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**Environmental Monitoring
and Surveillance on the
Oak Ridge Reservation:
1994 Data**

**MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY**

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ENVIRONMENTAL MONITORING AND SURVEILLANCE
ON THE OAK RIDGE RESERVATION:
1994 DATA

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Introduction

Environmental monitoring and surveillance are conducted on the Oak Ridge Reservation and its environs throughout the year. Environmental monitoring ensures that (1) the reservation is a safe place to work, (2) activities on the reservation do not adversely affect the neighboring communities, and (3) compliance is made with federal and state regulations.

This document is a compilation of the monitoring and surveillance data for calendar year 1994. It is a tool for analysts in the fields of environmental monitoring and environmental restoration. The summary information found in the annual site environmental report was drawn from the contents of this document.



1. Site and Operations Overview



**1. Site and Operations
Overview**

Table 1.1. Administrative units on the Oak Ridge Reservation

Administering body	Area	
	Hectares	Acres
Oak Ridge Y-12 Plant	1,769	4,370
Oak Ridge National Laboratory	9,879	24,400
Oak Ridge K-25 Site	1,954	4,825
Oak Ridge Institute for Science and Education	274	680
Johnson Controls World Services, Inc.	93	230
Total	13,969	34,505



2. Environmental Compliance



2. Environmental
Compliance

Table 2.1. RCRA and CERCLA corrective action processes

RCRA	CERCLA	Purpose
RCRA Facility Assessment	Preliminary Assessment/Site Investigation	Identify releases needing further investigations
RCRA Facility Investigation	Remedial Investigation	Characterize nature, extent, and rate of contaminant releases
Corrective Measures Study	Feasibility Study	Evaluate and select remedy
Corrective Measures Implementation	Remedial Design/Remedial Action	Design and implement of chosen remedy

Table 2.2. ORR UST status, 1994

	Y-12 Plant	ORNL	K-25 Site	ORISE
Active/in service	4	17	6	
Closed	40	34	11	1
Hazardous substance	3 ^a	5 ^b	5 ^c	
Upgraded		2		
Known or suspected sites			16	
Total	47	58	38	1

^aTwo USTs are deferred because they are regulated by the Atomic Energy Act of 1954. The third is a permanently closed methanol UST.

^bExcluded under 40 CFR 280; regulated under RCRA Subtitle C.

^cRegulated under RCRA Subtitle I.

Table 2.3. NEPA activities during 1994

Types of NEPA documentation	Y-12 Plant	ORNL	K-25 Site
Categorical exclusion (CX) recommendation	5	27	20
CX granted	5	23	20
Approved under general CX documents	151	51	85
Environmental assessment	2	9	2
Special environmental analysis	0	0	1
Programmatic environmental assessment	0	0	0
Supplement analysis	0	0	0
Environmental impact statement	0	0	0
Supplemental environmental impact statement	0	0	0
Programmatic environmental impact statement	0	0	0

Oak Ridge Reservation

Table 2.4. EPCRA Section 313 toxic chemical release summary for the ORR

Chemical	Year	Quantity (lb)			
		Y-12 Plant	ORNL	K-25 Site	Total
Chlorine	1993	0	7,146	5,220	12,366
	1994	0	0	0	0
Methanol	1993	47,000	164	1	47,165
	1994	39,000	367	7	39,374
Hydrochloric acid	1993	3,200	0	131	3,331
	1994	1,031	202	81	1,314
Sulfuric acid	1993	401	0	1,085	1,426
	1994	18	1	373	392
Nitric acid	1993	24,000	43	3	24,046
	1994	32,300	43	0	32,343
Total	1993				88,394
	1994	73,377	73,377	73,377	73,423

Table 2.5. Results of selected Oak Ridge Reservation recycling activities for the past 4 years

Material	Quantity (tons)			
	1991	1992	1993	1994
Aluminum cans	15.7	24.8	28.7	25.3
Cardboard	85.5	315.4	428.5	354.6
Paper	302.4	552.8	786.6	734.4

Table 2.6. Summary of environmental audits and assessments conducted at the Y-12 Plant, 1994

Date	Reviewer	Subject	Issues
1/10-13	EPA	RCRA/TSCA ORR field trip	1
4/1	DOE	Pollution prevention implementation and RCRA compliance	4
4/1-5/13	DOE	East Fork Poplar Creek buffer zone maintenance	0
5/23-25	TDEC	NPDES compliance evaluation inspection	0
6/10-11	DOE	West End Treatment Facility	0
6/15	DOE	Clean Air Act surveillance	3
6/20-24	TDEC	RCRA annual inspection	0
7/6-8/2	DOE	TDEC annual air emission compliance inspection	0
7/18	DOE	Maintenance of oil-water separator on East Fork Poplar Creek	0
7/25-8/5	DOE	Use of general categorical exclusions	0
8/2-3	TDEC	RCRA groundwater compliance evaluation inspection	0
8/22-9/2	DOE	Routine environmental audit of the Y-12 Plant	7
11/1-3	DOE	Health and safety surveillances of Building 9201-1	0

Table 2.7. Summary of environmental audits and assessments conducted at ORNL, 1994

Date	Reviewer	Subject	Issues
1/13	EPA	Selected hazardous mixed waste storage units	0
2/7	TDEC	Preparation of annual waste activity reports	0
3/7	USDA & Tenn. Dept. of Agriculture	ORNL projects and procedures on handling of soils before disposal	0
3/17	DOE-ORO	UST certificates	0
5/2-4	TDEC	Inspection of treatment, storage, and disposal facilities; groundwater; and generator areas	0
11/8-10	TDEC	Inspection of groundwater and RCRA programs	0

Table 2.8. Summary of environmental audits and assessments conducted at the K-25 Site, 1994

Date	Reviewer	Subject	Issues
2/7-18	DOE-ORO	Multimedia environmental, health, safety, and quality audit	44
2/14-18	EPA	Annual RCRA inspection	0
2/14-25	DOE	Multimedia environmental audit	11
9/12-13	TDEC	Annual inspection of TSCA Incinerator	0
9/21	Federal Energy Regulatory Commission, TDEC	Inspection of dams at water impoundments	0
11/7	TDEC	Annual air inspection of four air emission sources	0
11/17	U.S. Army Corps of Engineers	Inspection of Central Neutralization Facility pipeline extension in Poplar Creek	0

Table 2.9. Summary of Tiger Team corrective actions

Date of review	Site	Environmental findings	Status
6/89 2/10-21/92 (follow-up visit)	Y-12 Plant	62	58 have been closed (52 of these 58 have been verified closed by DOE); 4 remain open.
10/22-11/30/90	ORNL	69	53 have been closed; 45 of these 53 have been verified as closed by DOE; 16 remain open.
11/12-12/18/91	K-25 Site	102	63 have been closed; none of these 63 have been verified as closed by DOE; 39 remain open.

Table 2.10. Summary of permits as of December 1994

	Y-12 Plant	ORNL	K-25 Site
<i>Resource Conservation and Recovery Act</i>			
Part B	1 ^a	2	4
Part B applications in process	5 ^b	3	0
Post-closure	1	1	0
Permit-by-rule units	10	173 ^c	92
Solid waste landfills	6 ^d	0	0
Annual petroleum UST facility certificate	2	1	1
<i>Clean Water Act</i>			
NPDES	1	1 ^e	1
Storm water	1 ^f	1 ^f	1 ^f
Aquatic resource alteration/U.S. Army Corps of Engineers 404 permits	2	2	7
General storm water construction	2 ^g	0	3
<i>Clean Air Act</i>			
Operating air	64	37	52
Construction	6	0	1
Prevention of significant deterioration	0	0	0
<i>Sanitary Sewer</i>			
Sanitary sewer	1	0	0
<i>Toxic Substances Control Act</i>			
TSCA Incinerator	0	0	1
R&D for alternative disposal methods	1	2	0

^aOne permit was issued in 1994 for the Tank Storage Units (includes three storage units).

^bFive applications are under review by TDEC, representing 17 active units.

^cTanks regulated by permit-by-rule.

^dFour landfills are operational, one (Spoil Area 1) is inactive, and one (Landfill VII) is constructed but not in operation as of the end of 1994.

^eIssued 4/28/95 for the Y-12 Plant.

^fTDEC has incorporated storm water into individual NPDES permit applications.

^gTDEC is expected to incorporate storm water into the NPDES permit applications.

^hNotice of intent that accesses a general NPDES permit. Two notices of intent remain on file for construction at landfill V, VII, and the Walk-in Pits. No notice of completion had been issued for the Walk-in Pits by the end of 1994.

**3. Environmental
Management
Program**

Table 3.1. Bulk amount of sewage sludge hauled and applied on five active application sites for 1994

Site	Gallons hauled	Tons/acre applied in 1994 ^a	Total tons applied in 1994
Upper Hayfield #1	903,053	4.1	103.7
Upper Hayfield #2	433,310	2.4	47.9
High Pasture	254,210	0.7	30.2
Scarboro Road	1,590,210	4.3	192.9
Watson Road	433,460	1.4	55.5
Totals	3,623,243	<i>a</i>	430.2

^aNot applicable.

Table 3.2. Sludge application site inorganic soil analysis for 1994

Analyte	Highest detectable soil level ^a				
	Upper Hayfield No. 1	Upper Hayfield No. 2	High Pasture	Scarboro Road	Watson Road
Cation exchange capacity (meq/100 g)	13.0	9.4	11.0	7.4	12.0
Manganese (mg/kg dry weight)	5300.0	727.0	2140.0	1300.0	1730.0
pH	5.0	5.8	6.0	5.2	5.4
Phosphorus (mg/kg dry weight)	360.0	1000.0	160.0	370.0	18.0
Potassium (meq/100 g)	0.37	0.69	0.36	0.30	0.32
Priority pollutants	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
Total Kjeldahl nitrogen (mg-N/kg)	1700.0	3700.0	3200.0	2100.0	680.0

^aNo priority pollutants were identified by TDEC in 1994.

Oak Ridge Reservation

Table 3.3. Cumulative heavy metal loading levels for sludge land applications sites in 1994 (kg/ha)^a

Heavy metal	Upper Hayfield No. 1	Upper Hayfield No. 2	High Pasture	Scarboro Road	Watson Road	40 CFR 503 limits
Arsenic	0.13	0.15	0.09	0.12	0.14	41
Cadmium	0.30	0.34	0.20	0.28	0.31	39
Chromium	4.58	5.15	2.98	4.22	4.71	3000
Copper	14.4	16.19	9.36	13.26	14.83	1500
Lead	3.31	3.79	2.15	3.05	3.41	300
Mercury	0.24	0.28	0.16	0.22	0.25	17
Molybdenum	0.63	0.71	0.41	0.58	0.65	<i>b</i>
Nickel	1.20	1.35	0.78	1.11	1.24	420
Selenium	0.18	0.20	0.12	0.17	0.19	100
Zinc	54.33	61.10	35.34	50.07	55.97	2800

^aTotal amount of metals applied over life of site in kg/ha as of 12/31/94.

^b40 CFR 503 cumulative limits for molybdenum have been excised by the EPA until further notice.

Table 3.4. Sludge land application site radionuclide soil levels observed in 1994 (pCi/kg)

Application site	Sludge levels (reference levels) ^a			
	⁶⁰ Co	¹³⁷ Cs	²³⁵ U	²³⁸ U
Upper Hayfield No. 1	0.048 (<i>b</i>)	0.48 (0.55)	0.084 (0.088)	2.04 (1.51)
Upper Hayfield No. 2	0.021 (<i>b</i>)	0.40 (0.55)	0.086 (0.088)	0.87 (1.51)
High Pasture	0.064 (0.045)	0.71 (0.46)	0.089 (0.056)	1.90 (1.13)
Scarboro Road	<i>b</i> (<i>b</i>)	0.44 (0.55)	0.072 (0.088)	1.36 (1.51)
Watson Road	<i>b</i> (<i>b</i>)	0.15 (0.62)	0.052 (0.030)	1.33 (0.79)

^aNo sludge applied; areas adjacent to sludge application sites.

^bNo detectable activity.

Table 3.5. Historical sludge land application site vegetation radionuclide levels

Radionuclide	Sludge levels (reference levels) ^d							
	Rogers Site				Upper Hayfield Nos. 1 and 2 (1990) ^d		Pine Plantation (1990) ^e	
	1988 ^b		1990 ^c		<i>f</i>	<i>(f)</i>		
U (ppm)	<i>f</i>	<i>(f)</i>	0.01-0.03	(0.01)	<i>f</i>	<i>(f)</i>	0.11	(0.03)
¹³⁷ Cs (pCi/kg)	61	(61)	14-34	(16-26)	44	(14)	15-34	(15)
⁶⁰ Co (pCi/kg)	59	(86)	16	(24)	14	(14)	12-29	(15)
⁴⁰ K (pCi/kg)	27,400	(18,900)	26,100	(22,300)	14	(14)	12-29	(15)
³ He (pCi/kg)	5.360	(13.800)	1,490	(3,440)	2.337	(1.334)	1.913	(2.381)

^aVegetation radionuclide levels at the end of sludge application.

^bVegetation radionuclide levels 2 years after sludge application.

^cVegetation radionuclide levels 1 and 3 months after sludge application.

^dVegetation radionuclide levels 1 year after sludge application.

^eNo sludge applied; areas adjacent to active sludge land application sites.

^fParameter was not analyzed for in the given time period.



4. Effluent Monitoring

4. Effluent Monitoring

Table 4.1. Y-12 Plant airborne uranium emission estimates, 1994

Source of emissions	Quantity emitted	
	Ci ^a	kg
<i>Enriched uranium</i>		
Process exhaust (monitored)	0.027	0.41
Process and laboratory exhaust (unmonitored)	0.003	0.05
Room exhaust (from health physics data)	0.007	0.11
<i>Depleted uranium</i>		
Process exhaust (monitored)	0.010	23.9
Process and laboratory exhaust (unmonitored)	0.002	4.0
Room exhaust (from health physics data)	0.000	0.0
Total	0.049	28.5

^a1 Ci = 3.7E+10 Bq.

Oak Ridge Reservation

Table 4.2. Major sources of radiological airborne emissions at ORNL, 1994 (in curies)^a

Isotope	Stack			
	2026	3020	3039	7911
²⁴¹ Am	5.8E-06	4.8E-07	2.2E-07	1.4E-07
⁴¹ Ar				1.5E+03
¹³⁷ Ba	8.2E-05	3.2E-06	1.7E-04	1.1E-05
¹⁴⁰ Ba			1.2E-05	2.5E-04
⁷ Be			1.7E-03	
²⁴⁴ Cm	7.9E-05	8.9E-08	1.7E-07	1.1E-07
⁶⁰ Co	1.6E-08	2.7E-07	5.8E-06	
¹³⁷ Cs	8.2E-05	3.2E-06	1.7E-04	1.1E-05
¹³⁸ Cs				1.2E+03
¹⁵⁵ Eu	9.7E-08	9.7E-08		
³ H	5.6E-01		7.0E+01	1.5E+02
²⁰³ Hg				1.3E-02
¹²⁹ I				3.2E-06
¹³¹ I	1.8E-04	1.1E-06	6.8E-04	6.4E-02
¹³² I				2.7E-02
^{132m} I				
¹³³ I			2.9E-03	2.1E-01
¹³⁵ I	6.5E-05	2.1E-04	9.0E-03	6.1E-01
¹⁸⁸ Ir			8.1E-01	
⁸⁵ Kr				2.1E+01
^{85m} Kr				3.3E+00
⁸⁷ Kr				6.4E+00
⁸⁸ Kr				1.2E+00
⁸⁹ Kr				1.1E+00
⁹⁰ Kr				6.8E-02
¹⁴⁰ La				5.4E-03
¹⁹¹ Os		8.7E-05	1.2E-01	
²¹² Pb	1.3E-01	1.8E-01	4.2E-01	2.2E-01
²³⁸ Pu	9.8E-06	8.3E-09	2.4E-08	
²³⁹ Pu	1.1E-05	2.9E-07	9.4E-07	2.8E-09
¹⁸⁸ Re			5.7E-02	
¹⁰⁵ Ru				1.8E-02
Sr, total	4.9E-06	2.8E-06	5.0E-05	3.2E-05
²²⁸ Th	3.1E-06	2.2E-08	4.4E-08	2.1E-08
²³⁰ Th	5.0E-06	6.3E-08	2.8E-08	2.4E-08
²³² Th	6.0E-07	9.9E-09	2.9E-08	1.5E-08
²³⁴ U	1.2E-05	4.9E-07	4.4E-07	1.5E-07
²³⁵ U	4.8E-07	1.4E-07	2.4E-08	3.6E-08
²³⁸ U	2.5E-07	1.0E-07	2.1E-07	2.5E-08
¹³¹ Xe				1.5E+01
¹³³ Xe				2.6E+02
^{133m} Xe				6.5E+01
¹³⁵ Xe				1.1E+02
^{135m} Xe				5.0E+02
¹³⁷ Xe				7.3E+01
¹³⁸ Xe				4.9E+02

^a1 Ci = 3.7E+10 Bq.

Table 4.3. Minor sources of radiological airborne emissions at ORNL, 1994 (in curies)*

Isotope	Group												
	2000	3018	3074	3544	7025	7512	7567	7569	7830	7852	7860	7877	
²⁴¹ Am		5.4E-12	6.6E-13			7.1E-07	2.0E-09	2.0E-09	8.2E-09	6.5E-12	6.5E-12	1.4E-10	
¹³⁷ Ba		3.8E-11	1.4E-10	3.9E-07		2.5E-06	2.1E-05	2.1E-05	8.4E-05	4.7E-09	4.7E-09		
¹⁴⁰ Ba													
⁷ Be		3.0E-09	6.3E-11	1.8E-06		6.0E-06	1.2E-07	1.2E-07	4.6E-07				
²⁴⁴ Cm		4.6E-13	2.8E-11				7.1E-09	7.1E-09	2.8E-08	6.7E-11	6.7E-11		
⁶⁰ Co		4.9E-11	5.3E-13	9.5E-09			7.5E-08	7.5E-08	3.0E-07	2.5E-11	2.5E-11		
¹³⁴ Cs							2.8E-08	2.8E-08	1.1E-07				
¹³⁷ Cs		3.8E-11	1.4E-10	3.9E-07		2.5E-06	2.1E-05	2.1E-05	8.4E-05	4.7E-09	4.7E-09		
¹³⁸ Cs													
¹⁵² Eu			1.8E-12							2.1E-11	2.1E-11		
¹⁵⁴ Eu			1.3E-12							1.3E-11	1.3E-11		
¹ H													
²⁰¹ Hg	6.6E+01				1.2E+02		5.9E-02	5.9E-02	2.3E-01				
¹²⁹ I													
¹³¹ I							1.4E-06	1.4E-06	5.4E-06				
¹³² I							6.5E-08	6.5E-08	2.6E-07				
¹³⁵ I							4.9E-09	4.9E-09	1.9E-08				
¹³⁷ I							3.5E-06	3.5E-06	1.4E-05				
²¹⁰ Pb							2.5E-02	2.5E-02	1.0E-01				
²³⁹ Pu							1.8E-07	1.1E-09	4.4E-09	3.2E-12	3.2E-12		
²³⁸ Pu		3.4E-12	1.2E-13	3.4E-10		5.6E-07	1.1E-09	1.1E-09	4.4E-09	1.7E-12	1.7E-12		
²³⁹ Pu		4.7E-10	6.9E-11	5.4E-07		4.6E-08	1.5E-06	1.5E-06	6.1E-06	8.8E-10	8.8E-10	1.8E-09	
Sr, total													
radioactive													
²²⁸ Th		1.4E-12	3.9E-13	6.3E-10		5.6E-08	1.7E-08	1.7E-08	7.0E-08	1.6E-12	1.6E-12	6.1E-10	
²³⁰ Th		2.6E-12	3.1E-13	7.4E-10		3.3E-09	1.9E-10	1.9E-10	7.4E-10	1.7E-13	1.7E-13	5.7E-10	
²³² Th		1.3E-12	3.6E-13	6.8E-10		4.3E-09	1.5E-10	1.5E-10	5.8E-10	7.1E-14	7.1E-14	6.9E-10	
²³⁴ U		1.4E-11	2.3E-12	3.3E-09		2.3E-07	7.1E-09	7.1E-09	2.8E-08	4.7E-12	4.7E-12	1.1E-09	
²³⁵ U	3.2E-09		1.6E-13	4.7E-10		1.8E-09	3.3E-10	3.3E-10	1.3E-09	1.3E-13	1.3E-13	1.2E-10	
²³⁸ U	1.7E-09	5.6E-12	9.3E-13	6.7E-10		2.3E-08	9.9E-10	9.9E-10	4.0E-09	2.6E-13	2.6E-13	6.9E-10	
¹³⁵ Xe												4.9E-04	

*1 Ci = 3.7E+10 Bq.

