

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005

[ft bls, feet below land surface; $\mu\text{S}/\text{cm}$, microsiemens per centimeter at 25°C; ppm, parts per million; mg/L, milligrams per liter; $\mu\text{g}/\text{L}$, micrograms per liter; <, less than; deg C., degrees Celsius; CMT, continuous multilevel channel; PZ, piezometer; SS, stainless steel piezometer with inner Teflon tubing; Mini, mini porewater samplers; DS, diffusion sampler; a '-2' after a site number indicates a duplicate sample; Dashes indicate that no samples were collected.]

Device ID	Device Type	Hydro-geologic Unit	Depth, Screened Interval (ft bls)	Date sampled	Time	Specific conductance, $\mu\text{S}/\text{cm}$	pH	Water temp. deg C.	Alkalinity, mg/L as CaCO_3
PTZ1A	3/4" PVC PZ	Wetland	3.5-4.5	8/30/2004	1100	965	4.0	24.1	--
PTZ1B	3/4" PVC PZ	Wetland	7.5-8.5	8/30/2004	1150	344	6.1	19.8	91.3
PTZ1C	1/2" SS PZ	Aquifer	13-14	9/1/2004	1000	936	4.0	21.7	--
PTZ1C-2	1/2" SS PZ	Aquifer	13-14	9/1/2004--Dup	1010	--	--	--	--
PTZ1D	1/2" SS PZ	Aquifer	24.7-25.7	8/30/2004	1300	144	5.0	17.3	6.5
PTZ1D-2	1/2" SS PZ	Aquifer	24.7-25.7	8/30/04--Dup	1300	--	--	--	--
PTZ1E	1/2" SS PZ	Aquifer	35-36	Dry	--	--	--	--	--
PTZ2A	3/4" PVC PZ	Wetland	6-7	9/7/2004	0930	1488	6.7	24.7	382
PTZ2A	3/4" PVC PZ	Wetland	6-7	9/10/2004	0935	--	--	--	--
PTZ2B	3/4" PVC PZ	Wetland	12-13	Dry	--	--	--	--	--
PTZ2C	1/2" SS PZ	Aquifer	20-21	9/2/2004	1140	800	5.6	21.4	30.0
PTZ2D	1/2" SS PZ	Aquifer	29.5-30.5	9/3/2004	1420	261	4.5	21.0	--
PTZ2E	1/2" SS PZ	Aquifer	37.7-38.7	9/1/2004	1300	219	4.5	22.9	--
PTZ4A	2" PVC	Wetland	6.5-7.5	9/7/2004	1530	502	5.4	19.9	--
PTZ4B	2" PVC	Wetland	9-10	9/8/2004	0840	338	4.8	16.9	2
PTZ4C	2" PVC	Aquifer	11.6-12.6	9/7/2004	1610	577	4.2	18.3	--
PTC6A	CMT	Wetland	2.8-3.2	8/27/2004	0815	558	4.8	22.5	--
PTC6A	CMT	Wetland	2.8-3.2	9/2/2004	1445	665	4.0	24.9	--
PTC6B	CMT	Wetland	4.8-5.2	8/27/2004	0905	603	4.0	19.9	--
PTC6C	CMT	Wetland	7.8-8.2	8/27/2004	1030	525	6.1	20.7	28.0
PTC6D	CMT	Wetland	9.8-10.2	8/30/2004	1000	960	5.2	23.0	--
PTC6E	CMT	Aquifer	11.8-12.0	8/30/2004	1200	912	5.1	23.4	--
PTC7A	CMT	Wetland	2.8-3.2	8/26/2004	0850	920	4.0	23.0	--
PTC7A	CMT	Wetland	2.8-3.2	9/1/2004	1515	909	3.9	23.2	--
PTC7B	CMT	Wetland	4.8-5.2	8/26/2004	0925	901	4.0	19.5	--
PTC7B	CMT	Wetland	4.8-5.2	9/1/2004	1615	901	3.9	20.7	--
PTC7C	CMT	Wetland	7.8-8.2	8/30/2004	1130	799	5.0	21.1	30.0
PTC7C	CMT	Wetland	7.8-8.2	9/3/2004	0945	705	5.9	21.3	--
PTC7D	CMT	Wetland	10.3-10.5	8/30/2004	1115	678	3.7	20.5	--
PTC7D	CMT	Wetland	10.3-10.5	9/3/2004	1010	371	5.7	21.1	29.0
PTC8A	CMT	Wetland	2.8-3.2	8/30/2004	1415	465	4.6	22.9	--
PTC8A-2	CMT	Wetland	2.8-3.2	8/30/2004-Dup	1415	--	--	--	--
PTC8B	CMT	Wetland	4.8-5.2	8/30/2004	1200	699	4.8	22.6	5.2
PTC8C	CMT	Wetland	7.8-8.2	9/1/2004	0845	770	5.2	20.9	--
PTC8C	CMT	Wetland	7.8-8.2	9/2/2004	0910	--	--	--	14.3
PTC8D	CMT	Wetland	9.8-10.2	8/27/2004	1240	883	6.0	22.4	56.0
PTC8E	CMT	Aquifer	11.8-12.0	8/27/2004	1040	764	4.6	22.8	--
PTC9A	CMT	Wetland	2.8-3.2	9/7/2004	1120	917	4.0	22.4	--
PTC9B	CMT	Wetland	4.8-5.2	9/7/2004	1225	891	4.0	22.0	--
PTC9C	CMT	Wetland	7.8-8.2	8/26/2004	0922	893	4.0	20.1	--
PTC9C-2	CMT	Wetland	7.8-8.2	8/26/2004-Dup	0922	--	--	--	--
PTC9D	CMT	Wetland	9.8-10.2	8/26/2004	1350	1099	4.1	23.5	--
PTC9E	CMT	Aquifer	12.1-12.3	8/26/2004	1330	720	3.9	22.9	--
PTC10A	CMT	Wetland	2.4-2.8	9/1/2004	1500	1140	3.9	23.4	--
PTC10B	CMT	Wetland	4.4-4.8	9/1/2004	1200	933	4.0	22.5	--
PTC10C	CMT	Wetland	7.4-7.8	9/1/2004	1315	1093	5.9	20.3	--
PTC10C	CMT	Wetland	7.4-7.8	9/8/2004	--	--	--	--	44.3
PTC10D	CMT	Wetland	9.4-9.8	9/1/2004	1430	1107	5.9	21.2	--
PTC10D	CMT	Wetland	9.4-9.8	9/8/2004	--	--	--	--	42.0
PTC10E	CMT	Aquifer	12.6-12.8	9/1/2004	0830	944	4.6	20.9	--
PTC10E-2	CMT	Aquifer	12.6-12.8	9/1/2004-Dup	0835	--	--	--	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Date sampled	Time	Sulfide, mg/L	Ammonia, mg/L	Phos- phate, as PO4 mg/L	Nitrate as NO3, mg/L	Iron, (Fe2+) mg/L, <10 range	Iron, (Fe2+) mg/L, >10 range	Methane, µg/L	Methane duplicate µg/L
PTZ1A	8/30/2004	1100	1.75	< 0.70	--	< 0.2	--	4.65	213	246
PTZ1B	8/30/2004	1150	< 0.10	--	--	--	--	0.25	--	--
PTZ1C	9/1/2004	1000	0.48	0.78	1.15	1.27	0.02	0.25	346	357
PTZ1C-2	9/1/2004--Dup	1010	--	0.93	--	0.99	--	--	--	--
PTZ1D	8/30/2004	1300	0.27	1.3	--	0.58	< 0.01	--	<34.4	<37.5
PTZ1D-2	8/30/04--Dup	1300	--	1.2	--	--	--	--	--	--
PTZ1E	Dry	--	--	--	--	--	--	--	--	--
PTZ2A	9/7/2004	0930	--	--	--	--	--	--	--	--
