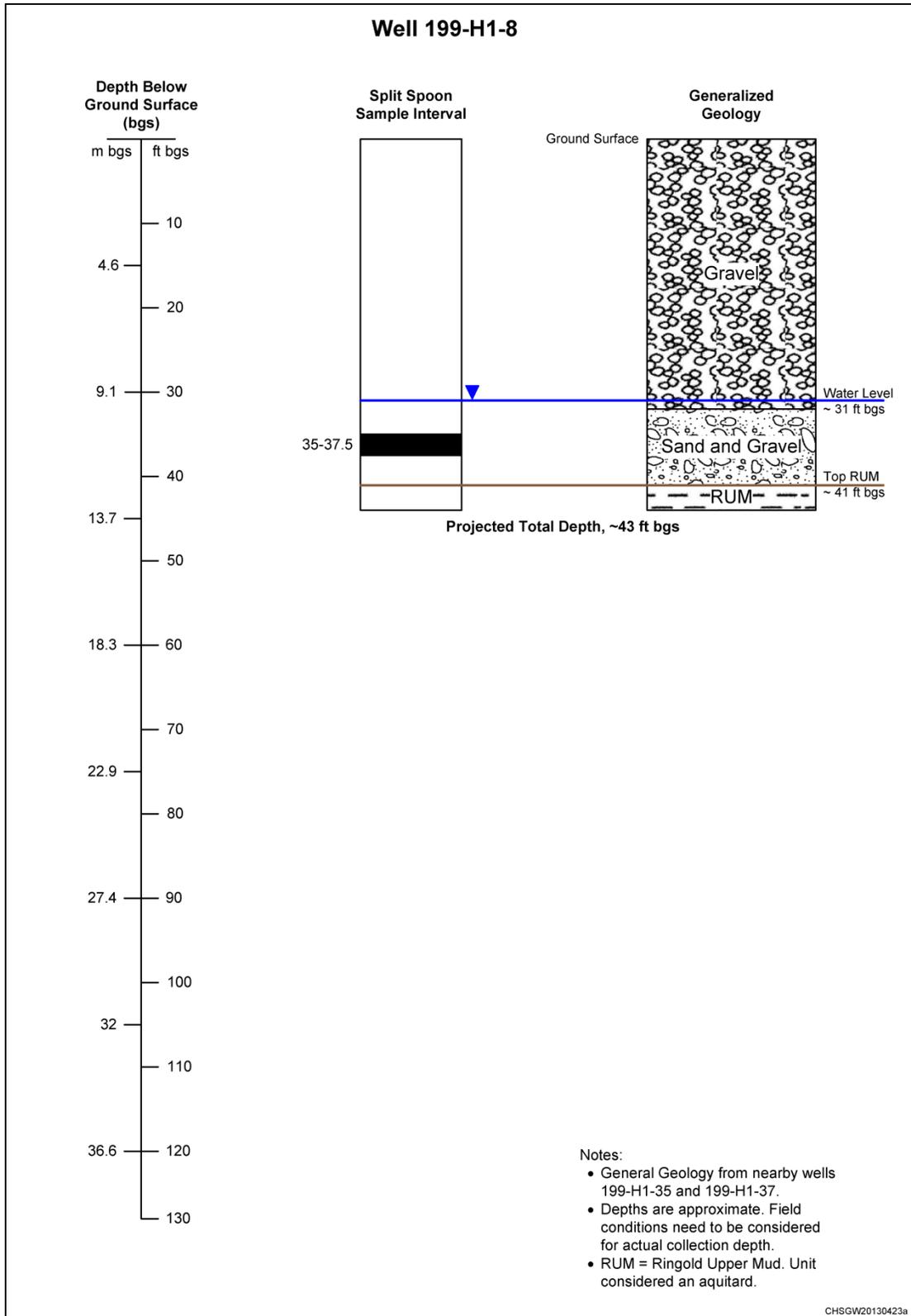


Figure 5. Extraction Well 199-H1-8 General Stratigraphy and Split Spoon Sample Collection Intervals

Table 4. Extraction Well 199-H1-8 Sample Collection

Sample Location	199-H1-8			
Estimated Depth to Water	31 ft			
Projected Total Depth	43 ft below ground surface, or the base of the unconfined plus 2 ft, whichever is deepest			
Media	Sample Type	Comments	Estimated Depth (ft)	Analytes
Geologic	Grab	Archival Purposes	Every 5 ft and at lithologic changes	None
		Screen Selection	Every 5 ft of screened interval	Grain Size (Field Measurement)
	Split Spoon	Midpoint of Unconfined Aquifer	35 to 37.5	Hydraulic Conductivity
Water	During Drilling	Midpoint of Unconfined Aquifer	35.0	Hexavalent Chromium (Field Measurement)
	Pumped	After Well Development	Screened Interval	Bicarbonate, Carbonate, Calcium, Hexavalent Chromium, Total Chromium, Magnesium, Nitrate, Potassium, Strontium-90, Sulfate, and Tritium

Note: Depths are approximate. Field conditions need to be considered for actual collection depth.