Table 4.4. K-25 Site radionuclide air emission totals
(in curies),^a 1994

Radionuclide	TSCA Incinerator	Minor sources
³ H	1.23E-01	1.79E-04
⁴⁰ K	1.88E-04	9.75E-07
⁶⁰ Co	1.46E-04	
^{99m} Tc	8.49E-02	8.61E-04
¹⁰⁶ Ru		-5.09E-07
¹³⁷ Cs	-3.95E-04	1.57E-06
²³⁷ Np	5.00E-04	4.07E-04
²³⁸ Pu	-7.64E-05	2.40E-06
²³⁹ Pu	-1.20E-04	1.39E-06
²²⁸ Th	2.07E-05	1.72E-06
²³⁰ Th	3.93E-04	5.32E-06
²³² Th	7.56E-06	2.22E-07
²³⁴ Th	2.40E-02	9.88E-04
^{234m} Pa	1.29E-01	2.36E-03
²³⁴ U	1.96E-03	1.73E-03
²³⁵ U	9.20E-05	9.09E-05
²³⁶ U		3.12E-10
²³⁸ U	1.99E-03	8.93E-04
Totals ^b	3.66E-01	7.52E-03

^a1 Ci = 3.7E+10 Bq.^bNegative values not included.

Table 4.5. Y-12 Plant nonradiological airborne emissions, 1994

Chemical	Quantity released		Major release source	Basis of estimate
	lb	kg		
<i>SARA 313 chemicals^a</i>				
Hydrochloric acid	1,000	455	Chemical processing aid	Engineering calculations
Methanol	39,000	17,727	Cleaning/cooling	Engineering calculations
Nitric acid	32,300	14,682	Chemical processing aid	Material balance
Sulfuric acid	3	1.4	Chemical processing aid	Engineering calculations
<i>Other large-inventory chemicals^b</i>				
Freon 11	2,350	1,068	Refrigerant	Operating records
Freon 12	160	73	Refrigerant	Operating records
Freon 22	1,048	476	Refrigerant	Operating records
<i>Steam plant emissions (all calculated emissions)^c</i>				
Particulates	24,487	11,180	Stack emission	Engineering calculations based on emission factors
SO ₂	4,972,218	2,260,099	Stack emission	Engineering calculations based on emission factors
Carbon monoxide	59,303	26,956	Stack emission	Engineering calculations based on emission factors
Volatile organic compounds	5,416	2,462	Stack emission	Engineering calculations based on emission factors
NO _x	2,570,607	1,168,458	Stack emission	Engineering calculations based on emission factors

^aSuperfund Amendments and Reauthorization Act, Title III, Section 313.

^bFugitive emissions.

^cPoint-source emissions.

Oak Ridge Reservation

Table 4.6. ORNL nonradiological airborne emissions, 1994

Chemical	Quantity released		Major release source	Basis of estimate
	lb	kg		
<i>SARA 313 chemicals^a</i>				
Nitric acid	43	20	Tank emissions	Engineering calculations
Sulfuric acid	0	0	Tank emissions	Engineering calculations
<i>Other large-inventory chemicals^b</i>				
Freon 11	1,800	818	Refrigerant	Operating records
Freon 12	1,645	748	Refrigerant	Operating records
Freon 22	3,515	1,598	Refrigerant	Inventory records
Freon 113	1,712	778	Refrigerant, laboratory uses	
<i>Steam plant emissions (all calculated emissions)^c</i>				
Particulates	14,429	6,559	Stack emission	Engineering calculations based on emission factors
SO ₂	1,953,862	888,119	Stack emission	Engineering calculations based on emission factors
Carbon monoxide	117,715	53,507	Stack emission	Engineering calculations based on emission factors
Volatile organic compounds	2,556	1,162	Stack emission	Engineering calculations based on emission factors
NO _x	422,705	192,139	Stack emission	Engineering calculations based on emission factors

^aSuperfund Amendments and Reauthorization Act, Title III, Section 313.

^bFugitive emissions.

^cPoint-source emissions.

Table 4.7. Potential emissions of criteria pollutants from the K-25 Site, 1992-94

Pollutant	Potential to emit (tons/year)		
	1992	1993	1994
Particulate matter	172	180	141
Volatile organic compounds	262	166	153
Sulfur dioxide	429	429	429
Nitrogen oxides	226	226	226
Carbon monoxide	157	157	157
Miscellaneous	291	291	145
Total	1537	1449	1251

Table 4.8. Actual emissions of criteria pollutants from the K-25 Site, 1994

Pollutant	Estimated emissions (tons/year)
Particulate matter	2.41
Volatile organic compounds	8.18
Sulphur dioxide	5.24
Nitrogen oxides	15.08
Carbon monoxide	20.49
Miscellaneous	0.05

Table 4.9. Estimated K-25 Site emissions of ozone-depleting substances, 1994

Ozone-depleting substance	Estimated emissions (lb/year)
CFC-12	88
HCFC-22	1,450
CFC-114	15,900

Table 4.10. Estimated air emissions from the K-1501 Steam Plant at the K-25 Site, 1994

Pollutant	Emissions (tons/year)	
	Estimated	Allowable
Particulate matter	1.55	18
Sulfur dioxide	5.06	390
Nitrogen oxides	15.08	205
Organics	0.96	8
Carbon monoxide	20.48	138

Table 4.11. Estimated air emissions from the TSCA Incinerator at the K-25 Site, 1994

Pollutant	Emissions (tons/year)		Percentage of allowable
	Estimated	Allowable	
Lead	0.00032	0.57	0.06
Beryllium	0.0000076	0.00037	2.07
Mercury	0.0043	0.088	4.89
Fluorine	0.00033	2.83	0.01
Chlorine	0.028	16.12	0.17
Sulfur	0.19	38.54	0.48
Particulate	0.018	13.14	0.14

Table 4.12. Summary of Y-12 Plant radiological monitoring plan sample requirements

Outfall No.	Location	Sample frequency	Sample type	Sum of DCG percentage
<i>Y-12 Plant wastewater treatment facilities</i>				
501	Central Pollution Control Facility	1/week	Composite during batch operation	8.80
502	West End Treatment Facility	1/week	24-hour composite	0
503	Steam Plant Wastewater Treatment Facility	1/week	24-hour composite	0.057
504	Plating Rinsewater Treatment Facility	1/week	24-hour composite	3.70
512	Groundwater Treatment Facility	1/week	24-hour composite	1.60
<i>Other Y-12 Plant point and area source discharges</i>				
142	Isotope Separation Process	1/month ^a	24-hour composite	0.43
301	Kerr Hollow Quarry	1/month	24-hour composite	0.19
302	Rogers Quarry	1/month	24-hour composite	0.36
<i>Y-12 Plant instream locations</i>				
304	Bear Creek, Plant Exist (west)	1/week	7-day composite	3.1
Station 17	East Fork Poplar Creek, Plant Exit (east)	1/week	7-day composite	1.9
Station 8	East Fork Poplar Creek, Plant Site	1/week	7-day composite	3.4

^aOnly one sample was collected in 1994; there was no flow for 11 months of the year.

Table 4.13. Release of uranium from the Y-12 Plant to the off-site environment as a liquid effluent, 1990-94

Year	Quantity released	
	Ci ^a	kg
<i>Station 17</i>		
1990	0.135	197
1991	0.162	235
1992	0.087	130
1993	0.081	134
1994	0.11	185
<i>Outfall 304</i>		
1990	0.131	204
1991	0.082	159
1992	0.060	110
1993	0.094	167
1994	0.13	236

^a1 Ci = 3.7E+10 Bq.

Table 4.14. Radionuclides released to off-site surface waters from the K-25 Site, 1994

Effluent discharge locations are K-1203, K-1407-J, and K-1515-C

Isotope	Amount (Ci) ^a	Isotope	Amount (Ci) ^a
¹⁴³ Ce	1.1E-01	⁹⁹ Tc	7.0E-02
¹³⁷ Cs	7.9E-03	²²⁸ Th	1.6E-02
⁴⁰ K	2.8E-02	²³⁴ Th	8.7E-02
²³⁷ Np	4.0E-04	²³⁴ U	1.9E-02
²³⁸ Pu	-2.1E-04	²³⁵ U	1.4E-02
²³⁹ Pu	-1.8E-04	²³⁶ U	3.4E-04
^{234m} Pa	1.87E-02	²³⁸ U	3.3E-03

^a1 Ci = 3.7E+10 Bq.

Table 4.15. Summary of Y-12 Plant NPDES excursions, 1994

Date	Location	Excursion	Explanation	Corrective action
1/27/94	Outfall 125	Visible oil sheen	An oil sheen was observed emitting from Outfall 125 on EFPC. The oil was traced back to a hydraulic pump for a heat exchanger that had been taken out of service for repairs. The oil leaked through a stainless steel drain cover that had deteriorated through years of use. The drain discharged directly to EFPC.	Upon detection of the oil sheen, the water to the heat exchanger was shut off and booms were positioned on the creek at the outfall. The stainless steel drain cover was removed, and the drain was plugged with concrete.
2/10/94	Outfall 503 (Steam Plant Wastewater Treatment Facility)	Treatment facility bypass	An unanticipated bypass occurred following exceptionally heavy rain event, which accounted for nearly five in. of accumulation between 2/7 and 2/10. The rain event, linked with extremely saturated ground conditions, placed a severe hydraulic load on the treatment facility. The south equalization basin filled to overflow capacity despite the increased hours of treatment operation. The bypass outlet was plugged, but about 100 gal of wastewater overflowed into the bypass during the operation.	The facility was placed on 24-hour operation. Once the bypass pipe was plugged, water from the equalization basin was pumped back to the coal pile for temporary holding.
2/23/94	Outfall 503 (Steam Plant Wastewater Treatment Facility)	Treatment facility bypass	The equalization basin remained full after the heavy rains during the week of February 7. The treatment facility was inefficient, resulting in less water being treated and discharged and more frequent recycling of water than in normal operations. A second rain event on 2/22 and 2/23 loaded the facility to near basin capacity. The additional storm water runoff from the coal pile overflowed the collection ditch and about 10 to 20 gal per minute entered one of the area storm drains for an estimated 90-min period.	The bypass pipe at the equalization basin was plugged, operations at the facility were increased, and sand bags were placed along the concrete collection ditch and around nearby storm drains.
3/9/94	Outfall 503 (Steam Plant Wastewater Treatment Facility)	Sample concentration (1.2 mg/L iron) exceeded permit limit	Heavy rains during February and March accounted for twice the normal volume of coal pile runoff accumulating in the holding basins, which increased the potential for a treatment facility bypass. The operation was increased to reduce the water level in the basins. This increased throughput compromised the efficiency of iron removal.	Heavy rains quit and the water level in the basins was returned to normal. With the reduced water level, operations returned to normal.
4/8/94	Outfall 503 (Steam Plant Wastewater Treatment Facility)	Unauthorized discharge	Coal pile runoff and sediment in the concrete trench surrounding the coal pile was being moved when a slug of coal fines was washed into a nearby storm drain. The black cloudy slug was observed at the North/South Pipes on EFPC.	Coal fines and residual material were removed from the storm drain. Signs were posted to limit the access of personnel to the area. All employees have been given instruction in the importance of environmental protection.

Table 4.15 (continued)

Date	Location	Excursion	Explanation	Corrective action
5/17/94	Outfall 160	Unauthorized discharge (acid waste)	A mix of sulfuric acid, caustic, and water was being pumped through a fire hose from the west side of Building 9404-18 to the east side of the building when the hose ruptured. The acid waste entered a nearby storm drain that flows through Outfall 160	A new pump for the west sump is on order. Until the new pump arrives, the fire hose has been shortened to provide stability. The hose is also being directed through the building, which serves as a dike
7/10/94	Outfall 21	Visible oil sheen	An oil sheen was observed emitting from Outfall 21. The sheen was traced back to a leaking steam trap in a pit in the basement of Building 9210. The steam leak may have generated enough moisture to wash residual oil into the pipes	The leaking steam trap was repaired
7/12/94	Outfall 67	Visible oil sheen	The roof of Building 9706-1A leaked water into a room containing a central air-conditioning unit. The water picked up residual oil from the equipment and carried it to an open floor drain that drained directly to Outfall 67	The floor drain was sealed with concrete. Roof repairs are being planned
8/1/94	Outfall 150	Visible oil sheen	A low-pressure hydraulic hose failed on a 75-ton crane and spilled about 2 gal of hydraulic fluid to the pavement. Some fluid entered into a nearby storm drain	The crane was repaired at the scene
8/18/94	Outfall 55	Unauthorized discharge (muddy water)	During a cleanout of the basement sump in Building 9201-2, sediments suspended in water were discharged to EFPC	The sump pump is shut down during clean-out operations
12/23/94	Outfall 503 (Steam Plant Wastewater Treatment Facility)	Sample concentration (1.3 mg/L iron) exceeded permit limit	Clarifier plates clogged with soft scale, and the facility was unable to optimize the treatment process. Treated wastewater was diverted to sanitary sewer system. A valve, inadvertently open, discharged wastewater to EFPC	The valve discharging to the creek is now under lock-out/tag-out procedures. The clarifier plates are scheduled to be cleaned and/or replaced, and a final filtration filter for the treatment facility is being designed

Annual Site Environmental Data

Table 4.16. NPDES compliance monitoring requirements and record for the Y-12 Plant, 1994

Discharge point	Effluent parameter	Effluent limits				Percentage of compliance	No. of samples
		Daily av (kg/d)	Daily max (kg/d)	Daily av (mg/L)	Daily max (mg/L)		
301 (Kerr Hollow Quarry)	Lithium				5.0	100	18
	pH, standard units			<i>a</i>	8.5	100	18
	Total suspended solids			30.0	50.0	100	18
	Temperature, °C				30.5	100	18
	Zirconium				3.0	100	18
302 (Rogers Quarry)	Oil and grease			10.0	15.0	100	52
	pH, standard units			<i>a</i>	8.5	100	52
	Settleable solids, mL/L				0.5	100	52
	Total suspended solids			30.0	50.0 ^b	100	52
	Temperature, °C				30.5	100	52
304 (Bear Creek)	Oil and grease			10.0	15.0	100	52
	pH, standard units			<i>a</i>	8.5	100	52
307 (West Borrow Area) ^c	Temperature, °C					100	4
	pH, standard units					100	4
	Oil and grease					100	4
	Total suspended solids					100	4
308 (East Borrow Area) ^c	Temperature, °C					100	4
	pH, standard units					100	4
	Oil and grease					100	4
	Total suspended solids					100	4
501 (Central Pollution Control Facility (CPCF-I))	Cadmium, total	0.07	0.19	0.26	0.69	100	69
	Chromium, total	0.5	0.75	1.71	2.77	100	69
	Copper, total	0.6	0.9	2.07	3.38	100	69
	Cyanide, total	0.2	0.33	0.65	1.20	100	69
	Lead, total	0.12	0.19	0.43	0.69	100	69
	Nickel, total	0.65	1.1	2.38	3.98	100	69
	Oil and grease	7.1	14.2	26.0	52.0	100	69
	pH, standard units			<i>a</i>	9.0	100	69
	Silver, total	0.07	0.12	0.24	0.43	100	69
	Temperature, °C				30.5	100	69
	Total suspended solids	8.5	16.4	31.0	60.0	100	69
	Total toxic organics		0.6		2.13	100	69
	Zinc, total	0.4	0.7	1.48	2.61	100	69
502 (West End Treatment Facility (WETF))	Cadmium, total	0.07	0.019	0.26	0.69	100	30
	Chromium, total	0.5	0.75	1.71	2.77	100	30
	Copper, total	0.6	0.92	2.07	3.38	100	30
	Cyanide, total	0.2	0.33	0.65	1.20	100	31
	Lead, total	0.12	0.19	0.43	0.69	100	30
	Nickel, total	0.65	1.10	2.38	3.98	100	30
	Oil and grease	7.1	14.2	26.0	52.0	100	31
	pH, standard units			<i>a</i>	9.0	100	31
	Silver, total	0.07	0.12	0.24	0.43	100	30
	Temperature, °C				30.5	100	31
	Total suspended solids	8.5	16.4	31.0	60.0	100	30
	Total toxic organics		0.6		2.13	100	8
	Zinc, total	0.4	0.7	1.48	2.61	100	30
503 (Steam Plant Wastewater Treatment Facility)	Chromium, total	0.38	0.38	0.20	0.20	100	151
	Copper, total	1.89	1.89	1.0	1.0	100	151
	Iron, total	1.89	1.89	1.0	1.0	99	151
	Zinc, total	1.89	1.89	1.0	1.0	100	151
	Oil and grease	28.4	37.9	15.0	20.0	100	151
	Total suspended solids	57.0	189.0	30.0	100.0	100	151
	Temperature, °C				30.5	100	151
pH, standard units			<i>a</i>	9.0	100	151	

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Table 4.16 (continued)

