0090134

TRI-PARTY AGREEMENT

Change Notice Number TPA-CN- 374	TPA CHANGE NOTICE FORM	Date: 08/10/2010
Document Number, Title, and Revision: DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units*, Rev. 0		Date Document Last Issued: 04/08/2010
Originator: Jon McKibben/Mark Kemner		Phone 373-4677/373-5353

Description of Change:
This change removes well 399-03-11 from the spatial and temporal uncertainty groundwater well network. The well was decommissioned.

Briant Charboneau (DOE) and Larry Gadbois (Lead Regulatory Agency) agree that the proposed change modifies an approved workplan/document and will be processed in accordance with the Tri-Party Agreement Action Plan, Section 9.0, *Documentation and Records,* and not Chapter 12.0, *Changes to the Agreement.*

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Note: Include affected page number(s)

Justification and Impacts of Change:
Well 399-03-11 was decommissioned. The changes include:

- Table 1-2, remove well 399-3-11 from Figure.
- Table 1-1, change "Sample spatial/temporal uncertainty groundwater monitoring wells" from "33 existing locations" to "32 existing locations." Change affects page 1-4.
- Table 3-2, change "Sample 16 spatial/temporal uncertainty monitoring wells (Table 3-3); three rounds in the 300 Area" to, "Sample 15 spatial/temporal uncertainty monitoring wells (Table 3-3); three rounds in the 300 Area." Change "16 wells x 3 rounds = 48 samples" to "15 wells x 3 rounds = 45 samples." Changes affect page 3-15.
- Table 3-2, change spatial and temporal uncertainty monitoring wells "Estimated number of samples" from 99 to 96 and "Estimated total number of samples" from 115 to 112. Change affects page 3-16.
- To Table 3-3, remove well 399-03-11. Change affects page 3-18.

Approvals:

Briant L. Charboneau DOE Project Manager	8-23-2010 Date	[X] Approved [ ] Disapproved
Larry Gadbois EPA Project Manager	Aug 30, 2010 Date	[X] Approved [ ] Disapproved

