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TRI-PARTY AGREEMENT

Change Notice Number TPA-CN- 335	TPA CHANGE NOTICE FORM	Date: 03/15/2010
Document Number, Title, and Revision: DOE/RL-2006-57 Rev 0 Reissue, *Sampling and Analysis Plan for Supplemental Remedial Investigation Activities at Model Group 5, Large-Area Ponds, Waste Sites Located Within the 200-CW-1 Operable Unit.*		Date Document Last Issued: 02/28/2008
Originator: Briant L. Charboneau		Phone: 373-6137

Description of Change:
Eight samples for characterization of the 216-U-10 Pond waste site from C5766, C5767, C5768 and C5773, will be collected via four direct pushes instead of four auger holes.

Briant L. Charboneau (**DOE**) and Nina Menard (**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.*

Specific changes:
Table 1-7, Page 1-19, Each 'auger' is replaced with 'direct push' and the number of samples is corrected from 6 to 8
Section 3.1.4, Page 3-4, 'hollow stem auger' is replaced with 'direct push' and text related to only samples via an auger is deleted.
Section 3.1.4, Page 3-5 'auger' is replaced with 'direct push'
Figure 3-6, Page 3-12, 'Planned Auger Samples' is replaced with 'Direct Push Sample' and borehole numbers are added
Table 3-1, Page 3-20, Each 'auger' is replaced with 'direct push' and the number of samples is corrected from 6 to 8
Table 3-2, Page 3-22, Each 'auger' is replaced with 'direct push' and the number of samples is corrected from 6 to 8. The numbers of total samples, boreholes and samples are updated/corrected. 216-U-11 'Ditch' is corrected to "Pond'. No. of shallow Pushes for 216-U-10 Pond is corrected to 5 to include the 'worst case location' specified on Table 1-7.

Note: Affected pages attached with added text shaded and deleted text in ~~strikeout~~

Justification and Impacts of Change:
Radiation Controls assessment of the 216-U-10 sampling plan based on the results of the geophysical logging completed in Summer 2008, resulted in a strong recommendation for changing augers to direct pushes to obtain the samples. The required samples at and below the organic mat (pond bottom) will be obtained using direct pushes.

Due to the contamination levels expected, a number of additional controls would be needed mainly due to the additional volume of soil produced by the auger. These would likely include a full enclosure and additional personal protective equipment.

With the change to direct push, the required samples can be made without the additional controls needed to protect workers and the environment.

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Approvals:

Briant L. Charboneau DOE Project Manager	3-16-2010 Date	[X] Approved [ ] Disapproved
Craig Cameron EPA Project Manager	3/19/2010 Date	[X] Approved [ ] Disapproved
Nina M. Menard Ecology Project Manager	3-17-2010 Date	[X] Approved [ ] Disapproved

A-6005-413 (REV 0)

Table 1-7. Summary Sampling Design. (2 Pages)