Discharge point	Effluent parameter	Effluent limits				Percentage of compliance	No. of samples
		Daily av (kg/d)	Daily max (kg/d)	Daily av (mg/L)	Daily max (mg/L)		
Category I outfalls (precipitation runoff and small amounts of groundwater)	pH, standard units			<i>a</i>	8.5	100	38
Category II outfalls (cooling waters, condensate, precipitation runoff, and building, roof, and foundation drains)	pH, standard units			<i>a</i>	8.5	100	77
	Temperature, °C					100	77
Category III outfalls (process wastewaters)	pH, standard units			<i>a</i>	8.5	100	40
Category IV outfalls (untreated process wastewaters)	pH, standard units			<i>a</i>	8.5	100	74
504 (Plating Rinsewater Treatment Facility)	Cadmium, total	0.07	0.019	0.26	0.69	100	3
	Chromium, total	0.50	0.75	1.71	2.77	100	3
	Copper, total	0.60	0.92	2.07	3.38	100	3
	Cyanide, total	0.2	0.33	0.65	1.20	100	3
	Lead, total	0.12	0.19	0.43	0.69	100	3
	Nickel, total	0.65	1.10	2.38	3.98	100	3
	Oil and grease	7.1	14.2	26.0	52.0	100	3
	pH, standard units			<i>a</i>	9.0	100	3
	Silver, total	0.07	0.12	0.24	0.43	100	3
	Temperature, °C				30.5	100	3
	Total suspended solids	8.5	16.4	31.0	60.0	100	3
	Total toxic organics		0.6		2.13	100	3
	Zinc, total	0.4	0.7	1.48	2.61	100	3
	501/504 (combined discharge from Central Pollution Control Facility and Plating Rinsewater Treatment Facility)	Cadmium, total	0.07	0.019	0.26	0.69	100
Chromium, total		0.50	0.75	1.71	2.77	100	4
Copper, total		0.60	0.92	2.07	3.38	100	4
Cyanide, total		0.2	0.33	0.65	1.20	100	4
Lead, total		0.12	0.19	0.43	0.69	100	4
Nickel, total		0.65	1.10	2.38	3.98	100	4
Oil and grease		7.1	14.2	26.0	52.0	100	4
pH, standard units		0.07	0.12	<i>a</i>	9.0	100	4
Silver, total		8.5	16.4	0.24	0.43	100	4
Temperature, °C		0.4	0.6	31.0	30.5	100	4
Total suspended solids			0.7	1.48	60.0	100	4
Total toxic organics					2.13	100	4
Zinc, total					2.61	100	4
623 (Steam Plant fly ash sluice water)		pH, standard units			<i>a</i>	8.5	<i>e</i>
506 (9204-3 sump pump oil)	Temperature, °C				30.5	<i>e</i>	
	Oil and grease			10.0	15.0	<i>e</i>	
	pH, standard units			<i>a</i>	8.5	<i>e</i>	
508 (Experimental Mobile Wastewater Treatment Facility)	Mercury, total			0.00	0.00	<i>e</i>	<i>a</i>
	pH, standard units			2	4	<i>e</i>	
	Total suspended solids			<i>a</i>	9.0	<i>e</i>	
				30.0	45.0		
510 (Waste Coolant Processing Facility)	Biochemical oxygen demand	1.33	2.65			<i>e</i>	
	Oil and grease			15.0	20.0	<i>e</i>	
	pH, standard units			<i>a</i>	9.0	<i>e</i>	
	Temperature, °C			30.0	30.5	<i>e</i>	
					50.0	<i>e</i>	
512 (Groundwater Treatment Facility)	Oil and grease			<i>a</i>	15	100	508
	Iron, total			<i>a</i>	1.0	100	508
	pH, standard units			<i>a</i>	9.0	100	continuous
	PCBs					100	508

Table 4.16 (continued)

Discharge point	Effluent parameter	Effluent limits				Percentage of compliance	No. of samples
		Daily av (kg/d)	Daily max (kg/d)	Daily av (mg/L)	Daily max (mg/L)		
Miscellaneous discharges (cooling tower blowdown)	Chromium, total				1.0	100	36
	Copper, total			0.5	1.0	100	36
	Free available chlorine			0.2	0.5	100	48
	pH, standard units			<i>a</i>	8.5	100	48
	Temperature, °C			35	38	100	48
	Zinc, total			0.5	1.0	100	36
Miscellaneous discharges (demineralizers)	pH, standard units			<i>a</i>	8.5	<i>e</i>	
	Total suspended solids			30	50	<i>e</i>	

^aNot applicable.

^bLimit not applicable during periods of increased surface runoff resulting from precipitation.

^cApplication submitted to add this outfall to the permit. No limits have been set.

^dTemperature shall be controlled such that the stream temperature standards delineated in the General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee, as amended, are not violated as a result of this discharge.

^eNo discharge.

Table 4.17. Surface water analytical results of polychlorinated biphenyls monitoring for the Y-12 Plant, 1994

Site No.	Location	Date sampled	PCB concentration (mg/L)
PCB-1	Outfall 301, Kerr Hollow Quarry	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005
PCB-2	Outfall 302, Rogers Quarry	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005
PCB-3	Outfall 303, New Hope Pond	<i>a</i>	<0.0005
PCB-5	New Hope Pond Inlet	<i>b</i>	<0.0005
PCB-6	Upstream of Outfall 135	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005
PCB-7	Outfall 304, Bear Creek	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005

^aThis outlet was closed in April 1989.

^bThis inlet was closed in November 1988.

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Table 4.18. Calculated sanitary sewer concentrations for parameters having a discharge limit, Y-12 Plant, 1994

Parameter	No. of samples	Concentration ^a			Reference Value ^b	No. of values exceeding reference
		Max	Min	Av		
<i>January 1, 1994 through June 27, 1994</i>						
pH, standard units	30	8.3	6.1	c	6-9 ^d	0
Cyanide	30	<0.01	<0.01	<0.01	0.007	30 ^e
Oil and grease	30	14	<2 ^f	<4	50	0
Phenols	30	0.047	<0.001 ^f	<0.01	5.0	0
Biochemical oxygen demand	30	96	<5 ^f	<20	300	0
Hexavalent chromium	30	<0.01	<0.01	<0.01	0.002	30 ^e
Mercury	29	0.0155	<0.0002	<0.002	0.1	0
Total Kjeldahl nitrogen	30	21.6	<0.2 ^f	1	90	0
Total suspended solids	30	199.1	<5 ^f	<20	300	0
Arsenic	30	<0.04	<0.04 ^f	<0.04	0.1	0
Cadmium	30	<0.004	<0.004	<0.004	0.000024	30
Copper	30	0.035	<0.006 ^f	<0.01	0.04	0
Iron	30	0.94	<0.06 ^f	<0.4	1.5	0
Lead	30	<0.02	<0.02	<0.02	0.0016	30 ^e
Manganese	30	0.107	g ^f	0.051	1.0	0
Nickel	30	<0.008	<0.008 ^f	<0.006	0.10	0
Silver	30	<0.026	<0.006	<0.007	0.1	0
Zinc	30	0.2	<0.01 ^f	<0.1	2.0	0
<i>June 28, 1994 through December 31, 1994</i>						
pH, standard units	26	8.1	7.1	c	6-9 ^d	0
Cyanide	26	<0.01	<0.01	<0.01	0.007	26 ^e
Oil and grease	26	8.6	<2.0	<4.0	50	0
Phenols	26	0.136	<0.005	<0.02	5.0	0
Hexavalent chromium	25	<0.01	<0.01	<0.01	0.002	25 ^e
Mercury	26	0.0036	<0.0002	<0.001	0.1	0
Total Kjeldahl nitrogen	26	24	6.6	13	90	0
Total suspended solids	26	96	<5	<40	300	0
Arsenic	26	<0.04	<0.04	<0.04	0.1	0
Cadmium	26	<0.004	<0.04	<0.004	0.000024	26 ^e
Copper	26	0.048	0.011	0.018	0.04	1
Iron	26	0.75	0.24	0.45	1.5	0
Lead	26	<0.02	<0.02	<0.02	0.0016	26 ^e
Manganese	26	0.064	0.028	0.044	1.0	0
Nickel	26	<0.008	<0.008	<0.008	0.10	0
Silver	26	0.012	<0.006	<0.007	0.1	0
Zinc	26	0.28	0.09	0.1	2.0	0

^aAll units in mg/L unless otherwise indicated.

^bSanitary Sewer Industrial Discharge permit limits.

^cNot applicable.

^dMinimum value/maximum value.

^eThe detection limit of this parameter is above the reference value.

^fCalculated value was below the detection limit.

Table 4.19. 1994 NPDES compliance at ORNL

Discharge point	Effluent parameters	Permit limits					Permit compliance		
		Monthly av (kg/d)	Daily max (kg/d)	Monthly av (mg/L)	Daily max (mg/L)	Daily min (mg/L)	Number of noncompliances	Number of samples	Percentage of compliance ^a
X01 (Sewage Treatment Plant)	Ammonia, as N (summer)	3.5	5.2	4.0	6.0		0	92	100
	Ammonia, as N (winter)	7.8	11.8	9.0	13.5		0	64	100
	Biochemical oxygen demand (summer)	8.7	13.1	10	15		0	92	100
	Biochemical oxygen demand (winter)	17.4	26.2	20	30		0	64	100
	Chlorine, total residual				0.5		1	157	99
	Dissolved oxygen					6.0	0	249	100
	Downstream pH (SU)			1000	9.0	6.0	0	52	100
	Fecal coliform (col/100 mL) ^b				5000		0	156	100
	Oil and grease	8.7	13.1	10	15		0	156	100
	pH (SU)				9.0	6.0	0	52	100
X02 (Coal Yard Runoff Treatment Facility)	Total suspended solids	26.2	39.2	30	45		0	156	100
	Chromium, total			0.2	0.2		0	52	100
	Copper, total			1.0	1.0		0	52	100
	Downstream pH (SU)				9.0	6.0	0	249	100
	Iron, total			1.0	1.0		3	52	94
	Oil and grease			15	20		0	51	100
	pH (SU)				9.0	6.0	0	263	100
	Selenium, total			0.22	0.95		0	52	100
	Temperature (°C)				30.5		0	263	100
	Total suspended solids				50		0	52	100
X12 (Nonradiological Wastewater Treatment Facility)	Zinc			1.0	1.0		0	52	100
	Cadmium, total	0.79	2.09	0.26	0.69		0	52	100
	Chromium, total	5.18	8.39	1.71	2.77		0	52	100
	Copper, total	6.27	10.24	2.07	3.38		0	52	100
	Cyanide, total	1.97	3.64	0.65	1.20		0	52	100
	Downstream pH (SU)				9.0	6.0	0	249	100
	Lead, total	1.30	2.09	0.43	0.69		0	52	100
	Nickel, total	7.21	12.06	2.38	3.98		0	52	100
	Oil and grease	30.3	45.4	10	15		0	52	100

Table 4.19 (continued)

Discharge point	Effluent parameters	Permit limits				Permit compliance			
		Monthly av (kg/d)	Daily max (kg/d)	Monthly av (mg/L)	Daily max (mg/L)	Daily min (mg/L)	Number of noncompliances	Number of samples	Percentage of compliance ^a
X12 (continued)	pH (SU)				9.0	6.0	0	c	100
	Silver, total	0.73	1.30	0.24	0.43		0	52	100
	Temperature (°C)				30.5		0	249	100
	Total suspended solids	93.9	182	31	60		0	52	100
	Total toxic organics		6.45		2.13		0	52	100
Category I outfalls ^d	Zinc, total	4.48	7.91	1.48	2.61		0	52	100
	Downstream pH (SU)				9.0	6.0	0	28	100
	Oil and grease			10	15		0	28	100
	pH (SU)				9.0	6.0	0	28	100
	Temperature (°C)				30.5		0	28	100
Category II outfalls	Total suspended solids			30	50		8	28	71
	Downstream pH (SU)				9.0	6.0	0	161	100
	Downstream temperature (°C) ^e			10	30.5		0	35	100
	Oil and grease				15		0	159	100
	pH (SU)			30	9.0	6.0	0	161	100
Cooling Systems	Total suspended solids				50		15	159	91
	Chlorine, total residual				0.2		0	35	100
	Chromium, total				1.0		0	34	100
	Copper, total			0.5	1.0		0	34	100
	Downstream pH (SU)				9.0	6.0	0	34	100
	pH (SU)				9.0	6.0	0	34	100
	Temperature (°C)			35	38		0	34	100
	Zinc, total			0.5	1.0		0	34	100

^aPercent compliance = 100 - [(number of noncompliances/number of samples) * 100].

^bColonies per 100 ml.

^cpH monitoring is continuous.

^dCategory I outfalls are monitored annually by the NPDES Permit year of April 1-March 31.

^eDownstream temperature is monitored to check that the stream temperature standards stated in the General Water Quality Criteria for the Definition and Control of Pollution in the Waters of Tennessee are not violated as a result of this discharge.

Table 4.20. NPDES compliance at the K-25 Site, 1994

Discharge point	Effluent parameter	Effluent limits				No. of noncompliances	Percentage of compliance	
		Monthly av ^a	Daily max ^c	Monthly av (kg/d)	Daily max (kg/d)			
005 (K-1203 Sewage Treatment Facility)	Ammonia nitrogen	5	7	12	17		100	
	Biochemical oxygen demand	15	20	37	49	2	98.7	
	Chlorine, total residual	0.14	0.24				100	
	Dissolved oxygen		5 ^b				100	
	Fecal coliform, col/100 ml	200 ^c	400			6	92.3	
	Flow, Mgd	<i>d</i>	<i>d</i>				100	
	LC ₅₀ , <i>Ceriodaphnia</i> , %		14.6 ^b				100	
	LC ₅₀ , <i>Pimephales</i> , %		14.6 ^b				100	
	NOEL ^c , <i>Ceriodaphnia</i>		4.2 ^b				100	
	NOEL ^c , <i>Pimephales</i> , %		4.2 ^b			1	83.3	
	pH, standard units		6.0-9.0				100	
	Settleable solids, mL/L		0.5				100	
	Suspended solids	30	45	74	111		100	
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		<i>f</i>	
	009 (K-1515-C Sanitary Water Plant)	Aluminum	1.0	2.0				100
		Chlorine, total residual		1.0				100
		Flow, Mgd	<i>d</i>	<i>d</i>				100
pH, standard units			6.0-9.0				100	
Settleable solids, mL/L			0.5				100	
Suspended solids		30	40				100	
Unpermitted discharge		<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		<i>f</i>	
011 (K-1407-J Central Neutralization Facility)	1,1,1-Trichloroethane	<i>d</i>	<i>d</i>				100	
	Acetone	<i>d</i>	<i>d</i>				100	
	Acetonitrile	<i>d</i>	<i>d</i>				100	
	Benzene	<i>d</i>	<i>d</i>				100	
	Bromoform	<i>d</i>	<i>d</i>				100	
	Cadmium	0.18	0.69				100	
	Carbon tetrachloride	0.5	0.5				100	
	Chemical oxygen demand	<i>d</i>	<i>d</i>				100	
	Chloride, total	9711	39,479				100	
	Chlorine, total residual		0.14			1	99.7	
	Chlorodibromomethane	<i>d</i>	<i>d</i>				100	
	Chloroform	0.5	0.5				100	
	Chromium	1.71	2.77				100	
	Copper	1.34	2.15				100	
	Dichlorobromomethane	<i>d</i>	<i>d</i>				100	
	Flow, Mgd	<i>d</i>	<i>d</i>				100	
	Ethylbenzene	<i>d</i>	<i>d</i>				100	
	Gross alpha, pCi/L	<i>d</i>	<i>d</i>				100	
	Gross beta, pCi/L	<i>d</i>	<i>d</i>				100	
	LC ₅₀ , <i>Ceriodaphnia</i> , %		7.05 ^b				100	
	LC ₅₀ , <i>Pimephales</i> , %		7.05 ^b				100	
	Lead	0.38	0.69				100	
	Methyl ethyl ketone	<i>d</i>	<i>d</i>				100	
	Methylene chloride	<i>d</i>	<i>d</i>				100	
	Naphthalene	<i>d</i>	<i>d</i>				100	
	Nickel	2.38	3.98				100	
	NOEL ^c , <i>Ceriodaphnia</i> , %		2.11 ^b				100	
	NOEL ^c , <i>Pimephales</i> , %		2.11 ^b				100	
	Oil and grease		30				100	
	PCB	0.00014	0.00014				100	
pH, standard units		6.0-9.0				100		
Silver	0.24	0.43				100		
Suspended solids		40				100		

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Table 4.20 (continued)

Discharge point	Effluent parameter	Effluent limits				No. of noncompliances	Percentage of compliance
		Monthly av ^a	Daily max ^b	Monthly av (kg/d)	Daily max (kg/d)		
	Temperature, °C	<i>g</i>	<i>g</i>				100
	Tetrachloroethylene		0.7				100
	Toluene	<i>d</i>	<i>d</i>				100
	Total toxic organics		2.13				100
	Trichloroethylene	0.5	0.5				<i>f</i>
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		100
	Uranium, total	<i>d</i>	<i>d</i>				100
	Vinyl chloride	0.2	0.2				100
	Zinc	1.48	2.61				
Category I storm drains	Flow, Mgd	<i>d</i>	<i>d</i>				100
	pH, standard units		4.0-9.0				100
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		<i>f</i>
Category II storm drains	Flow, Mgd	<i>d</i>	<i>d</i>				100
	pH, standard units		4.0-9.0				100
	Suspended solids	<i>d</i>	<i>d</i>				100
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		<i>f</i>
Category III storm drains	Flow, Mgd	<i>d</i>	<i>d</i>				100
	Oil and grease	<i>d</i>	<i>d</i>				100
	pH, standard units		4.0-9.0				99.7
	Suspended solids	<i>d</i>	<i>d</i>				100
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>	1	<i>f</i>
Category IV storm drains (to Poplar Creek)	Chlorine, total residual		0.14			3	98.1
	Flow, Mgd	<i>d</i>	<i>d</i>				100
	Oil and grease	<i>d</i>	<i>d</i>				100
	pH, standard units		6.0-9.0				99.3
	Suspended solids	<i>d</i>	<i>d</i>				100
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		<i>f</i>
Category IV storm drains (to Mitchell Branch)	Chlorine, total residual		0.019			1	99.5
	Flow, Mgd	<i>d</i>	<i>d</i>				100
	Oil and grease	<i>d</i>	<i>d</i>				100
	pH, standard units		6.0-9.0				100
	Suspended solids	<i>d</i>	<i>d</i>				100
	Unpermitted discharge	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>	1	<i>f</i>

^aUnits are mg/L unless otherwise stated.

^bDaily minimum.

^cGeometric mean.

^dNonlimited parameter.

^eNo-observed-effect limit.

^fNot applicable.

^gEffluent must not cause the temperature of the receiving stream to exceed 30.5°C.

Table 4.21. Y-12 Plant Toxicity Control and Monitoring Program (TCMP)
summary information for 1994^a

Site/Building	Test date	Species	NOEC ^b (%)	IWC ^c (%)
Groundwater Treatment Facility (Outfall 512)	1/27	Fathead minnow		0.41
		<i>Ceriodaphnia</i>	12	0.41
Steam Plant Wastewater Treatment Facility	2/3	Fathead minnow	6	7.35
		<i>Ceriodaphnia</i>	12	7.35
Proposed Outfall 201	3/10	Fathead minnow	100	<i>d</i>
		<i>Ceriodaphnia</i>	8	<i>d</i>
Groundwater Treatment Facility (Outfall 512)	4/7	Fathead minnow	3	0.37
		<i>Ceriodaphnia</i>	3	0.37
Central Pollution Control Facility (Outfall 501)	5/12	Fathead minnow	1	
		<i>Ceriodaphnia</i>	12	0.75 ^e
Central Pollution Control Facility (Outfall 501)	7/14	Fathead minnow	50	0.30
		<i>Ceriodaphnia</i>	12	0.30
Proposed Outfall 201	7/14	Fathead minnow	<80	<i>d</i>
		<i>Ceriodaphnia</i>	100	<i>d</i>
Groundwater Treatment Facility (Outfall 512)	10/13	Fathead minnow	30	<i>f</i>
		<i>Ceriodaphnia</i>	30	<i>f</i>

^aThese 7-day toxicity tests using fathead minnows and *Ceriodaphnia* were completed in 1994 as part of the TCMP conducted for the Y-12 Plant by ORNL. Summarized are the effluents and their corresponding no-observed-effect concentrations and in-stream waste concentrations (IWCs). NOTE: Discharge from the treatment facilities is intermittent because of batch operations.

^bNo-observed-effect concentrations.

^cThe IWC based on actual flows at East Fork Poplar Creek, Station 8.

^dThis is an in stream point; therefore, an IWC is not applicable.

^eThe IWC was calculated on 5/17/94.

^fData not available.

