Appendix C—Supporting Information for Aquifer Sampling Tubes

M.J. Hartman

Aquifer tubes are small-diameter, flexible tubes that have a screen on one end. The tubes are installed in the aquifer along the Columbia River shoreline by driving a temporary steel casing into the ground adjacent to the river. The temporary casing is filled with water to keep sediment from coming up into the casing, and then the drive-tip on the casing end is knocked out and the screened end of a tube is inserted into the casing. The steel casing is then pulled out, leaving the tube in place. Water is withdrawn from the tube using a peristaltic pump. Most aquifer tube sites include two or three separately installed tubes monitoring different depths, from ~1 to 8 meters. The tube sites cover the Hanford Site shoreline, from just upstream of 100-BC to downstream at the 300 Area. Sites are more closely spaced along some segments where higher density spatial resolution of contaminant plumes is needed.

A total of 562 aquifer tubes were installed on the Hanford Site. A subset of tubes is selected for sampling. *Sampling and Analysis Plan for Aquifer Sampling Tubes* (DOE/RL-2000-59) contains a list of tubes and constituents scheduled to be sampled in fiscal year 2009. The same list of tubes and constituents were scheduled for sampling in fiscal years 2010 through 2012. The sampling and analysis plan also summarizes the history of the Site's aquifer tube installation and describes tube site nomenclature.

Table C-1 summarizes the total number of tubes and clusters in each segment of shoreline, the number of tubes sampled, and the number of sampling trips in 2011. A total of 290 aquifer tubes were sampled in 2011 under the routine shoreline monitoring program (Table C-2), and many of the tubes were sampled more than once, for a total of 566 sampling trips.[1] Additional samples were collected from some 100-N aquifer tubes in support of the apatite barrier performance evaluation (Table C-3).

Most of the aquifer tubes are sampled once per year, generally in the fall, but the annual events were not comprehensive in 2010 and 2011. As stated in the 2010 annual report, fall 2010 sampling was delayed into calendar year 2011 because of a stop-work order and other factors. Not all of the tubes were sampled before the river stage rose and sampling was either cancelled or delayed until late summer. Fall 2011 sampling started slowly because of competing priorities for sampling personnel, and sampling continued into 2012.

Until fall 2011, at most aquifer tube sites, if the specific conductance of the water was less than 160 µS/cm, the conductance was recorded and water was not collected for laboratory analyses because the samples contain more river water than groundwater. This practice was changed in fall 2011, and samples are collected from all scheduled tubes, regardless of the specific conductance.

C.1 References

DOE/RL-2000-59, 2009, *Sampling and Analysis Plan for Aquifer Sampling Tubes*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

[1] These numbers include sampling trips where only field parameters were measured, either by design or because specific conductance was low. The sampling trip tallies in the main text of this report are based on samples collected, as reflected by data in HEIS.

Table C-1. Inventory of Hanford Site Aquifer Tubes as of December 31, 2011

Segment	Total Tubes/Sites	Tubes Not in Service	Tubes Sampled, 2011	Sites Sampled, 2011	Tube Trips, 2011
100-BC	53/21	1	15	8	21
100-K	70/28	1	44	19	58
100-N	84/40	1	42	22	124*
100-D	97/37	11	71	30	190
100-H	97/41	12	57	28	71
100-F	81/29	16	31	15	49
200-PO-1	28/17	4	2	2	2
300 Area	52/25	3	28	12	51
Total	**562/238**	**58**	**290**	**136**	**566**

* Does not include sampling trips made for performance monitoring of the 100-N apatite barrier. See Table C-3 for additional information.

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
100-BC-5				
	01-M	A	3/7/2011	Delayed from fall 2010
		A	12/7/2011	
	03-D	A		Underwater 12/7/2011
	AT-B-1-M	A	12/7/2011	
	AT-B-2-D	A		Underwater 12/7/2011
	04-D	A	3/7/2011	Delayed from fall 2010
		A	12/7/2011	
	C6227	A		Underwater 12/7/2011
	C6228	A		Underwater 12/7/2011
	C6229	A		Underwater 12/7/2011
	05-S	A	3/7/2011	Delayed from fall 2010
		A		Frozen line 12/9'2011; missing PVC end cap.
	05-M	A	3/7/2011	Delayed from fall 2010
		A	12/9/2011	
	05-D	A	3/7/2011	Delayed from fall 2010
		A	12/9/2011	
x	C7718	A		Tubing pulled too far down 12/12/2011
x	C7719	A		Tubing pulled too far down 12/12/2011
x	C7720	A		Tubing pulled too far down 12/12/2011

