2. ENVIRONMENTAL MONITORING

This section provides environmental monitoring data collected by DOE contractors, LATA/Parallax Portsmouth, LLC (LPP) and Uranium Disposition Services, LLC (UDS), as well as the United States Enrichment Corporation (USEC) at or nearby PORTS.

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Table 2.1. Radionuclide concentrations in LPP and USEC NPDES outfall water samples – 2009

NPDES outfall[a]	Parameter[b]	Number of samples[c]	Minimum[d]	Maximum[d]	Average[e]	DCG[f]
			LPP Outfalls			
015	americium-241	4(4)	0	< 0.009889		30
	neptunium-237	4(4)	0	< 0.000007251		30
	plutonium-238	4(4)	0	< 0.01517		40
	plutonium-239/240	4(4)	0	< 0.02421		30
	technetium-99	12(12)	0	< 4.68		100,000
	uranium	12(0)	0.2448	2.466	1.076	
	uranium-233/234	12(1)	< 0.1071	2.586	1.043	500
	uranium-235	12(6)	< 0.000009131	0.09299		600
	uranium-236	12(12)	0	< 0.025		500
	uranium-238	12(0)	0.0822	0.82	0.358	600
608	americium-241	4(4)	0	< 0.02397		
	neptunium-237	4(4)	0	< 0.01346		
	plutonium-238	4(4)	< 0.0000083	< 0.03701		
	plutonium-239/240	4(4)	< 0.0000166	< 0.0074		
	technetium-99	12(1)	< 3.29	926	425	
	uranium	12(0)	0.5118	1.304	0.859	
	uranium-233/234	12(0)	0.4047	0.7501	0.544	
	uranium-235	12(10)	< 0.00000908	0.0701		
	uranium-236	12(12)	0	< 0.01478		
	uranium-238	12(0)	0.171	0.4367	0.286	
610	americium-241	4(4)	0	< 0.02267		
	neptunium-237	4(4)	0	< 0.02339		
	plutonium-238	4(4)	0	< 0.05445		
	plutonium-239/240	4(4)	0	< 0.01556		
	technetium-99	12(10)	0	14		
	uranium	12(0)	1.04	50.33	25.66	
	uranium-233/234	12(0)	1.11	79.69	39.84	
	uranium-235	12(1)	< 0.02567	3.881	1.82	
	uranium-236	12(2)	< 0.000007675	0.3796		
	uranium-238	12(0)	0.3461	16.56	8.46	
611	americium-241	4(4)	0	< 0.02639		
	neptunium-237	4(4)	0	< 0.03018		
	plutonium-238	4(4)	0.007716	< 0.03087		
	plutonium-239/240	4(4)	0	< 0.00752		
	technetium-99	12(0)	126	1370	874	
	uranium	12(0)	4.18	6.595	5.023	
	uranium-233/234	12(0)	4.106	9.275	5.967	
	uranium-235	12(0)	0.1349	0.5201	0.263	
	uranium-236	12(7)	< 0.008274	0.06855		
	uranium-238	12(0)	1.384	2.169	1.664	

Table 2.1. Radionuclide concentrations in LPP and USEC NPDES outfall water samples – 2009 (continued)

NPDES outfall[a]	Parameter[b]	Number of samples[c]	Minimum[d]	Maximum[d]	Average[e]	DCG[f]
			USEC Outfalls			
001	americium-241	4(4)	< 0.019	< 0.099		30
	neptunium-237	4(4)	< 0.019	< 0.134		30
	plutonium-238	4(4)	< 0.019	< 0.09		40
	plutonium-239/240	4(4)	< 0.024	< 0.097		30
	technetium-99	52(34)	< 8.3	59.1		100,000
	uranium	52(0)	0.28	4.84	1.28	
002	americium-241	4(4)	< 0.022	< 0.082		30
	neptunium-237	4(4)	< 0.02	< 0.108		30
	plutonium-238	4(4)	< 0.019	< 0.066		40
	plutonium-239/240	4(4)	< 0.019	< 0.074		30
	technetium-99	50(50)	< 8.24	< 9.6		100,000
	uranium	50(0)	0.37	1.16	0.65	
003	americium-241	4(4)	< 0.078	< 0.13		30
	neptunium-237	4(4)	< 0.023	< 0.125		30
	plutonium-238	4(4)	< 0.023	< 0.062		40
	plutonium-239/240	4(4)	< 0.024	< 0.078		30
	technetium-99	52(0)	75	279	139	100,000
	uranium	52(0)	2	15.5	7.05	
004	americium-241	4(4)	< 0.022	< 0.146		30
	neptunium-237	4(4)	< 0.02	< 0.079		30
	plutonium-238	4(4)	< 0.018	< 0.09		40
	plutonium-239/240	4(4)	< 0.018	< 0.082		30
	technetium-99	49(49)	< 8.22	< 9.46		100,000
	uranium	49(0)	0.121	11.6	1.26	
009	americium-241	4(4)	< 0.023	< 0.146		30
	neptunium-237	4(4)	< 0.02	< 0.055		30
	plutonium-238	4(4)	< 0.02	< 0.053		40
	plutonium-239/240	4(4)	< 0.02	< 0.055		30
	technetium-99	52(52)	< 8.22	< 9.59		100,000
	uranium	52(0)	2.68	8.23	4.88	
010	americium-241	4(4)	< 0.082	< 0.102		30
	neptunium-237	4(4)	< 0.017	< 0.087		30
	plutonium-238	4(4)	< 0.017	< 0.093		40
	plutonium-239/240	4(4)	< 0.017	< 0.081		30
	technetium-99	52(52)	< 8.22	< 9.58		100,000
	uranium	52(0)	0.75	3.88	2.10	

Table 2.1. Radionuclide concentrations in LPP and USEC NPDES outfall water samples – 2009 (continued)

NPDES outfall[a]	Parameter[b]	Number of samples[c]	Minimum[d]	Maximum[d]	Average[e]	DCG[f]
			USEC Outfalls			
011	americium-241	4(4)	< 0.025	< 0.106		30
	neptunium-237	4(4)	< 0.018	< 0.094		30
	plutonium-238	4(4)	< 0.015	< 0.071		40
	plutonium-239/240	4(4)	< 0.042	< 0.071		30
	technetium-99	52(52)	< 8.22	< 9.58		100,000
	uranium	52(0)	0.56	3.63	1.14	
012	americium-241	4(4)	< 0.025	< 0.15		30
	neptunium-237	4(4)	< 0.052	< 0.095		30
	plutonium-238	4(4)	< 0.022	< 0.065		40
	plutonium-239/240	4(4)	< 0.019	< 0.053		30
	technetium-99	52(52)	< 8.55	< 9.67		100,000
	uranium	52(0)	0.33	2.16	1.34	
013	americium-241	4(4)	< 0.032	< 0.111		30
	neptunium-237	4(4)	< 0.019	< 0.104		30
	plutonium-238	4(4)	< 0.02	< 0.098		40
	plutonium-239/240	4(4)	< 0.019	< 0.085		30
	technetium-99	52(52)	< 8.35	< 9.41		100,000
	uranium	52(0)	0.27	2.34	1.30	

[a]LPP internal NPDES Outfalls 608, 610, and 611 discharge to USEC NPDES Outfall 003 (X-6619 Sewage Treatment Plant).

[b]Uranium is reported in µg/L; all other radionuclides are reported in pCi/L.

[c]Number in parentheses is the number of samples that were below the detection limit.

[d]Minimum values reported as "0" may actually be negative results. Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out. These negative value results are reported as "0" in the table for simplicity.

[e]Averages were not calculated for outfalls that had greater than 15% of the results below the detection limit. For outfalls with less than 15% of the results below the detection limit, any result below the detection limit was assigned a value at the detection limit to calculate the average for the parameter.

[f]Derived Concentration Guide (DCG)(pCi/L). DCGs are not provided for LPP internal outfalls (Outfalls 608, 610, and 611) because water from these outfalls flows through another outfall prior to discharge from the site. A DCG is not available for uranium.

Table 2.2. LPP and UDS NPDES permit summaries – 2009

Effluent characteristics		Monitoring requirements		Discharge limitations	
Parameter	Units	Measurement frequency	Sampling type	Concentration	
				Monthly	Daily
LPP Outfall 015 (X-624 Groundwater Treatment Facility)					
Flow rate	MGD	Daily	24-hour total		
pH	SU	1/2 weeks	Grab		6.5–9.0
Trichloroethene	µg/L	1/2 weeks	Grab	10	10
PCBs	µg/L	1/quarter	Grab	*a*	*a*
LPP Outfall 608 (X-622 Groundwater Treatment Facility)					
Flow rate	MGD	Daily	24-hour total		
pH	SU	1/2 weeks	Grab		
Trichloroethene	µg/L	1/2 weeks	Grab		10
1,2-*trans*-dichloroethene	µg/L	1/2 weeks	Grab	25	66
LPP Outfall 610 (X-623 Groundwater Treatment Facility)					
Flow rate	MGD	Daily	24-hour total		
pH	SU	1/2 weeks	Grab		
Trichloroethene	µg/L	1/2 weeks	Grab	10	10
1,2-*trans*-dichloroethene	µg/L	1/2 weeks	Grab	25	66
LPP Outfall 611 (X-627 Groundwater Treatment Facility)					
Flow rate	MGD	Daily	24-hour total		
pH	SU	1/2 weeks	Grab		
Trichloroethene	µg/L	1/2 weeks	Grab	10	10
UDS Outfall 001					
Water temperature	°F	Daily	Maximum	*b*	*b*
Flow rate	GPD	Daily	24-hour total		
Biochemical oxygen demand, 5-day	mg/L	1/week	24-hour composite		
pH	SU	1/day	Grab		6.5–9.0
Total suspended solids	mg/L	1/week	24-hour composite	30	45
Total suspended solids, loading	kg/day	1/week	-	0.9	1.4
Oil and grease, total	mg/L	1/month	Grab		
Nitrogen, ammonia	mg/L	1/week	24-hour composite		
Phosphorus, total	mg/L	1/week	24-hour composite		
Chlorine, total residual	mg/L	1/day	Grab		0.05
Dissolved solids, sum of	mg/L	1/week	24-hour composite		1500

[a]No detectable PCBs.
[b]Maximum daily and monthly average limits vary according to month.