Planned Survey or Analytical Methodology	Key Features of Design*
UPR-200-W-124 (Overflow Area of the 216-S-17 Pond) – CW-2	
Geophysical logging	Specific location/area of concern: Determine nature and extent of contamination emanating from the dike overflow at the southwest corner of the pond by installing two shallow pushes into overflow area soil and geophysically log pushes using spectral-gamma instruments.
Soil sampling	None.
216-T-4B Pond – CW-4	
Geophysical logging	Specific location/area of concern: Determine general extent of contamination in the primary pond location and the ditch that fed the pond by installing two shallow pushes into ditch soil and two shallow pushes into pond soil and geophysically log pushes using spectral-gamma instruments.
Soil sampling	Collect one soil sample from the worst case location with the highest Cs-137 concentration. Soil samples will be analyzed for contaminants identified in Table 1-2.
216-U-10 Pond – CW-5	
Geophysical logging (gamma and moisture)	Specific location/area of concern: Determine general extent of contamination in the primary pond location, contamination at the pond bottom (i.e., organic mat), and contamination at borehole depth by installing the following: (a) Four shallow pushes into ditch soil (b) One borehole to 42.7 m (140 ft) below ground surface to resolve prior data quality issues (Table 1-2) (c) Four augered holes (d) Two deep pushes (one pair) (e) Geophysically log the 10 existing direct push casings, if possible after an initial field evaluation. Geophysically log shallow pushes and borehole using spectral-gamma logging instruments. Additionally log the first push of the pair of deep pushes with slim hole gamma and moisture estimating tools. Based on the geophysical results of the first push of each pair, select up to three depths to collect soil samples from the second push in the pair.
Soil sampling	(a) Collect one soil sample from the worst case location with the highest Cs-137 concentration from the shallow pushes (C6968) (b) Borehole sampling: Collect one sample at depth, at a minimum. (c) ~~Auger~~Direct push holes C5766, C5767, C5768 and C5773: From each ~~auger~~direct pushed hole sample at and below the organic mat (pond bottom) for a total of eight~~six~~ samples. (d) Collect soil samples from the second push of the deep-push pair at a depth representative of the bottom of the pond and at two depths having elevated moisture levels for a total of six soil samples. Soil samples will be analyzed for contaminants identified in Table 1-2.
216-U-11 Ditch – CW-5	
Geophysical logging (gamma and moisture)	Specific location/area of concern: Determine general extent of contamination in the primary ditch sections and in the shallow overflow area between the ditch sections by installing five shallow pushes in ditch soil and geophysically log pushes using spectral-gamma instruments. Install two deep pushes (one pair) in the ditch for a total of two pushes. Additionally log the first push of each pair of deep pushes with a slim hole gamma and moisture estimating tools. Based on the geophysical results of the first push of each pair, select up to three depths to collect soil samples from the second push in the pair.
Soil sampling	Collect soil samples from the second push of the deep-push pair at a depth representative of the bottom of the pond and at two depths having elevated moisture levels for a total of six soil samples. Soil samples will be analyzed for contaminants identified in Table 1-2.

*Number of pushes, samples, augered samples, and boreholes is found in Tables 3-2 and 3-3.

The borehole soil sampling associated with this SAP will be performed in accordance with established sampling practices and requirements pertaining to sample collection, collection equipment, and sample handling. Samples will be collected for the focused list of COPCs identified in Table 3-1 to fulfill specific supplemental data needs identified during the DQO. Borehole soil samples will be collected and managed as described in Table 2-4. Samples will undergo laboratory analysis for radiological and nonradiological COPCs or analytical suites identified in Table 3-1 in accordance with analytical requirements in Tables 2-1 and 2-2. Samples will be analyzed at an onsite laboratory. Physical property samples, generally collected from boreholes to provide site-specific values to support the RESidual RADioactivity (RESRAD) dose model (ANL, 2002, *RESRAD for Windows*, Version 6.21), are not required for this focused sampling activity.

Soil samples generally are collected from the borehole using a split-spoon sampler equipped with up to four separate stainless-steel liners. Site personnel will not overdrive the sampling device. Soil will be transferred to a pre-cleaned, stainless-steel mixing bowl, homogenized, and then containerized in accordance with contractor sampling procedures. Cuttings and split-spoon samples could be field screened for radioactivity and/or organic contaminants, although organic vapors are not a concern in the vadose-zone soils of the pond waste sites.

Problems with sample collection, custody, or data acquisition that adversely impact the quality of data or that impair the ability to acquire data, or failure to follow procedure, will be documented in accordance with internal corrective action procedures, as appropriate. Soil sample preservation, containers, and holding times for chemical and radiological analytes of interest are presented in Table 2-4. Final sample collection requirements will be identified on the Sampling Authorization Form.

3.1.4 Test-Pit Excavation and Sampling and Analysis

Test pits will be excavated to obtain sample material at the 216-U-10 Pond (Section 3.2). Test pits are shallow excavations into the vadose zone to view soil materials and collect samples. The test pits will be excavated with an excavator and only need to be large enough to obtain the samples at the pond bottom or to a maximum target depth of 7.6 m (25 ft). Site-specific test-pit locations may be adjusted in the field to account for site conditions. Sampling at these locations will be conducted using a ~~hollow stem auger~~direct push. ~~Continuous coring will accompany the advance of the auger.~~ The field geologist will select the samples through the presence of residual radioactivity (field instruments) and visual examination of the soil.