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	AT-B-3-S	A		
	AT-B-3-M	A		
	AT-B-3-D	A		
x	C7724	A	12/9/2011	
x	C7725	A		Frozen line 12/9/2011; missing PVC end cap
x	C7726	A	12/9/2011	Missing PVC end cap
	06-S	A	3/7/2011	Delayed from fall 2010
	06-M	A	3/7/2011	Delayed from fall 2010
	06-D	A	3/7/2011	Delayed from fall 2010
	C6230	A		
	C6231	A		
	C6232	A		
	C6233	A		
	C6234	A		
	C6235	A		
x	C7780	A	5/11/2011	Delayed from fall 2010
x			12/9/2011	
x	C7781	A	5/11/2011	Delayed from fall 2010
x				Frozen line 12/9/2011.
x	C7782	A	5/11/2011	Delayed from fall 2010
x			12/9/2011	
	AT-B-7-M	A		
	AT-B-5-D	A		
	12-D	A	12/12/2011	Needs to be labeled w/ well ID
100-KR-4				
	14-D	A	9/6/2011	Delayed from fall 2010
	C6236	A	9/6/2011	Delayed from fall 2010
	C6237	A	9/6/2011	Delayed from fall 2010
	C6238	A	9/6/2011	Delayed from fall 2010
	AT-K-1-D	A	12/16/2010	Delayed from fall 2010
	17-D	A		
x	C7641		2/22/2011	Field readings only; low SC
x		Q	5/3/2011	Field readings only; low SC
x		Q	9/6/2011	Field readings only; low SC
x	C7642		2/22/2011	
x		Q	5/3/2011	
x		Q		Under water 8/23/2011
x	C7643		2/22/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
x		Q	5/3/2011	
x		Q	9/6/2011	Under water 8/23/2011
	C6239	A	1/28/2011	Field readings only; low SC; Delayed from fall 2010
	C6240	A	1/28/2011	Field readings only; low SC; Delayed from fall 2010
	C6241	A	1/28/2011	Delayed from fall 2010
x		Q		Not attempted
x		Q	5/12/2011	
x		Q	8/23/2011	
	C6242	A	2/22/2011	Field readings only; low SC; Delayed from fall 2010
	C6243	A	2/22/2011	Delayed from fall 2010
	C6244	A	2/22/2011	Delayed from fall 2010
x	18-S	A	1/28/2011	Delayed from fall 2010
	AT-K-2-D	A		
	C6245	A	9/12/2011	Delayed from fall 2010
	C6246	A	9/12/2011	Delayed from fall 2010
	C6247	A	9/12/2011	Delayed from fall 2010
	19-M	A	9/12/2011	Delayed from fall 2010
	19-D	A	9/12/2011	Delayed from fall 2010
	AT-K-3-S	A	9/12/2011	Delayed from fall 2010
	AT-K-3-M	A	9/12/2011	Delayed from fall 2010
	AT-K-3-D	A		
	C6248	A	5/3/2011	Delayed from fall 2010
	C6249	A	5/3/2011	Delayed from fall 2010
	C6250	A	5/3/2011	Delayed from fall 2010
x		Q		
x		Q		
x		Q	8/23/2011	
	C6251	A	9/26/2011	Delayed from fall 2010
	C6252	A	9/26/2011	Delayed from fall 2010
	C6253	A	9/26/2011	Delayed from fall 2010
	21-S	A	9/26/2011	Delayed from fall 2010
	21-M	A	9/26/2011	Delayed from fall 2010
	C6254	A	9/26/2011	Delayed from fall 2010
	C6255	A	9/26/2011	Delayed from fall 2010
	C6256	A	9/26/2011	Delayed from fall 2010
	C6257	A		
	C6258	A	9/9/2011	Delayed from fall 2010
	C6259	A	9/9/2011	Delayed from fall 2010