Table 2.3. LPP NPDES discharge and compliance rates – 2009

Parameter	NPDES compliance rate (%)	Number of measurements[a]	Concentration			Units
			Minimum	Maximum	Average[b]	
Outfall 015 (X-624 Groundwater Treatment Facility)						
Flow rate	*c*	365	0.0009	0.0375	0.00872	MGD
pH	100	26	6.83	8.22	7.54	SU
Trichloroethene	100	26(11)	< 0.16	7.95		µg/L
monthly average[d]	100	12	0	4.0	1.1	µg/L
PCBs	*e*	4(4)	< 0.092	< 1		µg/L
Outfall 608 (X-622 Groundwater Treatment Facility)						
Flow rate	*c*	365	0.0053	0.0746	0.0554	MGD
pH	*f*	26	7.37	8.63	7.91	SU
Trichloroethene	100	26(10)	< 0.16	4.1		µg/L
1,2-*trans*-dichloroethene	100	26(26)	< 0.15	< 0.5		µg/L
monthly average[d]	100	12	0	0	0	µg/L
Outfall 610 (X-623 Groundwater Treatment Facility)						
Flow rate	*c*	365	0	0.0592	0.00619	MGD
pH	*f*	26	7.26	8.35	7.72	SU
Trichloroethene	100	26(20)	< 0.16	< 1		µg/L
monthly average[g]	100	12	0	0.28	0.06	µg/L
1,2-*trans*-dichloroethene	100	26(26)	< 0.15	< 0.5		µg/L
monthly average[d]	100	12	0	0	0	µg/L
Outfall 611 (X-627 Groundwater Treatment Facility)						
Flow rate	*c*	365	0.013	0.029	0.0213	MGD
pH	*f*	26	7.67	8.32	8.08	SU
Trichloroethene	100	26(2)	0.17	1.6	0.69	µg/L
monthly average[d]	100	12	0	1.6	0.62	µg/L

[a]Number in parentheses is the number of samples that were below the detection limit.

[b]Averages were not calculated for outfalls that had greater than 15% of the results below the detection limit. For outfalls with less than 15% of the results below the detection limit, any result below the detection limit was assigned a value at the detection limit for calculating an average for the parameter.

[c]Flow rate does not have a numerical limit; therefore, no compliance rates are generated.

[d]To compute the monthly average, parameters that are undetected are assumed to be zero.

[e]The permit specifies no detectable PCBs in the effluent without setting a numerical limit of detection.

[f]Monitoring only required; therefore, no compliance rates are generated.

Table 2.4. UDS NPDES discharge and compliance rates – 2009

Parameter	NPDES compliance rate (%)	Number of measurements[a]	Concentration			Units
			Minimum	Maximum	Average[b]	
		Outfall 001				
Biochemical oxygen demand	*d*	17(0)	0	30.3	6.08	mg/L
Chlorine, total residual	100	18(0)	0	0.0375	0.02	mg/L
Dissolved solids	89	18(0)	16.1	4450	688	mg/L
Flow rate	*c*	18	2500	20000	8638	GPD
Nitrogen-ammonia	*d*	18(0)	0	0.207	0.090	mg/L
Oil and grease	*d*	11(0)	1.8	6.3	3.1	mg/L
pH	100	18	7.01	7.83	7.38	SU
Phosphorus, total	*d*	18(0)	0	0.42	0.067	mg/L
Suspended solids, total	67	18(0)	4.7	91.5	37.7	mg/L
monthly average	50	10	4.7	71.1	32.9	mg/L
Temperature	100	18	36.68	74	59	°F
monthly average	90	10	36.7	72	59.6	°F

[a]Number in parentheses is the number of samples that were below the detection limit.

[b]Averages were not calculated for outfalls that had greater than 15% of the results below the detection limit. For outfalls with less than 15% of the results below the detection limit, any result below the detection limit was assigned a value at the detection limit for calculating an average for the parameter.

[c]Flow rate does not have a numerical limit; therefore, no compliance rates are generated.

[d]Monitoring only required; therefore, no compliance rates are generated.

Table 2.5. USEC NPDES discharge monitoring results – 2009

Parameter	Number of samples[a]	Concentration			Units
		Minimum	Maximum	Average[b]	
Outfall 001 (X-230J7 East Holding Pond)					
Cadmium, total recoverable	12(12)	< 0.21	< 6		µg/L
Chlorine, total residual	48(47)	< 0.02	0.02		mg/L
Dissolved solids	48(0)	112	298	212	mg/L
Flow rate	365	0.599	5.460	1.346	MGD
Fluoride, total	13(4)	< 0.1	0.2		mg/L
Oil and grease, total	49(49)	< 5	< 5		mg/L
pH	51	6.90	8.60	7.59	SU
Silver, total recoverable	12(11)	< 1.58	< 7.38		µg/L
Suspended solids	48(38)	< 2	16		mg/L
Zinc, total recoverable	12(1)	< 4.19	34.1	16.7	µg/L
Outfall 002 (X-230K South Holding Pond)					
Cadmium, total recoverable	14(14)	< 1	< 1		µg/L
Flow rate	365	0	1.343	0.470	MGD
Fluoride, total	13(4)	< 0.1	0.2		mg/L
Mercury, total	12(0)	0.7	3.0	1.8	ng/L
Oil and grease, total	46(46)	< 5	< 5		mg/L
pH	46	6.88	8.24	7.61	SU
Silver, total recoverable	46(46)	< 1	< 1		µg/L
Suspended solids	46(1)	< 2	16.8		mg/L
Thallium, total recoverable	46(46)	< 1	< 1		µg/L
Outfall 003 (X-6619 Sewage Treatment Plant)					
Acute toxicity, *Ceriodaphnia dubia*	6(6)	< 1	< 1		Tua
Acute toxicity, *Pimephales promelas*	6(6)	< 1	< 1		Tua
Ammonia, nitrogen	25(15)	< 0.1	4.5		mg/L
Biochemical oxygen demand	49(47)	< 5	6.3		mg/L
Chlorine, total residual	126(126)	< 0.02	< 0.02		mg/L
Copper, total recoverable	18(10)	< 3.14	11.9		µg/L
Fecal coliform	24(0)	5	1114	69	#/100 mL
Flow rate	365	0.108	0.571	0.305	MGD
Mercury, total	12(0)	2.6	92.1	30.1	ng/L
Nitrite + nitrate	12(0)	5.7	9.0	7.4	mg/L
Oil and grease, total	4(3)	< 5	6		mg/L
pH	249	6.87	8.20	7.31	SU
Silver, total recoverable	17(15)	< 1.58	< 7.38		µg/L
Suspended solids	49(12)	< 2	12.6		mg/L
Zinc, total recoverable	18(0)	14.8	58.3	35.4	µg/L
Outfall 004 (Cooling Tower Blowdown)					
Acute toxicity, *Ceriodaphnia dubia*	6(6)	< 1	< 1		Tua
Acute toxicity, *Pimephales promelas*	6(6)	< 1	< 1		Tua

Table 2.5. USEC NPDES discharge monitoring results – 2009 (continued)

Parameter	Number of samples[a]	Concentration			Units
		Minimum	Maximum	Average[b]	
Outfall 004 (Cooling Tower Blowdown) (continued)					
Chlorine, total residual	45(44)	< 0.02	0.5		mg/L
Copper, total recoverable	16(0)	9.0	24.6	16.5	µg/L
Dissolved solids	13(0)	171	436	298	mg/L
Flow rate	365	0	0.792	0.332	MGD
Mercury, total	12(0)	2.2	7.8	4.0	ng/L
Oil and grease, total	13(13)	< 5	< 5		mg/L
pH	12	7.09	7.78	7.50	SU
Suspended solids	13(11)	< 2	7.2		mg/L
Zinc, total recoverable	16(1)	< 4.19	52.8	32.9	µg/L
Outfall 005 (X-611B Lime Sludge Lagoon)[c]					
Flow rate	0				MGD
pH	0				SU
Suspended solids	0				mg/L
Outfall 009 (X-230L North Holding Pond)					
Cadmium, total recoverable	15(15)	< 0.21	< 6		µg/L
Flow rate	364	0.121	2.823	0.412	MGD
Fluoride, total	12(1)	< 0.1	0.2		mg/L
Oil and grease, total	12(12)	< 5	< 5		mg/L
pH	50	7.34	8.41	7.83	SU
Suspended solids	48(4)	< 2	29.6	7.0	mg/L
Zinc, total recoverable	15(2)	< 4.19	59.6	17.2	µg/L
Outfall 010 (X-230J5 Northwest Holding Pond)					
Cadmium, total recoverable	16(16)	< 0.21	< 6		µg/L
Flow rate	364	0.018	0.847	0.364	MGD
Mercury. Total	12(2)	< 0.5	6.7		ng/L
Oil and grease, total	14(14)	< 5	< 5		mg/L
pH	29	7.43	8.23	7.73	SU
Suspended solids	24(10)	< 2	10		mg/L
Zinc, total recoverable	16(3)	< 4.19	< 57.7		µg/L
Outfall 011 (X-230J6 Northeast Holding Pond)					
Cadmium, total recoverable	14(14)	< 0.21	< 6		µg/L
Chlorine, total residual	24(24)	< 0.02	< 0.02		mg/L
Copper, total recoverable	14(9)	3.77	9		µg/L
Flow rate	365	0	0.187	0.014	MGD
Fluoride, total	12(1)	< 0.1	0.3		mg/L
Oil and grease, total	24(24)	< 5	< 5		mg/L
pH	24	7.13	8.32	7.73	SU
Suspended solids	24(20)	< 2	4.4		mg/L
Zinc, total recoverable	14(2)	4.19	42.6	21.4	µg/L
Outfall 012 (X-230M Southwest Holding Pond)					
Chlorine	24(24)	< 0.02	< 0.02		mg/L
Flow rate	361	0.006	1.790	0.201	mg/L
Iron	24(0)	114	1670	487	MGD
Oil and grease	24(24)	< 5	< 5		mg/L
PCBs, total	4(4)	< 0.5	< 0.5		µg/L
pH	24	6.98	8.40	7.87	SU
Suspended solids	24(5)	< 2	21.4		mg/L
Trichloroethene	24(24)	< 1	< 1		µg/L

Table 2.5. USEC NPDES discharge monitoring results – 2009 (continued)