~~Augered holes will be installed in a manner that minimizes the generation of visible emissions (e.g., dust) from the site boundary. If visible emissions cannot be controlled, the activity will be postponed. Samples collected from hollow-stem augers will require the use of a large-diameter split-spoon sampler that usually necessitates compositing the sample through at least 0.3 to 0.6 m (1 to 2 ft) to get adequate sample sizes for analysis.~~

Soil sampling associated with ~~auger~~direct pushing will be performed in accordance with established sampling practices and requirements pertaining to sample collection, collection equipment, and sample handling as described in Section 2.2 of this SAP, and Table 3-1. Samples

will be collected for the focused list of COPCs identified in Table 3-1 to fulfill specific supplemental data needs identified during the DQO. ~~Auger~~Direct pushed soil samples will be collected and managed as described in Table 2-4. Samples will undergo laboratory analysis for radiological and nonradiological COPCs identified in Table 3-1 in accordance with analytical requirements in Tables 2-1 and 2-2. Samples will be analyzed at an onsite laboratory. Physical property samples are not required for this focused sampling activity.

Samples will be collected from the waste site sediment layer (e.g., pond bottom/organic mat) as identified through radiological field screening, visual observation, and judgment of the geologist/sampler or at the first detection of contamination (generally above background), whichever is encountered first. Where ALARA considerations allow, samples should be taken directly from the test-pit strata. Alternatively, samples will be collected directly from the core that will target the interval 0.3 m (1 ft) below the specified sample depth.

Sample material will be removed from the sampling tool into a precleaned, stainless-steel mixing bowl, homogenized, and then containerized in accordance with contractor sampling procedures. Samples will be collected from non-wetted soils, whenever possible, when fixant/water is used for dust control. Additional samples may be collected at the discretion of the geologist/sampler based on field screening information, to further verify the location of the pond bottom, depending on the limits of the excavation equipment.

3.2 SITE-SPECIFIC CHARACTERIZATION

For each Model Group 5 site identified in Table 1-2 as requiring supplemental data, the site-specific data-collection activities and the rationale for data collection are identified in Table 3-1.

3.2.1 Preshipment Sample Screening

A representative portion of each sample to be shipped to an offsite laboratory will be submitted to the Radiological Counting Facility, 222-S Laboratory, or other suitable onsite laboratory for total activity analysis before it is shipped. Total activities will be used for sample preshipment characterization. Samples that slightly exceed the offsite laboratory criteria discussed in Section 2.2.3 may be reduced in volume to allow offsite shipment. Onsite and offsite laboratories will be identified before field activities are initiated and will be mutually acceptable to Sample and Data Management and to the Waste Site Remediation Task Lead.

3.2.2 Summary of Sampling Activities

The number and types of samples to be collected are summarized in Tables 3-2 and 3-2.

Figure 3-6. Planned Geophysical Logging and Soil Sampling Locations at the 216-U-10 Pond. See Table 3-1 for sample details.