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	22-M	A	3/31/2011	Field readings only; low SC; Delayed from fall 2010
	22-D	A	3/31/2011	Delayed from fall 2010
	AT-K-4-S	A		
	AT-K-4-M	A		
x	AT-K-4-D	A		
	23-M	A		
	23-D	A		Removed 3/28/2011
	C6260	A		
	C6261	A		
	AT-K-5-S	A		
	AT-K-5-M	A		
	AT-K-5-D	A		
	DK-04-2	A		
	25-D	A	3/17/2011	Field readings only; low SC; Delayed from fall 2010
	AT-K-6-S	A	3/17/2011	Field readings only; low SC; Delayed from fall 2010
	AT-K-6-M	A	3/17/2011	Field readings only; low SC; Delayed from fall 2010
	AT-K-6-D	A	3/17/2011	
	26-S	A	3/17/2011	Field readings only; low SC; Delayed from fall 2010
x		Q		
x		Q	5/4/2011	Field readings only; low SC
x		Q	8/23/2011	Field readings only; low SC
	26-M	A	3/17/2011	Field readings only; low SC; Delayed from fall 2010
x		Q		
x		Q	5/4/2011	Field readings only; low SC
x		Q	8/23/2011	
	26-D	A	3/17/2011	
x		Q		
x		Q	5/4/2011	
x		Q	8/23/2011	
	C6263	A		
	C6264	A		
	C6265	A		
100-NR-2				
	C6317	A	9/23/2011	Delayed from fall 2010
	C6318	A	9/23/2011	Delayed from fall 2010
	C6319	A	9/23/2011	Delayed from fall 2010
x	C7934	1		

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
x	C7935	1		
x	C7936	1		
x	C7937	1		
x	C7938	1		
x	C7939	1		
	C6320	A		
	C6321	A		
	C6352	A	2/23/2011	Field readings only; low SC; Delayed from fall 2010
	C6322	A		
	C6132	Q	2/23/2011	Delayed from fall 2010
		Q		No yield 3/15/2010
		Q	6/1/2011	
		Q	9/2/2011	
	N116mArray-0A	Q	6/1/2011	
		Q	9/2/2011	
	C6135	Q	2/23/2011	Delayed from fall 2010
		Q	3/15/2011	
		Q		
		Q	9/2/2011	
	N116mArray-1A	Q	3/23/2011	
		Q	6/1/2011	
		Q	9/2/2011	
	N116mArray-2A	Q	2/8/2011	Delayed from fall 2010
		Q	3/15/2010	
		Q	6/1/2011	
		Q	9/2/2011	
	N116mArray-3A	M	1/31/2011	
		M	2/8/2011	
		M	3/15/2011	
		M	4/14/2011	
		M	5/4/2011	
		M	6/1/2011	
		M	7/12/2011	
		M	8/15/2011	
		M	9/2/2011	
	N116mArray-4A	M	1/31/2011	
		M	2/8/2011	
		M	3/15/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
		M	4/14/2011	
		M	5/4/2011	
		M	6/1/2011	
		M	7/12/2011	
		M	8/15/2011	
		M	9/7/2011	
	NVP1-1	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/2/2011	
		Q		Lost flow 9/7/2011
	NVP1-2	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/2/2011	
		Q	9/7/2011	
	NVP1-3	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/2/2011	
		Q	9/7/2011	
	NVP1-4	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/1/2011	
		Q	9/7/2011	
	NVP1-5	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/2/2011	
		Q	8/31/2011	
	NVP2-116.3	Q		No yield 3/16/2011
		Q	6/1/2011	
		Q		No yield 8/31/2011
	NVP2-116.0	M	1/31/2011	
		M	2/8/2011	
		M	3/16/2011	
		M	4/14/2011	
		M	5/4/2011	
		M	6/1/2011	
		M	7/12/2011	
		M	8/15/2011	
		M	8/31/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	NVP2-115.7	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/1/2011	
		Q	8/31/2011	
	NVP2-115.4	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/1/2011	
		Q	8/31/2011	
	NVP2-115.1	Q	2/8/2011	Delayed from fall 2010
		Q	3/16/2011	
		Q	6/1/2011	
		Q	8/31/2011	
	N116mArray-6A	M	1/31/2011	
		M	2/8/2011	
		M	3/16/2011	
		M	4/14/2011	
		M	5/4/2011	
		M	6/2/2011	
		M	7/12/2011	
		M	8/15/2011	
		M	8/31/2011	
	N116mArray-7A	Q		Not scheduled; destroyed
x	C7881	Q	6/2/2011	Replaced Array-7A
x		Q	8/31/2011	
	N116mArray-8A	Q	2/8/2011	Delayed from fall 2010
		Q	3/10/2011	
		Q	6/2/2011	
		Q	8/31/2011	
	N116mArray-8.5A	Q	2/7/2011	Delayed from fall 2010
		Q	3/10/2011	
		Q	6/2/2011	
		Q	8/31/2011	
	N116mArray-9A	Q	2/7/2011	Delayed from fall 2010
		Q	3/10/2011	
		Q	6/2/2011	
		Q	8/31/2011	
	N116mArray-10A	Q	2/7/2011	Delayed from fall 2010
		Q	3/10/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
		Q		
		Q		8/31/2011 can't see poly tube in PVC protective casing
	N116mArray-11A	Q	2/7/2011	Delayed from fall 2010
		Q	3/10/2011	
		Q	6/2/2011	
		Q	8/31/2011	
	N116mArray-12A	Q		No yield 3/10/2011
		Q	6/2/2011	
		Q	8/31/2011	Very slow flow
	N116mArray-13A	Q		No yield 3/10/2011
		Q		No yield 6/2/2011
		Q		No yield 8/31/2011
	C6323	A	2/8/2011	Delayed from fall 2010
	C6324	A	2/8/2011	Delayed from fall 2010
	C6325	A	2/8/2011	Delayed from fall 2010
	N116mArray-14A	Q		No yield 3/10/2011
		Q		No yield 6/2/2011
		Q		No yield 8/31/2011
	N116mArray-15A	Q	2/7/2011	Delayed from fall 2010
		Q		
		Q	6/2/2011	
		Q	8/31/2011	
	C6326	A	2/23/2011	Scheduled for field readings only; delayed from fall 2011
	C6327	A	2/23/2011	Scheduled for field readings only; delayed from fall 2011
	C6328	A	2/23/2011	Delayed from fall 2010
	C6329	A	9/23/2011	Scheduled for field readings only; delayed from fall 2011
	C6330	A	9/23/2011	Scheduled for field readings only; delayed from fall 2011
	C6331	A	9/23/2011	Delayed from fall 2010
	C6332	A	2/23/2011	Scheduled for field readings only; delayed from fall 2011
	C6333	A	2/23/2011	Scheduled for field readings only; delayed from fall 2011
	C6334	A	2/23/2011	Delayed from fall 2010
100-HR-3 -- 100-D				
x	C7645	A	12/20/2011	
x	C7646	A	12/20/2011	
x	C7647	A	12/20/2011	
x	C7648	A	12/20/2011	
	DD-50-1	A	1/6/2011	Delayed from fall 2010