Parameter	Number of samples[a]	Concentration			Units
		Minimum	Maximum	Average[b]	
Outfall 013 (X-230N West Holding Pond)					
Chlorine	24(24)	< 0.02	< 0.02		mg/L
Flow rate	361	0.017	1.294	0.212	MGD
Oil and grease	30(30)	< 5	< 5		mg/L
PCBs, total	4(4)	< 0.5	< 0.5		µg/L
pH	24	7.38	8.41	7.96	SU
Suspended solids	24(11)	< 2	14		mg/L
Outfall 602 (X-621 Coal Pile Runoff Treatment Facility)					
Flow rate	365	0	0.170	0.030	MGD
Iron, total	23(0)	52	3860	621	µg/L
Manganese, total	23(0)	5.7	172	52.2	µg/L
pH	23	7.08	9.49	8.29	SU
Suspended solids	23(4)	< 2	30.8		mg/L
Outfall 604 (X-700 Biodenitrification Facility)					
Copper, total	9(2)	< 3.14	25.1		µg/L
Flow rate	304	0	0.023	0.005	MGD
Iron, total	9(0)	69.7	439	182	µg/L
Nickel, total	9(7)	< 7.09	< 11.5		µg/L
Nitrate, nitrogen	9(2)	< 0.1	57.9		mg/L
pH	9	6.90	7.83	7.41	SU
Zinc, total	9(0)	2.7	26	10	µg/L
Outfall 605 (X-705 Decontamination Microfiltration System)					
Ammonia, nitrogen	12(7)	< 0.1	1.9		mg/L
Chromium, hexavalent	12(6)	< 1.05	7.14		mg/L
Chromium, total	12(12)	< 0.01	< 0.01		µg/L
Copper, total	12(4)	< 3.14	22.8		µg/L
Flow rate	365	0	0.085	0.004	MGD
Iron, total	12(1)	4.4	139	26.2	µg/L
Kjeldahl nitrogen	12(0)	0.6	3	1.4	mg/L
Nickel, total	12(8)	< 1.6	13.6		µg/L
Nitrogen, nitrate	12(0)	0.3	153	57.6	mg/L
Nitrogen, nitrite	12(10)	< 0.1	0.84		mg/L
Oil and grease, total	12(11)	< 5	5.4		mg/L
pH	12	6.95	9.02	7.87	SU
Sulfate	12(0)	50	80.2	64.8	mg/L
Suspended solids	12(12)	< 2	< 2		mg/L
Trichloroethene	12(12)	< 1	< 5		µg/L
Zinc, total	12(2)	1.48	15.5		µg/L
Outfall 613 (X-6002 Particulate Separator)					
Chlorine	13(12)	< 0.02	0.07		mg/L
Flow rate	242	0	0.012	0.00039	MGD
Suspended solids	13(10)	< 2	4.4		mg/L

Table 2.5. USEC NPDES discharge monitoring results – 2009 (continued)

Parameter	Number of samples[a]	Concentration			Units
		Minimum	Maximum	Average[b]	
Station Number 801 (Scioto River control sample, upstream of Outfalls 003 and 004)					
48-hr. acute toxicity, *Ceriodaphnia dubia*	6	0	0		% affected
96-hr. acute toxicity, *Pimephales promelas*	6	0	0		% affected
Station Number 902 (downstream of Outfall 001)					
Water temperature	98	2	30	17	°C
Station Number 903 (downstream of Outfall 002)					
Water temperature	96	1	28	15	°C

[a]Number in parentheses is the number of samples that were below the detection limit.

[b]Averages were not calculated for outfalls that had greater than 15% of the results below the detection limit. For outfalls with less than 15% of the results below the detection limit, any result below the detection limit was assigned a value at the detection limit for calculating an average for the parameter.

[c]Outfall 005 did not discharge in 2009.

Table 2.6. Radionuclides in surface water runoff samples from UDS depleted uranium cylinder storage yards – 2009

Sample location	Parameter	Units	Number of samples[a]	Minimum[b]	Maximum[b]	Average[c]
X745-C1	alpha activity	pCi/L	12(7)	< 0.851	9.24	
	beta activity	pCi/L	12(0)	2.63	10.2	5.9
	uranium	µg/L	12(0)	1.39	15.9	4.9
X745-C2	alpha activity	pCi/L	12(1)	< 1.55	13	7.9
	beta activity	pCi/L	12(0)	4.58	11.7	7.6
	uranium	µg/L	12(0)	2.33	15.4	12.2
X745-C3	alpha activity	pCi/L	12(7)	< 0.323	5.42	
	beta activity	pCi/L	12(3)	< 2.16	10.1	
	uranium	µg/L	12(0)	0.536	6.13	2.5
X745-C4	alpha activity	pCi/L	12(1)	0	17.5	7.6
	beta activity	pCi/L	12(1)	< 2.62	22.7	8.9
	uranium	µg/L	12(0)	1.16	13.2	8.8
X745-E1	alpha activity	pCi/L	12(6)	< 0.0784	7.22	
	beta activity	pCi/L	12(0)	4.28	15.7	9.4
	uranium	µg/L	12(0)	0.968	2.63	1.7
X745-G1A[d]	alpha activity	pCi/L	10(4)	< 1.09	8.2	
	beta activity	pCi/L	10(0)	3.65	16.3	8.5
	uranium	µg/L	10(0)	0.661	10.5	3.7
X745-G2	alpha activity	pCi/L	12(7)	0	15.1	
	beta activity	pCi/L	12(3)	< 1.5	16.1	
	uranium	µg/L	12(0)	1.6	3.53	2.5

[a]Number in parentheses is the number of samples that were below the detection limit.

[b]Minimum values reported as "0" may actually be negative results. Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out. These negative value results are reported as "0" in the table for simplicity.

[c]Averages were not calculated for locations that had greater than 15% of the results below the detection limit. For locations with less than 15% of the results below the detection limit, any result below the detection limit was assigned a value at the detection limit to calculate the average for the parameter.

[d]Sampling location X745-G1A was dry in September and November; no samples could be collected.

Table 2.7. Drainage basin monitoring of surface water and sediment for UDS depleted uranium cylinder storage yards – 2009

Location	Parameter[a]	First quarter[b]			Second quarter[b]		
		SW-F	SW-UF	Sed	SW-F	SW-UF	Sed
UDS X01	PCB-1242	0.105U	0.104U	24.6U	0.104U	0.104U	26.2U
	PCB-1248	0.105U	0.104U	24.6U	0.104U	0.104U	26.2U
	PCB-1254	0.105U	0.104U	24.6U	0.104U	0.104U	19.4JP
	PCB-1260	0.105U	0.104U	49.1	0.104U	0.104U	35.1
	PCB-1262	0.105U	0.104U	24.6U	0.104U	0.104U	26.2U
	PCB-1268	0.105U	0.104U	24.6U	0.104U	0.104U	26.2U
	Total PCB	0.105U	0.104U	49.1	0.104U	0.104U	54.5
RM-8	PCB-1242	0.105U	0.114U	24.5U	0.105U	0.108U	22U
	PCB-1248	0.105U	0.114U	24.5U	0.105U	0.108U	22U
	PCB-1254	0.22P	0.114U	24.5U	0.105U	0.108U	36.4P
	PCB-1260	0.105U	0.114U	117	0.105U	0.108U	71.9
	PCB-1262	0.105U	0.114U	24.5U	0.105U	0.108U	22U
	PCB-1268	0.105U	0.114U	24.5U	0.105U	0.108U	22U
	Total PCB	0.22JP	0.114U	117	0.105U	0.108U	108
UDS X02	PCB-1242	0.106U	0.112U	22.8U	0.111U	0.108U	26.2U
	PCB-1248	0.106U	0.112U	22.8U	0.111U	0.108U	26.2U
	PCB-1254	0.106U	0.112U	22.8U	0.111U	0.108U	58.8P
	PCB-1260	0.106U	0.112U	161	0.111U	0.108U	139
	PCB-1262	0.106U	0.112U	22.8U	0.111U	0.108U	26.2U
	PCB-1268	0.106U	0.112U	22.8U	0.111U	0.108U	26.2U
	Total PCB	0.106U	0.112U	161	0.111U	0.108U	198
RM-10	PCB-1242	0.106U	0.108U	23.2U	0.118U	0.103U	4.27U
	PCB-1248	0.106U	0.108U	23.2U	0.118U	0.103U	4.27U
	PCB-1254	0.106U	0.108U	23.2U	0.118U	0.103U	4.27U
	PCB-1260	0.106U	0.108U	24.7	0.118U	0.103U	5.6
	PCB-1262	0.106U	0.108U	23.2U	0.118U	0.103U	4.27U
	PCB-1268	0.106U	0.108U	23.2U	0.118U	0.103U	4.27U
	Total PCB	0.106U	0.108U	24.7	0.118U	0.103U	5.6J

Table 2.7. Drainage basin monitoring of surface water and sediment for UDS depleted uranium cylinder storage yards – 2009 (continued)

Location	Parameter[a]	Third quarter[b]			Fourth quarter[b]		
		SW-F	SW-UF	Sed	SW-F	SW-UF	Sed
UDS X01	PCB-1242	0.104U	0.104U	186	0.113U	0.11U	23.3U
	PCB-1248	0.104U	0.104U	26.1U	0.113U	0.11U	23.3U
	PCB-1254	0.104U	0.104U	321	0.113U	0.11U	23.3U
	PCB-1260	0.104U	0.104U	101	0.113U	0.11U	24.9
	PCB-1262	0.104U	0.104U	26.1U	0.113U	0.11U	23.3U
	PCB-1268	0.104U	0.104U	26.1U	0.113U	0.11U	23.3U
	Total PCB	0.104U	0.104U	608	0.113U	0.11U	24.9
RM-8	PCB-1242	0.11U	0.104U	4.26U	0.105U	0.104U	4.3U
	PCB-1248	0.11U	0.104U	4.26U	0.105U	0.104U	4.3U
	PCB-1254	0.11U	0.104U	14.9P	0.105U	0.104U	26.8P
	PCB-1260	0.11U	0.104U	29.3	0.105U	0.104U	44.8
	PCB-1262	0.11U	0.104U	4.26U	0.105U	0.104U	4.3U
	PCB-1268	0.11U	0.104U	4.26U	0.105U	0.104U	4.3U
	Total PCB	0.11U	0.104U	44.2	0.105U	0.104U	71.6
UDS X02	PCB-1242	0.105U	0.104U	5.4U	0.112U	0.105U	24.5U
	PCB-1248	0.105U	0.104U	5.4U	0.112U	0.105U	24.5U
	PCB-1254	0.105U	0.104U	42P	0.112U	0.105U	24.5U
	PCB-1260	0.105U	0.104U	148	0.112U	0.105U	136P
	PCB-1262	0.105U	0.104U	5.4U	0.112U	0.105U	24.5U
	PCB-1268	0.105U	0.104U	5.4U	0.112U	0.105U	24.5U
	Total PCB	0.105U	0.104U	190	0.112U	0.105U	136P
RM-10	PCB-1242	0.104U	0.104U	4.51U	0.104U	0.109U	4.24U
	PCB-1248	0.104U	0.104U	4.51U	0.104U	0.109U	4.24U
	PCB-1254	0.104U	0.104U	6.3	0.104U	0.109U	4.24U
	PCB-1260	0.104U	0.104U	21.6	0.104U	0.109U	4.24U
	PCB-1262	0.104U	0.104U	4.51U	0.104U	0.109U	4.24U
	PCB-1268	0.104U	0.104U	4.51U	0.104U	0.109U	4.24U
	Total PCB	0.104U	0.104U	27.9	0.104U	0.109U	4.24U

[a]Results for surface water (SW) are reported in µg/L; results for sediment (Sed) are reported in µg/kg.