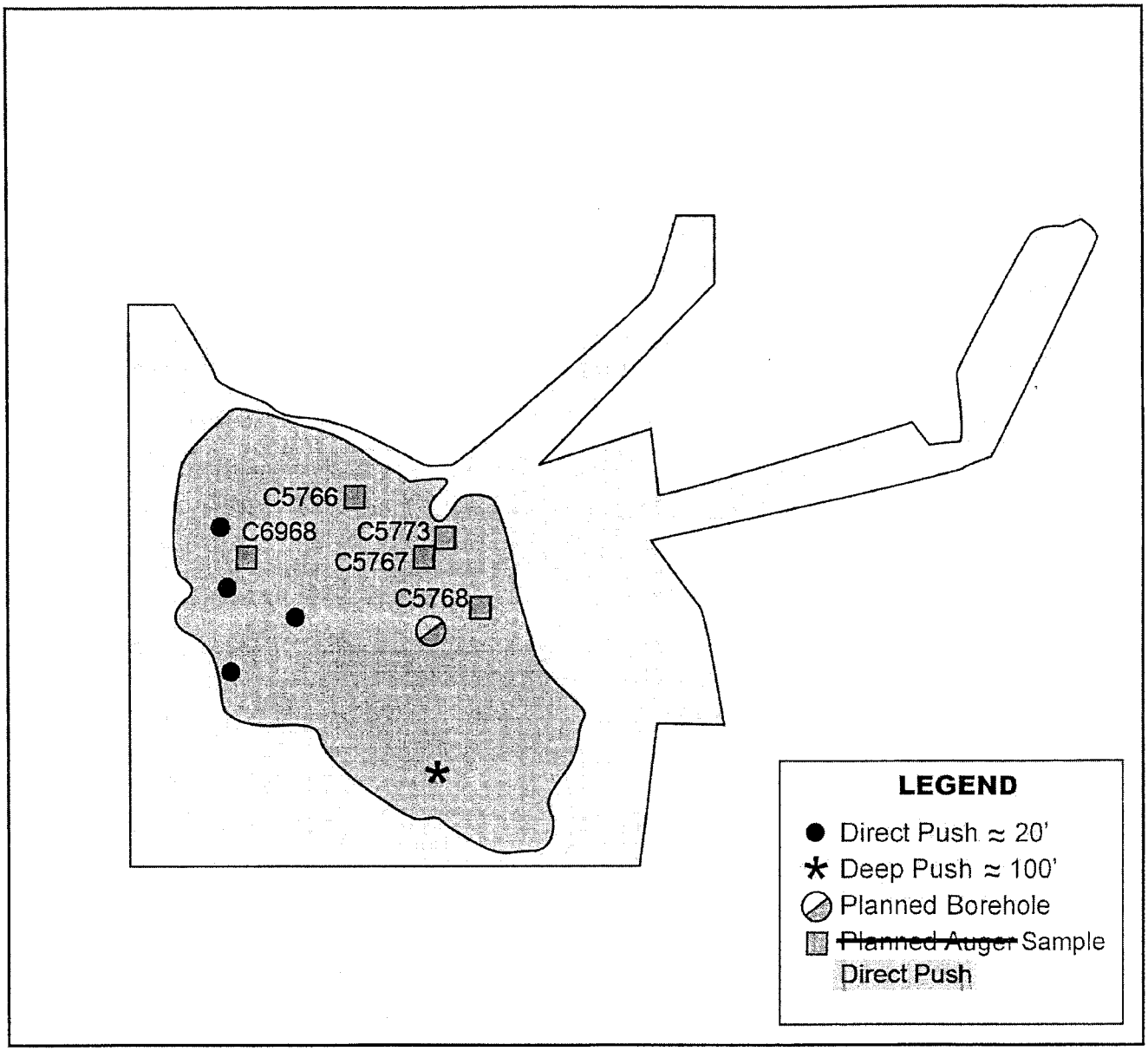

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Table 3-1. Key Features of Model Group 5, Large-Area Ponds, Sampling Design. (7 Pages)