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Table 4.22. 1994 toxicity test results of ORNL wastewaters and ambient waters

Outfall	Test date	Treatment ^d	Fathead minnow NOEC ^e (%)	<i>Ceriodaphnia</i> NOEC ^e (%)	IWC ^f (%)
Coal Yard Runoff Treatment Facility (X02)	May	N	100	50	0.5
	Nov	N	100	12	8.0
Sewage Treatment Plant (X01)	Apr	N	<i>d</i>	12	37.2
	Apr ^g	N	<i>d</i>	6	22.8
	July	N	<i>d</i>	50	24.5
	Sep	N	<i>d</i>	25	19.2
	Nov	N	<i>d</i>	12	15.7
Nonradiological Wastewater Treatment Plant (X12)	Apr	N	<i>d</i>	100	<i>f</i>
	Oct	N	<i>d</i>	100	<i>f</i>
Melton Branch (X13)	Feb	N	100	80	
		UV	100	<i>d</i>	
	Feb ^h	N	<i>d</i>	100	
		N	80	<i>g</i>	
	Apr	UV	100	<i>d</i>	
	May ⁱ	N	<i>g</i>	100	
		UV	<i>g</i>	<i>d</i>	
	May ^j	N	<80	<i>d</i>	
		UV	100	<i>d</i>	
	June	N	100	100	
		UV	100	<i>d</i>	
	Aug	N	100	100	
		UV	100	<i>d</i>	
	Oct	N	<80	100	
		UV	100	<i>d</i>	
	Nov ^k	N	<80	<i>d</i>	
	UV	100	<i>d</i>		
Dec	N	<80	80		
	UV	100	<i>d</i>		
Dec ^l	N	100	100		
	UV	100	<i>d</i>		
White Oak Creek (X14)	Feb	N	100	100	
		UV	100	<i>d</i>	
	Apr	N	80	<i>g</i>	
		UV	100	<i>d</i>	
	May	N	<i>g</i>	100	
		UV	<i>g</i>	<i>d</i>	
	May ^m	N	80	<i>d</i>	
		UV	100	<i>d</i>	
	June	N	100	100	
		UV	100	<i>d</i>	
	Aug	N	100	<80	
		UV	100	<i>d</i>	
	Sep ⁿ	N	<i>d</i>	100	
Oct	N	100	100		
	UV	100	<i>d</i>		
Dec	N	100	80		
	UV	100	<i>d</i>		
Dec ^o	N	<i>d</i>	100		

^aN = no sample pretreatment; UV = ultraviolet light pretreatment.

^bNo-observed-effect concentration.

^cIn-stream waste concentration (based on critical low flow of White Oak Creek).

^dNot tested.

^eConfirmatory test.

^fNot calculated.

^gInvalid test.

Table 4.23. 1994 average water quality parameters measured during toxicity tests of ORNL wastewaters and ambient waters

Values are for full-strength wastewater for each test (N = 1 or 7) or averages of full-strength ambient water for each test (N = 7)

Outfall	Test date	pH (standard units)	Conductivity ($\mu\text{S}/\text{cm}$)	Alkalinity (mg/L CaCO_3)	Hardness (mg/L CaCO_3)
Coal Yard Runoff Treatment Facility (X02)	May	8.00	3240	23	1460
	Nov	7.29	3580	22	1510
Sewage Treatment Plant (X01)	Apr ^a	7.91	385	108	151
	Apr ^b	7.89	408	104	147
	July	7.91	331	81	140
	Sep	7.72	363	76	143
	Nov	7.82	450	76	168
Nonradiological Wastewater Treatment Facility (X12)	Apr	8.04	431	83	77
	Oct	7.85	626	58	108
Melton Branch (X13)	Feb ^c	7.95	392	90	184
	Feb ^d	7.07	215	71	109
	Apr	8.05	423	116	213
	May ^e	8.03	579	106	297
	May ^f	8.03	501	121	260
	June	8.04	430	101	211
	Aug	8.04	536	114	270
	Oct	7.83	680	92	335
	Nov	7.84	423	138	217
	Dec ^g	7.94	342	109	186
	Dec ^h	7.80	618	101	291
White Oak Creek (X14)	Feb	8.05	370	106	154
	Apr	8.16	308	107	139
	May ^e	8.17	322	107	146
	May ^f	8.11	337	106	145
	June	8.16	354	105	147
	Aug	8.08	367	97	161
	Sep	7.93	326	101	152
	Oct	8.00	391	105	165
	Dec ^g	8.00	368	116	181
	Dec ^h	7.97	401	117	167

^aData for test conducted April 7–14, 1994.

^bData for test conducted April 21–28, 1994.

^cData for test conducted February 3–10, 1994.

^dData for test conducted February 10–16, 1994.

^eData for test conducted May 12–19, 1994.

^fData for test conducted May 20–27, 1994.

^gData for test conducted December 8–15, 1994.

^hData for test conducted December 29–January 5, 1995.

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Table 4.24. 1994 K-25 Site NPDES Permit Number TN 0002950 toxicity test results at the K-25 Site

K-25 Site Outfall	Test date	Species	NOEL ^a (%)	LC ₅₀ ^b (%)	IWC ^c (%)
K-1407-J (Outfall 011)	May	Fathead minnows	75	>75	0.8
		<i>Ceriodaphnia</i>	7.05	53.49	0.8
	December	Fathead minnows	75	>75	0.6
		<i>Ceriodaphnia</i>	25	>25	0.6
K-1203 (Outfall 005)	January	Fathead minnows	100	>100	3.5
		<i>Ceriodaphnia</i>	100	>100	3.5
	March	Fathead minnows	<4.2	54.77	3.7
		<i>Ceriodaphnia</i>	100	>100	3.7
	March ^d	Fathead minnows	30	>100	N/A
	May	Fathead minnows	30	>100	1.8
		<i>Ceriodaphnia</i>	30	>100	1.8
	July	Fathead minnows	100	>100	2.2
		<i>Ceriodaphnia</i>	100	>100	2.2
	September	Fathead minnows	100	>100	2.2
		<i>Ceriodaphnia</i>	100	>100	2.2
	November	Fathead minnows	100	>100	2.1
<i>Ceriodaphnia</i>		100	>100	2.1	

^aNo-observable-effect level.

^b96-hour lethal concentration for 50% of the test organisms.

^cInstream waste concentration (based on critical low flow of Poplar Creek).

^dConfirmatory test.

Table 4.25. 1994 K-25 Site average water quality parameters measured during toxicity tests of the K-25 Site wastewaters

Values are averages of full-strength wastewater for each test (N = 7)

K-25 Site Outfall	Test date	pH (standard units)	Conductivity (μ S/cm)	Alkalinity (mg/L CaCO ₃)	Hardness (mg/L CaCO ₃)	
K-1407-J (011)	May	7.83	1659	51	371	
	December	7.96	1554	88	614	
K-1203 (005)	January	8.05	383	109	154	
	March ^a	8.01	373	108	151	
	March ^b	7.95	331	99	132	
	May	8.03	363	86	144	
	July	7.95	341	81	132	
	September	7.92	382	83	153	
	November		7.90	437	87	164

^aData are for test conducted March 3–10, 1994.

^bData are for test March 24–31, 1994.

Table 4.26. Y-12 Plant Discharge Point 142^a

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	1	-1.3	4.5	-1.3	4.5	-1.3	<i>b</i>	<i>b</i>	<i>b</i>
²⁴¹ Am (pCi/L)	1	0.36	0.40	0.36	0.40	0.36	<i>b</i>	<i>b</i>	1.4
Beta activity (pCi/L)	1	5.4	8.6	5.4	8.6	5.4	<i>b</i>	<i>b</i>	<i>b</i>
²³⁷ Np (pCi/L)	1	0.047	0.066	0.047	0.066	0.047	<i>b</i>	<i>b</i>	0.16
²³⁸ Pu (pCi/L)	1	0.032	0.26	0.032	0.26	0.032	<i>b</i>	<i>b</i>	0.080
^{239/240} Pu (pCi/L)	1	0.21	0.30	0.21	0.30	0.21	<i>b</i>	<i>b</i>	0.70
²²⁶ Ra (pCi/L)	1	0.059	0.36	0.059	0.36	0.059	<i>b</i>	<i>b</i>	0.059
²²⁸ Ra (pCi/L)	1	-2.5	2.9	-2.5	2.9	-2.5	<i>b</i>	<i>b</i>	-2.5
⁹⁰ Sr (pCi/L)	1	1.9	2.7	1.9	2.7	1.9	<i>b</i>	<i>b</i>	0.19
⁹⁹ Tc (pCi/L)	1	22	400	22	400	22	<i>b</i>	<i>b</i>	0.022
Thorium, total (mg/L)	1	<0.003	<i>b</i>	<0.003	<i>b</i>	<0.003	<i>b</i>	<i>b</i>	<i>b</i>
²²⁸ Th (pCi/L)	1	0.09	0.11	0.09	0.11	0.09	<i>b</i>	<i>b</i>	0.02
²³⁰ Th (pCi/L)	1	0.28	0.17	0.28	0.17	0.28	<i>b</i>	<i>b</i>	0.093
²³² Th (pCi/L)	1	-0.04	0.05	-0.04	0.05	-0.04	<i>b</i>	<i>b</i>	-0.08
²³⁴ Th (pCi/L)	1	0.16	0.23	0.16	0.23	0.16	<i>b</i>	<i>b</i>	0.0016
Tritium (pCi/L)	1	-18	20	-18	20	-18	<i>b</i>	<i>b</i>	-0.00090
Uranium, total (mg/L)	1	<0.001	<i>b</i>	<0.001	<i>b</i>	<0.001	<i>b</i>	<i>b</i>	<i>b</i>
²³⁴ U (pCi/L)	1	1.3	0.72	1.3	0.72	1.3	<i>b</i>	<i>b</i>	0.26
²³⁵ U (pCi/L)	1	0	0	0	0	0	<i>b</i>	<i>b</i>	0
²³⁵ U (%)	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
²³⁶ U (pCi/L)	1	0	0	0	0	0	<i>b</i>	<i>b</i>	0
²³⁸ U (pCi/L)	1	0.16	0.23	0.16	0.23	0.16	<i>b</i>	<i>b</i>	0.027

^aFlow for the month sampled was 9511 gpd.^bNot applicable.

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Table 4.27. Y-12 Plant Station 8, radiological data summary^a

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	52	3700	450	-1.7	5.5	12	<i>b</i>	71	<i>b</i>
²⁴¹ Am (pCi/L)	52	0.25	0.18	-0.045	0.091	0.042	<i>b</i>	0.0082	0.14
Beta activity (pCi/L)	52	2100	260	-4.4	7.6	13	<i>b</i>	40	<i>b</i>
²³⁷ Np (pCi/L)	52	2.1	0.54	-0.047	0.055	0.041	<i>b</i>	0.040	0.14
²³⁸ Pu (pCi/L)	52	0.24	0.18	-0.20	0.17	0.012	<i>b</i>	0.010	0.029
^{239/240} Pu (pCi/L)	52	0.34	0.39	-0.087	0.17	0	<i>b</i>	0.0088	0
²²⁶ Ra (pCi/L)	52	80	9.5	-0.68	0.79	0.058	<i>b</i>	1.5	0.058
²²⁸ Ra (pCi/L)	52	2.8	4.0	-7.2	4.4	-0.42	<i>b</i>	0.23	-0.42
⁹⁰ Sr (pCi/L)	52	48	12	-28	37	-0.79	<i>b</i>	1.9	-0.079
⁹⁹ Tc (pCi/L)	52	130	20	-48	43	10	<i>b</i>	4.7	0.010
Thorium, total (mg/L)	52	0.039	<i>b</i>	<0.003	<i>b</i>	<0.003	<i>b</i>	0.001	<i>b</i>
²²⁸ Th (pCi/L)	52	1.0	0.41	-0.059	0.17	0.20	<i>b</i>	0.028	0.049
²³⁰ Th (pCi/L)	52	0.99	0.45	-0.08	0.22	0.3	<i>b</i>	0.03	0.1
²³² Th (pCi/L)	52	0.34	0.23	-0.06	0.08	0.04	<i>b</i>	0.01	0.08
²³⁴ Th (pCi/L)	52	36	5.3	2.7	0.70	8.7	<i>b</i>	1.3	0.87
Tritium (pCi/L)	52	970	240	-300	210	200	<i>b</i>	35	0.010
Uranium, total (mg/L)	52	0.26	<i>b</i>	0.008	<i>b</i>	0.02	<i>b</i>	0.006	<i>b</i>
²³⁴ U (pCi/L)	52	11	1.8	1.8	0.58	4.5	<i>b</i>	0.34	0.89
²³⁵ U (%)	52	0.91	0.50	-0.029	0.058	0.27	<i>b</i>	0.032	0.040
²³⁵ U (pCi/L)	52	0.53	<i>b</i>	0.25	<i>b</i>	0.39	<i>b</i>	0.011	<i>b</i>
²³⁶ U (pCi/L)	52	0.61	0.30	-0.025	0.049	0.10	<i>b</i>	0.018	0.020
²³⁸ U (pCi/L)	52	36	5.3	2.7	0.70	8.7	<i>b</i>	1.3	1.5

^aFlow not available.

^bNot applicable.

Table 4.28. Y-12 Plant Discharge Point 301, Kerr Hollow Quarry

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, c gpm	18	3521	0.9894	570.9	<i>d</i>	<i>d</i>
pH, standard units	18	7.8	7.1	<i>d</i>	6.5/8.5 ^c	0
Temperature, °C	18	16.5	6.0	11	30.5	0
Mercury	18	0.0002	<0.0002	<0.0002	<i>d</i>	<i>d</i>
Total suspended solids	18	9.0	<5	<5	50	0
Selenium	18	<0.1	<0.1	<0.1	<i>d</i>	<i>d</i>
Arsenic	18	<0.04	<0.04	<0.04	<i>d</i>	<i>d</i>
Cadmium	18	<0.004	<0.004	<0.004	<i>d</i>	<i>d</i>
Chromium	18	<0.006	<0.006	<0.006	<i>d</i>	<i>d</i>
Copper	18	<0.006	<0.006	<0.006	<i>d</i>	<i>d</i>
Iron	18	0.83	<0.06	<0.2	<i>d</i>	<i>d</i>
Lead	18	<0.02	<0.02	<0.02	<i>d</i>	<i>d</i>
Lithium	18	0.02	<0.02	<0.02	5	0
Nickel	18	<0.008	<0.008	<0.008	<i>d</i>	<i>d</i>
Potassium	18	1.2	0.9	1	<i>d</i>	<i>d</i>
Sodium	18	1.21	0.58	0.79	<i>d</i>	<i>d</i>
Zinc	18	0.03	<0.01	<0.01	<i>d</i>	<i>d</i>
Zirconium	18	<0.004	<0.004	<0.004	3	0

^aUnits in mg/L unless otherwise indicated.

^bNPDES permit limits.

^cFlow during operations and/or discharging.

^dNot applicable.

^eMinimum value/maximum value.

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Table 4.29. Y-12 Plant Discharge Point 301, radiological data summary

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	12	8.8	7.0	-3.2	-6.8	5.8	<i>a</i>	1.2	<i>a</i>
²⁴¹ Am (pCi/L)	12	0.10	0.17	-0.046	0.066	0.040	<i>a</i>	0.017	0.13
Beta activity (pCi/L)	12	13	9.0	-8.1	8.7	-0.84	<i>a</i>	2.1	<i>a</i>
²³⁷ Np (pCi/L)	12	0.23	0.18	-0.022	0.045	0.050	<i>a</i>	0.021	0.17
²³⁸ Pu (pCi/L)	12	0.43	0.38	-0.11	0.10	0.036	<i>a</i>	0.049	0.089
^{239/240} Pu (pCi/L)	12	0.27	0.27	-0.096	0.11	-0.017	<i>a</i>	0.026	-0.057
²²⁶ Ra (pCi/L)	12	0.28	1.1	-0.52	0.35	0.12	<i>a</i>	0.073	0.12
²²⁸ Ra (pCi/L)	12	6.6	15	-1.7	1.6	-0.35	<i>a</i>	0.62	-0.35
⁹⁰ Sr (pCi/L)	12	3.2	11	-12	29	-3.9	<i>a</i>	1.3	-0.39
⁹⁹ Tc (pCi/L)	12	74	16	-29	19	-1.5	<i>a</i>	7.9	-0.0015
Thorium, total (mg/L)	12	0.009	<i>a</i>	<0.003	<i>a</i>	<0.003	<i>a</i>	0.0005	<i>a</i>
²³² Th (pCi/L)	12	0.37	0.43	0.012	0.099	0.21	<i>a</i>	0.034	0.051
²³⁰ Th (pCi/L)	12	0.78	0.34	0.16	0.38	0.24	<i>a</i>	0.055	0.080
²³² Th (pCi/L)	12	0.12	0.24	0	0	0.035	<i>a</i>	0.010	0.069
²³⁴ Th (pCi/L)	12	1.4	0.62	0.056	0.14	0.45	<i>a</i>	0.11	0.0045
Tritium (pCi/L)	12	170	200	-520	220	-4.7	<i>a</i>	56	-0.00024
Uranium, total (mg/L)	12	0.004	<i>a</i>	<0.001	<i>a</i>	<0.001	<i>a</i>	0.0003	<i>a</i>
²³⁴ U (pCi/L)	12	2.9	0.96	0.38	0.29	0.96	<i>a</i>	0.21	0.19
²³⁵ U (pCi/L)	10	1.1	<i>a</i>	0.66	<i>a</i>	0.91	<i>a</i>	0.050	<i>a</i>
²³⁵ U (%)	12	0.21	0.19	0	0	0.056	<i>a</i>	0.021	0.0093
²³⁶ U (pCi/L)	12	0.18	0.16	0	0	0	<i>a</i>	0.016	0
²³⁸ U (pCi/L)	12	1.4	0.62	0.056	0.14	0.45	<i>a</i>	0.11	0.075

^aNot applicable.

Table 4.30. CY 1994 NPDES Permit Number TN 0002968
Y-12 Plant Discharge Point 302, Rogers Quarry (McCoy Branch)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Total suspended solids	52	27	<5	<6	50	0
Chemical oxygen demand (COD)	52	<20	<20	<20	c	c
Sulfate	52	20	10	17	c	c
Oil and grease	52	2.5	<2.0	<2.0	15	0
Settleable solids, ml/L	52	0.1	<0.1	<0.1	0.5	0
Selenium	52	<0.1	<0.1	<0.1	0.020	52 ^d
Mercury	52	<0.0002	<0.0002	<0.0002	0.00015	52 ^d
Arsenic	52	<0.04	<0.04	<0.04	0.36	0
Cadmium	52	<0.004	<0.004	<0.004	0.004	0
Chromium	52	<0.006	<0.006	<0.006	0.016	0
Copper	52	<0.006	<0.006	<0.006	0.018	0
Iron	52	1.93	<0.06	<0.1	c	c
Nickel	52	<0.008	<0.008	<0.008	1.400	0
Zinc	52	<0.01	<0.01	<0.01	0.117	0
Lead	52	<0.02	<0.02	<0.02	0.082	0
pH, standard units	52	8.1	6.9	c	6.5/8.5 ^e	0/0
Temperature, °C	52	17.1	6.8	11	30.5	0
Turbidity, NTU	52	55	0.08	3	c	c
Flow, Mgd ^f	365	3.306	0.049	0.401	c	c

^aUnits in mg/L unless otherwise indicated.

^bNPDES permit limits and/or Tennessee Water Quality criteria.

^cNot applicable.