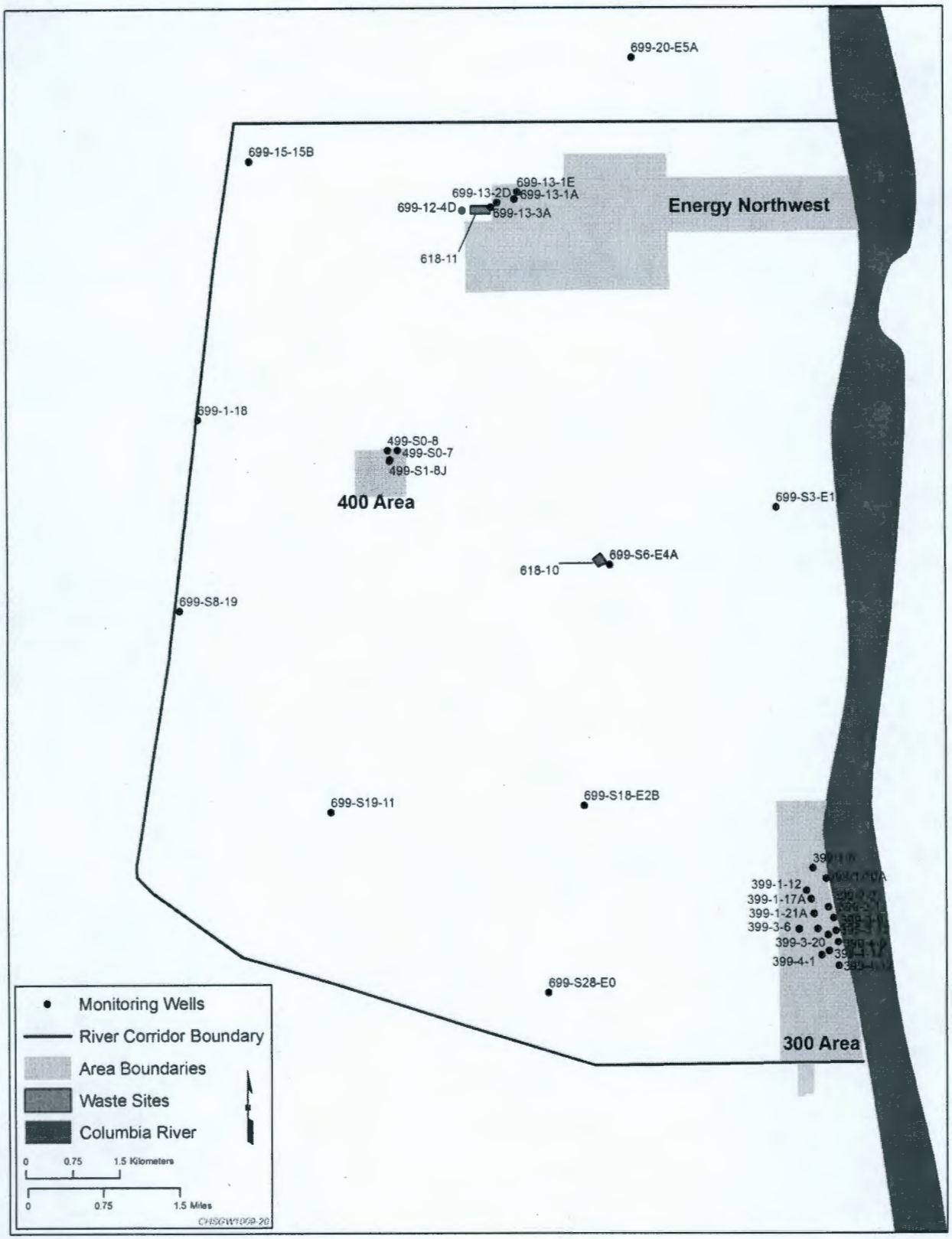

Figure 1-2. 300 Area Spatial and Temporal Uncertainty Monitoring Well Locations

This revised Figure 1-2 and Table 1-1 (pages 1-3 and 1-4) were approved under TPA-CN-374

Table 1-1. Plan Activities and Data Needs

Planned Activity	300 Area		Data Needs No.
	Quantity	Location	
New boreholes (vadose zone)*	3	Borehole 300-DU-VZ-1 Borehole 300-DU-VZ-2 Borehole 300-DU-VZ-3	32
New temporary wells to characterize vadose zone and unconfined aquifer*	5	RIFS-a RIFS-b RIFS-c RIFS-d RIFS-e	2, 7, 8, 14, 17
New wells to characterize vadose zone, unconfined aquifer, and the Ringold lower member*	11	C7657 (399-1-58) C7658 (399-6-3) C7659 (399-1-59) C7661 (399-6-4) C7662 (399-4-15) C7656 (399-1-57) C7663 (399-3-33) C7653 (399-1-54) C7654 (399-1-55) C7655 (399-1-56) C7660 (399-2-32)	2, 3, 4, 7, 8,10, 11, 13, 14, 17, 20, 26
Sample spatial and temporal uncertainty groundwater monitoring wells	~~33~~ 32 existing locations		~~33~~32

Note: This SAP is in addition to field activities described in DOE/RL-2008-27, Sampling and Analysis Plan for 618-10 and 618-11 Nonintrusive Sampling, and other planned activities.

* Boreholes and new groundwater monitoring wells will be logged with a neutron moisture tool and the high-resolution, spectral gamma ray logging system. Geologic samples also will be logged.

1.1 Contaminants of Potential Concern

Samples will be collected and analyzed for contaminants of potential concern (COPCs) as described in this SAP. The following sections present the vadose zone soil, aquifer sediment, and groundwater COPC lists.

Sample results will be reported in the Hanford Environmental Information System (HEIS) database. The tables in the appendix have been provided to define the analytes that will be reported when using a method-based analysis approach. In addition, tentatively identified compounds will be reported for SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*, Methods 8260 and 8270.

Table 3-2. Sample/Measurement Locations and Depth

Sampling Location	Estimated Depth to GW (ft bgs)	Soil/Aquifer Sediment Sample/Measurement		Water Sample/Measurement	
		Sample Interval Depth (ft bgs)	Analyte/Property List	Sample Interval Depth (ft bgs) or Frequency	Analyte/Property List
Sample one existing monitoring well in the 300 Area: 399-1-16B. Justification. Proposed to support Data Need 4.	N/A	None	None	Total of 10 samples as pumping proceeds.	For the 1st and 10th samples – only analyze for the following in accordance with Table 2-6: Uranium (total, unfiltered sample) Method 6010 or 6020 Method 7470 or 200.8 Method 8260 Method 300.0 Alkalinity Field parameters at the time of sampling in accordance with Table 2-6. For the 2nd through 9th samples: Only analyze for the following in accordance with Table 2-6: Method 8260 Alkalinity Field parameters at the time of sampling in accordance with Table 2-6.
Sample one existing and one new monitoring well in the 300 Area: 399-1-8 Well C7654 (399-1-55) Justification. Proposed to support Data Need 4.	N/A	None	None	One sample at the beginning of the pump test and one a day following completion of the test for each well. (2 samples x 2 wells=4 samples)	Only analyze for the following in accordance with Table 2-6: Uranium (total, unfiltered sample) Method 6010 or 6020 Method 7470 or 200.8 Method 8260 Method 300.0 Alkalinity Field parameters at the time of sampling in accordance with Table 2-6.
Sample ~~16~~ 15 spatial/temporal uncertainty monitoring wells (Table 3-3); three rounds in the 300 Area.	N/A	None	None	Multiple sampling rounds to support RI. (~~16~~ 15 wells × 3 rounds = ~~48~~ 45 samples)	Laboratory analyses in accordance with Table 2-7. Field parameters at the time of sampling in accordance with Table 2-7.
Sample 17 spatial/temporal uncertainty monitoring wells (Table 3-3); three rounds in the 600 Area.	N/A	None	None	Multiple sampling rounds to support RI. (17 wells × 3 rounds = 51 samples)	Laboratory analyses in accordance with Table 2-8. Field parameters at the time of sampling in accordance with Table 2-8.