[b]Abbreviations and data qualifiers are as follows: SW-F – filtered surface water; SW-UF – unfiltered surface water; Sed – sediment; J – the reported value is an estimated concentration greater than the method detection limit but less than the practical quantitation limit; P – there is a greater than 25% difference for detected concentrations between two gas chromatograph columns. U – undetected.

Table 2.8. Ambient air monitoring program summary for radionuclides and fluoride – 2009

Sampling Location	Parameter[a]	No. of measurements[b]	Minimum[c, d]	Maximum[c]	Average[c, e]
		On-site air samplers			
A8	americium-241	4(4)	0	6.5E-06	
	fluoride	46(27)	2.1E-02	6.8E-02	
	neptunium-237	4(4)	0	2.9E-09	
	plutonium-238	4(4)	1.9E-09	6.4E-06	
	plutonium-239/240	4(4)	0	6.2E-06	
	technetium-99	12(12)	0	1.3E-03	
	uranium	12(0)	4.3E-04	1.3E-03	9.0E-04
	uranium-233/234	12(0)	2.3E-04	7.4E-04	4.3E-04
	uranium-235	12(8)	5.9E-09	4.1E-05	
	uranium-236	12(12)	0	1.1E-05	
	uranium-238	12(0)	1.4E-04	4.5E-04	3.0E-04
A10	americium-241	4(4)	1.9E-06	6.1E-06	
	fluoride	47(28)	8.3E-03	4.1E-02	
	neptunium-237	4(4)	0	4.0E-06	
	plutonium-238	4(4)	3.8E-09	7.9E-06	
	plutonium-239/240	4(4)	0	5.1E-06	
	technetium-99	12(12)	0	9.8E-04	
	uranium	12(0)	4.6E-04	1.2E-03	9.2E-04
	uranium-233/234	12(0)	2.6E-04	7.0E-04	4.5E-04
	uranium-235	12(3)	3.1E-06	3.8E-05	
	uranium-236	12(10)	0	1.9E-05	
	uranium-238	12(0)	1.5E-04	4.0E-04	3.1E-04
A29	americium-241	4(4)	2.3E-09	9.8E-06	
	fluoride	47(27)	1.7E-02	7.7E-02	
	neptunium-237	4(4)	0	1.9E-06	
	plutonium-238	4(4)	0	3.5E-06	
	plutonium-239/240	4(4)	0	3.9E-09	
	technetium-99	12(12)	0	7.8E-04	
	uranium	12(0)	4.2E-04	1.5E-02	2.1E-03
	uranium-233/234	12(0)	2.2E-04	4.9E-03	8.3E-04
	uranium-235	12(4)	4.6E-06	2.0E-04	
	uranium-236	12(11)	0	3.2E-05	
	uranium-238	12(0)	1.4E-04	5.1E-03	7.1E-04
A36	americium-241	4(4)	0	6.4E-06	
	fluoride	47(13)	2.3E-02	7.8E-02	
	neptunium-237	4(4)	0	2.8E-06	
	plutonium-238	4(4)	0	1.1E-05	
	plutonium-239/240	4(4)	0	6.4E-06	
	technetium-99	12(12)	0	1.5E-03	
	uranium	12(0)	4.1E-04	2.8E-03	1.1E-03
	uranium-233/234	12(0)	1.9E-04	1.3E-03	6.5E-04
	uranium-235	12(7)	5.1E-06	6.1E-05	
	uranium-236	12(12)	0	8.9E-06	
	uranium-238	12(0)	1.4E-04	9.2E-04	3.8E-04
A40	fluoride	47(4)	2.2E-02	1.7E-01	7.2E-02

Table 2.8. Ambient air monitoring program summary for radionuclides and fluoride – 2009 (continued)

Sampling Location	Parameter[a]	No. of measurements[b]	Minimum[c, d]	Maximum[c]	Average[c, e]
		On-site air samplers			
T7	americium-241	4(4)	0	9.6E-06	
	neptunium-237	4(4)	0	1.9E-06	
	plutonium-238	4(4)	1.9E-06	8.5E-06	
	plutonium-239/240	4(4)	0	3.9E-06	
	technetium-99	12(12)	0	1.4E-03	
	uranium	12(0)	3.6E-04	1.6E-03	8.7E-04
	uranium-233/234	12(0)	1.7E-04	8.7E-04	3.9E-04
	uranium-235	12(3)	5.2E-06	4.0E-05	
	uranium-236	12(12)	0	7.2E-06	
	uranium-238	12(0)	1.2E-04	5.2E-04	2.9E-04
		Off-site air samplers			
A3	americium-241	4(4)	0	6.8E-06	
	fluoride	47(19)	1.8E-02	4.3E-01	
	neptunium-237	4(4)	0	5.9E-06	
	plutonium-238	4(4)	2.2E-06	1.2E-05	
	plutonium-239/240	4(4)	0	8.8E-06	
	technetium-99	12(12)	0	1.3E-03	
	uranium	12(0)	4.8E-04	3.0E-03	1.1E-03
	uranium-233/234	12(0)	1.7E-04	1.3E-03	5.3E-04
	uranium-235	12(9)	0	4.7E-05	
	uranium-236	12(12)	0	1.6E-05	
	uranium-238	12(0)	1.6E-04	9.9E-04	3.6E-04
A6	americium-241	4(4)	3.5E-09	1.3E-05	
	fluoride	47(38)	2.6E-02	5.0E-02	
	neptunium-237	4(4)	0	3.7E-06	
	plutonium-238	4(4)	0	5.5E-06	
	plutonium-239/240	4(4)	0	7.4E-06	
	technetium-99	12(12)	0	5.1E-04	
	uranium	12(0)	4.5E-04	1.1E-03	8.6E-04
	uranium-233/234	12(0)	1.4E-04	6.7E-04	3.7E-04
	uranium-235	12(8)	0	3.7E-05	
	uranium-236	12(12)	0	4.2E-06	
	uranium-238	12(0)	1.5E-04	3.8E-04	2.9E-04
A9	americium-241	4(4)	2.1E-06	9.5E-06	
	fluoride	47(43)	1.8E-02	2.0E-01	
	neptunium-237	4(4)	0	1.8E-06	
	plutonium-238	4(4)	2.9E-06	7.3E-06	
	plutonium-239/240	4(4)	0	8.0E-06	
	technetium-99	12(12)	0	1.0E-03	
	uranium	12(0)	3.2E-04	1.6E-03	9.2E-04
	uranium-233/234	12(0)	1.4E-04	1.1E-03	4.5E-04
	uranium-235	12(9)	2.0E-06	7.6E-05	
	uranium-236	12(12)	0	9.7E-06	
	uranium-238	12(0)	1.1E-04	5.3E-04	3.1E-04

Table 2.8. Ambient air monitoring program summary for radionuclides and fluoride – 2009 (continued)

Sampling Location	Parameter[a]	No. of measurements[b]	Minimum[c, d]	Maximum[c]	Average[c, e]
A12	americium-241	4(4)	4.2E-09	1.2E-05	
	fluoride	47(22)	1.4E-02	6.6E-02	
	neptunium-237	4(4)	0	2.8E-06	
	plutonium-238	4(4)	2.1E-06	8.4E-06	
	plutonium-239/240	4(4)	0	8.4E-06	
	technetium-99	12(12)	0	1.2E-03	
	uranium	12(0)	4.3E-04	1.5E-03	9.7E-04
	uranium-233/234	12(0)	2.0E-04	7.7E-04	5.0E-04
	uranium-235	12(6)	5.7E-06	3.0E-05	
	uranium-236	12(12)	0	1.1E-05	
	uranium-238	12(0)	1.4E-04	5.0E-04	3.2E-04
A15	americium-241	4(4)	0	6.7E-06	
	fluoride	47(31)	1.6E-02	3.3E-01	
	neptunium-237	4(4)	0	5.6E-06	
	plutonium-238	4(4)	0	4.9E-06	
	plutonium-239/240	4(4)	0	4.9E-06	
	technetium-99	12(12)	0	1.1E-03	
	uranium	12(0)	4.6E-04	1.3E-03	8.7E-04
	uranium-233/234	12(0)	1.9E-04	7.5E-04	4.2E-04
	uranium-235	12(8)	0	3.1E-05	
	uranium-236	12(12)	0	7.6E-06	
	uranium-238	12(0)	1.6E-04	4.4E-04	2.9E-04
A23	americium-241	4(4)	0	2.1E-06	
	fluoride	47(28)	1.6E-02	7.0E-02	
	neptunium-237	4(4)	0	2.0E-06	
	plutonium-238	4(4)	3.9E-06	1.2E-05	
	plutonium-239/240	4(4)	2.0E-09	5.9E-06	
	technetium-99	12(11)	0	2.8E-03	
	uranium	12(0)	4.8E-04	1.7E-03	1.0E-03
	uranium-233/234	12(0)	2.1E-04	9.7E-04	5.5E-04
	uranium-235	12(4)	9.0E-06	4.9E-05	
	uranium-236	12(10)	0	2.3E-05	
	uranium-238	12(0)	1.6E-04	5.6E-04	3.3E-04
A24	americium-241	4(4)	2.5E-06	1.4E-05	
	fluoride	47(29)	1.7E-02	5.6E-02	
	neptunium-237	4(4)	0	0	
	plutonium-238	4(4)	0	9.0E-06	
	plutonium-239/240	4(4)	0	2.9E-06	
	technetium-99	12(11)	0	3.1E-03	
	uranium	12(0)	3.0E-04	1.6E-03	8.8E-04
	uranium-233/234	12(0)	2.0E-04	8.4E-04	4.6E-04
	uranium-235	12(5)	2.2E-06	4.0E-05	
	uranium-236	12(12)	0	2.1E-05	
	uranium-238	12(0)	9.9E-05	5.4E-04	2.9E-04

Table 2.8. Ambient air monitoring program summary for radionuclides and fluoride – 2008 (continued)