PTZ2A	9/10/2004	0935	< 0.10	< 0.70	--	--	--	< 0.1	7,830	7,470
PTZ2B	Dry	--	--	--	--	--	--	--	--	--
PTZ2C	9/2/2004	1140	0.39	< 0.70	0.75	< 0.2	2.22	2.09	2,310	2,300
PTZ2D	9/3/2004	1420	< 0.10	< 0.88	< 0.75	0.42	< 0.01	--	--	--
PTZ2E	9/1/2004	1300	< 0.10	< 0.70	< 0.75	0.45	0.02	0.05	<34.5	<43.0
PTZ4A	9/7/2004	1530	1.17	< 0.70	--	--	0.26	--	94.5	91.8
PTZ4B	9/8/2004	0840	< 0.10	< 0.70	--	--	--	< 0.1	<35.3	<33.3
PTZ4C	9/7/2004	1610	< 0.10	< 0.70	--	--	< 0.01	< 0.1	<34.5	<30.9
PTC6A	8/27/2004	0815	--	--	--	--	--	1.30	<31.5	<34.8
PTC6A	9/2/2004	1445	< 0.10	< 0.70	< 0.75	< 0.2	--	2.64	<33.9	<36.8
PTC6B	8/27/2004	0905	0.24	< 0.70	< 0.75	< 0.2	--	0.68	<38.4	<37.8
PTC6C	8/27/2004	1030	< 0.13	< 0.70	--	< 0.2	--	2.79	<29.2	<39.5
PTC6D	8/30/2004	1000	--	--	--	--	--	--	87.9	85.8
PTC6E	8/30/2004	1200	0.24	0.7	--	--	1.46	--	42.2	41.4
PTC7A	8/26/2004	0850	1.38	0.79	--	--	--	5.68	146	156
PTC7A	9/1/2004	1515	2.63	< 0.70	< 0.75	< 0.2	--	4.28	162	151
PTC7B	8/26/2004	0925	1.35	< 0.70	--	--	--	4.34	239	244
PTC7B	9/1/2004	1615	1.73	< 0.70	--	--	--	3.34	214	240
PTC7C	8/30/2004	1130	< 0.10	< 0.70	--	--	--	3.16	265	260
PTC7C	9/3/2004	0945	< 0.10	< 0.70	--	--	--	--	375	429
PTC7D	8/30/2004	1115	0.34	< 0.70	--	--	--	17.2	189	203
PTC7D	9/3/2004	1010	0.12	< 0.70	--	--	--	13.8	176	169
PTC8A	8/30/2004	1415	0.10	< 0.70	--	--	--	2.21	<29.7	<26.8
PTC8A-2	8/30/2004-Dup	1415	< 0.10	< 0.70	--	--	--	2.29	--	--
PTC8B	8/30/2004	1200	< 0.10	< 0.70	--	< 0.2	--	0.80	38.7	39.6
PTC8C	9/1/2004	0845	< 0.10	< 0.70	< 0.75	< 0.2	--	--	84.1	85.0
PTC8C	9/2/2004	0910	--	--	--	--	--	--	--	--
PTC8D	8/27/2004	1240	0.30	< 0.70	< 0.75	--	--	3.26	63.8	56.8
PTC8E	8/27/2004	1040	1.12	< 0.70	1.25	0.59	0.22	--	42.7	42.8
PTC9A	9/7/2004	1120	< 0.10	< 0.70	--	--	0.91	--	53.7	59.1
PTC9B	9/7/2004	1225	< 0.10	< 0.70	--	--	3.55	2.56	52.5	53.3
PTC9C	8/26/2004	0922	< 0.10	< 0.70	--	--	--	0.32	71.8	53.5
PTC9C-2	8/26/2004-Dup	0922	0.20	< 0.70	--	--	--	--	--	--
PTC9D	8/26/2004	1350	0.38	0.84	--	--	--	7.41	37.2	<34.0
PTC9E	8/26/2004	1330	< 0.13	< 0.70	--	--	0.13	--	<33.2	<36.2
PTC10A	9/1/2004	1500	--	--	--	--	--	7.89	62.4	61.9
PTC10B	9/1/2004	1200	0.10	< 0.70	< 0.75	< 0.2	--	6.31	57.6	54.8
PTC10C	9/1/2004	1315	0.38	< 0.70	< 0.75	< 0.2	--	19.5	91.9	98.1
PTC10C	9/8/2004	--	--	--	--	--	--	17.7	--	--
PTC10D	9/1/2004	1430	< 0.10	< 0.70	< 0.75	0.22	--	28.3	76.7	75.2
PTC10D	9/8/2004	--	--	--	--	--	--	--	--	--
PTC10E	9/1/2004	0830	< 0.10	< 0.70	< 0.75	< 0.2	--	8.51	42.6	38.1
PTC10E-2	9/1/2004-Dup	0835	--	0.76	--	0.31	--	--	--	--

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Device ID	Device Type	Hydro-geologic Unit	Depth, Screened Interval (ft bls)	Date sampled	Time	Specific conductance, $\mu\text{S}/\text{cm}$	pH	Water temp. deg C.	Alkalinity, mg/L as CaCO_3
PTC11A	CMT	Wetland	1.8-2.2	9/7/2004	1120	734	3.9	23.7	--
PTC11B	CMT	Wetland	4.8-5.2	9/7/2004	--	804	4.0	19.9	--
PTC11C	CMT	Wetland	7.8-8.2	9/7/2004	--	832	3.9	20.2	--
PTC11D	CMT	Wetland	9.8-10.2	8/25/2004	1523	972	4.1	18.9	--
PTC11D	CMT	Wetland	9.8-10.2	9/7/2004	--	836	3.9	19.5	--
PTC11E	CMT	Wetland	11.8-12.2	8/25/2004	1615	834	4.4	18.6	--
PTC11E	CMT	Wetland	11.8-12.2	9/2/2004	1045	827	4.1	18.5	--
PTC11F	CMT	Aquifer	14-14.2	8/26/2004	0915	782	3.8	19.5	--
PTC11F	CMT	Aquifer	14-14.2	9/2/2004	1130	784	3.8	18.6	--
PTC11F-2	CMT	Aquifer	14-14.2	9/2/2004--Dup	1130	--	--	--	--
PTC12A	CMT	Wetland	2.8-3.2	8/26/2004	1032	939	3.6	22.7	--
PTC12B	CMT	Wetland	4.8-5.2	9/1/2004	1140	819	4.2	23.2	--
PTC12C	CMT	Wetland	7.8-8.2	9/7/2004	1115	844	5.5	24.0	34.4
PTC12C	CMT	Wetland	7.8-8.2	9/8/2004	0850	--	--	--	--
PTC12D	CMT	Wetland	9.8-10.2	9/2/2004	0945	951	6.0	26.3	--
PTC12D	CMT	Wetland	9.8-10.2	9/7/2004	1050	--	--	--	56.5
PTC12E	CMT	Aquifer	11.8-12.2	9/1/2004	1340	887	5.8	25.2	31.7
PTC12F	CMT	Aquifer	15.2-15.4	9/1/2004	1050	808	5.7	20.1	28.2
PTC13A	CMT	Wetland	2.8-3.2	9/1/2004	1420	609	3.9	25.6	--
PTC13B	CMT	Wetland	4.8-5.2	9/1/2004	1500	655	3.9	24.9	--
PTC13C	CMT	Wetland	7.8-8.2	9/1/2004	1540	809	3.7	20.5	--
PTC13D	CMT	Wetland	9.8-10.2	9/1/2004	1555	757	3.6	24.2	--
PTC1A	CMT	Wetland	4.8-5.2	9/3/2004	1345	926	4.0	21.5	--
PTC1B	CMT	Wetland	7.8-8.2	8/12/2004	1330	989	4.9	20.8	--
PTC1B	CMT	Wetland	7.8-8.2	8/25/2004	1140	866	6.1	22.3	--
PTC1B	CMT	Wetland	7.8-8.2	9/8/2004	1355	921	5.5	21.9	47.5
PTC1B	CMT	Wetland	7.8-8.2	9/10/2004	--	--	--	--	--
PTC1C	CMT	Aquifer	11.3-11.5	9/3/2004	1420	832	4.0	19.5	--
PTC2A	CMT	Wetland	4.8-5.2	8/25/2004	1324	--	--	--	--