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
			12/15/2011	
	DD-50-2	A	1/6/2011	Delayed from fall 2010
			12/15/2011	
	DD-50-3	A	1/6/2011	Delayed from fall 2010
			12/15/2011	
	DD-50-4	A	1/6/2011	Delayed from fall 2010
			12/15/2011	
	DD-49-1	A	1/6/2011	Delayed from fall 2010
			12/15/2011	
	DD-49-2	A	1/6/2011	Delayed from fall 2010
			12/15/2011	
	DD-49-3	A	1/6/2011	Delayed from fall 2010
			12/15/2011	
	DD-49-4	A	2/18/2011	Delayed from fall 2010
			12/15/2011	
	C6266	Q	1/6/2011	Delayed from fall 2010
		Q	2/1/2011	
		Q	4/20/2011	
		Q	8/3/2011	
		Q	12/15/2011	
	C6267	Q	1/6/2011	Delayed from fall 2010
		Q		No yield 2/1/11
		Q	4/20/2011	
		Q	8/3/2011	
		Q	12/15/2011	
	C6268	Q	1/6/2011	Delayed from fall 2010
		Q		Under water 2/1/11
		Q	4/20/2011	
		Q	8/3/2011	
		Q	12/15/2011	
	C6269	Q	1/6/2011	
		Q	4/20/2011	Field readings only; low SC
		Q	8/3/2011	Field readings only; low SC
		Q	12/15/2011	
	C6270	Q	1/6/2011	
		Q	4/20/2011	Field readings only; low SC
		Q	8/3/2011	
		Q	12/15/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	C6271	Q	1/6/2011	
		Q	4/20/2011	
		Q	8/3/2011	
		Q	12/15/2011	
	DD-44-3	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q	2/18/2011	Field readings only; low SC
		Q	4/20/2011	
		Q	8/3/2011	
		Q	12/16/2011	
	DD-44-4	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q	2/18/2011	
		Q	4/20/2011	
		Q	8/3/2011	
		Q	12/16/2011	
	DD-43-2	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q	2/18/2011	Field readings only; low SC
		Q	4/20/2011	
		Q	8/10/2011	Field readings only; low SC
		Q	12/16/2011	
	DD-43-3	Q	1/6/2011	Delayed from fall 2010
		Q	2/18/2011	Field readings only; low SC
		Q	4/20/2011	Field readings only; low SC
		Q	8/10/2011	
		Q	12/16/2011	
	DD-42-2	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q	2/18/2011	Field readings only; low SC
		Q	4/20/2011	
		Q	8/10/2011	
		Q	12/16/2011	
	DD-42-3	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q	2/18/2011	Field readings only; low SC
		Q	4/20/2011	
		Q	8/10/2011	
		Q	12/16/2011	
	DD-42-4	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q	2/18/2011	
		Q	4/20/2011	
		Q	8/10/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
		Q	12/16/2011	
	DD-41-1	Q	1/6/2011	Delayed from fall 2010
		Q	2/18/2011	Field readings only; low SC
		Q	4/19/2011	
		Q	8/18/2011	Field readings only; low SC
		Q	12/16/2011	
	DD-41-2	Q	1/6/2011	Field readings only; low SC; Delayed from fall 2010
		Q		No yield 2/18/2011
		Q	4/19/2011	
		Q	8/18/2011	
		Q	12/16/2011	
	DD-41-3	Q	1/6/2011	Delayed from fall 2010
		Q	2/18/2011	
		Q	4/19/2011	Field readings only; low SC
		Q		No yield 8/10/2011
		Q	12/16/2011	
	REDOX-4-3.0	Q	1/26/2011	Field readings only; low SC
		Q	4/19/2011	
		Q	8/18/2011	Field readings only; low SC
		Q	12/13/2011	
	REDOX-4-6.0	Q	1/26/2011	Field readings only; low SC
		Q	4/19/2011	
		Q	8/18/2011	Field readings only; low SC
		Q	12/13/2011	
	REDOX-3-3.3	Q		No yield 1/26/11
		Q	4/26/2011	Not sampled 4/21 b/c no label!
		Q	8/18/2011	Field readings only; low SC
		Q		No yield 12/13/2011
	REDOX-3-4.6	Q	1/26/2011	Field readings only; low SC
		Q	4/21/2-11	
		Q	8/18/2011	Field readings only; low SC
		Q		No yield 12/13/2011
	DD-39-1	Q	1/26/2011	Field readings only; low SC
		Q	4/21/2011	
		Q	8/18/2011	
		Q	12/13/2011	
	DD-39-2	Q	1/26/2011	Field readings only; low SC
		Q	4/21/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
		Q	8/18/2011	
		Q	12/13/2011	
	DD-39-3	Q	1/26/2011	
		Q	4/26/2011	
		Q	8/18/2011	
		Q		Tube broken; cancelled
	REDOX-2-3.0	Q		Not scheduled; destroyed
	REDOX-2-6.0	Q	1/26/2011	
		Q	4/26/2011	
		Q	8/18/2011	
		Q	12/13/2011	
	REDOX-1-3.3	Q	1/26/2011	Field readings only; low SC
		Q	4/26/2011	
		Q	8/18/2011	
		Q	12/13/2011	
	REDOX-1-6.0	Q	1/26/2011	
		Q	4/26/2011	
		Q	8/18/2011	
		Q	12/13/2011	
	AT-D-1-S	A	2/18/2011	Delayed from fall 2010
		A	12/13/2011	
	AT-D-1-M	A	2/18/2011	Delayed from fall 2010
		A	12/13/2011	
	AT-D-1-D	A	2/18/2011	Delayed from fall 2010
		A	12/13/2011	
	C6272	A	3/18/2011	Delayed from fall 2010
		A	12/13/2011	
	AT-D-4-S	A	3/18/2011	Delayed from fall 2010
		A	12/14/2011	
	AT-D-4-M	A	3/18/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/14/2011	Scheduled for field readings only
	AT-D-4-D	A	3/18/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/14/2011	Scheduled for field readings only
	AT-D-2-S	A	3/18/2011	Delayed from fall 2010
		A	12/14/2011	
	AT-D-2-M	A	3/18/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/14/2011	
	36-S	A	12/15/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	36-M	A	12/15/2011	
	36-D	A	12/15/2011	
	AT-D-3-S	A	3/18/2011	Delayed from fall 2010
		A	12/14/2011	
	AT-D-3-M	A	3/18/2011	Delayed from fall 2010
		A	12/14/2011	
	AT-D-3-D	A	3/18/2011	Delayed from fall 2010
		A	12/14/2011	
	C6275	A	3/18/2011	Delayed from fall 2010
		A	12/16/2011	
	38-M	A		
		A	12/13/2011	
	38-D	A		Scheduled for field readings only
		A	12/13/2011	Scheduled for field readings only
	C6278	A	9/13/2011	Delayed from fall 2010
		A	12/21/2011	
	DD-17-2	A	9/13/2011	Delayed from fall 2010
		A	12/21/2011	
	DD-17-3	A	9/13/2011	Delayed from fall 2010
		A	12/21/2011	
	DD-16-3	A	3/18/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/16/2011	
	DD-16-4	A	3/18/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/16/2011	
	DD-15-2	A	3/18/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/21/2011	
	DD-15-3	A	3/18/2011	Delayed from fall 2010
		A	12/21/2011	
	DD-15-4	A	3/18/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/21/2011	
	DD-12-2	A	9/13/2011	Field readings only; low SC; Delayed from fall 2010
		A		Tubing disconnected & PVC broken 12/21/2011
	DD-12-4	A	9/13/2011	Delayed from fall 2010
		A	12/21/2011	
	AT-D-5-M	A	4/26/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/19/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	AT-D-5-D	A	4/26/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/19/2011	
	DD-06-2	A	12/19/2011	
	DD-06-3	A	9/13/2011	Delayed from fall 2010
		A	12/19/2011	
	C6281	A	9/13/2011	Field readings only; low SC; Delayed from fall 2010
		A	12/19/2011	
	C6282	A	9/13/2011	Delayed from fall 2010
		A	12/19/2011	
100-HR-3 -- Horn and 100-H				
	C6284	A	9/15/2011	Delayed from fall 2010
	C6285	A	9/15/2011	Delayed from fall 2010
	C6286	A	9/15/2011	Delayed from fall 2010
	C5632	A	2/9/2011	Field readings only; low SC; Delayed from fall 2010
	C5633	A	2/9/2011	Delayed from fall 2010
	C5634	A	2/9/2011	Delayed from fall 2010
	C5635	A	2/9/2011	Delayed from fall 2010
	C5636	A	2/9/2011	Delayed from fall 2010
	C5637	A	2/9/2011	Delayed from fall 2010
	C5638	A	2/9/2011	Delayed from fall 2010
	C6287	A		
	C6288	A	9/15/2011	Delayed from fall 2010
	C5641	A	2/9/2011	Delayed from fall 2010
	C5644	A	2/9/2011	Delayed from fall 2010
	44-M	A		
	44-D	A		
	C5673	A	3/3/2011	Field readings only; low SC; Delayed from fall 2010
	C5674	A	3/3/2011	Delayed from fall 2010
	C5676	A	3/3/2011	Delayed from fall 2010
	C5677	A	3/3/2011	Delayed from fall 2010
	C5678	A	3/3/2011	Delayed from fall 2010
	C5679	A	3/3/2011	Field readings only; low SC; Delayed from fall 2010
	C5680	A	3/3/2011	Delayed from fall 2010
	C5681	A		
	45-S	A	12/29/2011	
	45-M	A	12/29/2011	
	45-D	A	12/29/2011	
	C5682	A	9/15/2011	Delayed from fall 2010