Sampling Location	Parameter[a]	No. of measurements[b]	Minimum[c, d]	Maximum[c]	Average[c, e]
A28	americium-241	4(4)	0	1.3E-05	
	fluoride	47(27)	2.0E-02	5.6E-02	
	neptunium-237	4(4)	0	6.2E-06	
	plutonium-238	4(4)	0	6.2E-06	
	plutonium-239/240	4(4)	0	2.1E-09	
	technetium-99	12(12)	0	8.7E-04	
	uranium	12(0)	5.2E-04	1.6E-02	2.2E-03
	uranium-233/234	12(0)	2.1E-04	5.1E-03	7.6E-04
	uranium-235	12(8)	3.7E-06	2.8E-04	
	uranium-236	12(11)	0	3.1E-05	
	uranium-238	12(0)	1.7E-04	5.4E-03	7.3E-04
A37	americium-241	4(4)	2.1E-06	1.4E-05	
(background)	fluoride	47(24)	2.2E-02	9.8E-02	
	neptunium-237	4(4)	0	3.1E-06	
	plutonium-238	4(4)	0	9.4E-06	
	plutonium-239/240	4(4)	0	3.8E-06	
	technetium-99	12(12)	0	6.0E-04	
	uranium	12(0)	5.1E-04	1.2E-03	8.2E-04
	uranium-233/234	12(0)	1.6E-04	5.6E-04	3.5E-04
	uranium-235	12(7)	2.5E-06	3.6E-05	
	uranium-236	12(12)	0	7.8E-06	
	uranium-238	12(0)	1.7E-04	3.9E-04	2.7E-04
A41	americium-241	4(4)	5.7E-06	1.2E-05	
	fluoride	47(31)	7.5E-03	5.1E-02	
	neptunium-237	4(4)	0	4.2E-06	
	plutonium-238	4(4)	2.1E-09	6.9E-06	
	plutonium-239/240	4(4)	0	6.2E-06	
	technetium-99	12(12)	0	1.0E-03	
	uranium	12(0)	5.1E-04	1.3E-03	8.6E-04
	uranium-233/234	12(0)	2.4E-04	5.4E-04	3.7E-04
	uranium-235	12(10)	9.3E-09	4.5E-05	
	uranium-236	12(12)	0	4.1E-06	
	uranium-238	12(0)	1.7E-04	4.2E-04	2.9E-04

[a]All parameters are measured in pCi/m^3 with the exception of uranium and fluoride which are measured in $\mu g/m^3$.

[b]Radiological samples for technetium-99, uranium, and uranium isotopes are analyzed monthly, samples for americium-241, neptunium-237, plutonium-238, and plutonium-239/240 are analyzed one month per quarter, and samples for fluoride are analyzed weekly. Number in parentheses is the number of samples that were below the detection limit. If the analytical result for a sample was below the detection limit, the ambient air concentration was calculated based on the detection limit for the sample.

[c]Results are provided in scientific notation. The number and sign (+ or -) to the right of the "E" indicate the number of places to the right or left of the decimal point. For example, 3.4E-04 is 0.00034 (the decimal point moves four places to the left); 2.1E+02 is 210 (the decimal point moves two places to the right).

[d]Values reported as "0" may actually be negative results. Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out. These negative value results are reported as "0" in the table for simplicity.

[e]Averages are not calculated for locations that had greater than 15% of the results below the detection limit.

Table 2.9. DOE environmental radiation monitoring program (mrem) – 2009

Location	First quarter	Second quarter	Third quarter	Fourth quarter	Cumulative annual whole body dose[a]
#1404A	17	18	23	20	78
#518	17	19	23	18	77
#862	28	32	36	28	124
#874	144	198	192	153	687
#906	16	17	21	18	72
#933	38	40	50	45	173
A12	16	19	25	19	79
A15	16	19	26	21	82
A23	19	20	23	20	82
A24	18	21	26	20	85
A28	16	19	23	19	77
A29	19	20	25	21	85
A3	16	19	20	18	73
A36	18	18	23	18	77
A40	13	14	17	17	61
A6	16	17	24	18	75
A8	22	22	28	23	95
A9	17	19	25	21	82
X-230J2	17	21	24	20	82
Control[b]	16	18	23	17	74
Trip blank[b]	20	19	24	23	86

[a]The annual occupational whole body dose limit set by 10 CFR Part 20 is 5000 mrem.

[b]The control dosimeter is sent from the laboratory at the beginning of the quarter, remains at PORTS throughout the quarter in a low background location, and is returned to the laboratory with the other dosimeters at the end of the quarter. The trip blank dosimeter is sent from the laboratory at the beginning of the quarter, accompanies the sample team to the field locations at the beginning and end of each quarter and is returned to the laboratory with the other dosimeters at the end of the quarter. The control and trip blank measurements are an indication of background radiation.

Table 2.10. Environmental radiation monitoring (mrem) at locations near UDS depleted uranium cylinder storage yards – 2009

Location	First quarter			Second quarter		
	Deep[a,b]		Shallow[c]	Deep[a,b]		Shallow[c]
	X+G	N		X+G	N	
#41	52	ND	52	65	ND	65
#868	323	ND	323	419	ND	419
#874	143	ND	143	197	ND	197
#882	203	ND	203	261	ND	261
#890	45	ND	45	53	ND	53
Trip blank	19	ND	19	20	ND	20

	Third quarter			Fourth quarter			Annual (total)		
	Deep[a,b]		Shallow[c]	Deep[a,b]		Shallow[c]	Deep[a,b]		Shallow[c]
	X+G	N		X+G	N		X+G	N	
#41	72	ND	72	60	ND	60	249	ND	249
#868	473	ND	473	334	ND	334	1549	ND	1549
#874	198	ND	198	150	ND	150	688	ND	688
#882	254	ND	254	219	ND	219	937	ND	937
#890	63	ND	63	50	ND	50	211	ND	211
Trip blank	24	ND	24	23	ND	23	86	ND	86

[a]ND – not detected above the minimum reportable dose.

[b]Deep dose (dose equivalent at a tissue depth of 1 cm) applies to external whole body exposure and consists of x-ray and gamma radiation (X+G) and neutron radiation (N).

[c]Shallow dose (dose equivalent at a tissue depth of 0.007 cm) applies to exposure of the skin or an extremity.

Table 2.11. Local surface water monitoring program results – 2009

Location	Parameter[a,b]	Second quarter[c,d]	Fourth quarter[c,d]
Scioto River	americium-241	0.000008861U	0.0123U
RW-1	neptunium-237	0.01483U	-0.007379U
(downstream)	plutonium-238	0U	0.02949U
	plutonium-239/240	0.02218U	0.000007367U
	technetium-99	-2.94U	-2.06U
	uranium	0.1756	1.67
	uranium-233/234	0.0444	0.4383
	uranium-235	0U	0.05499
	uranium-236	-0.01638U	0U
	uranium-238	0.05908	0.5561
Scioto River	americium-241	0.03637U	-0.01528U
RW-6	neptunium-237	0U	-0.01455U
(upstream)	plutonium-238	0.007113U	0.000007263U
	plutonium-239/240	0.007099U	0.007277U
	technetium-99	-4.92U	-0.758U
	uranium	1.633	1.27
	uranium-233/234	0.5567	0.4624
	uranium-235	0.009672U	0.01783U
	uranium-236	0U	-0.01599U
	uranium-238	0.5477	0.4254
Little Beaver	americium-241	0.02084U	0.008646U
Creek	neptunium-237	0.02335U	0.000008344U
RW-7	plutonium-238	0.007767U	0.04166U
(downstream)	plutonium-239/240	0.01552U	0.00000832U
	technetium-99	5.99U	4.82U
	uranium	1.299	1.62
	uranium-233/234	1.549	2.266
	uranium-235	0.04383	0.05554
	uranium-236	0.007871U	0.02493U
	uranium-238	0.4326	0.5392
RW-8	americium-241	0U	0.01012U
(downstream)	neptunium-237	0U	0.008106U
	plutonium-238	0.02495U	0.01614U
	plutonium-239/240	0.000008309U	-0.008035U
	technetium-99	-5.19U	-0.619U
	uranium	5.204	6.21
	uranium-233/234	1.843	2.691
	uranium-235	0.05362	0.1132
	uranium-236	0.009629U	0.008468U
	uranium-238	1.744	2.075
RW-12	americium-241	-0.008312U	0.02279U
(upstream)	neptunium-237	0U	-0.00762U
	plutonium-238	0.007243U	-0.007606U
	plutonium-239/240	0.01449U	0.007613U
	technetium-99	-5.86U	-5.28U
	uranium	0.06985U	0.0956U
	uranium-233/234	0.02359U	0.008086U
	uranium-235	0U	0U
	uranium-236	-0.008682U	0U
	uranium-238	0.02352U	0.03212U

Table 2.11. Local surface water monitoring program results – 2009 (continued)

Location	Parameter[a,b]	Second quarter[c,d]	Fourth quarter[c,d]
Big Beaver Creek	americium-241	0U	0.009509U
RW-13	neptunium-237	0.007084U	0.00001478U
(downstream)	plutonium-238	0U	0.007381U
	plutonium-239/240	0.01413U	0.007381U
	technetium-99	3.34U	-1.52U
	uranium	0.9827	1.61
	uranium-233/234	1.228	2.196
	uranium-235	0.04794	0.06341
	uranium-236	0.01722U	0.03253U
	uranium-238	0.3258	0.535
RW-5	americium-241	0.008051U	0.03605U
(upstream)	neptunium-237	0.01698U	0U
	plutonium-238	0U	0.007853U
	plutonium-239/240	0U	0.0314U
	technetium-99	-3.85U	-3.16U
	uranium	0.04925U	0.355
	uranium-233/234	0.007878U	0.03741U
	uranium-235	0.009689U	0U
	uranium-236	0U	0U
	uranium-238	0.01568U	0.1194
Big Run Creek	americium-241	0.008579U	0.0363U
RW-2	neptunium-237	0.01347U	0U
(downstream)	plutonium-238	0.02015U	-0.01724U
	plutonium-239/240	0.00000671U	0U
	technetium-99	-1.59U	-3.75U
	uranium	0.1611	0.288
	uranium-233/234	0.1447	0.3058
	uranium-235	0.009392U	0.05659
	uranium-236	0.01687U	0U
	uranium-238	0.05319	0.09157
RW-3	americium-241	0.01668U	-0.03951U
(downstream)	neptunium-237	0U	-0.007324U
	plutonium-238	-0.007983U	0.00001461U
	plutonium-239/240	0.01598U	0.007311U
	technetium-99	-4.76U	-0.305U
	uranium	1.149	0.541
	uranium-233/234	1.197	0.7573
	uranium-235	0.03381U	0.02889U
	uranium-236	0.01012U	0.01729U
	uranium-238	0.383	0.1792

Table 2.11. Local surface water monitoring program results – 2009 (continued)