PTC2A	CMT	Wetland	4.8-5.2	9/2/2004	1221	725	3.9	20.6	--
PTC2B	CMT	Wetland	7.8-8.2	8/25/2004	1333	811	5.4	24.3	--
PTC2B	CMT	Wetland	7.8-8.2	9/7-10/2004	--	784	4.6	22.3	--
PTC2C	CMT	Aquifer	11.8-12.0	8/25/2004	1341	805	5.8	19.6	--
PTC2C	CMT	Aquifer	11.8-12.0	9/7-10/2004	1310	835	5.1	24.7	12.4
PTC3A	CMT	Wetland	4.4-4.8	9/3/2004	1135	865	4.0	21.6	--
PTC3B	CMT	Wetland	7.4-7.8	9/1/2004	1210	538	3.8	19.4	--
PTC3C	CMT	Aquifer	13.1-13.3	9/1/2004	1315	528	3.8	19.2	--
PTC4A	CMT	Wetland	4.8-5.2	9/7/2004	0930	867	3.9	17.6	--
PTC4A	CMT	Wetland	4.8-5.2	9/8/2004	1055	--	--	--	--
PTC4B	CMT	Wetland	7.8-8.2	9/7/2004	1020	842	3.9	19.6	--
PTC4C	CMT	Aquifer	11.8-12.0	8/25/2004	1458	654	3.9	16.1	--
PTC4C	CMT	Aquifer	11.8-12.0	9/8/2004	1025	--	--	--	--
PTC4C-2	CMT	Aquifer	11.8-12.0	9/8/2004-Dup	--	--	--	--	--
PTC5A	CMT	Wetland	4.8-5.2	8/26/2004	1510	650	3.9	21.2	--
PTC5A	CMT	Wetland	4.8-5.2	9/7/2004	1012	750	4.0	20.5	--
PTC5B	CMT	Wetland	7.8-8.2	8/27/2004	0900	686	4.1	20.9	--
PTC5B	CMT	Wetland	7.8-8.3	8/30/2004	--	--	--	--	--
PTC5B	CMT	Wetland	7.8-8.2	9/1/2004	1400	612	3.9	21.3	--
PTC5B-2	CMT	Wetland	7.8-8.2	9/1/2004-Dup	--	--	--	--	--
PTC5C	CMT	Aquifer	11.8-12.0	8/30/2004	1005	935	3.7	25.1	--
PTC5C	CMT	Aquifer	11.8-12.0	9/2/2004	1000	--	--	--	--

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Device ID	Date sampled	Time	Sulfide, mg/L	Ammonia, mg/L	Phos- phate, as PO4 mg/L	Nitrate as NO3, mg/L	Iron, (Fe2+) mg/L, <10 range	Iron, (Fe2+) mg/L, >10 range	Methane, µg/L	Methane duplicate µg/L
PTC11A	9/7/2004	1120	< 0.10	< 0.70	--	--	0.22	--	<33.0	<30.1
PTC11B	9/7/2004	--	--	--	--	--	1.70	--	86.8	91.5
PTC11C	9/7/2004	--	--	--	--	--	1.48	--	71.5	79.6
PTC11D	8/25/2004	1523	--	--	--	--	--	2.45	123	108
PTC11D	9/7/2004	--	--	--	--	--	1.78	--	66.2	77.9
PTC11E	8/25/2004	1615	0.93	< 0.70	--	--	--	1.82	117	115
PTC11E	9/2/2004	1045	0.18	< 0.70	--	--	0.19	--	136	135
PTC11F	8/26/2004	0915	< 0.10	< 0.70	--	--	0.18	--	<36.0	40.3
PTC11F	9/2/2004	1130	0.17	< 0.70	--	--	0.18	0.13	<61.4	42.4
PTC11F-2	9/2/2004--Dup	1130	--	--	--	--	0.19	--	--	--
PTC12A	8/26/2004	1032	0.30	< 0.70	< 0.75	< 0.2	--	5.20	65.2	68.4
PTC12B	9/1/2004	1140	0.36	< 0.70	< 0.75	0.9	--	7.17	104	132
PTC12C	9/7/2004	1115	--	--	--	--	--	4.10	123	124
PTC12C	9/8/2004	0850	< 0.10	< 0.70	< 0.75	< 0.2	--	2.09	--	--
PTC12D	9/2/2004	0945	--	--	--	--	--	--	--	--
PTC12D	9/7/2004	1050	< 0.10	< 0.70	< 0.75	< 0.2	--	6.24	150	127
PTC12E	9/1/2004	1340	--	--	--	--	--	--	103	94.7
PTC12F	9/1/2004	1050	0.13	< 0.70	< 0.75	< 0.2	--	49.8	206	211
PTC13A	9/1/2004	1420	0.49	1.21	--	--	1.62	--	<33.6	<32.0
PTC13B	9/1/2004	1500	0.25	< 0.70	--	--	--	4.44	<32.8	<36.8
PTC13C	9/1/2004	1540	< 0.10	< 0.70	--	--	--	10.6	<34.1	<32.3
PTC13D	9/1/2004	1555	< 0.10	< 0.70	--	--	--	12.2	32.5	29.7
PTC1A	9/3/2004	1345	0.45	< 0.70	--	--	--	4.83	105	96.5
PTC1B	8/12/2004	1330	--	--	--	--	--	--	--	--
PTC1B	8/25/2004	1140	--	--	--	--	--	--	--	--
PTC1B	9/8/2004	1355	--	--	--	--	--	--	<33.5	<48.0
PTC1B	9/10/2004	--	< 0.17	< 1.17	--	--	6.09	5.61	--	--
PTC1C	9/3/2004	1420	< 0.10	< 0.70	--	--	0.2	--	<33.8	<36.9
PTC2A	8/25/2004	1324	--	--	--	--	--	--	--	--
PTC2A	9/2/2004	1221	0.28	1.29	< 0.75	< 0.2	--	0.30	<39.0	<36.3
PTC2B	8/25/2004	1333	--	--	--	--	--	--	--	--
PTC2B	9/7-10/2004	--	< 0.10	< 0.88	--	--	--	2.72	<32.9	<38.1
PTC2C	8/25/2004	1341	--	--	--	--	--	--	--	--
PTC2C	9/7-10/2004	1310	< 0.10	< 0.70	< 0.75	< 0.2	--	13.1	268	279
PTC3A	9/3/2004	1135	0.28	< 0.88	< 0.75	< 0.2	--	10.6	<39.5	<33.8
PTC3B	9/1/2004	1210	< 0.10	< 0.70	--	--	--	0.72	<33.3	<35.1
PTC3C	9/1/2004	1315	< 0.10	< 0.70	< 0.75	1.04	--	0.17	<32.6	<36.3
PTC4A	9/7/2004	0930	< 0.10	< 0.70	0.75	0.5	--	2.40	<33.6	<32.5
PTC4A	9/8/2004	1055	--	--	--	--	--	2.72	--	--
PTC4B	9/7/2004	1020	< 0.10	< 0.70	0.9	0.67	3.41	2.32	<35.0	<34.1
PTC4C	8/25/2004	1458	0.11	< 0.70	--	--	0.22	--	<37.9	<34.3
PTC4C	9/8/2004	1025	--	--	1.35	1.1	--	--	--	--
PTC4C-2	9/8/2004-Dup	--	--	--	--	0.98	--	--	--	--
PTC5A	8/26/2004	1510	< 0.13	< 0.88	--	--	1.20	--	<26.9	<28.0
PTC5A	9/7/2004	1012	--	--	--	--	--	6.32	<30.7	<33.6
PTC5B	8/27/2004	0900	< 0.10	2.29	--	--	--	0.10	<33.2	<39.4
PTC5B	8/30/2004	--	--	--	--	--	8.38	7.80	--	--
PTC5B	9/1/2004	1400	< 0.10	< 0.70	--	--	0.80	--	<28.4	<19.5
PTC5B-2	9/1/2004-Dup	--	--	< 0.70	--	--	--	--	--	--
PTC5C	8/30/2004	1005	< 0.10	< 0.70	--	--	2.86	--	<29.8	<39.2
PTC5C	9/2/2004	1000	< 0.10	< 0.70	--	--	--	16.1	<27.3	<34.0