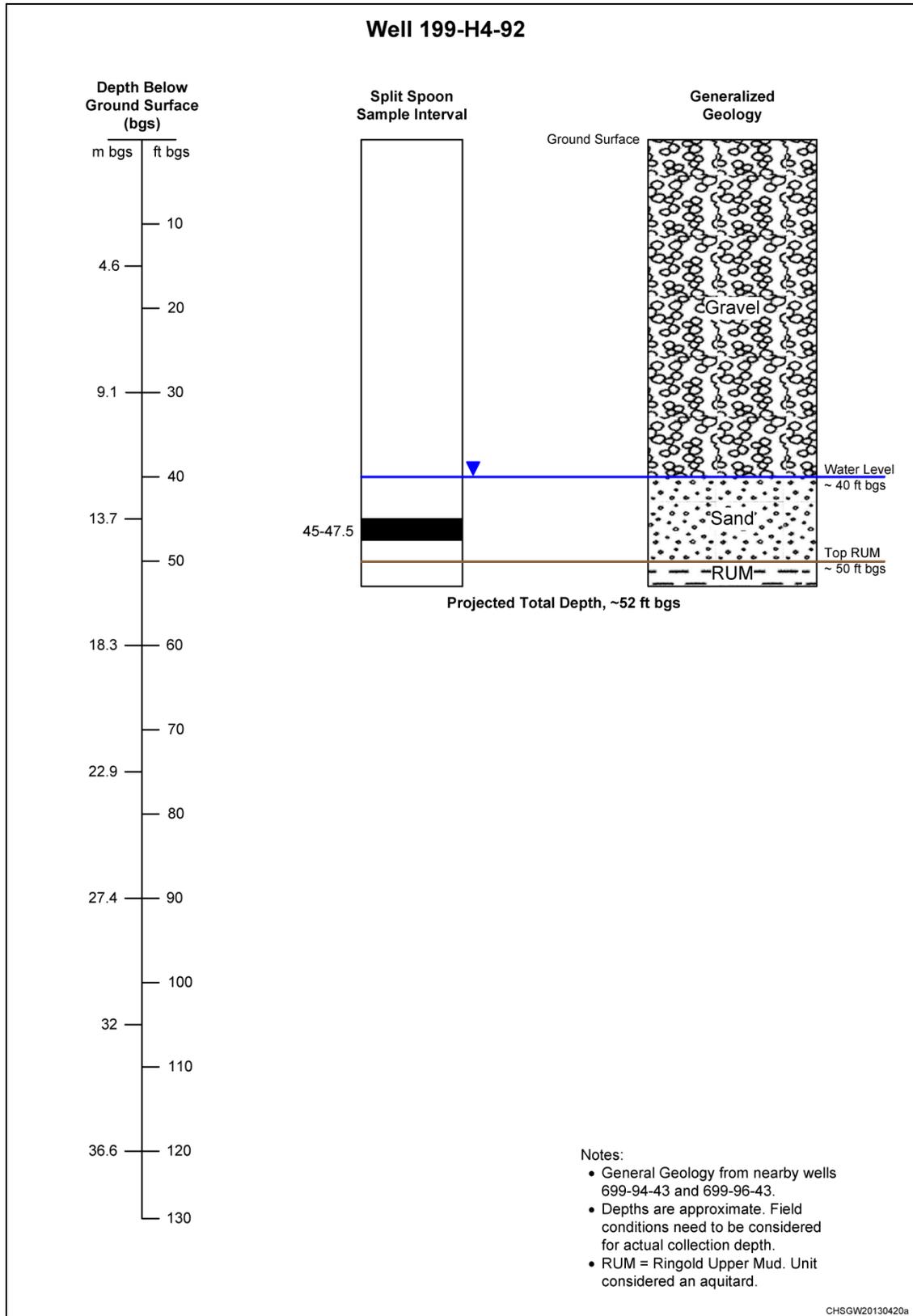


Figure 6. Extraction Well 199-H4-92 General Stratigraphy and Split Spoon Sample Collection Intervals

Table 5. Extraction Well 199-H4-92 Sample Collection

Sample Location	199-H4-92			
Estimated Depth to Water	40 ft			
Projected Total Depth	52 ft below ground surface, or the base of the unconfined plus 2 ft, whichever is deepest			
Media	Sample Type	Comments	Estimated Depth (ft)	Analytes
Geologic	Grab	Archival Purposes	Every 5 ft and at lithologic changes	None
		Screen Selection	Every 5 ft of screened interval	Grain Size (Field Measurement)
	Split Spoon	Midpoint of Unconfined Aquifer	45 to 47.5	Hydraulic Conductivity
Water	During Drilling	Midpoint of Unconfined Aquifer	45.0	Hexavalent Chromium (Field Measurement)
	Pumped	After Well Development	Screened Interval	Bicarbonate, Carbonate, Calcium, Hexavalent Chromium, Total Chromium, Magnesium, Nitrate, Potassium, Strontium-90, Sulfate, and Tritium

Note: Depths are approximate. Field conditions need to be considered for actual collection depth.