Location	Parameter[a,b]	Second quarter[c,d]	Fourth quarter[c,d]
Big Run Creek (continued)	americium-241	0.05033U	-0.008744U
RW-33	neptunium-237	0.008324U	0U
(upstream)	plutonium-238	0.02489U	0.00668U
	plutonium-239/240	0.008292U	0U
	technetium-99	-2.64U	-0.0787U
	uranium	0.1146	0.0648U
	uranium-233/234	0.02312U	0.007286U
	uranium-235	0U	0U
	uranium-236	0.008535U	0U
	uranium-238	0.03845	0.02177U
Background creeks	americium-241	0.009217U	0.01938U
RW-10N	neptunium-237	-0.008028U	-0.0144U
	plutonium-238	0.008022U	0.007208U
	plutonium-239/240	0.008014U	0.02162U
	technetium-99	-5.13U	-3.51U
	uranium	0.3858	0.3
	uranium-233/234	0.1126	0.1084
	uranium-235	0U	0U
	uranium-236	0U	0U
	uranium-238	0.1296	0.1009
RW-10S	americium-241	-0.008732U	0.000009803U
	neptunium-237	0.000008308U	0.00002302U
	plutonium-238	0.000008285U	0.007674U
	plutonium-239/240	0.01658U	0.01533U
	technetium-99	-1.44U	-5.53U
	uranium	0.1917	0.408
	uranium-233/234	0.05649U	0.1221
	uranium-235	0U	0.000009407U
	uranium-236	0U	-0.008437U
	uranium-238	0.0644	0.1371
RW-10E	americium-241	0.01241U	0.01128U
	neptunium-237	0U	-0.01439U
	plutonium-238	0.01622U	-0.007181U
	plutonium-239/240	0.008104U	0.007188U
	technetium-99	-4.6U	-1.04U
	uranium	0.07761U	0.069U
	uranium-233/234	0.04355	0.03729U
	uranium-235	0U	0.009195U
	uranium-236	0U	0.008256U
	uranium-238	0.02608U	0.02232U

Table 2.11. Local surface water monitoring program results – 2009 (continued)

Location	Parameter[a,b]	Second quarter[c,d]	Fourth quarter[c,d]
Background creeks	americium-241	0.02317U	-0.009298U
RW-10W	neptunium-237	-0.007417U	-0.008491U
	plutonium-238	0.01482U	0.01699U
	plutonium-239/240	0.007412U	-0.01695U
	technetium-99	-4.06U	-3.96U
	uranium	0.05052U	0.0668U
	uranium-233/234	0.08037	0.02998U
	uranium-235	0.009915U	0U
	uranium-236	0.008903U	0U
	uranium-238	0.01604U	0.02243U

[a]Results are reported in µg/L (uranium) and pCi/L (all other parameters).

[b]The derived concentration guide (DCG) for each radionuclide is as follows: americium-241, 30 pCi/L; neptunium-237, 30 pCi/L; plutonium-238, 40 pCi/L; plutonium-239/240, 30 pCi/L; technetium-99, 100,000 pCi/L; uranium-233/234, 500 pCi/L; uranium-235, 600 pCi/L; uranium-236, 500 pCi/L; uranium-238, 600 pCi/L. All results are well below these DOE standards. A DCG is not available for total uranium.

[c]Abbreviations and data qualifiers are as follows: U – undetected.

[d]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.

Table 2.12. Sediment monitoring program results – 2009

Parameter	Unit	Location/results[a,b]			
		Scioto River and outfalls that discharge to the Scioto River			
		RM-6 Upstream @ Piketon	*RM-1 Downstream @ Lucasville*	*RM-9 Outfall 012*	*RM-10 Outfall 010/Outfall 013*
Aluminum	mg/kg	3810	4260	3770	3080
Americium-241	pCi/g	0.01003U	0.009543	0.000001751U	0.001625U
Antimony	mg/kg	0.49U	0.459U	0.952U	0.536
Arsenic	mg/kg	5.98	6.39	9.8	10.6
Barium	mg/kg	42.1	50.4	56.9	25.3
Beryllium	mg/kg	0.266	0.277	0.449	0.328
Cadmium	mg/kg	0.227	0.314	0.677	0.0946J
Calcium	mg/kg	17600	16500	4340	955
Chromium	mg/kg	6.25	6.54	6.86	9.44
Copper	mg/kg	8.51	11	9.2	7.97
Iron	mg/kg	10200	10500	26100	23400
Lead	mg/kg	7.33	8.79	5.3	8.67
Magnesium	mg/kg	7680	7140	1370	1060
Manganese	mg/kg	283	338	4860	314
Mercury	mg/kg	0.0236	0.0239J	0.029U	0.029U
Neptunium-237	pCi/g	-0.001482U	0.001605U	0.001191U	0.001238U
Nickel	mg/kg	10.3	11.4	30	11.9
PCB, total	µg/kg	18J	27.7J	40U	17.3J
PCB-1016	µg/kg	12.7J	14.3	13.3U	13.3U
PCB-1221	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1232	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1242	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1248	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1254	µg/kg	5.33J	8.67J	13.3U	13.3U
PCB-1260	µg/kg	13.3U	4.67J	3.67J	17.3
PCB-1268	µg/kg	13.3U	13.3U	13.3U	13.3U
Plutonium-238	pCi/g	0.00445U	0.001602U	-0.001187U	0.003705U
Plutonium-239/240	pCi/g	0.00445U	0U	0U	0.001236U
Selenium	mg/kg	0.49U	0.184J	0.952U	0.267J
Silicon	mg/kg	489	624	1050	745
Silver	mg/kg	0.49U	0.459U	0.952U	0.472U
Technetium-99	pCi/g	0.0108U	-0.0294U	-0.0139U	0.393
Thallium	mg/kg	0.17J	0.219J	0.286J	0.136J
Uranium	µg/g	0.6863	0.7573	1.417	1.169
Uranium-233/234	pCi/g	0.2223	0.237	0.5615	0.4376
Uranium-235	pCi/g	0.01143	0.009616	0.02129	0.02243
Uranium-236	pCi/g	0.00513U	0.001727U	-0.001469U	0.002685U
Uranium-238	pCi/g	0.2296	0.2536	0.4743	0.3907
Zinc	mg/kg	45.8	56.8	97	78.1

Table 2.12. Sediment monitoring program results – 2009 (continued)

Parameter	Unit	Location/results[a,b]			
		Little Beaver Creek			
		RM-12 Upstream	*RM-11 X-230J7 Discharge*	*RM-8 Downstream @ Outfall 009 Discharge*	*RM-7 Downstream @ Confluence*
Aluminum	mg/kg	4440	3240	4140	4090
Americium-241	pCi/g	0.00583U	0.008877	0.001605U	0.02173
Antimony	mg/kg	0.374J	0.447	0.147J	0.495U
Arsenic	mg/kg	15.7	16.6	8.61	8.02
Barium	mg/kg	47.3	97.9	40.7	59.4
Beryllium	mg/kg	0.561	0.393	0.406	0.419
Cadmium	mg/kg	0.118U	0.26	0.0956J	0.667
Calcium	mg/kg	996	16200	2700	1900
Chromium	mg/kg	11	12.7	12.6	17
Copper	mg/kg	7.61	20.3	8.53	14.8
Iron	mg/kg	21400	21800	14400	12700
Lead	mg/kg	13.6	18.6	9.38	11.3
Magnesium	mg/kg	905	9710	1640	1350
Manganese	mg/kg	717	1250	323	233
Mercury	mg/kg	0.0175J	0.0356	0.0234J	0.133
Neptunium-237	pCi/g	-0.002402U	0.000002789U	0U	0.08866
Nickel	mg/kg	10.8	13.8	14	34.9
PCB, total	µg/kg	40U	120	75.7	187
PCB-1016	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1221	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1232	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1242	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1248	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1254	µg/kg	13.3U	41.7	12.7J	49.3
PCB-1260	µg/kg	13.3U	78.3	63	137
PCB-1268	µg/kg	13.3U	13.3U	13.3U	13.3U
Plutonium-238	pCi/g	0.003597U	0.001392U	0.001369U	0.01444
Plutonium-239/240	pCi/g	0.003599U	0.0181	0.00684	0.06676
Selenium	mg/kg	0.227J	0.506	0.256J	0.322J
Silicon	mg/kg	856	834	841	383
Silver	mg/kg	0.472U	0.446U	0.417U	0.495U
Technetium-99	pCi/g	-0.0729U	7.41	1.1	57.4
Thallium	mg/kg	0.472U	0.161J	0.417U	0.129J
Uranium	µg/g	0.6464	1.962	2.04	1.668
Uranium-233/234	pCi/g	0.2822	3.554	1.011	2.01
Uranium-235	pCi/g	0.01597	0.1436	0.02831	0.07306
Uranium-236	pCi/g	0U	0.00741	0.008971	0.003748U
Uranium-238	pCi/g	0.2158	0.6463	0.683	0.5539
Zinc	mg/kg	35.9	192	68.5	102

Table 2.12. Sediment monitoring program results – 2009 (continued)

Parameter	Unit	Location/results[a,b]	
		Big Beaver Creek	
		RM-5	*RM-13*
		Upstream	*Downstream*
Aluminum	mg/kg	4390	2400
Americium-241	pCi/g	0.001714U	0.003298U
Antimony	mg/kg	0.427U	0.138J
Arsenic	mg/kg	6.5	9.95
Barium	mg/kg	45	23.3
Beryllium	mg/kg	0.37	0.333
Cadmium	mg/kg	0.23	0.272
Calcium	mg/kg	2220	3170
Chromium	mg/kg	6.47	15.7
Copper	mg/kg	8.1	7.42
Iron	mg/kg	11000	13200
Lead	mg/kg	10.5	6.67
Magnesium	mg/kg	1790	1840
Manganese	mg/kg	453	299
Mercury	mg/kg	0.0155J	0.0124J
Neptunium-237	pCi/g	0.000001731U	0.008824U
Nickel	mg/kg	13	14.7
PCB, total	µg/kg	40U	27.7J
PCB-1016	µg/kg	13.3U	13.3U
PCB-1221	µg/kg	13.3U	13.3U
PCB-1232	µg/kg	13.3U	13.3U
PCB-1242	µg/kg	13.3U	13.3U
PCB-1248	µg/kg	13.3U	13.3U
PCB-1254	µg/kg	13.3U	10J
PCB-1260	µg/kg	13.3U	17.7
PCB-1268	µg/kg	13.3U	13.3U
Plutonium-238	pCi/g	0.001728U	-0.001256U
Plutonium-239/240	pCi/g	0.008639	0.006284
Selenium	mg/kg	0.427U	0.223J
Silicon	mg/kg	428	467
Silver	mg/kg	0.427U	0.446U
Technetium-99	pCi/g	0.397U	6.99
Thallium	mg/kg	0.131J	0.143J
Uranium	µg/g	0.6084	1.32
Uranium-233/234	pCi/g	0.2656	1.323
Uranium-235	pCi/g	0.01533	0.05389
Uranium-236	pCi/g	0.00172U	0.005692U
Uranium-238	pCi/g	0.2031	0.4385
Zinc	mg/kg	39.6	49.5