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Table 3-2. Sample/Measurement Locations and Depth

Sampling Location	Estimated Depth to GW (ft bgs)	Soil/Aquifer Sediment Sample/Measurement		Water Sample/Measurement	
		Sample Interval Depth (ft bgs)	Analyte/Property List	Sample Interval Depth (ft bgs) or Frequency	Analyte/Property List
Estimated number of samples		Soil/aquifer sediment chemical: 264 Physical property: 80 Geologic archive samples: variable		Water samples collected during drilling: 60 Spatial and temporal uncertainty groundwater samples: ~~99~~ 96 (3 rounds total) Pump test groundwater samples: 14	
Estimated minimum number of field QC samples		Soil/aquifer sediment chemical: 43(14 equipment rinsate blank, 14 field blank, 14 duplicate, 1 split) Physical property: 0 Geologic archive samples: 0		Water samples collected during drilling: 10 (3 equipment rinsate blank, 3 field blank, 3 duplicate, 1 split) Spatial and temporal uncertainty groundwater samples: 16 (5 equipment rinsate blank, 5 field blank, 5 duplicate, 1 split) Pump test groundwater samples: 6 (2 equipment rinsate blank, 2 field blank, 2 duplicate)	
Estimated total number of samples		Soil/aquifer sediment chemical: 307 Physical property: 80 Geologic archive samples: variable		Water samples collected during drilling: 70 Spatial and temporal uncertainty groundwater samples: ~~115~~112 Pump test groundwater samples: 20	

Note:

* Archive samples may be omitted at the discretion of the field geologist due to radiological field data.

bgs = below ground surface

GW = groundwater

UKPA = total uranium by kinetic phosphorescence analysis

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1.1.1.1 Geophysical Logging

The planned boreholes and new groundwater monitoring wells will be geophysically logged with the high-resolution, spectral gamma-ray logging system to determine the vertical distribution and concentration of gamma emitting radionuclides. Soil moisture will be determined using a neutron logging tool. The groundwater monitoring wells and boreholes will be logged before the casing is telescoped and before the borehole is decommissioned. The starting point for logging will be recorded; this is usually at the ground surface or the top of the casing. Boreholes will be decommissioned with RL and EPA approval, in accordance with WAC 173-160 after geophysical logging and all sampling are completed.

1.1.2 Groundwater Characterization

Groundwater characterization, including well activities, identification of wells to be sampled, well depth and screen placement, and well drilling and completion procedures, is discussed in this section.

1.1.2.1 New Groundwater Wells

Table 3-2 summarizes well activities. For each new well screened in the Ringold Formation Upper Mud Unit, slug testing and pump testing will be performed to characterize hydraulic conductivity. Groundwater samples will be collected from the groundwater wells (including temporary wells) installed under the scope of this SAP quarterly for the first year, with a reduction in frequency for subsequent years, if warranted, in accordance with DOE/RL-2002-11, *300-FF-5 Operable Unit Sampling and Analysis Plan.*

Well Depth and Screen Placement

For the 11 new groundwater wells in the unconfined aquifer in the 300 Area, a 4.6 m (15-ft) screen will be installed such that groundwater samples can be taken from the well during all expected groundwater elevation conditions. .An exception to this will be made if VOC contamination is discovered deeper in the unconfined aquifer (i.e., at a depth horizon comparable to that observed at Well 399-1-16B). If that occurs, screen length and placement will be specified based on the contaminated horizons and sediment characteristics encountered, with the intent to be able to sample distinct contaminated horizons. Concurrence of EPA on screen placement will be gained prior to completing the well. This exception has the greatest likelihood of occurrence at locations No. 6, No. 8, and No. 9 (Figure 1-1) (wells C7656, C7653, and C7654). Screen length at a particular location may be modified to account for local hydrologic conditions. Also, screen slot size will be based on conditions encountered at the site.