^dThe analytical detection limit for this parameter is higher than the reference value.

^eMinimum value/maximum value.

^fFlow during operation and/or discharging.

Table 4.31. CY 1994 radiological data summary
Y-12 Plant Discharge Point 302, Rogers Quarry (McCoy Branch)

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-	Median	+/-			
Alpha activity (pCi/L)	12	9.7	13	-4.9	1.5	2.0	1.3	a	a	
²⁴¹ Am (pCi/L)	12	0.23	0.53	-0.081	0.28	0.035	0.028	0.12	2.4E-05	
Beta activity (pCi/L)	12	17	2.1	-10	6.7	1.055	2.4	a	a	
²³⁷ Np (pCi/L)	12	0.20	0.40	-0.03	0.095	0.03	0.02	0.09	2.0E-05	
²³⁸ Pu (pCi/L)	12	0.36	0.97	-0.07	0.20	0.03	0.04	0.1	4.0E-05	
^{239/240} Pu (pCi/L)	12	0.12	0.16	-0.07	0.96	-0.02	0.01	-0.06	-4.0E+06	
²²⁶ Ra (pCi/L)	12	0.33	0.09	-0.43	0.38	0.085	0.060	0.080	3.2E-05	
²²⁸ Ra (pCi/L)	12	5.4	0.19	-4.0	0.27	-0.37	0.61	-0.37	-9.9E-05	
⁹⁰ Sr (pCi/L)	12	6.0	2.2	-20	2.0	0	0.64	0.068	-8.0E-04	
⁹⁹ Tc (pCi/L)	12	64	0.01	-64	0.01	-5.0	8.1	-0.0050	-9.6E-04	
²³² Th (pCi/L)	12	38	0.36	0.039	0.18	0.16	3.2	0.0021	1.9E-03	
Thorium, total (mg/L)	12	0.009	a	<0.003	a	<0.003	0.0005	a	a	
²²⁸ Th (pCi/L)	12	6.2	0.51	0.045	0.44	0.30	0.50	0.075	4.1E-04	
²³⁰ Th (pCi/L)	12	0.53	0.75	-0.067	0.09	0.28	0.060	0.090	1.3E-04	
²³² Th (pCi/L)	12	0.10	0.62	-0.03	0.13	0.05	0.01	0.1	2.0E-05	
Tritium (pCi/L)	12	1000	180	-430	170	64	110	0.0030	6.1E-02	
Uranium, total (mg/L)	12	<0.001	a	<0.001	a	<0.001	0	a	a	
²³⁴ U (pCi/L)	12	0.47	0.33	0.039	0.19	0.22	0.042	0.043	1.3E-04	
²³⁵ U (pCi/L)	12	0.08	0.18	-0.034	0.047	0.0065	0.010	0.0010	7.8E-06	
²³⁵ U (%)	0	a	a	a	a	a	a	a	a	
²³⁸ U (pCi/L)	12	0.08	0.11	-0.044	0.092	0	0.009	0	4.0E-06	
²³⁸ U (pCi/L)	12	0.48	0.36	0.039	0.18	0.16	0.041	0.027	1.0E-04	

^aNot applicable.

Table 4.32. Y-12 Plant Discharge Point 304, Bear Creek

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Oil and grease	52	13	<2.0	<2	15	0
Biochemical oxygen demand	52	43	<5	<6	c	c
Chemical oxygen demand	52	<20	<20	<20	c	c
Total dissolved solids	52	290	<5	<200	c	c
Total suspended solids	52	190	<5	<10	c	c
Nitrate as N	52	8.8	0.56	3.0	c	c
Conductivity, μ mhos/cm	52	380	70	240	c	c
Dissolved oxygen	52	11.8	7.2	9.2	c	c
Turbidity, NTU	52	64	0.48	7.2	c	c
pH, standards units	52	8.0	6.9	c	6.5/8.5 ^d	0
Flow, Mgd ^e	365	165	0.095	7.3	c	c

^aUnits in mg/L unless otherwise indicated.

^bNPDES Permit limits.

^cNot applicable.

^dMinimum value/maximum value.

^eFlow during operations and/or discharging.

Table 4.33. Y-12 Plant Discharge Point 304, radiological data summary

Parameter	Number of samples	Concentration				Median	+/-	Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-					
Alpha activity (pCi/L)	52	73	17	-0.65	6.9	13	a	1.6	a	a
²⁴¹ Am (pCi/L)	52	0.86	0.36	-0.11	0.11	0.035	a	0.024	0.12	3.6E-04
Beta activity (pCi/L)	52	110	20	-5.1	8.7	13	a	2.6	a	a
²³⁷ Np (pCi/L)	52	0.36	0.24	-0.08	0.24	0.06	a	0.01	0.2	7.0E-04
²³⁸ Pu (pCi/L)	52	0.47	0.25	-0.21	0.24	0	a	0.014	0	6.8E-04
^{239/240} Pu (pCi/L)	52	0.24	0.28	-0.063	0.073	0	a	0.0073	0	6.5E-05
²²⁶ Ra (pCi/L)	52	1.3	0.67	-1.2	0.36	0.099	a	0.057	0.099	3.4E-04
²²⁸ Ra (pCi/L)	52	26	4.1	-5.4	4.5	-0.48	a	0.57	-0.48	2.6E-03
⁹⁰ Sr (pCi/L)	52	15	7.8	-23	18	-0.55	a	0.78	-0.055	-2.5E-02
⁹⁹ Tc (pCi/L)	52	110	28	-59	20	8.5	a	3.9	0.00085	3.9E-02
Thorium, total (mg/L)	52	0.012	a	<0.003	a	<0.003	a	0.0002	a	a
²²⁸ Th (pCi/L)	52	0.92	0.67	-0.064	0.075	0.18	a	0.032	0.045	2.1E-03
²³⁰ Th (pCi/L)	52	0.72	0.40	-0.016	0.11	0.26	a	0.021	0.085	3.2E-03
²³² Th (pCi/L)	52	0.23	0.18	-0.037	0.073	0.057	a	0.0082	0.11	3.6E-04
²³⁴ Th (pCi/L)	52	19	2.9	0.31	0.22	7.8	a	0.53	0.78	5.4E-03
Tritium (pCi/L)	52	1800	300	-620	220	78	a	50.2	0.0039	-5.8E-01
Uranium, total (mg/L)	52	0.0046	a	0.004	a	0.02	a	0.0014	a	a
²³⁴ U (pCi/L)	52	8.9	1.5	0.60	0.29	4.2	a	0.28	0.83	1.1E-02
²³⁵ U (pCi/L)	52	0.70	a	0.22	a	0.38	a	0.0083	a	a
²³⁵ U (%)	52	0.69	0.34	0	0	0.21	a	0.022	0.035	6.7E-04
²³⁶ U (pCi/L)	52	0.22	0.16	-0.021	0.043	0.090	a	0.00090	0.018	3.2E-04
²³⁸ U (pCi/L)	52	19	2.9	0.31	0.22	7.8	a	0.53	1.3	5.4E-03

^aNot applicable.

Table 4.34. Y-12 Plant Discharge Point 307, West Borrow Area

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, gpd	4	129,600	24,727	79,461	c	c
pH, standard units	4	8.1	7.5	c	6.5/8.5 ^d	0
Temperature, °C	4	23.9	6.7	16	30.5	0
Ammonia	4	0.42	<0.2	<0.3	c	c
Biochemical oxygen demand	4	<5	<5.0	<5	c	c
Chemical oxygen demand	4	<20	<20	<20	c	c
Color, ACU	4	1,000	30	340	c	c
Oil and grease	4	<2.0	<2.0	<2.0	c	c
Total organic carbon	4	4.9	<2.0	<3.3	c	c
Total suspended solids	4	690	<5	<200	c	c

^aUnits in mg/L unless otherwise noted.^bTennessee Water Quality criteria.^cNot applicable.^dMinimum value/maximum value.

Table 4.35. Y-12 Plant Discharge Point 308, East Borrow Area

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, gpd	4	23,328	222	9,073	c	c
pH, standard units	4	8.1	6.7	c	6.5/8.5 ^d	0
Temperature, °C	4	22.9	9.3	16	30.5	0
Ammonia	4	0.24	<0.2	<0.2	c	c
Biochemical oxygen demand	4	<5	<5.0	<5	c	c
Chemical oxygen demand	4	<20	<20	<20	c	c
Color, ACU	4	500	20	170	c	c
Oil and grease	4	7.6	<2.0	<3.4	c	c
Total organic carbon	4	4.6	<2.0	<3.2	c	c
Total suspended solids	4	44	5	20	c	c

^aUnits in mg/L unless otherwise noted.^bTennessee Water Quality criteria.^cNot applicable.^dMinimum value/maximum value.

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Table 4.36. Y-12 Plant Discharge Point 309, Sanitary Landfill IV Sedimentation Basin

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, gpd	4	3,456	1,870	2,663	c	c
pH, standard units	4	8.1	7.5	c	6/9 ^d	0
Temperature, °C	4	22.4	5.5	15	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	c	c
Biochemical oxygen demand	4	<5	<5.0	<5	c	c
Chemical oxygen demand	4	<20	<20	<20	c	c
Color, ACU	4	150	100	125	c	c
Oil and grease	4	<2.0	<2.0	<2.0	c	c
Total organic carbon	4	4.4	<2.0	<3.0	c	c
Total suspended solids	4	95	27	48	c	c

^aUnits in mg/L unless otherwise noted.

^bTennessee Water Quality criteria.

^cNot applicable.

^dMinimum value/maximum value.

Table 4.37. CY 1994 NPDES Permit Number TN 0002968
Y-12 Plant Discharge Point 501, Central Pollution Control Facility

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, ^c gpd	69	18,300	5,697	9,995	<i>d</i>	<i>d</i>
pH, standard units	69	8.4	6.3	<i>d</i>	6.0/9.0 ^e	0
Temperature, °C	69	29.6	11.8	23.1	30.5	0
Cyanide	69	0.12	<0.01	<0.01	1.2	0
Oil and grease	69	48.0	<2.0	<3.0	52	0
Phenols	69	0.044	<0.005	<0.007	<i>d</i>	<i>d</i>
Total toxic organics	69	0.075	<0.010	<0.011	2.13	0
Chloride	69	870	24	198	<i>d</i>	<i>d</i>
Color	69	100	<5	<23	<i>d</i>	<i>d</i>
Fluoride	69	4.9	0.30	1.4	<i>d</i>	<i>d</i>
Mercury	69	<0.0002	<0.0002	<0.0002	<i>d</i>	<i>d</i>
Nitrate	69	5.8	<0.001	<0.83	<i>d</i>	<i>d</i>
Total suspended solids	69	26	<5.0	<5	60	0
Sulfate	69	2,700	120	2,000	<i>d</i>	<i>d</i>
Surfactants (MBAS)	69	0.06	<0.05	<0.05	<i>d</i>	<i>d</i>
Aluminum	69	1.4	<0.2	<0.3	<i>d</i>	<i>d</i>
Beryllium	69	<0.002	<0.002	<0.002	<i>d</i>	<i>d</i>
Cadmium	69	<0.02	<0.02	<0.02	0.69	0
Chromium	69	<0.03	<0.03	<0.03	2.77	0
Copper	69	0.04	<0.03	<0.03	3.38	0
Iron	69	16.2	<0.3	<0.7	<i>d</i>	<i>d</i>
Lead	69	<0.1	<0.1	<0.1	0.69	0
Nickel	69	0.61	<0.04	<0.2	3.98	0
Phosphorus	69	5.2	<0.1	<0.2	<i>d</i>	<i>d</i>
Silver	69	<0.03	<0.03	<0.03	0.43	0
Sodium	69	322	37	130	<i>d</i>	<i>d</i>
Zinc	69	0.09	<0.05	<0.06	2.61	0

^aUnits in mg/L unless otherwise noted.

^bNPDES permit limits.

^cFlow during operations and/or discharging.

^dNot applicable.

^eMinimum value/maximum value.

Table 4.38. CY 1994 radiological data summary
Y-12 Plant Discharge Point 501, Central Pollution Control Facility

Parameter	Number of Samples	Concentration						Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-	Median	+/-			
Alpha activity (pCi/L)	42	560	100	-47	74	22	16	a	a	
²⁴¹ Am (pCi/L)	42	0.24	0.45	-0.15	0.19	0.013	0.012	0.040	7.0E-08	
Beta activity (pCi/L)	42	1200	200.0	-22	39	180	44	a	a	
²³⁷ Np (pCi/L)	42	0.62	0.41	-0.17	0.26	0.032	0.023	0.11	2.4E-07	
²³⁸ Pu (pCi/L)	41	0.36	0.14	-0.13	0.18	0.016	0.014	0.040	1.0E-07	
^{239/240} Pu (pCi/L)	41	0.43	0	-0.10	0.11	0	0.011	0.00	4.1E-08	
²²⁶ Ra (pCi/L)	42	1.3	0.82	-0.086	0.47	0.41	0.050	0.41	1.2E-06	
²²⁸ Ra (pCi/L)	42	33	5.9	-2.1	2.4	4.4	1.5	4.4	2.2E-05	
⁹⁰ Sr (pCi/L)	42	110	16	-22	12	14	4.1	1.4	5.7E-05	
⁹⁹ Tc (pCi/L)	42	600	71	-10	28	120	20	0.12	3.8E-04	
²³⁴ Th (pCi/L)	42	110	17	0.07	0.36	4	4	0.04	4.0E-05	
Thorium, total (mg/L)	42	0.007	a	<0.003	a	<0.003	0.0001	a	a	
²³² Th (pCi/L)	42	0.84	0.36	-0.048	0.34	0.19	0.030	0.048	5.8E-07	
²³⁰ Th (pCi/L)	42	2.0	0.58	-0.040	0.080	0.28	0.050	0.090	9.6E-07	
²³² Th (pCi/L)	42	0.28	0.56	-0.051	0.10	0.030	0.010	0.060	9.9E-08	
Tritium (pCi/L)	42	930	250	-500	210	160	44	0.0080	4.0E-04	
Uranium, total (mg/L)	42	0.33	a	<0.001	a	<0.011	0.010	a	a	
²³⁴ U (pCi/L)	42	230	36	0.21	0.17	5.2	7.4	1.0	6.1E-05	
²³⁵ U (pCi/L)	42	12	2.9	-0.12	0.17	0.30	0.40	0.050	3.5E-06	
²³⁵ U (%)	39	1.5	a	0.49	a	0.74	0.03	a	a	
²³⁶ U (pCi/L)	42	14	3.3	-0.056	0.11	0.16	0.50	0.030	4.0E-06	
²³⁸ U (pCi/L)	42	110	17	0.065	0.29	3.8	2.0	1.0	3.7E-05	

^aNot applicable.

Table 4.39. Y-12 Plant Discharge Point 501/504

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, ^c gpd	4	27,100	13,893	21,923	<i>d</i>	<i>d</i>
pH, standard units	4	8.4	7.4	<i>d</i>	6/9 ^e	0
Temperature, °C	4	24.5	17.4	21.9	30.5	0
Cyanide	4	0.016	<0.01	<0.01	1.2	0
Oil and grease	4	2.3	<2.0	<2.1	52	0
Total toxic organics	4	<0.010	<0.010	<0.010	2.13	0
Chloride	4	170	27	70	<i>d</i>	<i>d</i>
Fluoride	4	1.6	0.91	1.1	<i>d</i>	<i>d</i>
Mercury	4	<0.0002	<0.0002	<0.0002	<i>d</i>	<i>d</i>
Nitrate	4	4.0	<0.10	1.8	<i>d</i>	<i>d</i>
Total suspended solids	4	<5	<5	<5	60	0
Sulfate	4	1,500	780	993	<i>d</i>	<i>d</i>
Aluminum	4	0.3	<0.2	<0.3	<i>d</i>	<i>d</i>
Beryllium	4	<0.002	<0.002	<0.002	<i>d</i>	<i>d</i>
Cadmium	4	<0.02	<0.02	<0.02	0.69	0
Chromium	4	<0.03	<0.03	<0.03	2.77	0
Copper	4	<0.03	<0.03	<0.03	3.38	0
Iron	4	0.7	<0.3	<0.5	<i>d</i>	<i>d</i>
Lead	4	<0.1	<0.1	<0.1	0.69	0
Nickel	4	0.33	0.20	0.26	3.98	0
Phosphorus	4	1.76	<0.1	<0.6	<i>d</i>	<i>d</i>
Potassium	4	39	13	26	<i>d</i>	<i>d</i>
Silver	4	<0.03	<0.03	<0.03	0.43	0
Sodium	4	121	37.2	75.2	<i>d</i>	<i>d</i>
Zinc	4	0.06	<0.05	<0.05	2.61	0

^aUnits in mg/L unless otherwise noted.

^bNPDES permit limits.

^cFlow during operations and/or discharging.

^dNot applicable.

^eMinimum value/maximum value.

Table 4.40. Y-12 Plant Discharge Point 501/504, radiological data summary

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-	Median	+/-			
Alpha activity (pCi/L)	4	210	45	-15	-27	65	a	47	a	a
²⁴¹ Am (pCi/L)	4	0.18	0.24	-0.019	0.14	0.022	a	0.050	0.070	1.7E-08
Beta activity (pCi/L)	4	330	61	-4.9	24	61	a	74	a	a
²³⁷ Np (pCi/L)	4	0.62	0.41	-0.038	0.076	0	a	0.16	0	4.8E-08
²³⁸ Pu (pCi/L)	4	0.18	0.21	0	0	0.028	a	0.041	0.070	2.0E-08
^{239/240} Pu (pCi/L)	4	0	0	-0.036	0.071	-0.01	a	0.009	-0.03	-4.6E-09
²²⁶ Ra (pCi/L)	4	1.1	0.68	0.01	0.21	0.5	a	0.2	0.5	2.0E-07
²²⁸ Ra (pCi/L)	4	14	3.9	-0.77	4.9	0.66	a	3.5	0.66	1.2E-06
⁹⁰ Sr (pCi/L)	4	17	6.5	0.33	1.3	2.3	a	3.9	0.23	1.8E-06
⁹⁹ Tc (pCi/L)	4	290	37	-40	23	38	a	72	0.038	2.7E-05
Thorium, total (mg/L)	4	0.003	a	<0.003	a	<0.003	a	0	a	a
²³² Th (pCi/L)	4	0.35	0.31	0.051	0.10	0.19	a	0.062	0.046	6.4E-08
²³⁰ Th (pCi/L)	4	0.71	0.41	0.22	0.18	0.26	a	0.12	0.085	1.2E-07
²²⁸ Th (pCi/L)	4	0.11	0.190	0	0	0.07	a	0.03	0.1	2.0E-08
²³⁴ Th (pCi/L)	4	60	9.6	1.7	0.50	23	a	12	8.0	8.9E-06
Tritium (pCi/L)	4	180	150	-240	230	-39	a	86	-0.0019	-1.1E-05
Uranium, total (mg/L)	4	0.16	a	0.005	a	0.06	a	0.03	a	a
²³⁴ U (pCi/L)	4	180	28	2.0	0.55	27	a	41	5.4	2.0E-05
²³⁵ U (%)	4	1.5	a	0.49	a	0.83	a	0.21	a	a
²³⁵ U (pCi/L)	4	8.7	2.2	0.11	0.13	1.2	a	2.0	0.19	9.2E-07
²³⁶ U (pCi/L)	4	8.6	2.2	0.0091	0.072	2.0	a	1.9	0.39	1.0E-06
²³⁸ U (pCi/L)	4	60	6.6	1.7	0.50	22	a	12	3.7	8.8E-06

*Not applicable.