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	C6290	A	9/16/2011	Delayed from fall 2010
	C6291	A	9/16/2011	Delayed from fall 2010
	C6293	A	9/22/2011	Delayed from fall 2010
	AT-H-1-S	A	12/29/2011	
	AT-H-1-M	A	12/29/2011	
	AT-H-1-D	A	12/29/2011	
	AT-H-2-S	A	9/22/2011	Scheduled for field readings only; delayed from fall 2011
			12/29/2011	
	AT-H-2-M	A	9/22/2011	Scheduled for field readings only; delayed from fall 2011
			12/29/2011	
	AT-H-2-D	A	9/22/2011	Delayed from fall 2010
			12/29/2011	
	AT-H-3-S	A	9/16/2011	Delayed from fall 2010
			12/28/2011	
	AT-H-3-D	A	9/16/2011	Delayed from fall 2010
			12/28/2011	
	47-M	A	4/28/2011	Delayed from fall 2010
		A	12/27/2011	
	47-D	A		No yield 12/27/2011
x	C7649	A	12/28/2011	
x	C7650	A	12/28/2011	
	C6296	A	9/16/2011	Delayed from fall 2010
			12/27/2011	
	C6297	A	9/16/2011	Delayed from fall 2010
			12/27/2011	
	48-S	A	2/4/2011	Field readings only; low SC; Delayed from fall 2010
			12/27/2011	
	48-M	A	2/4/2011	Delayed from fall 2010
			12/27/2011	
	C6299	A	9/14/2011	Delayed from fall 2010
			12/27/2011	
	C6300	A	9/14/2011	Delayed from fall 2010
			12/27/2011	
	C6301	A	9/14/2011	Delayed from fall 2010
			12/27/2011	
	49-D	A	2/4/2011	Delayed from fall 2010
			12/27/2011	
	50-S	A	2/4/2011	Delayed from fall 2010