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Device Type	Hydro-geologic Unit	Depth, Screened Interval (ft bls)	Date sampled	Time	Specific conductance, $\mu\text{S}/\text{cm}$	pH	Water temp. deg C.	Alkalinity, mg/L as CaCO_3
PTN1	Mini	Wetland	1.0	11/17/2004	1015	732	5.0	14.5	--
PTN1	Mini	Wetland	1.0	11/29/2004	1125	759	4.3	9.6	--
PTN2	Mini	Wetland	1.0	11/16/2004	1440	574	4.7	18.2	--
PTN2	Mini	Wetland	1.0	11/30/2004	1110	467	4.7	12.0	--
PTN3	Mini	Wetland	1.0	11/16/2004	1335	502	5.0	18.2	--
PTN3	Mini	Wetland	1.0	11/29/2004	1450	451	5.1	10.3	--
PTN4	Mini	Wetland	1.0	11/17/2004	1025	610	4.6	14.1	--
PTN4	Mini	Wetland	1.0	11/29/2004	1105	562	4.2	8.8	--
PTN5	Mini	Wetland	1.0	11/16/2004	1350	720	4.5	17.6	--
PTN5	Mini	Wetland	1.0	11/30/2004	0955	672	4.5	13.5	--
PTN6	Mini	Wetland	1.0	11/17/2004	0915	454	5.4	12.4	--
PTN6	Mini	Wetland	1.0	11/29/2004	1500	283	4.6	10.3	--
PTN6-2	Mini	Wetland	1.0	11/29/2004	--	--	--	--	--
PTN7	Mini	Wetland	1.0	11/17/2004	1050	758	5.7	14.5	--
PTN7	Mini	Wetland	1.0	11/29/2004	1050	760	5.8	9.6	--
PTN8	Mini	Wetland	1.0	11/16/2004	1325	557	5.7	17.6	--
PTN8	Mini	Wetland	1.0	11/30/2004	0930	490	6.0	9.1	--
PTN9	Mini	Wetland	1.0	11/16/2004	1430	485	4.5	17.7	--
PTN9	Mini	Wetland	1.0	11/30/2004	0911	501	4.4	11.6	--
PTC1A	CMT	Wetland	4.8-5.2	11/16/2004	1030	686	3.9	13.6	--
PTC1A	CMT	Wetland	4.8-5.2	11/29/2004	1316	719	4.0	11.1	--
PTC1B	CMT	Wetland	7.8-8.2	11/17/2004	1100	884	5.5	13.8	--
PTC1B	CMT	Wetland	7.8-8.2	11/29/2004	1355	912	5.3	12.9	--
PTC1C	CMT	Wetland	11.3-11.5	11/16/2004	1220	746	4.0	19.1	--
PTC1C	CMT	Wetland	11.3-11.5	11/29/2004	1350	758	4.0	10.6	--
PTC2A	CMT	Wetland	4.8-5.2	11/16/2004	1000	330	4.0	11.9	--
PTC2A	CMT	Wetland	4.8-5.2	11/29/2004	1410	318	4.0	10.3	--
PTC2A-2	CMT	Wetland	4.8-5.2	11/29/2004	--	--	--	--	--
PTC2B	CMT	Wetland	7.8-8.2	11/16/2004	--	--	--	--	--
PTC2B	CMT	Wetland	7.8-8.2	11/29/2004	1437	770	5.4	11.4	--
PTC2C	CMT	Wetland	11.8-12.0	11/29/2004	--	--	--	--	--
PTC3A	CMT	Wetland	4.4-4.8	11/16/2004	1305	555	4.0	15.7	--
PTC3A	CMT	Wetland	4.4-4.8	11/30/2004	1100	509	4.1	10.4	--
PTC3A-2	CMT	Wetland	4.4-4.8	11/30/2004 Dup	1100	--	--	--	--
PTC3B	CMT	Wetland	7.4-7.8	11/16/2004	1135	824	4.5	17.4	--
PTC3B	CMT	Wetland	7.4-7.8	11/30/2004	1220	840	4.6	10.3	--
PTC3C	CMT	Wetland	13.1-13.3	11/16/2004	1035	474	4.0	12.1	--
PTC3C	CMT	Wetland	13.1-13.3	11/30/2004	1145	459	3.9	10.2	--
PTC3C-2	CMT	Wetland	13.1-13.3	11/30/2004 Dup	1145	--	--	--	--
PTC4A	CMT	Wetland	4.8-5.2	11/16/2004	1330	632	4.0	16.6	--
PTC4A	CMT	Wetland	4.8-5.2	11/29/2004	1215	598	4.0	9.7	--
PTC4B	CMT	Wetland	7.8-8.2	11/16/2004	1410	662	3.9	16.8	--
PTC4B	CMT	Wetland	7.8-8.2	11/29/2004	1235	714	3.8	10.0	--
PTC4C	CMT	Wetland	11.8-12.0	11/16/2004	1235	587	3.9	15.0	--
PTC4C	CMT	Wetland	11.8-12.0	11/29/2004	1259	717	3.8	10.8	--
PTC5A	CMT	Wetland	4.8-5.2	11/16/2004	1100	682	4.0	12.4	--
PTC5A	CMT	Wetland	4.8-5.2	11/30/2004	0959	686	4.0	10.9	--
PTC5B	CMT	Wetland	7.8-8.2	11/16/2004	1120	418	3.8	14.7	--
PTC5B	CMT	Wetland	7.8-8.2	11/30/2004	1115	531	3.9	12.0	--
PTC5C	CMT	Wetland	11.8-12.0	11/16/2004	1325	864	4.5	15.8	--
PTC5C	CMT	Wetland	11.8-12.0	11/30/2004	--	910	3.7	12.4	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Date sampled	Time	Sulfide, mg/L	Ammonia, mg/L	Phos- phate, as PO4 mg/L	Nitrate as NO3, mg/L	Iron, (Fe2+) mg/L, <10 range	Iron, (Fe2+) mg/L, >10 range	Methane, µg/L	Methane duplicate	µg/L
PTN1	11/17/2004	1015	--	--	--	--	--	--	--	--	--
PTN1	11/29/2004	1125	1.19	< 0.70	--	--	--	11.8	55.4	--	55.2
PTN2	11/16/2004	1440	--	--	--	--	--	--	--	--	--
PTN2	11/30/2004	1110	0.73	< 0.70	--	--	--	12.8	41.8	--	<43.4
PTN3	11/16/2004	1335	--	--	--	--	--	--	--	--	--
PTN3	11/29/2004	1450	0.91	< 0.70	--	--	--	18.3	75.5	--	84.2
PTN4	11/17/2004	1025	--	--	--	--	--	--	--	--	--
PTN4	11/29/2004	1105	< 0.10	< 0.70	--	--	--	12.6	36.5	--	44.7
PTN5	11/16/2004	1350	--	--	--	--	--	--	--	--	--
PTN5	11/30/2004	0955	1.15	0.72	--	--	--	23.9	69.8	--	65.4
PTN6	11/17/2004	0915	--	--	--	--	--	--	--	--	--
PTN6	11/29/2004	1500	0.39	< 0.70	--	--	--	7.55	64.7	--	60.5
PTN6-2	11/29/2004	--	--	--	--	--	--	7.55	--	--	--
PTN7	11/17/2004	1050	--	--	--	--	--	--	--	--	--
PTN7	11/29/2004	1050	< 0.10	< 0.70	--	--	--	78.6	122	--	131
PTN8	11/16/2004	1325	--	--	--	--	--	--	--	--	--
PTN8	11/30/2004	0930	< 0.10	< 0.70	--	--	--	53.0	223	--	215
PTN9	11/16/2004	1430	--	--	--	--	--	--	--	--	--
PTN9	11/30/2004	0911	0.13	< 0.70	--	--	--	4.97	94.6	--	108
PTC1A	11/16/2004	1030	--	--	--	--	--	--	--	--	--