Table 4.41. Y-12 Plant Discharge Point 502, West End Treatment Facility

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, ^c gpd	31	25,201	563	15,253	<i>d</i>	<i>d</i>
pH, standard units	31	8.1	6.8	<i>d</i>	6.0/9.0 ^e	0
Temperature, °C	31	27.9	23.3	25.2	30.5	0
Residual chlorine	31	0.05	0.01	0.03	<i>d</i>	<i>d</i>
Cyanide	31	<0.01	<0.01	<0.01	1.2	0
Oil and grease	31	<2	<2	<2	52	0
Total toxic organics	8	<0.01	<0.01	<0.01	2.13	0
Chloride	30	500	97	360	<i>d</i>	<i>d</i>
Fluoride	30	18	1.2	7.4	<i>d</i>	<i>d</i>
Mercury	30	<0.0004	<0.0002	<0.0002	<i>d</i>	<i>d</i>
Nitrate	30	30	0.22	15	<i>d</i>	<i>d</i>
Total suspended solids	30	28	<5	<7	60	0
Sulfate	30	11,000	4,100	6,000	<i>d</i>	<i>d</i>
Aluminum	30	<0.6	<0.2	<0.4	<i>d</i>	<i>d</i>
Arsenic	30	<0.6	<0.2	<0.4	<i>d</i>	<i>d</i>
Barium	30	0.123	0.01	0.04	<i>d</i>	<i>d</i>
Beryllium	30	<0.006	<0.002	<0.004	<i>d</i>	<i>d</i>
Calcium	30	65	16.7	45	<i>d</i>	<i>d</i>
Cadmium	30	<0.06	<0.02	<0.04	0.69	0
Chromium	30	<0.09	<0.03	<0.06	2.77	0
Cobalt	30	0.05	<0.01	<0.02	<i>d</i>	<i>d</i>
Copper	30	0.42	<0.03	<0.1	3.38	0
Iron	30	<0.9	<0.3	<0.6	<i>d</i>	<i>d</i>
Lead	30	<0.3	<0.1	<0.2	0.69	0
Magnesium	30	17.2	5.6	13	<i>d</i>	<i>d</i>
Manganese	30	0.15	0.036	0.066	<i>d</i>	<i>d</i>
Molybdenum	30	0.34	<0.03	<0.2	<i>d</i>	<i>d</i>
Nickel	30	2.7	<0.04	<0.7	3.98	0
Phosphorus	30	8.1	<0.1	<5	<i>d</i>	<i>d</i>
Potassium	30	129	25	91	<i>d</i>	<i>d</i>
Silver	30	<0.09	<0.03	<0.06	0.43	0
Sodium	30	3,460	1,960	2,760	<i>d</i>	<i>d</i>
Zinc	30	1.1	0.07	0.4	2.61	0

^aUnits in mg/L unless otherwise indicated.

^bNPDES permit limits.

^cFlow during operations and/or discharging.

^dNot applicable.

^eMinimum value/maximum value.

Table 4.42. Y-12 Plant Discharge Point 502, radiological data summary

Parameter	Number of samples	Concentration						Standard error	Percentage of DCO	Total curies
		Max	+/-	Min	+/-	Median	+/-			
Alpha activity (pCi/L)	8	160	200	-72	-100	40	a	29	a	a
²⁴¹ Am (pCi/L)	8	0.14	0.14	-0.09	0.24	0.03	a	0.03	0.1	7.1E-08
Beta activity (pCi/L)	8	500	220	-140	150	72	a	70	a	a
²³⁷ Np (pCi/L)	8	0.17	0.22	-0.041	0.082	0.033	a	0.025	0.11	8.1E-08
²³⁸ Pu (pCi/L)	8	0.14	0.23	-0.085	0.099	0.0055	a	0.025	0.014	3.1E-08
^{239/240} Pu (pCi/L)	8	0.06	0.13	-0.089	0.13	-0.007	a	0.02	-0.02	-2.0E-08
²²⁶ Ra (pCi/L)	8	0.68	0.61	0	0.45	0.27	a	0.094	0.27	5.3E-07
²²⁸ Ra (pCi/L)	8	0.66	0.79	-2.3	2.8	-0.73	a	0.37	-0.73	-1.2E-06
⁹⁰ Sr (pCi/L)	8	30	5.8	-57	140	-15	a	10	-1.5	-2.7E-05
⁹⁹ Tc (pCi/L)	8	120	22	61	32	99	a	7.6	0.099	1.7E-04
Thorium, total (mg/L)	8	0.008	a	<0.003	a	<0.003	a	0.0006	a	a
²³² Th (pCi/L)	8	0.31	0.24	0.094	0.16	0.17	a	0.027	0.041	3.2E-07
²³⁰ Th (pCi/L)	8	0.58	0.42	0.035	0.16	0.33	a	0.060	0.11	6.1E-07
²³⁴ Th (pCi/L)	8	0.085	0.099	0	0	0.024	a	0.011	0.047	5.3E-08
^{234m} Th (pCi/L)	8	3.6	0.78	0.87	0.49	1.6	a	0.33	0.16	3.1E-06
Tritium (pCi/L)	8	1500	250	-75	190	150	a	180	0.0076	5.4E-04
Uranium, total (mg/L)	8	0.012	a	0.002	a	0.005	a	0.001	a	a
²³⁵ U (pCi/L)	8	2.1	0.55	0.48	0.27	0.99	a	0.18	0.20	1.9E-06
²³³ U (%)	8	0.43	a	0.39	a	0.41	a	0.052	a	a
²³⁵ U (pCi/L)	8	0.28	0.20	0.01	0.10	0.1	a	0.03	0.02	2.0E-07
²³⁸ U (pCi/L)	8	0.11	0.12	0	0	0.02	a	0.02	0.003	7.0E-08
²³⁴ U (pCi/L)	8	3.6	0.78	0.87	0.49	1.6	a	0.33	0.26	3.1E-06

^aNot applicable.

Table 4.43. CY 1994 NPDES Permit Number TN 0002968
Y-12 Plant Discharge Point 503, Central Steam Plant Wastewater Treatment Facility

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, ^c gpd	350	426,000	0	167,640	<i>d</i>	<i>d</i>
pH, standard units	151	8.7	6.2	<i>d</i>	6.0/9.0 ^e	0
Temperature, °C	151	29.7	11.1	21.0	30.5	0
Oil and grease	151	16	<2.0	<2.2	20	0
Phenols	151	0.069	<0.005	<0.006	<i>d</i>	<i>d</i>
Chloride	151	1,000	26	310	<i>d</i>	<i>d</i>
Fluoride	151	4.6	0.50	2.7	<i>d</i>	<i>d</i>
Mercury	151	0.0007	<0.0002	<0.0002	<i>d</i>	<i>d</i>
Total suspended solids	151	31	<5.0	<6.9	100	0
Selenium	151	<0.5	<0.5	<0.5	<i>d</i>	<i>d</i>
Sulfate	151	2,400	400	1,249	<i>d</i>	<i>d</i>
Sulfide	151	1.2	<1.0	<1.0	<i>d</i>	<i>d</i>
Aluminum	151	4.3	<0.2	<0.6	<i>d</i>	<i>d</i>
Arsenic	151	<0.2	<0.2	<0.2	<i>d</i>	<i>d</i>
Barium	151	0.147	0.026	0.076	<i>d</i>	<i>d</i>
Beryllium	151	<0.002	<0.002	<0.002	<i>d</i>	<i>d</i>
Boron	151	0.25	<0.03	<0.07	<i>d</i>	<i>d</i>
Cadmium	151	<0.02	<0.02	<0.02	<i>d</i>	<i>d</i>
Calcium	151	847	106	459	<i>d</i>	<i>d</i>
Cerium	151	0.09	<0.08	<0.08	<i>d</i>	<i>d</i>
Chromium	151	<0.03	<0.03	<0.03	0.2	0
Cobalt	151	<0.01	<0.01	<0.01	<i>d</i>	<i>d</i>
Copper	151	0.05	<0.03	<0.03	1.0	0
Gallium	151	<0.09	<0.09	<0.09	<i>d</i>	<i>d</i>
Iron	151	1.3	<0.3	<0.4	1.0	2
Lead	151	<0.1	<0.1	<0.1	<i>d</i>	<i>d</i>
Lithium	151	2.49	<0.08	<0.20	<i>d</i>	<i>d</i>
Magnesium	151	23.4	<0.2	<5	<i>d</i>	<i>d</i>
Manganese	151	0.099	<0.009	<0.013	<i>d</i>	<i>d</i>
Molybdenum	151	<0.09	<0.03	<0.03	<i>d</i>	<i>d</i>
Nickel	151	0.04	<0.04	<0.04	<i>d</i>	<i>d</i>
Niobium	85	<0.05	<0.05	<0.05	<i>d</i>	<i>d</i>
Phosphorus	151	0.44	<0.1	<0.1	<i>d</i>	<i>d</i>
Potassium	151	12	<3	<7	<i>d</i>	<i>d</i>

Oak Ridge Reservation

Table 4.43 (continued)

Parameter	Number of samples	Concentration ^c			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Scandium	0	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>
Silver	151	<0.03	<0.03	<0.03	<i>d</i>	<i>d</i>
Sodium	151	1,030	82	280	<i>d</i>	<i>d</i>
Strontium	151	1.38	0.166	0.523	<i>d</i>	<i>d</i>
Thorium	151	0.08	<0.05	<0.05	<i>d</i>	<i>d</i>
Titanium	151	<0.06	<0.06	<0.06	<i>d</i>	<i>d</i>
Vanadium	151	<0.02	<0.02	<0.02	<i>d</i>	<i>d</i>
Zinc	151	0.08	<0.05	<0.05	1.0	0
Zirconium	151	<0.02	<0.02	<0.02	<i>d</i>	<i>d</i>

^aUnits in mg/L unless otherwise noted.

^bNPDES permit limits.

^cFlow during operations and/or discharging.

^dNot applicable.

^eMinimum value/maximum value.

Table 4.44. CY 1994 radiological data summary
Y-12 Plant Discharge Point 503, Steam Plant Wastewater Treatment Facility

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-	Median	+/-			
Alpha activity (pCi/L)	51	1300	240	-40	5.5	25.6	0	2.9	a	a
²⁴¹ Am (pCi/L)	51	1.1	0.47	-0.20	0.18	0.010	0.10	0.024	0.030	8.7E-06
Beta activity (pCi/L)	51	440	96	-29	36	11	35	10	a	a
²³⁷ Np (pCi/L)	51	0.26	0.22	-0.07	0.078	0.02	0.05	0.009	0.08	9.0E-06
²³⁹ Pu (pCi/L)	51	0.23	0.55	-0.28	0.3	0	0	0.010	0.00	2.7E-06
^{239/240} Pu (pCi/L)	51	0.19	0.15	-0.11	0.11	0	0	0.0070	0	4.5E-07
²²⁶ Ra (pCi/L)	51	10	1.9	-1.9	0.22	0.030	0.49	0.20	0.030	3.8E-05
²²⁸ Ra (pCi/L)	51	2.9	2.2	-7.9	4.5	-0.40	0.96	0.25	-0.40	-1.6E-04
⁹⁰ Sr (pCi/L)	51	36	11	-20	59	0.060	0.26	1.4	0.010	3.0E-04
⁹⁹ Tc (pCi/L)	51	150	230	-63	270	-3.0	8.1	5.4	-0.0030	6.5E-04
²³⁴ Th (pCi/L)	50	2.4	0.66	-0.047	0.093	0.060	a	0.052	0.00056	3.1E-05
Thorium, total (mg/L)	51	0.022	a	<0.003	a	<0.003	a	0.0004	a	a
²³² Th (pCi/L)	50	4.0	1.0	0.028	0.16	0.20	a	0.080	0.050	6.8E-05
²³⁰ Th (pCi/L)	50	1.1	0.59	0.031	0.18	0.030	a	0.040	0.10	7.6E-05
²³² Th (pCi/L)	50	0.93	0.6	-0.49	0.41	0.061	0	0.026	0.12	9.3E-06
Tritium (pCi/L)	51	950	240	-740	200	140	200	39	0.0070	3.4E-02
Uranium, total (mg/L)	51	<0.001	a	<0.001	a	<0.001	a	a	a	a
²³⁴ U (pCi/L)	51	1.9	0.57	-0.11	0.14	0.10	0.24	0.040	0.020	3.4E-05
²³⁵ U (pCi/L)	51	0.26	0	-0.16	0.32	0	0	0.0090	0	4.8E-06
²³⁵ U (%)	0	a	a	a	a	a	a	a	a	a
²³⁶ U (pCi/L)	51	0.09	0.13	-0.064	0.13	0	0	0.004	0.00	1.0E-06
²³⁸ U (pCi/L)										

^aNot applicable.

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Table 4.45. Y-12 Plant Discharge Point 504, Plating Rinsewater Facilities

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Flow, ^c gpd	3	10,300	9,770	10,035	<i>d</i>	<i>d</i>
pH, standard units	3	8.1	7.2	<i>d</i>	6.0/9.0 ^e	0
Temperature	3	25.8	22.0	23.4	30.5	0
Cyanide	3	<0.01	<0.01	<0.01	1.2	0
Oil and grease	3	<2.0	<2.0	<2.0	52.0	0
Total toxic organics	3	<0.010	<0.010	<0.010	2.13	0
Chloride	3	240	41	130	<i>d</i>	<i>d</i>
Fluoride	3	5.2	0.71	2.8	<i>d</i>	<i>d</i>
Mercury	3	<0.0002	<0.0002	<0.0002	<i>d</i>	<i>d</i>
Nitrate	3	8.5	1.6	4.5	<i>d</i>	<i>d</i>
Total suspended solids	3	<5	<5	<5	60.0	0
Sulfate	3	360	97	250	<i>d</i>	<i>d</i>
Aluminum	3	0.8	<0.2	<0.5	<i>d</i>	<i>d</i>
Beryllium	3	<0.002	<0.002	<0.002	<i>d</i>	<i>d</i>
Cadmium	3	<0.02	<0.02	<0.02	0.69	0
Chromium	3	<0.03	<0.03	<0.03	2.77	0
Copper	3	<0.03	<0.03	<0.03	3.38	0
Iron	3	2.4	<0.3	<2	<i>d</i>	<i>d</i>
Lead	3	<0.1	<0.1	<0.1	0.69	0
Nickel	3	0.49	0.40	0.46	3.98	0
Phosphorus	3	0.11	<0.1	<0.1	<i>d</i>	<i>d</i>
Potassium	3	12	7	9	<i>d</i>	<i>d</i>
Silver	3	<0.03	<0.03	<0.03	0.43	0
Sodium	3	188	38.2	106	<i>d</i>	<i>d</i>
Zinc	3	0.09	<0.05	<0.06	2.61	<i>d</i>

^aUnits in mg/L unless otherwise noted.

^bNPDES permit limits.

^cFlow during operations and/or discharging.

^dNot applicable.

^eMinimum value/maximum value.

Table 4.46. CY 1994 radiological data summary
Y-12 Plant Discharge Point 512, Groundwater Treatment Facility

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-	Median	+/-			
Alpha activity (pCi/L)	104	460	130	-3.2	8.4	9.9	a	4.4	a	a
²⁴¹ Am (pCi/L)	104	6.0	1.1	-0.19	0.17	0.012	a	0.058	0.040	1.5E-06
Beta activity (pCi/L)	104	91	54.0	-7.8	27	10	a	1.3	a	a
²³⁷ Np (pCi/L)	104	0.36	0.34	-0.093	0.13	0.020	a	0.0060	0.070	5.5E-07
²³⁸ Pu (pCi/L)	101	0.60	0.62	-0.21	0.29	0.01	0.10	0.01	0.03	5.0E-07
^{239/240} Pu (pCi/L)	101	0.41	0.47	-0.091	0.13	0	0	0.0070	0	3.2E-07
²²⁶ Ra (pCi/L)	104	6.8	1.3	-1.1	1.70	0.00070	a	0.072	0.00070	6.0E-07
²²⁸ Ra (pCi/L)	103	42	5.8	-5.3	3.6	-0.61	0.59	0.45	-0.61	-4.7E-06
⁹⁰ Sr (pCi/L)	104	40	12	-26	29.0	0.43	a	1.0	0.043	2.8E-05
⁹⁹ Tc (pCi/L)	104	92	17	-100	20	3.0	a	2.7	0.0030	1.0E-04
²³² Th (pCi/L)	104	67	9.7	0.073	0.15	7.3	a	1.0	0.10	1.9E-04
Thorium, total (mg/L)	104	0.03	a	<0.003	a	<0.003	a	0.0003	a	a
²³² Th (pCi/L)	104	1.6	0.65	-0.024	0.049	0.18	a	0.020	0.040	4.2E-06
²³⁰ Th (pCi/L)	104	18	3.9	-0.027	0.20	0.29	a	0.20	0.10	8.2E-06
²³⁴ Th (pCi/L)	104	1.1	0.53	-0.056	0.080	0.039	a	0.010	0.10	1.2E-06
Tritium (pCi/L)	104	4000	530	-180	220	1400	a	110	0.070	2.8E-02
Uranium, total (mg/L)	104	0.140	a	<0.001	a	<0.02	a	0.002	a	a
²³⁴ U (pCi/L)	104	16	2.9	0.022	0.18	1.9	a	0.20	0.40	4.9E-05
²³⁵ U (pCi/L)	104	1.8	0.78	-0.037	0.26	0.17	a	0.030	0.030	4.2E-06
²³⁵ U (%)	103	0.49	a	0.09	a	0.25	a	0.005	a	a
²³⁶ U (pCi/L)	104	0.64	0.42	-0.054	0.77	0.060	a	0.010	0.010	1.4E-06
²³⁸ U (pCi/L)	104	67	9.7	0.073	0.15	7.3	a	1.0	1.2	1.9E-04

a Not applicable.

Table 4.47. 1994 Y-12 Plant annual radiological data summary for Station 17
 EFPC 23.4 km, near junction of Bear Creek and Scarboro Road

Parameter	Number of samples	Concentration					Standard error	Percentage of DCG	Total curies
		Max	+/-	Min	+/-	Median			
Flow, ^a mgd	363	83.4	b	2.8	3.7	b	b	b	b
Alpha activity (pCi/L)	52	30	11	-3.3	7.1	12	1.0	b	b
²⁴¹ Am (pCi/L)	52	0.61	0.37	-0.097	0.098	0.017	0.015	0.060	2.4E-04
Beta activity (pCi/L)	52	25	9.7	-5.5	9.5	9.0	0.90	b	b
²³⁷ Np (pCi/L)	52	0.3	0.18	-0.041	0.082	0.05	0.009	0.2	5.0E-04
²³⁸ Pu (pCi/L)	52	0.27	0.38	-0.11	0.32	0.011	0.010	0.026	2.0E-04
^{239/240} Pu (pCi/L)	52	0.42	0.35	-0.11	0.15	0	0.011	0	6.9E-05
²²⁶ Ra (pCi/L)	52	0.71	0.52	-0.49	0.50	0.010	0.040	0.010	5.7E-04
²²⁸ Ra (pCi/L)	52	2.2	3.9	-9.4	5.6	-0.59	0.26	-0.59	-7.6E-03
⁹⁰ Sr (pCi/L)	52	27	13	-18	26.0	-0.045	1.1	0	4.4E-03
⁹⁹ Tc (pCi/L)	52	130	24	-52	200	940	4.9	0.010	1.5E-01
²³⁴ Th (pCi/L)	51	27	5.3	3.1	0.83	6.8	0.72	0.068	7.0E-02
Thorium, total (mg/L)	51	0.008	b	<0.003	b	<0.003	0.0002	b	b
²²⁸ Th (pCi/L)	51	1.7	0.86	-0.10	0.39	0.19	0.036	0.048	1.9E-03
²³⁰ Th (pCi/L)	51	2.2	1.0	-0.013	0.092	0.2	0.05	0.1	3.0E-03
²³² Th (pCi/L)	51	1.3	0.82	-0.096	0.14	0.027	0.028	0.054	5.9E-04
Tritium (pCi/L)	52	2000	290	-370	200	140	55	0.0070	1.5E+00
Uranium, total (mg/L)	52	0.071	b	0.005	b	0.018	0.002	b	b
²³⁴ U (pCi/L)	52	8.2	2.2	1.4	2.8	4.2	0.21	0.83	3.6E-02
²³⁵ U (pCi/L)	52	0.59	0.33	0.046	0.092	0.23	0.020	0.040	2.1E-03
²³⁵ U (%)	52	1.0	b	0.27	b	0.42	0.015	b	b
²³⁶ U (pCi/L)	52	0.31	0.23	-0.08	0.09	0.080	0.012	0.023	8.2E-04
²³⁸ U (pCi/L)	52	27	5.3	3.1	0.83	6.7	0.71	1.1	6.9E-02

^aFlow during operation and/or discharging.