Survey or Analytical Methodology	Key Features of Design	Sampling Design Rationale
216-U-10 Pond		
Geophysical logging – shallow push and high-resolution spectral-gamma logging; deep push and slim hole gamma and neutron logging; augered borings with soil sampling; cable tool drilling with high-resolution gamma logging and soil sampling	*Medium*: Soil *Specific Location/Area of Concern*: Nature and extent of contamination in the primary pond location and ditch that fed the pond. *Investigation Method*: This investigation will require installation of shallow-push and deep-push borings, test pits (auger holes), and a borehole as identified in Figure 3-6. Four shallow pushes will be installed to a depth of 6 m (20 ft) as shown in Figure 3-6 and will be logged with a high-resolution gamma tool for Cs-137 and other gamma emitters. One deep push will be installed in the south end of the pond (Figure 3-6) and logged with slim hole gamma and neutron tools. The deep push will be driven to 30 m (100 ft) or refusal, whichever comes first. Three soil samples will be collected: one at the pond bottom and two at levels indicated having high moisture contents. Four locations will be sampled by auger and soil samples collected from the historical pond bottom (Figure 3-6). One new borehole approximately 42.7 m (140 ft) deep will be installed in the immediate vicinity of existing Borehole 299-W23-231 (Figure 3-7). The borehole will be geophysically logged and three soil samples collected. The ten existing deep probes will be examined and logged, if feasible, with the small diameter gamma logging systm. *Parameter*: Gamma-emitting contaminants including Cs-137 and elevated moisture levels.	Use gamma activity including Cs-137 and elevated moisture zones for tracking the extent of contamination. Deep soil samples and the proposed borehole will be used to address the significance of contaminants moving through the groundwater pathway. Analysis of augered samples will be used to estimate the level of uranium contamination.
Soil sampling: two samples from each of four~~three~~ direct push~~augured~~ boreholes; three samples from the borehole, and three samples from the deep push (total of 15~~3~~ soil samples)	~~Auger~~*Direct pushed samples*: At four separate locations, ~~auger~~direct pushed soil samples will be taken to locate and identify the depth and thickness of the organic mat. The mat will be located visually or by use of hand-held radiological survey instruments through the examination of core material removed during ~~auger~~direct pushing. Once the organic mat at each test pit is located, take two samples – one of the mat material and one of soil directly below the mat – at each of the four~~three~~ locations for a total of eight~~six~~ test-pit samples. *Borehole sample(s)*: Collect one sample at the pond bottom equating to the pond sediment layer (organic mat). Collect one sample at 4.6 m (15 ft) bgs and one sample at depth (approximately 42.7 m or 140 ft bgs). *Shallow-push sample(s)*: One soil sample will be selected based on the results of the geophysical logging of the shallow pushes. *Deep-push samples*: Take one sample at the suspected pond bottom (based on Cs-137 levels) and two additional samples at depths indicated by elevated moisture levels. Samples will be collected using the dual well sampling tool associated with deep pushes. *Contaminants*: Nonradionuclides include antimony, cadmium, manganese, cyanide, selenium, total uranium, silver, thallium, fluoride, and nitrate. [b] Radionuclides include Cs-137, Eu-154, Sr-90, Tc-99, Np-237, Pu-239/240, Am-241, and uranium isotopes.	~~Auger~~Direct pushed samples will be used to sample the organic mat at the pond bottom and the location of most contamination because of sorption of contaminants onto organic materials. The borehole will be used to clear up an outstanding data quality issue and to evaluate uranium with depth. Shallow-push samples taken at the Cs-137 hotspots are intended to represent worst-case conditions at the pond and facilitate evaluation of a partial-removal alternative. Deep-push samples will be collected to evaluate risk associated with the groundwater pathway.

Table 3-2. Summary of Model Group 5 Shallow Push and Drilling Sample Collection Requirements. (2 Pages)

Site	Number of Shallow Pushes and Boreholes	Sample Collection Methodology	COPCs	Sample Location Information					Analytical Requirements and Parameters [c]	
				Sample Location [a]	Sample Depth (ft bgs)	No. of Samples from Shallow Pushes & Drilling	No. of Field Quality Control Samples Dup/Rinsate		Radionuclides	Nonradio-nuclides
216-A-25 Pond	2	Push	Table 3-1	--	≤ 15 [b]	2	1 [d]	1	Table 2-1	Table 2-2
216-B-3 Pond	5	Push	Table 3-1	Footnote a	≤ 15 [b]	1 [e]	0	1	Table 2-1	Table 2-2
216-S-16 Pond	9	Push	Table 3-1	Footnote a	≤ 15 [b]	1	0	1	Table 2-1	Table 2-2
216-S-17 Pond	10	Push	Table 3-1	Footnote a	≤ 15 [b]	1	0	1	Table 2-1	Table 2-2
UPR-200-W-124	2	N/A	--	--	--	--	--		--	--
216-T-4B Pond	4	Push	Table 3-1	Footnote a	≤ 20 [b]	1	0	1	Table 2-1	Table 2-2
216-U-10 Pond	~~45~~	~~Augered boreholes (4)~~Push	Table 3-1	Sediment layer and 1 ft below (Fig 3-6)	TBD	2 at each ~~auger~~direct push~~ed borehole~~ (~~8~~6 total) (~~4~~Test Pit locations). ~~+~~ 1 at worst case location	0	1	Table 2-1	Table 2-2
	1	Borehole (3)		Sediment layer, 15 ft bgs and depth (140 ft bgs) (Fig 3-6)	Sediment layer (TBD), 15 ft and 140 ft	3	1 [d]	1	Table 2-1	Table 2-2
	4	Push/log		TBD (Fig 3-6)	< 20 [b]	1	--	1	Table 2-1	Table 2-2
216-U-11 ~~Ditch~~Pond	5	N/A	--	--	--	--	--		--	--
Total number of shallow pushes: 4~~7~~1										
Number of boreholes (drilled ~~and augered~~): ~~1~~ 5										
Total number of samples: 16~~9~~										
Minimum number of field quality control samples: 2 duplicate samples and 8 equipment rinsate samples										