PTC1A	11/29/2004	1316	0.25	< 0.70	--	--	--	4.10	41.5	--	42.6
PTC1B	11/17/2004	1100	--	--	--	--	--	--	--	--	--
PTC1B	11/29/2004	1355	--	--	--	--	--	--	--	--	--
PTC1C	11/16/2004	1220	--	--	--	--	--	--	--	--	--
PTC1C	11/29/2004	1350	< 0.10	< 0.70	--	--	--	2.75	32.9	--	<36.1
PTC2A	11/16/2004	1000	--	--	--	--	--	--	--	--	--
PTC2A	11/29/2004	1410	< 0.10	< 0.70	--	--	1.37	--	<27.5	--	<30.6
PTC2A-2	11/29/2004	--	--	--	--	--	1.36	--	--	--	--
PTC2B	11/16/2004	--	--	--	--	--	--	--	--	--	--
PTC2B	11/29/2004	1437	--	--	--	--	--	--	--	--	--
PTC2C	11/29/2004	--	--	--	--	--	--	--	--	--	--
PTC3A	11/16/2004	1305	--	--	--	--	--	--	--	--	--
PTC3A	11/30/2004	1100	0.29	< 0.70	--	--	--	5.89	<49.9	--	<27.4
PTC3A-2	11/30/2004 Dup	1100	0.32	< 0.70	--	--	--	5.70	--	--	--
PTC3B	11/16/2004	1135	--	--	--	--	--	--	--	--	--
PTC3B	11/30/2004	1220	0.75	1.6	--	--	--	21.2	<32.7	--	<46.1
PTC3C	11/16/2004	1035	--	--	--	--	--	--	--	--	--
PTC3C	11/30/2004	1145	0.14	< 0.70	--	--	0.82	0.60	<34.9	--	<28.1
PTC3C-2	11/30/2004 Dup	1145	0.18	< 0.70	--	--	--	--	--	--	--
PTC4A	11/16/2004	1330	--	--	--	--	--	--	--	--	--
PTC4A	11/29/2004	1215	0.15	< 0.70	--	--	2.07	1.89	<30.6	--	<32.3
PTC4B	11/16/2004	1410	--	--	--	--	--	--	--	--	--
PTC4B	11/29/2004	1235	< 0.10	< 0.70	--	--	1.22	--	<32.7	--	<30.7
PTC4C	11/16/2004	1235	--	--	--	--	--	--	--	--	--
PTC4C	11/29/2004	1259	< 0.10	< 0.70	--	--	0.07	--	<37.3	--	<32.7
PTC5A	11/16/2004	1100	--	--	--	--	--	--	--	--	--
PTC5A	11/30/2004	0959	< 0.10	< 0.70	--	--	--	3.00	34.6	--	35.0
PTC5B	11/16/2004	1120	--	--	--	--	--	--	--	--	--
PTC5B	11/30/2004	1115	< 0.10	< 0.70	--	--	0.48	--	<28.6	--	<37.7
PTC5C	11/16/2004	1325	--	--	--	--	--	--	--	--	--
PTC5C	11/30/2004	--	--	--	--	--	--	--	--	--	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Device Type	Hydro-geologic Unit	Depth, Screened Interval (ft bls)	Date sampled	Time	Specific conductance, $\mu\text{S}/\text{cm}$	pH	Water temp. deg C.	Alkalinity, mg/L as CaCO_3
PTZ1A	3/4" PVC PZ	Wetland	3.5-4.5	11/5/2004	1205	1050	4.0	15.6	--
PTZ1A	3/4" PVC PZ	Wetland	3.5-4.5	11/5/2004	1330	1050	4.0	15.6	--
PTZ1B	3/4" PVC PZ	Wetland	7.5-8.5	11/8/2004	1240	422	6.5	13.6	--
PTZ1B	1/2" SS PZ	Aquifer	7.5-8.5	11/8/2004	0900	422	6.5	13.6	--
PTZ1B	1/2" SS PZ	Aquifer	7.5-8.5	11/9/2004	--	--	--	--	77
PTZ1C	1/2" SS PZ	Aquifer	13-14	11/8/2004	1330	932	4.3	12.7	--
PTZ1D	1/2" SS PZ	Aquifer	24.7-25.7	11/8/2004	1500	183	5.5	12.9	7
PTZ1E	1/2" SS PZ	Aquifer	35-36	11/10/2004	1215	350	4.7	10.5	--
PTZ2A	3/4" PVC PZ	Wetland	6-7	11/5/2004	0920	1740	7.0	15.5	--
PTZ2A	3/4" PVC PZ	Wetland	6-7	11/9/2004	1440	--	--	--	--
PTZ2A	3/4" PVC PZ	Wetland	6-7	11/12/2004	--	--	--	--	375
PTZ2B	3/4" PVC PZ	Wetland	12-13	11/5/2004	1000	893	7.2	14.3	--
PTZ2C	1/2" SS PZ	Aquifer	20-21	11/9/2004	1530	638	5.9	12.8	--
PTZ2C	1/2" SS PZ	Aquifer	20-21	11/10/2004	--	--	--	--	31.4
PTZ2D	1/2" SS PZ	Aquifer	29.5-30.5	11/5/2004	1115	219	4.6	14.3	--
PTZ2E	1/2" SS PZ	Aquifer	37.7-38.7	11/10/2004	0945	239	4.7	12.0	3.0
PTZ2E	1/2" SS PZ	Aquifer	37.7-38.7	11/10/2004	--	--	--	--	--
PTC6A	CMT	Wetland	2.8-3.2	11/8/2004	1030	568	4.1	12.5	--
PTC6A	CMT	Wetland	2.8-3.2	11/8/2004	1100	--	--	--	--
PTC6B	CMT	Wetland	4.8-5.2	11/3/2004	0850	434	4.1	16.2	--
PTC6B	CMT	Wetland	4.8-5.2	11/3/2004	0930	--	--	--	--
PTC6C	CMT	Wetland	7.8-8.2	11/4/2004	1030	873	5.5	16.4	--
PTC6C	CMT	Wetland	7.8-8.2	11/5/2004	1000	--	--	--	--
PTC6D	CMT	Wetland	9.8-10.2	11/4/2004	0937	1000	5.5	15.4	--
PTC6D	CMT	Wetland	9.8-10.2	11/5/2004	1000	--	--	--	--
PTC6E	CMT	Aquifer	11.8-12.0	11/8/2004	1235	952	4.3	13.0	--
PTC6E	CMT	Aquifer	11.8-12.0	11/9/2004	1320	--	--	--	--
PTC7A	CMT	Wetland	2.8-3.2	11/3/2004	1200	864	4.1	17.7	--
PTC7B	CMT	Wetland	4.8-5.2	11/3/2004	1315	849	4.1	16.6	--
PTC7C	CMT	Wetland	7.8-8.2	11/4/2004	0852	707	5.9	18.2	--
PTC7D	CMT	Wetland	10.3-10.5	11/3/2004	1440	910	5.8	16.0	5.6
PTC8A	CMT	Wetland	2.8-3.2	11/1/2004	1230	484	4.6	21.9	--
PTC8A	CMT	Wetland	2.8-3.2	11/1/2004	1255	--	--	--	--
PTC8B	CMT	Wetland	4.8-5.2	11/1/2004	1420	696	4.5	20.9	--
PTC8B	CMT	Wetland	4.8-5.2	11/1/2004	1445	696	4.5	20.9	--
PTC8C	CMT	Wetland	7.8-8.2	11/2/2004	1335	767	5.6	20.8	--
PTC8C	CMT	Wetland	7.8-8.2	11/5/2004	0930	--	--	--	29
PTC8D	CMT	Wetland	9.8-10.2	11/1/2004	1600	889	5.7	16.3	--
PTC8D	CMT	Wetland	9.8-10.2	11/2/2004	1237	846	5.4	19.3	--
PTC8D	CMT	Wetland	9.8-10.2	11/2/2004	1237	--	--	--	--
PTC8D	CMT	Wetland	9.8-10.2	11/3/2004	--	--	--	--	20.7
PTC8E	CMT	Aquifer	11.8-12.0	11/2/2004	1335	810	4.4	18.2	--