^bNot applicable.

Table 4.48. 1994 Y-12 Plant annual nonradiological data summary for Station 17^a

Parameter	Number of samples	Concentration ^b			Reference value ^c	Number of values exceeding reference
		Max	Min	Av		
Acrolein	146	<0.010	<0.010	<0.010	0.78	0
Silver	245	<0.03	<0.006	<0.006	0.004 ^d	245 ^e
Aluminum	245	4.42	<0.06	<0.37	<i>f</i>	<i>f</i>
Arsenic	245	<0.2	<0.04	<0.04	0.36 ^e	0
Tetrachlorethane	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Boron	245	0.222	<0.030	<0.100	<i>f</i>	<i>f</i>
Barium	245	0.0727	0.0205	0.0523	<i>f</i>	<i>f</i>
Bromodichloromethane	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Beryllium	245	<0.002	<0.0004	<0.0004	0.0013	1 ^e
Benzene	245	<0.010	<0.010	<0.010	0.71	0
Bromoform	245	<0.010	<0.010	<0.010	4.7	0
Chlorobenzene	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Carbon tetrachloride	245	<0.010	<0.010	<0.010	0.044	0
1,2-Dichloropropene	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Cerium	245	<0.08	<0.02	<0.02	<i>f</i>	<i>f</i>
Chloroethane	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Chloroethylvinyl ether	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Bromomethane	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Chloromethane	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Chloroform	245	<0.010	<0.010	<0.010	4.7	0
Cobalt	245	<0.01	<0.002	<0.002	<i>f</i>	<i>f</i>
Dibromochloromethane	245	<0.010	<0.010	<0.010	4.7	0
Ethylbenzene	245	<0.010	<0.010	<0.010	29	0
Iron	245	6.6	<0.06	<0.49	<i>f</i>	<i>f</i>
Trichlorofluoromethane	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Gallium	245	<0.09	<0.02	<0.02	<i>f</i>	<i>f</i>
Methylene chloride	245	<0.010	<0.010	<0.010	16	0
Methanol	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Manganese	245	0.392	0.0021	0.071	<i>f</i>	<i>f</i>
Niobium	136	<0.05	<0.01	<0.01	<i>f</i>	<i>f</i>
Tetrachloroethylene	245	<0.010	<0.010	<0.010	0.088	0
Strontium	245	0.172	0.051	0.118	<i>f</i>	<i>f</i>
Trichloroethene	245	<0.010	<0.010	<0.010	0.807	0

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Table 4.48 (continued)

Parameter	Number of samples	Concentration ^b			Reference value ^c	Number of values exceeding reference
		Max	Min	Av		
Dichloroethene	245	<0.010	<0.010	<0.010	0.032	0
1,3-Dichloropropene	245	<0.010	<0.010	<0.010	1.7	0
Thorium	245	<0.05	<0.01	<0.01	<i>f</i>	<i>f</i>
Titanium	245	0.06	<0.01	<0.02	<i>f</i>	<i>f</i>
Thallium	245	<0.2	<0.03	<0.03	<i>f</i>	<i>f</i>
Vanadium	245	<0.02	<0.004	<0.004	<i>f</i>	<i>f</i>
Vinyl chloride	245	<0.010	<0.010	<0.010	<i>f</i>	<i>f</i>
Acrylonitrile	245	<0.010	<0.010	<0.010	0.0067	245 ^e
Zirconium	245	<0.02	<0.004	<0.004	<i>f</i>	<i>f</i>
Mercury	245	0.0090	0.0002	0.0012	0.00015	245 ^e
Nitrate	245	14.0	1.2	3.6	<i>f</i>	<i>f</i>
Total phosphorus	245	7.0	<0.10	<0.27	<i>f</i>	<i>f</i>
Copper	245	<0.03	<0.006	<0.007	0.018 ^d	2
Zinc	245	0.22	<0.01	<0.05	0.117 ^d	5
Chromium	245	<0.03	<0.006	<0.006	0.016 ^b	1 ^e
Toluene	245	<0.010	<0.010	<0.010	300	0
1,1,1-Trichloroethane	245	<0.010	<0.010	<0.010	170	0
1,1,2-Trichloroethane	245	<0.010	<0.010	<0.010	0.42	0
Molybdenum	245	<0.03	<0.006	<0.006	<i>f</i>	<i>f</i>
Lithium	245	0.52	<0.02	<0.06	<i>f</i>	<i>f</i>
Selenium	245	<0.5	<0.1	<0.1	0.02	245 ^e
Cadmium	245	<0.02	<0.004	<0.004	0.004 ^d	1 ^e
Lead	245	<0.1	<0.02	<0.02	0.082 ^d	1 ^e
Nickel	245	<0.04	<0.008	<0.008	1.4	0
Calcium	245	75.3	25.5	53.9	<i>f</i>	<i>f</i>
Magnesium	245	12.8	4.5	9.9	<i>f</i>	<i>f</i>
Sodium	245	45.1	3.04	16.9	<i>f</i>	<i>f</i>
Potassium	245	3.0	1.1	2.0	<i>f</i>	<i>f</i>
Sulfate	245	110	<10	<50	<i>f</i>	<i>f</i>
Chloride	245	85	4.1	22.1	<i>f</i>	<i>f</i>
Fluoride	245	2.7	0.18	0.80	<i>f</i>	<i>f</i>
Total suspended solids	245	264	<5	<15	<i>f</i>	<i>f</i>
Total dissolved solids	245	650	<5	<268	<i>f</i>	<i>f</i>
Alkalinity	245	260	57	103	<i>f</i>	<i>f</i>

Table 4.48 (continued)

Parameter	Number of samples	Concentration ^b			Reference value ^c	Number of values exceeding reference
		Max	Min	Av		
Total organic carbons	245	30	22	12.6	<i>f</i>	<i>f</i>
Residual chlorine, total	363	0.01	0	0.002	<i>f</i>	<i>f</i>
Temperature, °F	362	84.7	3.1	69.3	86.9	0
pH, standard units	333	8.9	7.5	<i>f</i>	6/9 ^d	0
Dissolved oxygen	352	55.5	3.1	6.3	<i>f</i>	<i>f</i>
Conductivity, mhos/cm	363	103.2	21.1	43.0	<i>f</i>	<i>f</i>

^aFlow during operations and/or discharging.

^bUnits are in mg/L unless otherwise noted.

^cTennessee Water Quality Criteria minimum limits.

^dThis limit is for the dissolved form of this parameter only. The data represent all forms.

^eThe analytical detection level for this parameter is higher than the reference value.

^fNot applicable.

^gThis limit applies to Arsenic III only. The data represent all forms of arsenic.

^hThis limit applies to Chromium IV only. The data represent all forms of chromium.

ⁱMinimum value/maximum value.

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Table 4.49. Y-12 Plant annual summary for Upper Bear Creek nonradiological data km 11.97

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Arsenic	52	<0.2	<0.04	<0.2	0.36	0
Cadmium	52	0.02	<0.004	<0.02	0.004	51 ^{c,d}
Chromium	52	<0.03	<0.006	<0.03	0.016	51 ^{d,e}
Cyanide	52	<0.1	<0.1	<0.1	0.022	0
Lead	52	<0.1	<0.02	<0.1	0.082	51 ^{c,d}
Mercury	52	0.0005	<0.0002	<0.0002	0.00015	52 ^d
Nitrate (as N)	52	200	3	60	<i>f</i>	<i>f</i>
Dissolved oxygen	52	13.3	5.8	9.2	5 ^e	0
Phenols	52	0.052	<0.005	<0.007	<i>f</i>	<i>f</i>
Total dissolved solids	52	1700	220	910	<i>f</i>	<i>f</i>
Total suspended solids	52	67	<5	<8	<i>f</i>	<i>f</i>
Selenium	52	<0.5	<0.1	<0.5	0.02	52 ^d
Thallium	52	<0.2	<0.03	<0.2	<i>f</i>	<i>f</i>
pH, standard units	52	8.2	7.1	<i>f</i>	6.5-8.5 ^h	0
Aluminum	52	1.4	<0.2	<0.3	<i>f</i>	<i>f</i>
Barium	52	0.628	0.041	0.28	<i>f</i>	<i>f</i>
Beryllium	52	<0.002	<0.0004	<0.002	0.0013	51 ^d
Boron	52	0.08	<0.03	<0.05	<i>f</i>	<i>f</i>
Calcium	52	314	24.3	170	<i>f</i>	<i>f</i>
Cerium	52	<0.08	<0.02	<0.08	<i>f</i>	<i>f</i>
Cobalt	52	<0.01	<0.002	<0.01	<i>f</i>	<i>f</i>
Copper	52	<0.03	<0.006	<0.03	0.018	51 ^{c,d}
Gallium	52	<0.09	<0.02	<0.09	<i>f</i>	<i>f</i>
Iron	52	2.2	<0.24	<0.38	<i>f</i>	<i>f</i>
Lithium	52	<0.08	<0.02	<0.08	<i>f</i>	<i>f</i>
Magnesium	52	41.3	<3.4	<2	<i>f</i>	<i>f</i>
Manganese	52	2.6	<0.009	<0.7	<i>f</i>	<i>f</i>
Molybdenum	52	<0.03	<0.006	<0.03	<i>f</i>	<i>f</i>
Nickel	52	0.07	<0.016	<0.04	1.4	0
Niobium	52	<0.05	<0.01	<0.05	<i>f</i>	<i>f</i>
Phosphorus	17	0.3	<0.3	<0.3	<i>f</i>	<i>f</i>
Potassium	51	6	<2.2	<4	<i>f</i>	<i>f</i>
Silver	52	<0.03	<0.006	<0.03	0.004	52 ^{c,d}
Sodium	52	101	18.5	45.1	<i>f</i>	<i>f</i>
Strontium	52	0.884	0.075	0.49	<i>f</i>	<i>f</i>

Table 4.49 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Thorium	52	<0.05	<0.01	<0.05	<i>f</i>	<i>f</i>
Titanium	52	<0.06	<0.02	<0.06	<i>f</i>	<i>f</i>
Vanadium	52	<0.02	<0.004	<0.02	<i>f</i>	<i>f</i>
Zinc	52	0.05	<0.01	<0.05	0.117	0
Zirconium	52	<0.02	<0.004	<0.02	<i>f</i>	<i>f</i>
PCB, total	52	<0.0005	<0.0005	<0.0005	0.000001	52 ^d
Volatile organics, total	52	<0.01	<0.01	<0.01	542	0

^aAll units in mg/L unless otherwise indicated.

^bTennessee Water Quality criteria.

^cReference value represents the dissolved form of this metal only. The actual data are representative of all forms.

^dThe analytical detection limit for this parameter is higher than the reference value.

^eThis limit applies to hexavalent chromium only. The data represent total chromium.

^fNot applicable.

^gMinimum value.

^hMinimum value/maximum value.

Table 4.50. Y-12 Plant annual summary for Upper Bear Creek radiological data km 11.97

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	52	360	57	11	8.3	84	<i>a</i>	7.8	<i>a</i>
²⁴¹ Am (pCi/L)	52	0.44	0.27	-0.10	0.20	0.020	<i>a</i>	0.010	0.070
Beta activity (pCi/L)	52	490	67	25	11	190	<i>a</i>	15	<i>a</i>
²³⁷ Np (pCi/L)	52	3.3	0.64	0.025	0.051	0.90	<i>a</i>	0.091	3.0
²³⁸ Pu (pCi/L)	51	0.34	0.25	-0.12	0.24	0.008	0.08	0.01	0.02
^{239/240} Pu (pCi/L)	51	0.22	0.54	-0.066	0.094	0	0.05	0.007	0
⁹⁹ Tc (pCi/mL)	52	910	110	-25	16	320	<i>a</i>	32	0.325
Uranium, total (mg/L)	52	0.62	<i>a</i>	<0.001	<i>a</i>	0.2	<i>a</i>	0.02	<i>a</i>
²³⁵ U (%)	51	0.48	<i>a</i>	0.30	<i>a</i>	0.36	<i>a</i>	0.0050	<i>a</i>

^aNot applicable.

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Table 4.51. Y-12 Plant annual summary for Upper Bear Creek nonradiological data km 12.4

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Arsenic	52	<0.2	<0.04	<0.2	0.36	0
Cadmium	52	<0.02	<0.004	<0.02	0.004	51 ^{c,d}
Chromium	52	<0.03	<0.006	<0.03	0.016	51 ^{d,e}
Cyanide	52	<0.01	<0.01	<0.01	0.022	0
Lead	52	<0.1	<0.02	<0.1	0.082	51 ^{c,d}
Mercury	52	0.0008	<0.0002	<0.0002	0.00015	52 ^d
Nitrate (as N)	52	170	0.76	18	<i>f</i>	<i>f</i>
Dissolved oxygen	52	11.5	5	7.5	5 ^e	0
Phenols	52	0.0054	<0.005	<0.005	<i>f</i>	<i>f</i>
Total dissolved solids	52	2300	390	890	<i>f</i>	<i>f</i>
Total suspended solids	52	15	<5	<6	<i>f</i>	<i>f</i>
Selenium	52	<0.5	<0.1	<0.5	0.02	52 ^d
Thallium	52	<0.2	<0.03	<0.2	<i>f</i>	<i>f</i>
pH, standard units	52	7.9	6.9	<i>f</i>	6.5-8.5 ^h	0
Aluminum	52	0.9	<0.07	<0.2	<i>f</i>	<i>f</i>
Barium	52	0.635	0.042	0.11	<i>f</i>	<i>f</i>
Beryllium	52	<0.002	<0.0004	<0.002	0.0013	51 ^d
Boron	52	0.10	<0.03	<0.06	<i>f</i>	<i>f</i>
Calcium	52	318	40.7	149	<i>f</i>	<i>f</i>
Cerium	52	<0.08	<0.02	<0.08	<i>f</i>	<i>f</i>
Cobalt	52	<0.01	<0.002	<0.01	<i>f</i>	<i>f</i>
Copper	52	<0.03	<0.006	<0.03	0.018	51 ^{c,d}
Gallium	52	<0.09	<0.02	<0.09	<i>f</i>	<i>f</i>
Iron	52	1.2	<0.07	<0.3	<i>f</i>	<i>f</i>
Lithium	52	0.08	<0.02	<0.08	<i>f</i>	<i>f</i>
Magnesium	52	41.8	4.9	19	<i>f</i>	<i>f</i>
Manganese	52	2.02	<0.009	<0.08	<i>f</i>	<i>f</i>
Molybdenum	52	<0.03	<0.006	<0.03	<i>f</i>	<i>f</i>
Nickel	52	0.07	<0.008	<0.04	1.4	0
Niobium	28	<0.05	<0.01	<0.05	<i>f</i>	<i>f</i>
Phosphorus	3	<0.3	<0.3	<0.3	<i>f</i>	<i>f</i>
Potassium	52	6	<3	<4	<i>f</i>	<i>f</i>
Silver	52	<0.03	<0.006	<0.03	0.004	52 ^{c,d}
Sodium	52	323	35.9	101	<i>f</i>	<i>f</i>

Table 4.51 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Strontium	52	0.881	0.114	0.397	<i>f</i>	<i>f</i>
Thorium	52	<0.05	<0.01	<0.05	<i>f</i>	<i>f</i>
Titanium	52	<0.06	<0.02	<0.06	<i>f</i>	<i>f</i>
Vanadium	52	<0.02	<0.004	<0.02	<i>f</i>	<i>f</i>
Zinc	52	<0.05	<0.01	<0.05	0.117	0
Zirconium	52	<0.02	<0.004	<0.02	<i>f</i>	<i>f</i>
PCB, total	52	<0.0005	<0.0005	<0.0005	0.000001	52 ^d
Volatile organics, total	52	0.016	<0.01	<0.01	542	0

^aAll units are mg/L unless otherwise indicated.

^bTennessee Water Quality criteria.

^cReference value represents the dissolved form of this metal only. The actual data are representative of all forms.

^dThe analytical detection limit for this parameter is higher than the reference value.

^eThis limit applies to hexavalent chromium only. The data represent total chromium.

^fNot applicable.

^gMinimum value.

^hMinimum value/maximum value.

Table 4.52. Y-12 Plant annual radiological summary for Upper Bear Creek radiological data km 12.4

Parameter	Number of samples	Concentration						Standard error	Percentage of DGG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	52	360	61	8.8	6.4	205	<i>a</i>	10	<i>a</i>
²⁴¹ Am (pCi/L)	52	0.78	0.50	-0.068	0.079	0.023	<i>a</i>	0.17	0.077
Beta activity (pCi/L)	52	620	84	8.1	9.4	120	<i>a</i>	12	<i>a</i>
²³⁷ Np (pCi/L)	52	2.4	0.52	-0.03	0.09	0.5	<i>a</i>	0.06	2
²³⁸ Pu (pCi/L)	52	0.11	0.16	-0.42	0.41	-0.0013	<i>a</i>	0.011	-0.0033
^{239/240} Pu (pCi/L)	52	0.40	0.23	-0.064	0.13	0	<i>a</i>	0.091	0
⁹⁹ Tc (pCi/mL)	52	1100	150	-61	16	65	<i>a</i>	25	0.065
Uranium, total (mg/L)	52	0.69	<i>a</i>	0.10	<i>a</i>	0.51	<i>a</i>	0.020	<i>a</i>
²³⁵ U (%)	52	0.57	<i>a</i>	0.27	<i>a</i>	0.33	<i>a</i>	0.068	<i>a</i>

^aNot applicable.

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Table 4.53. Surface water analytical results of polychlorinated biphenyls monitoring plan for the Oak Ridge Y-12 Plant, CY 1994

Site number	Location	Date sampled	PCB concentration (mg/L)
PCB-1	Outfall 301, Kerr Hollow Quarry	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005
PCB-2	Outfall 302, Rogers Quarry	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005
PCB-3	Outfall 303, New Hope Pond	<i>a</i>	
PCB-5	New Hope Pond Inlet	<i>b</i>	
PCB-6	Upstream of Outfall 135	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005
PCB-7	Outfall 304, Bear Creek	3/2	<0.0005
		4/4	<0.0005
		7/25	<0.0005
		10/13	<0.0005

^aThis outlet was closed in April 1989.

^bThis inlet was closed in November 1988.