For the five temporary groundwater wells, designated RIFS-a, RIFS-b, RIFS-c, RIFS-d and RIFS-e, to be completed in the unconfined aquifer in the 300 Area, a 0.6 m (2-ft) screen will be installed to cover the top of the water table at low seasonal conditions. Screen length may be modified to account for local hydrologic conditions. Also, screen slot size will be based on conditions encountered at the site.

For the three boreholes in the 600 Area subregion, each will be decommissioned with RL and EPA approval, in accordance with WAC 173-160, after sampling and geophysical logging are completed.

Well Drilling and Completion Procedures

Well drilling will be performed in accordance with WAC 173-160. The 11 new wells will be drilled using 25.4-cm (10-in.)-diameter (or larger) casing to total depth. The five temporary wells will be drilled using 20.3-cm (8-in.)-diameter (or larger) casing to total depth. The drilling method(s) will be determined based on discussions between the drilling lead and drilling contractor.

The 11 new wells will be constructed as 15.2-cm (6-in.) wells with Schedule 10, Type 304 or 316 stainless steel, V-slot continuous wire-wrap screen, atop a 1.5 m (5-ft)-long, stainless steel sump with end cap. A Schedule 10 stainless steel riser will be used to extend the permanent well into the vadose zone,

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with Schedule 10 stainless steel casing through the vadose zone to ground surface. Colorado silica sand will be used for the sand pack; sodium bentonite pellets and/or natural sodium bentonite chunks, crumbles, or powdered bentonite will be used for bentonite sealing material; and Type I/II Portland cement will be used for cement grout.

The five temporary wells will be constructed as 10-cm (4-in.) wells with Schedule 40 polyvinyl chloride (PVC), including sump and end cap, and 20-slot well screen. A Schedule 40 PVC riser will be used to extend the temporary well into and through the vadose zone to ground surface. Colorado silica sand will be used for the sand pack; sodium bentonite pellets and/or natural sodium bentonite chunks, crumbles, or powdered bentonite will be used for sealing material; and Type I/II Portland cement to grout the remaining annular space.

For all 16 wells, surface construction consisting of protective casing, protective guard posts, and cement pad must be in place before job completion. The protective casing will be a minimum of 5 cm (2 in.) larger in diameter than the permanent casing. Protective casing will rise approximately 0.9 m (3 ft) above the ground surface. Permanent casing will rise to approximately 0.3 m (1 ft) below the top of the protective casing. Protective casing will have a lockable well cap extending approximately 38 cm (15 in.) above the top of the protective casing.

Final well design, including screen placement and length, will be determined by concurrence of the field geologist, drilling lead, and operable unit lead based on field conditions.

1.1.2.2 Groundwater Network to Evaluate Spatial and Temporal Uncertainty

Table 3-2 summarizes groundwater monitoring activities to address spatial and temporal uncertainties. Tables 3-3 and 3-4 present the spatial and temporal uncertainty groundwater monitoring wells to be sampled under the scope of this SAP. Three rounds of groundwater samples will be collected for analysis to support the spatial and temporal uncertainty evaluation at the 300 Area for the RI. To capture baseline conditions fully, it is required that samples represent spatial variations and changes occurring over time. For representing baseline groundwater conditions, samples are required and will be collected to represent the varying aquifer conditions associated with the "high", "transition," and "low" river stages (June, late July/August, and September/October, respectively). The dates and frequency of sample collection are based on measurements of river elevations to optimize collection of samples representing the temporal changes groundwater conditions. This groundwater sampling schedule captures the maximum effects of changes river elevations on aquifer conditions as well as the transition time between the maximum and minimum conditions.

The samples collected during the three spatial and temporal sampling events will be analyzed for COPCs listed in Tables 1-4 and 1-5 in accordance with performance requirements in Table 2-7 and 2-8, respectively.

Table 3-3. 300 Area Subregion Spatial and Temporal Uncertainty Monitoring Well Network Near-Field Uranium Plume Wells

399-1-10A	399-1-6	399-3-12	399-4-1
399-1-12	399-2-1	399-3-20	399-4-9
399-1-21A	399-2-2	399-3-6	399-4-12
399-1-17A	~~399-3-11~~	399-3-9	399-4-14

This revised Table 3-3 (pages 3-17 and 3-18) were approved under TPA-CN-374