PTC8E	CMT	Aquifer	11.8-12.0	11/2/2004	1355	--	--	--	--
PTC9A	CMT	Wetland	2.8-3.2	11/4/2004	0900	862	3.9	10.8	--
PTC9B	CMT	Wetland	4.8-5.2	11/4/2004	0950	825	4.0	9.9	--
PTC9C	CMT	Wetland	7.8-8.2	11/4/2004	1035	826	4.0	11.1	--
PTC9D	CMT	Wetland	9.8-10.2	11/8/2004	1200	987	4.0	12.3	--
PTC9D-2	CMT	Wetland	9.8-10.2	11/8/2004	--	--	--	--	--
PTC9E	CMT	Aquifer	12.1-12.3	11/8/2004	1010	482	3.8	12.3	--
PTC9E-2	CMT	Aquifer	12.1-12.3	11/8/2004	--	--	--	--	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Date sampled	Time	Sulfide, mg/L	Ammonia, mg/L	Phos- phate, as PO4 mg/L	Nitrate as NO3, mg/L	Iron, (Fe2+) mg/L, <10 range	Iron, (Fe2+) mg/L, >10 range	Methane, µg/L	Methane duplicate µg/L
PTZ1A	11/5/2004	1205	> 2.5	< 0.70	< 0.75	< 0.20	2.03	4.35	221	234
PTZ1A	11/5/2004	1330	--	--	--	--	--	--	--	--
PTZ1B	11/8/2004	1240	0.20	< 0.70	2.00	0.48	0.33	0.17	1,410	1,460
PTZ1B	11/8/2004	0900	--	--	2.33	< 0.20	--	--	--	--
PTZ1B	11/9/2004	--	--	--	--	--	--	--	--	--
PTZ1C	11/8/2004	1330	1.42	2.66	--	1.12	< 0.01	< 0.04	328	333
PTZ1D	11/8/2004	1500	0.13	< 0.70	< 0.75	0.45	--	< 0.04	<29.0	<33.9
PTZ1E	11/10/2004	1215	< 0.10	< 0.70	< 0.75	0.23	1.08	1.03	--	--
PTZ2A	11/5/2004	0920	--	--	--	--	--	--	2,690	2,620
PTZ2A	11/9/2004	1440	0.51	< 0.70	--	0.43	0.45	--	--	--
PTZ2A	11/12/2004	--	--	--	--	--	0.28	--	--	--
PTZ2B	11/5/2004	1000	0.15	0.93	5.80	0.57	0.37	0.23	4,980	4,910
PTZ2C	11/9/2004	1530	0.47	< 0.70	< 0.75	< 0.20	--	--	2,080	2,120
PTZ2C	11/10/2004	--	--	--	--	--	--	--	--	--
PTZ2D	11/5/2004	1115	< 0.10	< 0.70	< 0.75	0.36	< 0.01	< 0.04	<30.0	<40.1
PTZ2E	11/10/2004	0945	< 0.10	< 0.70	< 0.75	--	--	< 0.04	<37.9	<30.9
PTZ2E	11/10/2004	--	0.25	--	--	--	--	--	--	--
PTC6A	11/8/2004	1030	0.35	1.05	5.10	< 0.20	--	2.93	<36.7	<37.2
PTC6A	11/8/2004	1100	--	--	--	--	--	--	<36.7	<37.2
PTC6B	11/3/2004	0850	< 0.10	< 0.70	< 0.75	--	0.80	--	<31.9	<37.4
PTC6B	11/3/2004	0930	< 0.10	< 0.70	--	--	--	0.60	--	--
PTC6C	11/4/2004	1030	0.65	1.42	1.70	< 0.20	--	8.23	<40.6	34.1
PTC6C	11/5/2004	1000	--	--	--	--	--	--	--	--
PTC6D	11/4/2004	0937	< 0.10	--	< 0.75	--	--	23.2	78.0	84.7
PTC6D	11/5/2004	1000	--	--	< 0.75	--	--	23.4	--	--
PTC6E	11/8/2004	1235	0.29	1.15	1.45	0.46	--	--	<33.9	30.2
PTC6E	11/9/2004	1320	--	--	--	--	--	15.7	--	--
PTC7A	11/3/2004	1200	1.70	< 0.70	--	--	--	4.78	105	109
PTC7B	11/3/2004	1315	1.08	< 0.70	--	--	--	4.35	138	139
PTC7C	11/4/2004	0852	< 0.10	< 0.70	--	--	--	9.64	443	477
PTC7D	11/3/2004	1440	0.11	< 0.70	--	--	--	--	269	265
PTC8A	11/1/2004	1230	< 0.10	< 0.70	--	< 0.20	--	2.87	49.7	<38.0
PTC8A	11/1/2004	1255	--	--	--	--	--	2.44	--	--
PTC8B	11/1/2004	1420	--	--	--	--	1.73	1.58	72.1	67.1
PTC8B	11/1/2004	1445	--	--	--	--	--	--	--	--
PTC8C	11/2/2004	1335	< 0.10	< 0.70	< 0.75	< 0.20	--	9.27	164	176
PTC8C	11/5/2004	0930	--	--	--	--	--	--	--	--
PTC8D	11/1/2004	1600	--	--	--	--	--	--	107	126
PTC8D	11/2/2004	1237	--	--	--	--	--	5.58	--	--
PTC8D	11/2/2004	1237	--	--	--	--	--	5.09	--	--
PTC8D	11/3/2004	--	--	--	--	--	--	--	--	--
PTC8E	11/2/2004	1335	< 0.10	< 0.70	< 0.75	0.23	--	3.43	62.7	59.7
PTC8E	11/2/2004	1355	--	--	--	--	--	--	--	--
PTC9A	11/4/2004	0900	0.12	< 0.70	--	--	--	2.01	52.0	54.7
PTC9B	11/4/2004	0950	< 0.10	< 0.70	--	--	--	5.49	52.0	50.0
PTC9C	11/4/2004	1035	< 0.10	< 0.70	--	--	--	5.15	52.3	52.9
PTC9D	11/8/2004	1200	0.23	0.77	--	--	--	8.41	51.5	50.7
PTC9D-2	11/8/2004	--	--	--	--	--	--	8.23	--	--
PTC9E	11/8/2004	1010	0.10	< 0.70	--	--	0.05	< 0.4	<34.7	<29.7
PTC9E-2	11/8/2004	--	--	--	--	--	--	< 0.4	--	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Device Type	Hydro-geologic Unit	Depth, Screened Interval (ft bls)	Date sampled	Time	Specific conductance, $\mu\text{S}/\text{cm}$	pH	Water temp. deg C.	Alkalinity, mg/L as CaCO_3
PTC10A	CMT	Wetland	2.4-2.8	11/1/2004	1230	940	3.8	18.2	--
PTC10A	CMT	Wetland	2.4-2.8	11/1/2004	1300	940	3.8	18.2	--
PTC10B	CMT	Wetland	4.4-4.8	11/1/2004	1410	793	3.8	17.1	--
PTC10C	CMT	Wetland	7.4-7.8	11/2/2004	1200	1050	5.0	15.6	--
PTC10C	CMT	Wetland	7.4-7.8	11/3/2004	--	--	--	--	20.7
PTC10D	CMT	Wetland	9.4-9.8	11/2/2004	1250	1130	5.6	18.3	--
PTC10E	CMT	Aquifer	12.6-12.8	11/2/2004	1430	943	4.5	18.0	--
PTC11A	CMT	Wetland	1.8-2.2	11/2/2004	1530	574	4.0	NR	--
PTC11B	CMT	Wetland	4.8-5.2	11/3/2004	1030	769	3.9	14.7	--
PTC11C	CMT	Wetland	7.8-8.2	11/3/2004	1130	786	3.9	14.2	--
PTC11D	CMT	Wetland	9.8-10.2	11/3/2004	1230	805	3.9	15.7	--
PTC11E	CMT	Wetland	11.8-12.2	11/3/2004	1330	789	4.0	15.8	--