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	50-M	A	2/4/2011	Delayed from fall 2010
	51-S	A	2/4/2011	Delayed from fall 2010
	51-M	A	2/4/2011	Delayed from fall 2010
	51-D	A	2/4/2011	Delayed from fall 2010
	52-S	A	2/4/2011	Delayed from fall 2010
	52-M	A	2/4/2011	Delayed from fall 2010
	52-D	A	2/4/2011	Delayed from fall 2010
	54-S	A	4/28/2011	Delayed from fall 2010
	54-M	A	4/28/2011	Delayed from fall 2010
	54-D	A	4/28/2011	Delayed from fall 2010
100-FR-3				
	62-M	A	2/10/2011	Delayed from fall 2010
		A	12/5/2011	missing PVC pipe
	C6302	A	9/14/2011	Delayed from fall 2010
				lower priority; sampled 9/2011
	C6303	A	9/14/2011	Delayed from fall 2010
				lower priority; sampled 9/2011
	64-S	A	2/10/2011	Field readings only; low SC; Delayed from fall 2010
		A	11/14/2011	Field readings only; low SC
	64-M	A	2/10/2011	Field readings only; low SC; Delayed from fall 2010
		A	11/14/2011	Field readings only; low SC
	64-D	A	2/10/2011	Delayed from fall 2010
		A	11/14/2011	
	C6305	A	11/16/2011	Field readings only; low SC
	C6306	A	11/16/2011	
	C6307	A	11/16/2011	
	C6308	A	11/15/2011	
	C6309	A	11/15/2011	Field readings only; low SC
	C6311	A	11/15/2011	
	C6312	A	11/15/2011	
	C6314	A	3/8/2011	Field readings only; low SC; Delayed from fall 2010
		A	11/28/2011	
	C6315	A	3/8/2011	Delayed from fall 2010
		A	11/28/2011	
	C6316	A	3/8/2011	Delayed from fall 2010
		A	11/28/2011	
	AT-F-1-S	A	3/8/2011	Field readings only; low SC; Delayed from fall 2010
		A	11/28/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	AT-F-1-M	A	3/8/2011	Field readings only; low SC; Delayed from fall 2010
		A	11/28/2011	
	AT-F-1-D	A	3/8/2011	Delayed from fall 2010
		A	11/28/2011	
	66-S	A	3/8/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/2/2011	
	66-M	A	3/8/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/2/2011	
	66-D	A	3/8/2011	Delayed from fall 2010
		A	12/2/2011	
	67-S	A	3/9/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/2/2011	Scheduled for field readings only
	67-M	A	3/9/2011	Delayed from fall 2010
		A	12/2/2011	
	68-S	A	3/9/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/2/2011	
	68-M	A	3/9/2011	Scheduled for field readings only; delayed from fall 2011
		A	12/2/2011	
	68-D	A	3/9/2011	Delayed from fall 2010
		A	12/2/2011	
	AT-F-2-M	A		
	74-D	A	12/6/2011	
	75-D	A	12/6/2011	
	76-D	A	12/6/2011	
	77-D	A	12/6/2011	
200-PO-1 (Hanford Town Site)				
	85-D	A	2/17/2011	Field readings only; low SC; Delayed from fall 2010
	86-D	A		Cap melted to tube 2/17/2011
	C6383	A		Scheduled for field readings only
	C6384	A		
	C6353	A		
	C6356	A		
	C6359	A		
	C6362	A		
	C6365	A		
	C6368	A		
	C6371	A		
	C6374	A		Scheduled for field readings only