Table 2.12. Sediment monitoring program results – 2009 (continued)

Parameter	Unit	Location/results[a,b]		
			Big Run Creek	
		RM-33 Upstream	*RM-3 Downstream*	*RM-2 Downstream @ Wakefield*
Aluminum	mg/kg	3380	4470	5220
Americium-241	pCi/g	0.007868	0.003632U	0.001728U
Antimony	mg/kg	0.276J	0.307J	0.431U
Arsenic	mg/kg	11.4	18	10.1
Barium	mg/kg	34.9	45.5	48.6
Beryllium	mg/kg	0.539	0.578	0.529
Cadmium	mg/kg	0.122	0.114	0.138
Calcium	mg/kg	623	1950	633
Chromium	mg/kg	6.8	10.6	7.5
Copper	mg/kg	6.8	8.42	7.96
Iron	mg/kg	31800	19700	14700
Lead	mg/kg	9.49	13.2	10
Magnesium	mg/kg	636	1360	975
Manganese	mg/kg	405	696	497
Mercury	mg/kg	0.0107J	0.0176J	0.0151J
Neptunium-237	pCi/g	0U	-0.001212U	0.002751U
Nickel	mg/kg	10.6	14	13
PCB, total	µg/kg	40U	58.3	40U
PCB-1016	µg/kg	13.3U	13.3U	13.3U
PCB-1221	µg/kg	13.3U	13.3U	13.3U
PCB-1232	µg/kg	13.3U	13.3U	13.3U
PCB-1242	µg/kg	13.3U	13.3U	13.3U
PCB-1248	µg/kg	13.3U	13.3U	13.3U
PCB-1254	µg/kg	13.3U	24	13.3U
PCB-1260	µg/kg	13.3U	34.3	13.3U
PCB-1268	µg/kg	13.3U	13.3U	13.3U
Plutonium-238	pCi/g	0.002429U	0.00242U	0.001371U
Plutonium-239/240	pCi/g	0.004855U	0.000001209U	0.001371U
Selenium	mg/kg	0.14J	0.428J	0.431U
Silicon	mg/kg	254	847	232
Silver	mg/kg	0.439U	0.439U	0.431U
Technetium-99	pCi/g	-0.0221U	0.399	-0.0183U
Thallium	mg/kg	0.215J	0.231J	0.17J
Uranium	µg/g	0.8592	1.536	0.9017
Uranium-233/234	pCi/g	0.3241	0.8848	0.3544
Uranium-235	pCi/g	0.01029	0.04414	0.008607
Uranium-236	pCi/g	0U	0.006097U	0.004637U
Uranium-238	pCi/g	0.2878	0.5123	0.3022
Zinc	mg/kg	34	58.6	37.8

Table 2.12. Sediment monitoring program results – 2009 (continued)

Parameter	Unit	Location/results[a,b]			
		Background creeks			
		RM-10N North background	*RM-10S South background*	*RM-10E East background*	*RM-10W West background*
Aluminum	mg/kg	2350	3710	466	4640
Americium-241	pCi/g	0.000001477U	0.007405U	0.003009U	0.000006246U
Antimony	mg/kg	0.467U	0.157J	0.485U	0.433J
Arsenic	mg/kg	3.91	8.73	0.914	21.7
Barium	mg/kg	25.7	72.5	5.24	30.8
Beryllium	mg/kg	0.237	0.396	0.064J	0.676
Cadmium	mg/kg	0.331	0.0269J	0.121U	0.55
Calcium	mg/kg	4030	1170	65.2	414
Chromium	mg/kg	3.78	6.86	1.64	11
Copper	mg/kg	5.41	4.85	0.334J	12.7
Iron	mg/kg	7050	14200	1780	21000
Lead	mg/kg	5.66	11.1	1.71	11.8
Magnesium	mg/kg	2250	820	41.7	678
Manganese	mg/kg	248	760	38.1	165
Mercury	mg/kg	0.0097J	0.0257U	0.0273U	0.0153J
Neptunium-237	pCi/g	0U	0.003259U	-0.001165U	0U
Nickel	mg/kg	11.6	7.1	0.938J	19
PCB, total	µg/kg	40U	40U	40U	40U
PCB-1016	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1221	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1232	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1242	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1248	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1254	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1260	µg/kg	13.3U	13.3U	13.3U	13.3U
PCB-1268	µg/kg	13.3U	13.3U	13.3U	13.3U
Plutonium-238	pCi/g	0.001155U	0.003249U	-0.00116U	0U
Plutonium-239/240	pCi/g	0U	0.008124	0.002326U	0.006337U
Selenium	mg/kg	0.467U	0.455U	0.162J	0.9
Silicon	mg/kg	342	347	319	297
Silver	mg/kg	0.467U	0.455U	0.485U	0.459U
Technetium-99	pCi/g	0.0697U	0.0833U	0.135U	0.251U
Thallium	mg/kg	0.467U	0.128J	0.485U	0.271J
Uranium	µg/g	0.4765	0.5943	0.1066	2.882
Uranium-233/234	pCi/g	0.1772	0.2101J	0.04022J	0.9973
Uranium-235	pCi/g	0.01487	0.0096	0.004378U	0.05886
Uranium-236	pCi/g	0U	0.003448U	0.00131U	0.001705U
Uranium-238	pCi/g	0.1588	0.1988	0.03542	0.963
Zinc	mg/kg	35.3	27.4	3.81	73.4

[a]Abbreviations and data qualifiers are as follows: J (metals) – the reported value is an estimated concentration greater than the method detection limit but less than the practical quantitation limit; J (radionuclides) – the reported value is estimated; U – undetected.

[b]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.

Table 2.13. Soil and vegetation monitoring at ambient air monitoring stations – 2009

Parameter[a]	Location/results[b,c]			
	A8 – On site at northwest boundary		*T7 – On site near X-230L North Holding Pond*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	-0.003057U	-0.0026U	-0.005596U	0.004995U
Neptunium-237	-0.02681U	0.000002144U	-0.002407U	-0.002959U
Plutonium-238	-0.002547U	0.00214U	0.002404U	0.002955U
Plutonium-239/240	0.002552U	0.00428U	0.002404U	0.003944U
Technetium-99	0.00734U	0.00449U	-0.0116U	0.0118U
Uranium	0.02365	3.409	0.003583U	2.789
Uranium-233/234	0.002281U	1.147	0.007277U	0.9219
Uranium-235	0U	0.05813	0U	0.04354
Uranium-236	-0.00126U	0.004349U	-0.001341U	0.009772U
Uranium-238	0.007955	1.14	0.001211U	0.9333
	A10 – On site on northwest segment of Perimeter Road		*A29 – On site at OVEC*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	0.004103U	0.000001715U	-0.003042U	0.005607U
Neptunium-237	-0.00719U	0.001748U	-0.00123U	-0.00199U
Plutonium-238	0.002876U	-0.0008699U	0.001241U	0U
Plutonium-239/240	0.000004306U	0.003487U	0.002478U	0.004972U
Technetium-99	-0.0229U	-0.0645U	-0.00415U	-0.0629U
Uranium	0.02966	2.299	0.01833U	2.779
Uranium-233/234	0.01872	0.8489	0.001554U	0.91
Uranium-235	0U	0.04884	0U	0.04765
Uranium-236	0U	0.004872U	-0.00171U	0.004754U
Uranium-238	0.009967	0.7682	0.006168U	0.9296
	A36 – On site at X-611 Water Treatment Plant		*A6 – North of PORTS in Piketon*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	0.001745U	-0.002062U	0.003855U	0.006263U
Neptunium-237	0.00283U	0.002003U	0.0012U	0.001116U
Plutonium-238	0.002821U	0.0000009976U	0.004773U	0.002223U
Plutonium-239/240	0.001412U	0.001998U	0U	0.001111U
Technetium-99	0.141	-0.0592U	-0.015U	0.00302U
Uranium	-0.006868U	2.671	0.003966U	3.254
Uranium-233/234	0.01387U	0.8473	0.006679U	1.05
Uranium-235	0U	0.03045U	0U	0.05005
Uranium-236	-0.002555U	0U	0U	0.004993U
Uranium-238	-0.002295U	0.8948	0.001333U	1.089

Table 2.13. Soil and vegetation monitoring at ambient air monitoring stations – 2009 (continued)

Parameter[a]	Location/results[b,c]			
	A24 – North of PORTS at Schuster Road		*A41 - North of PORTS at Zahns Corner*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	-0.004231U	-0.001833U	-0.001627U	0U
Neptunium-237	-0.00618U	0.002885U	-0.02496U	-0.005037U
Plutonium-238	0.003704U	0.000001915U	0.008304U	0.000003014U
Plutonium-239/240	0.000003699U	0.0009601U	-0.002074U	0.004025U
Technetium-99	0.0411U	-0.0156U	0.00556U	-0.00431U
Uranium	1.369	2.828	0.01561U	2.692
Uranium-233/234	0.4415	0.8317	0.001314U	0.8916
Uranium-235	0.02318	0.04178	0U	0.03422
Uranium-236	0.001487U	0.004168U	0.001454U	0U
Uranium-238	0.4581	0.9464	0.005239U	0.9017
	A23 – Northeastern PORTS boundary		*A12 – Eastern PORTS boundary*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	0U	0.001885U	0.001433U	0.007721U
Neptunium-237	-0.002182U	-0.0009629U	-0.003554U	0.0000009982U
Plutonium-238	0.000002179U	0.001925U	0.001776U	0.001993U
Plutonium-239/240	0.004364U	0.003851U	-0.001773U	0.002989U
Technetium-99	0.361	-0.0511U	-0.0121U	-0.0399U
Uranium	0.01034U	2.571	0.03881	3.229
Uranium-233/234	0.00001274U	0.858	0.0147U	1.049
Uranium-235	0U	0.04033	0U	0.03263
Uranium-236	0U	0U	0U	0U
Uranium-238	0.003473U	0.8603	0.01304	1.082
	A15 – Southeast of PORTS on Loop Road		*A3 – Southern PORTS boundary*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	0.001311U	0.003836U	0.001312U	0.003755U
Neptunium-237	-0.005101U	-0.003251U	0.001371U	-0.005239U
Plutonium-238	0.002549U	0.002164U	0.002723U	0.002094U
Plutonium-239/240	-0.002545U	0.001082U	0.005446U	0.002095U
Technetium-99	0.0628U	-0.0272U	0.0294U	0.0131U
Uranium	0.01165U	2.759	0.03443	1.634
Uranium-233/234	0.01046	0.7387	0.001266U	0.7321
Uranium-235	0U	0.03666	0.003102U	0.04592
Uranium-236	0U	0U	0.000001391U	-0.004577U
Uranium-238	0.003915U	0.9237	0.01129	0.5449