PTC11F	CMT	Aquifer	14-14.2	11/3/2004	1400	770	3.9	15.4	--
PTC12A	CMT	Wetland	2.8-3.2	11/8/2004	1340	865	3.9	12.5	--
PTC12A	CMT	Wetland	2.8-3.2	11/8/2004	1415	--	--	--	--
PTC12B	CMT	Wetland	4.8-5.2	11/8/2004	1500	801	4.3	12.5	--
PTC12B	CMT	Wetland	4.8-5.2	11/8/2004	1535	--	--	--	--
PTC12C	CMT	Wetland	7.8-8.2	11/9/2004	1200	887	6.3	10.3	--
PTC12C	CMT	Wetland	7.8-8.2	11/10/2004	--	--	--	--	--
PTC12C	CMT	Wetland	7.8-8.2	11/12/2004	1005	--	--	--	55.7
PTC12D	CMT	Wetland	9.8-10.2	11/9/2004	1410	951	6.4	11.0	--
PTC12D	CMT	Wetland	9.8-10.2	11/10/2004	--	--	--	--	65.4
PTC12D	CMT	Wetland	9.8-10.2	11/12/2004	0900	--	--	--	--
PTC12E	CMT	Wetland	11.8-12.2	11/9/2004	1430	860	6.0	12.2	--
PTC12E	CMT	Wetland	11.8-12.2	11/12/2004	0940	--	--	--	37.6
PTC12F	CMT	Aquifer	15.2-15.4	11/9/2004	1030	805	5.3	13.3	30.3
PTC12F	CMT	Aquifer	15.2-15.4	11/9/2004	1107	--	--	--	--
PTC13A	CMT	Wetland	2.8-3.2	11/9/2004	1125	355	4.0	10.9	--
PTC13A-2	CMT	Wetland	2.8-3.2	11/9/2004	1125	--	--	--	--
PTC13B	CMT	Wetland	4.8-5.2	11/9/2004	1200	658	4.0	11.5	--
PTC13C	CMT	Wetland	7.8-8.2	11/9/2004	1300	790	3.6	12.9	--
PTC13D	CMT	Wetland	9.8-10.2	11/9/2004	1320	847	3.4	12.9	--
PTB1B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB1C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB2B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB2C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB3B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB3C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB4A	DS	Mat	-0.7	12/2/2004	--	--	--	--	--
PTB4B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB4C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB5A	DS	Mat	-0.7	12/2/2004	--	--	--	--	--
PTB5B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB5C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB6B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB6C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB7A	DS	Mat	-0.7	12/2/2004	--	--	--	--	--
PTB7B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB7C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB8A	DS	Mat	-0.7	12/2/2004	--	--	--	--	--
PTB8B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB8C	DS	Mat	0.01	12/2/2004	--	--	--	--	--
PTB9B	DS	Mat	-0.35	12/2/2004	--	--	--	--	--
PTB9C	DS	Mat	0.01	12/2/2004	--	--	--	--	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Date sampled	Time	Sulfide, mg/L	Ammonia, mg/L	Phos- phate, as PO4 mg/L	Nitrate as NO3, mg/L	Iron, (Fe2+) mg/L, <10 range	Iron, (Fe2+) mg/L, >10 range	Methane, µg/L	Methane duplicate µg/L
PTC10A	11/1/2004	1230	0.98	0.74	3.90	--	--	6.44	48.8	44.8
PTC10A	11/1/2004	1300	--	--	--	--	--	--	--	--
PTC10B	11/1/2004	1410	< 0.10	< 0.70	< 0.75	< 0.20	--	5.09	35.2	33.9
PTC10C	11/2/2004	1200	< 0.10	< 0.70	< 0.75	0.25	--	17.1	74.9	78.3
PTC10C	11/3/2004	--	--	--	--	--	--	--	--	--
PTC10D	11/2/2004	1250	< 0.10	0.76	--	--	--	31.1	114	110
PTC10E	11/2/2004	1430	< 0.10	< 0.70	< 0.75	< 0.20	--	11.9	105	66.3
PTC11A	11/2/2004	1530	0.17	< 0.70	--	--	0.15	< 0.4	<39.6	<22.4
PTC11B	11/3/2004	1030	0.74	--	--	--	1.62	1.52	84.1	92.7
PTC11C	11/3/2004	1130	0.78	1.78	--	--	1.32	1.27	94.1	89.7
PTC11D	11/3/2004	1230	0.38	1.11	--	--	1.41	1.23	84.7	92.2
PTC11E	11/3/2004	1330	0.25	1.21	--	--	1.13	1.33	146	149
PTC11F	11/3/2004	1400	< 0.10	< 0.70	--	--	0.34	0.23	74.1	74.7
PTC12A	11/8/2004	1340	0.57	< 0.70	< 0.75	< 0.20	--	14.9	72.2	--
PTC12A	11/8/2004	1415	--	--	--	--	--	--	--	--
PTC12B	11/8/2004	1500	0.58	< 0.70	< 0.75	< 0.20	--	5.70	85.6	90.3
PTC12B	11/8/2004	1535	--	--	--	--	--	5.58	--	--
PTC12C	11/9/2004	1200	0.20	< 0.70	0.90	< 0.20	--	8.84	136	107
PTC12C	11/10/2004	--	--	--	--	--	--	8.91	--	--
PTC12C	11/12/2004	1005	--	--	--	--	--	--	--	--
PTC12D	11/9/2004	1410	< 0.10	< 0.70	< 0.75	< 0.20	--	17.8	262	254
PTC12D	11/10/2004	--	--	--	--	--	--	14.3	--	--
PTC12D	11/12/2004	0900	--	--	--	--	--	--	--	--
PTC12E	11/9/2004	1430	0.17	< 0.70	< 0.75	< 0.20	--	--	218	202
PTC12E	11/12/2004	0940	--	--	--	--	--	--	--	--
PTC12F	11/9/2004	1030	0.15	0.75	1.25	< 0.20	--	53.2	278	274
PTC12F	11/9/2004	1107	--	--	--	--	--	--	--	--
PTC13A	11/9/2004	1125	0.34	< 0.70	--	--	0.31	< 0.4	<31.7	<25.3
PTC13A-2	11/9/2004	1125	--	--	--	--	0.31	--	--	--
PTC13B	11/9/2004	1200	0.31	0.82	--	--	--	4.72	29.6	<32.9
PTC13C	11/9/2004	1300	0.16	< 0.70	--	--	--	7.18	25.1	30.9
PTC13D	11/9/2004	1320	< 0.10	< 0.70	--	--	--	14.4	<26.4	<30.3
PTB1B	12/2/2004	--	< 0.25	< 1.94	--	--	--	--	14,700	--