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	C6375	A		
	C6378	A	9/28/2011	
	C6380	A		
300-FF-5				
	AT-3-1-S	A	3/25/2011	Delayed from fall 2010
		A	11/18/2011	
	AT-3-1-M	SA	3/25/2011	
		SA	11/17/2011	
	AT-3-1-D(1)	A	3/25/2011	Delayed from fall 2010
		A	11/17/2011	
	AT-3-2-S	A	3/25/2011	Field readings only; low SC; Delayed from fall 2010
		A		11/17 - SC did not stabilize; no sample
	AT-3-2-M	SA	3/25/2011	
		SA		11/17 - Field readings only; SC low
	C6341	SA	3/25/2011	
		SA	11/29/2011	
	C6342	SA	3/25/2011	
		SA	11/29/2011	
	C6343	SA	3/25/2011	
		SA	11/29/2011	
	AT-3-3-S	SA	3/25/2011	Field readings only; low SC
		SA		11/18 - Field readings only; SC low
	AT-3-3-M	SA	3/25/2011	
		SA	11/18/2011	
	AT-3-3-D	SA	4/7/2011	No yield 3/25/2011; Fixed 3/28/2011
		SA	11/18/2011	
	C6344	SA	3/25/2011	
		SA	11/21/2011	
	AT-3-4-S	SA	3/25/2011	
		SA	11/21/0211	
	AT-3-4-M	SA	4/13/2011	SC declined during sampling
		SA		Insufficient yield 11/21/2011
	AT-3-4-D	SA	3/25/2011	
		SA	11/21/0211	
	C6347	SA	3/29/2011	
		SA	11/29/2011	
	C6348	SA	3/29/2011	
		SA	11/29/2011	