Table 2.13. Soil and vegetation monitoring at ambient air monitoring stations – 2009 (continued)

Parameter[a]	Location/results[b,c]			
	A9 – South of PORTS		*A28 – Southwest of PORTS on Camp Creek Road*	
	Vegetation	Soil	Vegetation	Soil
Americium-241	0.003849U	0.005472U	-0.001426U	0.000002005U
Neptunium-237	0.000001045U	-0.001132U	-0.001569U	-0.002048U
Plutonium-238	0.001043U	0.00227U	0.00471U	0.001022U
Plutonium-239/240	0.000002085U	0.01021U	0.000001568U	0.000002042U
Technetium-99	-0.0151U	0.00714U	0.019U	-0.0513U
Uranium	0.04304	1.247	0.01133U	2.618
Uranium-233/234	0.006638U	0.3714	0.01017	0.922
Uranium-235	0.001364U	-0.005029U	0U	0.06176
Uranium-236	-0.001224U	0U	0U	0U
Uranium-238	0.01435	0.4195	0.003806U	0.8743
	A37 – Background station near Otway			
	Vegetation	Soil		
Americium-241	0.001367U	0.004365U		
Neptunium-237	-0.008386U	0.000001869U		
Plutonium-238	-0.001672U	-0.0009309U		
Plutonium-239/240	-0.001673U	0.0028U		
Technetium-99	-0.00792U	0.0446U		
Uranium	0.02317	2.682		
Uranium-233/234	-0.008922U	0.8033		
Uranium-235	0.001575U	0.05591		
Uranium-236	0.000001413U	0.004563U		
Uranium-238	0.007646	0.8962		

[a]All parameters are measured in pCi/g with the exception of uranium which is measured in µg/g.
[b]Abbreviations and data qualifiers are as follows: U – undetected.
[c]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.

Table 2.14. Biota (fish) monitoring program results – 2009

Parameter	Unit	Location/fish/results[a,b]		
		Scioto River (RW-1) freshwater drum & catfish	*Scioto River (RW-6) freshwater drum*	*Big Beaver Creek (RW-15) sunfish & large mouth bass*
Americium-241	pCi/g	0.0021U	0.001488U	0.001418U
Neptunium-237	pCi/g	-0.0009689U	-0.001207U	-0.001219U
PCB, total	µg/kg	769U	714U	1180U
PCB-1248	µg/kg	256U	238U	391U
PCB-1254	µg/kg	66.7J	238U	391U
PCB-1260	µg/kg	256U	238U	391U
PCB-1268	µg/kg	256U	238U	391U
Plutonium-238	pCi/g	0.002907U	-0.001206U	0.0006086U
Plutonium-239/240	pCi/g	0.0009691U	0.001207U	-0.001823U
Technetium-99	pCi/g	0.0696U	-0.00714U	-0.0237U
Uranium	µg/g	0.007748U	0.005277U	0.003563U
Uranium-233/234	pCi/g	0.006086U	0.0006111U	-0.001726U
Uranium-235	pCi/g	0U	0.0007509U	-0.0007096U
Uranium-236	pCi/g	0U	0U	0U
Uranium-238	pCi/g	0.002603U	0.001823U	0.00115U
		Little Beaver Creek (RW-8) large mouth bass	*Little Beaver Creek (RW-8) sunfish*	
Americium-241	pCi/g	-0.002209U	0.001337U	
Neptunium-237	pCi/g	-0.001212U	0.001807U	
PCB, total	µg/kg	968U	678J	
PCB-1248	µg/kg	322U	332U	
PCB-1254	µg/kg	322U	120J	
PCB-1260	µg/kg	225J	558	
PCB-1268	µg/kg	322U	332U	
Plutonium-238	pCi/g	0U	0.001198U	
Plutonium-239/240	pCi/g	0.0006084U	0.001199U	
Technetium-99	pCi/g	-0.0156U	-0.0293U	
Uranium	µg/g	0.003798U	-0.001794U	
Uranium-233/234	pCi/g	0.006143U	0.002424U	
Uranium-235	pCi/g	-0.0007568U	0U	
Uranium-236	pCi/g	0U	0U	
Uranium-238	pCi/g	0.001226U	-0.000603U	

[a]Abbreviations and data qualifiers are as follows: J – the reported value is an estimated concentration greater than the method detection limit but less than the practical quantitation limit; U – undetected.

[b]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.

Table 2.15. Biota (crops) monitoring program results – 2009

Type	Location	Tc-99[a,b,c]	U	U-233/234	U-235	U-238
Cucumber	Off-site #1	0U	0.003352U	-0.002172U	-0.0006701U	0.001085U
Green pepper	Off-site #1	0.0146U	0.002594U	-0.004387U	0U	0.000877U
Pumpkin	Off-site #1	-0.00604U	0.004154U	0.00623U	0.0005909U	0.001435U
Tomatoes	Off-site #1	-0.00118U	-0.001812U	0.0006138U	0U	-0.0006089U
Watermelon	Off-site #1	0.0113U	0.004757U	0.002312U	-0.0009481U	0.001536U
Zucchini	Off-site #1	0.00384U	-0.00427U	0.001435U	0U	-0.001427U
Corn	Off-site #2	0.0115U	-0.003823U	-0.000643U	0U	-0.001289U
Tomatoes	Off-site #2	0.0336U	-0.01375U	-0.002966U	-0.001832U	-0.004447U
Tomatoes	Off-site #3	-0.0295U	-0.004787U	-0.001186U	0.0004882U	-0.001578U
Blackberries	Off-site #4	-0.000751U	-0.005378U	0.000009595U	0.001186U	-0.001913U
Melon	Off-site #4	-0.0164U	-0.002749U	0.02682	0.00000114U	-0.00092U
Pumpkins	Off-site #4	-0.0357U	-0.0004446U	-0.002597U	-0.001603U	0.000001297U
Red raspberries	Off-site #4	-0.0311U	-0.0000006043U	-0.003775U	0U	0U
Tomatoes	Off-site #4	-0.018U	-0.008076U	-0.01223U	0U	-0.002713U
Yellow squash	Off-site #4	-0.00203U	-0.00002171U	-0.001246U	0U	0U
Squash	Off-site #5	-0.00249U	0.002827U	-0.001888U	0U	0.0009446U
Tomatoes	Off-site #5	-0.0137U	0.00001754U	0.000003788U	0U	0.000001512U

[a]Results are reported in µg/g (uranium) and pCi/g (all other parameters). Abbreviations are as follows: Tc-99 – technetium-99, U – uranium, U-233/234 – uranium-233/234, U-235 – uranium-235, U-238 – uranium-238. Data qualifiers are as follows: U – undetected.

[b]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.

[c]Samples were also analyzed for transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240) and uranium-236. None of these radionuclides were detected in the samples.

Table 2.16 Biota (deer) monitoring program results – 2009

Parameter	Units	April 2009[a,b]	November 2009[a,b]
		kidney	
Americium-241	pCi/g	0.002584U	0.000001355U
Neptunium-237	pCi/g	0.000000698U	-0.002775U
Plutonium-238	pCi/g	0.002091U	0.0006938U
Plutonium-239/240	pCi/g	0.000000696U	-0.0006904U
Technetium-99	pCi/g	0.0543U	-0.00548U
Uranium	µg/g	-0.003798U	0.00185U
Uranium-233/234	pCi/g	0.004486U	0.004037U
Uranium-235	pCi/g	0U	0.0008299U
Uranium-236	pCi/g	0U	0.0007451U
Uranium-238	pCi/g	-0.001277U	0.000672U
		liver	
Americium-241	pCi/g	0.001842U	0.001396U
Neptunium-237	pCi/g	-0.005082U	-0.006547U
Plutonium-238	pCi/g	0.001902U	-0.0006531U
Plutonium-239/240	pCi/g	-0.0006334U	0.0000006531U
Technetium-99	pCi/g	0.00598U	-0.00606U
Uranium	µg/g	-0.00212U	-0.0000111U
Uranium-233/234	pCi/g	-0.0006473U	-0.0006345U
Uranium-235	pCi/g	0.0008075U	-0.0007851U
Uranium-236	pCi/g	-0.001449U	-0.0007057U
Uranium-238	pCi/g	-0.0006513U	0U
		muscle	
Americium-241	pCi/g	0.000677U	-0.0007006U
Neptunium-237	pCi/g	-0.005145U	-0.002036U
Plutonium-238	pCi/g	0.002568U	0.0000006779U
Plutonium-239/240	pCi/g	0U	0.0006792U
Technetium-99	pCi/g	0.0153U	-0.0132U
Uranium	µg/g	-0.00000994U	-0.00174U
Uranium-233/234	pCi/g	0.004337U	-0.00236U
Uranium-235	pCi/g	0U	0U
Uranium-236	pCi/g	-0.0006855U	0.000654U
Uranium-238	pCi/g	0.000000617U	-0.000589U

[a]Abbreviations and data qualifiers are as follows: U – undetected.

[b]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.

Table 2.17 Off-site dairy monitoring – 2009

Parameter	Units	Milk[a,b]	Eggs[a,b]
		Regular sample	
Americium-241	pCi/g	0.0008766U	0.003347U
Neptunium-237	pCi/g	0.002178U	0.001522U
Plutonium-238	pCi/g	0.001449U	0.002276U
Plutonium-239/240	pCi/g	0U	0.002275U
Technetium-99	pCi/g	0.0433U	0.0557U
Uranium	µg/g	0.000977U	0.00685U
Uranium-233/234	pCi/g	0.001711U	0.009984
Uranium-235	pCi/g	0.00211U	0U
Uranium-236	pCi/g	0U	0U
Uranium-238	pCi/g	0.0000008526U	0.0023U
		Duplicate sample	
Americium-241	pCi/g	0U	0.002486U
Neptunium-237	pCi/g	-0.0008283U	0.002291U
Plutonium-238	pCi/g	-0.0008244U	0.0000007606U
Plutonium-239/240	pCi/g	0.0008269U	-0.001521U
Technetium-99	pCi/g	0.0526U	0.101U
Uranium	µg/g	0.00245U	0.00922U
Uranium-233/234	pCi/g	0.0000008276U	0.006986
Uranium-235	pCi/g	0U	0U
Uranium-236	pCi/g	-0.0009166U	0U
Uranium-238	pCi/g	0.0008267U	0.003099U

[a]Abbreviations and data qualifiers are as follows: U – undetected.
[b]Because of the statistical nature of radiation detection, results for samples that have no radioactivity are often negative values because background radioactivity is subtracted out.