PTB1C	12/2/2004	--	< 0.21	< 4.38	--	--	--	< 0.4	16,100	16,000
PTB2B	12/2/2004	--	< 0.14	< 0.70	--	--	--	0.10	20,300	--
PTB2C	12/2/2004	--	< 0.14	< 0.70	--	--	--	0.29	17,600	--
PTB3B	12/2/2004	--	< 0.13	< 0.70	--	--	--	0.10	13,900	--
PTB3C	12/2/2004	--	< 0.13	< 0.70	--	--	--	0.23	19,300	--
PTB4A	12/2/2004	--	< 0.25	< 1.94	--	--	--	2.75	5,930	--
PTB4B	12/2/2004	--	< 0.25	< 1.94	--	--	--	0.72	14,500	--
PTB4C	12/2/2004	--	< 0.25	< 1.94	--	--	--	2.75	11,700	--
PTB5A	12/2/2004	--	< 0.17	< 0.70	--	--	--	< 0.4	833	--
PTB5B	12/2/2004	--	< 0.31	5.44	--	--	--	0.23	17,300	--
PTB5C	12/2/2004	--	< 0.28	< 1.75	--	--	--	0.12	16,200	--
PTB6B	12/2/2004	--	< 0.25	< 1.94	--	--	--	0.23	18,400	--
PTB6C	12/2/2004	--	< 0.25	< 1.94	--	--	--	1.83	15,500	--
PTB7A	12/2/2004	--	< 0.17	< 5.83	--	--	--	< 0.4	<32.9	--
PTB7B	12/2/2004	--	0.78	--	--	--	--	0.84	1,340	--
PTB7C	12/2/2004	--	0.28	< 8.75	--	--	--	1.40	1,270	--
PTB8A	12/2/2004	--	< 0.19	< 2.92	--	--	--	< 0.4	291	--
PTB8B	12/2/2004	--	< 0.19	< 2.92	--	--	--	0.72	12,200	--
PTB8C	12/2/2004	--	< 0.19	< 2.92	--	--	--	0.41	9,720	--
PTB9B	12/2/2004	--	< 0.19	< 2.92	--	--	--	< 0.4	58.4	--
PTB9C	12/2/2004	--	< 0.19	< 2.92	--	--	--	5.49	14,100	--

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Device Type	Hydro-geologic Unit	Depth, Screened Interval (ft bls)	Date sampled	Time	Specific conductance, $\mu\text{S}/\text{cm}$	pH	Water temp. deg C.	Alkalinity, mg/L as CaCO_3
PTB1B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB1C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB2B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB2C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB3B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB3C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB4A	DS	Mat	-0.70	1/13/2005	--	--	--	--	--
PTB4B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB4C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB5A	DS	Mat	-0.70	1/13/2005	--	--	--	--	--
PTB5B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB5C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB6B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB6C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB7A	DS	Mat	-0.70	1/13/2005	--	--	--	--	--
PTB7B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB7C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB8A	DS	Mat	-0.70	1/13/2005	--	--	--	--	--
PTB8B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB8C	DS	Mat	0.01	1/13/2005	--	--	--	--	--
PTB9B	DS	Mat	-0.35	1/13/2005	--	--	--	--	--
PTB9C	DS	Mat	0.01	1/13/2005	--	--	--	--	--

"PTC" samples are groundwater samples collected from multi-level piezometers

"PTZ" samples are groundwater samples collected from individual piezometers

"PTB" samples are groundwater samples collected from in-mat passive diffusion samplers

"PTN" samples are groundwater samples collected from below-mat mini sand-pack screens

Appendix 1A. Field measurements, and concentrations of reduction-oxidation (redox)-sensitive constituents and nutrients from groundwater samples, seep 3-4W reactive mat pilot test area, West Branch Canal Creek, Aberdeen Proving Ground, Maryland, August 2004-January 2005--Continued

Device ID	Date sampled	Time	Sulfide, mg/L	Ammonia, mg/L	Phos- phate, as PO4 mg/L	Nitrate as NO3, mg/L	Iron, (Fe2+) mg/L, <10 range	Iron, (Fe2+) mg/L, >10 range	Methane, µg/L	Methane duplicate µg/L
PTB1B	1/13/2005	--	--	--	--	--	--	--	4,880	--
PTB1C	1/13/2005	--	--	--	--	--	--	--	9,180	9,130
PTB2B	1/13/2005	--	--	--	--	--	--	--	5,600	--
PTB2C	1/13/2005	--	--	--	--	--	--	--	17,200	--
PTB3B	1/13/2005	--	--	--	--	--	--	--	847	--
PTB3C	1/13/2005	--	--	--	--	--	--	--	20,600	20,400
PTB4A	1/13/2005	--	--	--	--	--	--	--	56.6	--
PTB4B	1/13/2005	--	--	--	--	--	--	--	3,070	--
PTB4C	1/13/2005	--	--	--	--	--	--	--	5,750	--
PTB5A	1/13/2005	--	--	--	--	--	--	--	236	--
PTB5B	1/13/2005	--	--	--	--	--	--	--	7,260	7,470
PTB5C	1/13/2005	--	--	--	--	--	--	--	18,300	18,300
PTB6B	1/13/2005	--	--	--	--	--	--	--	6,540	--
PTB6C	1/13/2005	--	--	--	--	--	--	--	19,400	--
PTB7A	1/13/2005	--	--	--	--	--	--	--	280	--
PTB7B	1/13/2005	--	--	--	--	--	--	--	3,880	--
PTB7C	1/13/2005	--	--	--	--	--	--	--	4,330	4,370
PTB8A	1/13/2005	--	--	--	--	--	--	--	293	--
PTB8B	1/13/2005	--	--	--	--	--	--	--	11,900	--
PTB8C	1/13/2005	--	--	--	--	--	--	--	14,800	--
PTB9B	1/13/2005	--	--	--	--	--	--	--	3,120	--
PTB9C	1/13/2005	--	--	--	--	--	--	--	6,870	--