Table C-2. Aquifer Tube Sampling Dates, 2011

Supp.[a]	Tube Name	Frequency[b]	2011 Sample Dates[c]	Comments
	AT-3-5-S	SA	3/29/2011	
		SA	11/30/2011	
	C6350	SA	3/29/2011	
		SA	11/30/2011	
	C6351	SA	3/29/2011	
		SA	11/30/2011	
	AT-3-6-S	SA	3/29/2011	
		SA	11/30/2011	
	AT-3-6-M	A	3/29/2011	Delayed from fall 2010
		A	11/30/2011	
	AT-3-6-D	SA	3/29/2011	
		SA	11/30/2011	
	AT-3-7-S	A	3/29/2011	Delayed from fall 2010
		A	12/1/2011	
	AT-3-7-M	SA	3/29/2011	
		SA		No yield 12/1/2011
	AT-3-7-D	SA	3/29/2011	
		SA	12/1/2011	Tube mislabeled (PVC correct)
	AT-3-8-S	SA	3/29/2011	
		SA	12/1/2011	
	AT-3-8-M	A	3/29/2011	Delayed from fall 2010
		A	12/1/2011	
	AT-3-8-D	A		Not scheduled; no yield previous years

Note: Aquifer tubes are listed in order of location, upstream to downstream. Clusters of tubes are indicated by alternating shades.

a. An x in this column indicates tubes or sampling events that are not included in the aquifer tube SAP (*Sampling and Analysis Plan for Aquifer Sampling Tubes*, DOE/RL-2000-59, Rev. 1). These include aquifer tubes installed for River Corridor remedial investigation/feasibility studies, and increased sampling frequency at the discretion of project staff.

b. Abbreviations are as follows:

A = to be sampled annually
M = to be sampled monthly
Q = to be sampled quarterly
SA = to be sampled semiannually

c. This column includes dates sampled in 2011, without regard to when the tube was scheduled to be sampled. A blank in this column means the tube was not sampled in 2011. If both date and comment are blank, it means a sampling trip was not attempted because of schedule constraints or other factors.

SC = specific conductance
PVC = polyvinyl chloride

Table C-3. Nonroutine Aquifer Tube Sampling at 100-N Apatite Barrier, 2011

Tube Name	Sample Date	Comment
N116Array-1A	9/16/2011	
	9/28/2011	
	10/13/2011	
N116Array-2A	6/27/2011	
	9/16/2011	
	9/28/2011	
	10/13/2011	
APT-1	5/2/2011	
N116Array-3A	6/27/2011	
		Unsuccessful 11/10/2011
N116Array-4A	6/27/2011	
	11/10/2011	
NVP2-116.0	6/27/2011	
	11/10/2011	
N116Array-6A	6/27/2011	
	11/10/2011	
APT-5	6/27/2011	
C7881	6/27/2011	
	9/27/2011	
	10/12/2011	
	10/27/2011	
C7882	6/27/2011	
N116Array-8A	9/27/2011	
	10/12/2011	
	10/27/2011	

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