Table 4.54. CY 1994 NPDES Permit Number TN 0002968
Y-12 Plant Cooling Towers

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge point 602 (on ozone)</i>						
Temperature, °C	c					
pH, standard units	c					
Free chlorine	c					
Chromium	c					
Copper	c					
Zinc	c					
Flow, gpd ^d	c					
<i>Discharge point 604</i>						
Temperature, °C	4	25.2	9.8	16.9	38	0
pH, standard units	4	8.2	7.9	e	6.5/8.5 ^f	0
Free chlorine	4	0.05	0.01	0.03	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	0.44	0.17	0.33	1	0
Flow, gpd ^d	4	122,622	28,612	48,879	e	e
<i>Discharge point 606 (out of service)</i>						
Temperature, °C	c					
pH, standard units	c					
Free chlorine	c					
Chromium	c					
Copper	c					
Zinc	c					
Flow, gpd ^d	c					
<i>Discharge point 610</i>						
Temperature, °C	4	28.9	23.7	26.6	38	0
pH, standard units	4	8.2	7.9	e	6.5/8.5 ^f	0
Free chlorine	4	0.04	0.01	0.03	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	<0.05	<0.05	<0.05	1	0
Flow, gpd ^d	4	36,769	14,330	21,320	e	e

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Table 4.54 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge point 612 (not in operation CY 94)</i>						
Temperature, °C	c					
pH, standard units	c					
Free chlorine	c					
Chromium	c					
Copper	c					
Zinc	c					
Flow, gpd ^d	c					
<i>Discharge point 613</i>						
Temperature, °C	4	28.0	23.2	24.8	38	0
pH, standard units	4	8.1	7.6	e	6.5/8.5 ^f	0
Free chlorine	4	0.09	0.01	0.04	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	0.08	<0.05	<0.06	1	0
Flow, gpd ^d	4	86,250	20,424	39,655	e	e
<i>Discharge point 615</i>						
Temperature, °C	4	26.5	10.4	16.6	38	0
pH, standard units	4	8.0	7.5	e	6.5/8.5 ^f	0
Free chlorine	4	0.01	0.00	0.01	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	0.07	0.06	0.07	1	0
Zinc	3	0.68	0.33	0.51	1	0
Flow, gpd ^d	4	7,245	612	1,130	e	e
<i>Discharge point 616 (torn down)</i>						
Temperature, °C	c					
pH, standard units	c					
Free chlorine	c					
Chromium	c					
Copper	c					
Zinc	c					
Flow, gpd ^d	c					

Table 4.54 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge point 617</i>						
Temperature, °C	4	26.4	19.8	23.5	38	0
pH, standard units	4	8.2	7.8	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.04	0.00	0.01	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	0.05	<0.03	<0.04	1	0
Zinc	3	0.08	0.07	0.07	1	0
Flow, gpd ^d	4	31,740	9,918	13,727	<i>e</i>	<i>e</i>
<i>Discharge point 618</i>						
Temperature, °C	4	28.1	23.8	25.2	38	0
pH, standard units	4	8.3	7.6	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.03	0.02	0.03	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	0.04	<0.03	<0.03	1	0
Zinc	3	<0.05	<0.05	<0.05	1	0
Flow, gpd ^d	4	46,460	7,039	9,659	<i>e</i>	<i>e</i>
<i>Discharge point 619 (not in operation in CY 1994)</i>						
Temperature, °C	<i>c</i>					
pH, standard units	<i>c</i>					
Free chlorine	<i>c</i>					
Chromium	<i>c</i>					
Copper	<i>c</i>					
Zinc	<i>c</i>					
Flow, gpd ^d	<i>c</i>					
<i>Discharge point 620</i>						
Temperature, °C	4	24.5	17.1	21.0	38	0
pH, standard units	4	8.0	7.8	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.04	0.00	0.02	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	0.03	<0.03	<0.03	1	0
Zinc	3	0.29	0.11	0.19	1	0
Flow, gpd ^d	4	86,250	2,156	14,914	<i>e</i>	<i>e</i>

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Table 4.54 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge point 622</i>						
Temperature, °C	4	30.1	19.3	24.8	38	0
pH, standard units	4	8.2	7.5	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.08	0.02	0.04	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	0.05	<0.05	<0.05	1	0
Flow, gpd ^d	4	90,327	28,661	33,490	<i>e</i>	<i>e</i>
<i>Discharge point 624 (combined with 622)</i>						
Temperature, °C	<i>c</i>					
pH, standard units	<i>c</i>					
Free chlorine	<i>c</i>					
Chromium	<i>c</i>					
Copper	<i>c</i>					
Zinc	<i>c</i>					
Flow, gpd ^d	<i>c</i>					
<i>Discharge point 626</i>						
Temperature, °C	4	23.1	14.0	18.2	38	0
pH, standard units	4	8.2	7.9	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.03	0.01	0.02	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	<0.05	<0.05	<0.05	1	0
Flow, gpd ^d	4	3,750	980	1,888	<i>e</i>	<i>e</i>
<i>Discharge point 628</i>						
Temperature, °C	4	31.8	17.9	22.7	38	0
pH, standard units	4	8.1	8.0	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.05	0.00	0.02	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	0.11	0.07	0.09	1	0
Flow, gpd ^d	4	124,200	27,600	43,643	<i>e</i>	<i>e</i>

Table 4.54 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge point 630</i>						
Temperature, °C	1	21.9	21.9	21.9	38	0
pH, standard units	1	8.0	8.0	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	1	0.01	0.01	0.01	0.5	0
Chromium	1	<0.03	<0.03	<0.03	1	0
Copper	1	<0.03	<0.03	<0.03	1	0
Zinc	1	0.07	0.07	0.07	1	0
Flow, gpd ^d	1	6,077	6,077	6,077	<i>e</i>	<i>e</i>
<i>Discharge point 632</i>						
Temperature, °C	3	26.5	20.3	23.4	38	0
pH, standard units	3	8.2	7.8	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	3	0.06	0.02	0.04	0.5	0
Chromium	2	<0.03	<0.03	<0.03	1	0
Copper	2	0.03	<0.03	<0.03	1	0
Zinc	2	0.06	<0.05	<0.06	1	0
Flow, gpd ^d	3	19,166	6,571	8,992	<i>e</i>	<i>e</i>
<i>Discharge point 633 (out of service)</i>						
Temperature, °C	<i>c</i>					
pH, standard units	<i>c</i>					
Free chlorine	<i>c</i>					
Chromium	<i>c</i>					
Copper	<i>c</i>					
Zinc	<i>c</i>					
Flow, gpd ^d	<i>c</i>					

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Table 4.54 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge point 634</i>						
Temperature, °C	4	24.1	22.1	23.4	38	0
pH, standard units	4	8.2	7.9	<i>e</i>	6.5/8.5 ^f	0
Free chlorine	4	0.03	0.01	0.02	0.5	0
Chromium	3	<0.03	<0.03	<0.03	1	0
Copper	3	<0.03	<0.03	<0.03	1	0
Zinc	3	0.12	0.10	0.11	1	0
Flow, gpd ^d	4	75,900	15,180	26,987	<i>e</i>	<i>e</i>

^aUnits in mg/L unless otherwise indicated

^bNPDES permit limits.

^cNo flow.

^dFlow during operation and/or discharging.

^eNot applicable.

^fMinimum value/maximum value.

Table 4.55. Y-12 Plant Category I Outfalls

Outfall	Number of samples	pH (standard units)			Min ref. value ^a	No. of values exceeding reference	Max ref. value ^a	No. of values exceeding reference	Flow (gpd) ^b		
		Max	Min	Av					Max	Min	Av
001	0	c	c	d	6.5	0	8.5	0	c	c	c
003	0	c	c	d	6.5	0	8.5	0	c	c	c
006	0	c	c	d	6.5	0	8.5	0	c	c	c
007	0	c	c	d	6.5	0	8.5	0	c	c	c
009	1	7.5	7.5	d	6.5	0	8.5	0	30,436	30,436	30,436
011	1	7.8	7.8	d	6.5	0	8.5	0	15,218	15,218	15,218
015	1	7.8	7.8	d	6.5	0	8.5	0	5,707	5,707	5,707
017	0	c	c	d	6.5	0	8.5	0	c	c	c
018	0	c	c	d	6.5	0	8.5	0	c	c	c
019	0	c	c	d	6.5	0	8.5	0	c	c	c
031	1	7.2	7.2	d	6.5	0	8.5	0	5,600	5,600	5,600
032	1	8.4	8.4	d	6.5	0	8.5	0	4,565	4,565	4,565
041	1	7.9	7.9	d	6.5	0	8.5	0	7,609	7,609	7,609
044	0	c	c	d	6.5	0	8.5	0	c	c	c
045	0	c	c	d	6.5	0	8.5	0	c	c	c
057	0	c	c	d	6.5	0	8.5	0	c	c	c
062	1	7.6	7.6	d	6.5	0	8.5	0	780	780	780
086	1	8.0	8.0	d	6.5	0	8.5	0	9,511	9,511	9,511
108	1	7.7	7.7	d	6.5	0	8.5	0	6,080	6,080	6,080
134	1	7.7	7.7	d	6.5	0	8.5	0	2,282	2,282	2,282
156	1	8.1	8.1	d	6.5	0	8.5	0	5,707	5,707	5,707
159	1	7.9	7.9	d	6.5	0	8.5	0	7,609	7,609	7,609

Table 4.55 (continued)

Outfall	Number of samples	pH (standard units)			Min ref. value ^a	No. of values exceeding reference	Max ref. value ^a	No. of values exceeding reference	Flow (gpd) ^b		
		Max	Min	Av					Max	Min	Av
161	1	8.1	8.1	d	6.5	0	8.5	0	22,827	22,827	22,827
170	1	7.1	7.1	d	6.5	0	8.5	0	234,720	234,720	234,720
178	1	8.0	8.0	d	6.5	0	8.5	0	1,141	1,141	1,141
180	1	7.7	7.7	d	6.5	0	8.5	0	9,511	9,511	9,511
183	1	7.7	7.7	d	6.5	0	8.5	0	2,282	2,282	2,282
184	1	8.3	8.3	d	6.5	0	8.5	0	3,044	3,044	3,044
186	1	7.7	7.7	d	6.5	0	8.5	0	190,222	190,222	190,222
193	1	8.3	8.3	d	6.5	0	8.5	0	34,240	34,240	34,240
194	1	7.8	7.8	d	6.5	0	8.5	0	9,511	9,511	9,511
195	1	7.9	7.9	d	6.5	0	8.5	0	2,282	2,282	2,282
196	1	8.4	8.4	d	6.5	0	8.5	0	7,100	7,100	7,100
197	0	c	c	c	6.5	0	8.5	0	c	c	c
198	1	7.8	7.8	d	6.5	0	8.5	0	19,022	19,022	19,022
202	1	8.1	8.1	d	6.5	0	8.5	0	1,522	1,522	1,522
205	1	7.4	7.4	d	6.5	0	8.5	0	30,436	30,436	30,436
206	1	7.9	7.9	d	6.5	0	8.5	0	1,522	1,522	1,522
207	1	7.7	7.7	d	6.5	0	8.5	0	9,511	9,511	9,511
208	1	7.2	7.2	d	6.5	0	8.5	0	3,044	3,044	3,044
215	1	8.3	8.3	d	6.5	0	8.5	0	22,827	22,827	2,287
221	1	7.7	7.7	d	6.5	0	8.5	0	152,180	152,180	152,180
223	1	7.8	7.8	d	6.5	0	8.5	0	10,652	10,652	10,652
224	1	8.0	8.0	d	6.5	0	8.5	0	9,511	9,511	9,511

Table 4.55 (continued)

Outfall	Number of samples	pH (standard units)		Min ref. value ^c	No. of values exceeding reference	Max ref. value ^a	No. of values exceeding reference	Flow (gpd) ^b	
		Max	Min					Max	Min
232	1	8.1	8.1	6.5	0	8.5	0	22,827	22,827
233	1	8.2	8.2	6.5	0	8.5	0	31,110	31,110
234	1	7.8	7.8	6.5	0	8.5	0	1,902	1,902
235	1	7.7	7.7	6.5	0	8.5	0	2,282	2,282
236	1	7.7	7.7	6.5	0	8.5	0	9,511	9,511

^aNPDES permit limits.^bFlow during operations and/or discharging. No reference value for flow rate.^cNo flow.^dNot applicable.

Table 4.56. Y-12 Plant Category II Outfalls

Outfall	Number of samples	pH (standard units)			Min ref. value ^a	No. of values exceeding reference	Max ref. value ^a	No. of values exceeding reference	Temperature (°C) ^b			Flow (gpd) ^c		
		Max	Min	Av					Max	Min	Av	Max	Min	Av
013	1	7.2	7.2	d	6.5	8.5	0	13.6	13.6	13.6	3,400	3,400	3,400	
016	4	8.0	7.5	d	6.5	8.5	0	23.6	8.3	17.3	1,522	285	1,118	
020	4	8.1	7.9	d	6.5	8.5	0	23.3	8.0	16.8	9,511	761	3,614	
023	3	7.9	7.4	d	6.5	8.5	0	42.7	23.5	34.5	1,141	95	539	
027	0	e	e	d	6.5	8.5	0	e	e	e	e	e	e	
035	0	e	e	d	6.5	8.5	0	e	e	e	e	e	e	
046	2	7.9	7.2	d	6.5	8.5	0	44.5	30.9	37.7	285	190	238	
053	0	e	e	d	6.5	8.5	0	e	e	e	e	e	e	
054	4	8.3	7.7	d	6.5	8.5	0	24.0	12.6	18.8	53,262	1,141	22,446	
058	4	8.2	7.5	d	6.5	8.5	0	24.6	8.5	16.7	28,511	47	7,393	
066	4	8.3	6.6	d	6.5	8.5	0	31.3	23.4	26.8	254	30	166	
068	4	8.3	7.4	d	6.5	8.5	0	56.1	13.8	30.0	190	95	151	
073	4	8.3	7.8	d	6.5	8.5	0	28.5	10.3	19.9	190	95	151	
077	3	7.8	7.2	d	6.5	8.5	0	22.1	17.4	20.0	199,721	1,522	77,214	
087	4	8.4	7.1	d	6.5	8.5	0	24.8	11.2	16.2	6,950	761	2,784	
098	4	7.9	7.4	d	6.5	8.5	0	22.9	14.5	17.8	2,282	127	841	
111	0	e	e	d	6.5	8.5	0	e	e	e	e	e	e	
117	4	8.3	6.9	d	6.5	8.5	0	36.2	20.0	25.5	190	95	164	
133	3	7.8	7.6	d	6.5	8.5	0	24.8	11.5	15.9	3,804	1,522	2,409	
137	1	7.7	7.7	d	6.5	8.5	0	12.6	12.6	12.6	1,141	1,141	1,141	

Table 4.56 (continued)

Outfall	Number of samples	pH (standard units)			Min ref. value ^a	No. of values exceeding reference	Max ref. value ^a	No. of values exceeding reference	Temperature (°C) ^b			Flow (gpd) ^c		
		Max	Min	Av					Max	Min	Av	Max	Min	Av
172	2	7.6	7.4	d	6.5	0	8.5	0	21.5	9.1	15.3	3,804	260	2,032
185	4	8.4	7.3	d	6.5	0	8.5	0	31.6	16.1	24.1	2,282	285	1,213
201	4	8.2	7.1	d	6.5	0	8.5	0	24.6	10.1	17.5	22,827	7,609	14,267
203	3	8.0	7.3	d	6.5	0	8.5	0	22.8	7.1	15.8	11,413	245	7,690
204	4	8.1	7.2	d	6.5	0	8.5	0	24.6	8.34	16.8	1,141	380	856
213	4	7.7	7.3	d	6.5	0	8.5	0	26.0	8.9	15.9	3,044	190	1,664
240	3	8.4	7.8	d	6.5	0	8.5	0	19.2	7.2	11.8	2,282	47	819

^aNPDES permit limits.^bNo reference value.^cFlow during operations and/or discharging. No reference value for flow rate.^dNot applicable.^eNo flow.

Table 4.57. Y-12 Plant Category III Outfalls

Outfall	Number of samples		pH (standard units)		Min ref. value ^a		No. of values exceeding reference		Max ref. values ^a		No. of values exceeding reference		Temperature (°C) ^b		Ref. value ^b		Flow (gpd) ^b	
	Max	Min	Max	Min	Av	Av	Max	Min	Max	Min	Av	Av	Max	Min	Max	Min	Max	Av
002	4	4	8.0	7.4	c	6.5	0	8.5	8.5	0	21.5	8.9	15.0	30.5	0	417,600	33,340	190,408
071	4	4	7.9	7.3	c	6.5	0	8.5	8.5	0	22.2	11.0	17.5	30.5	0	114,130	5,707	55,640
135	4	4	8.0	7.0	c	6.5	0	8.5	8.5	0	28.1	20.6	24.4	30.5	0	658,080	121,730	417,208
147	4	4	8.3	7.6	c	6.5	0	8.5	8.5	0	26.4	11.2	16.9	30.5	0	5,250	780	3,219
150	4	4	8.1	7.6	c	6.5	0	8.5	8.5	0	32.2	23.3	27.3	30.5	0	1,071,000	462,000	718,350
157	4	4	8.2	7.7	c	6.5	0	8.5	8.5	0	23.7	15.2	20.5	30.5	0	1,522	380	856
160	4	4	8.0	7.8	c	6.5	0	8.5	8.5	0	29.6	20.2	24.8	30.5	0	218,201	11,587	91,310
163	4	4	8.1	6.9	c	6.5	0	8.5	8.5	0	30.7	21.2	25.8	30.5	0	245,494	149,769	192,024
169	4	4	8.0	6.6	c	6.5	0	8.5	8.5	0	26.9	18.8	21.7	30.5	0	929,105	170,864	485,279
181	0	0	d	d	c	6.5	0	8.5	8.5	0	d	d	d	30.5	0	d	d	d
192	4	4	7.2	6.7	c	6.5	0	8.5	8.5	0	21.0	11.7	15.5	30.5	0	34,200	2,282	13,491

^aNPDES permit limits.
^bFlow during operations and/or discharging. No reference value for flow rate.
^cNot applicable.
^dNo flow.

Table 4.58. CY 1994 NPDES Permit Number TN 0002968 Y-12 Plant Category IV Outfalls^a

Outfall	Number of samples	pH (standard units)			Minimum reference value ^b	Number of values below reference	Maximum reference value	Number of values exceeding reference
		Max	Min	Av				
401	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
402	<i>c</i>				6.5	0	8.5	0
403	<i>c</i>				6.5	0	8.5	0
404	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
405	22	8.2	6.7	<i>d</i>	6.5	0	8.5	0
406	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
407	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
408	52	8.1	7.0	<i>d</i>	6.5	0	8.5	0
409	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
410	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
411	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
412	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
413	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
414	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
415	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
416	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
417	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
418	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
419	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
420	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
421	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>
422	<i>c</i>				6.5	<i>d</i>	8.5	<i>d</i>

^aFlow during operation and/or discharging.^bNPDES permit limits.^cNo flow.^dNot applicable.

Oak Ridge Reservation

Table 4.59. City Flow Monitoring Station-SS4 (northeast of Y-12 Plant)
January 1, 1994 through June 27, 1994

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
pH, standard units	30	8.2	6.6	c	c	c
Cyanide	30	<0.01	<0.01	<0.01	c	c
Oil and grease	30	16.3	<2.0	<6.0	c	c
Phenols	30	0.041	<0.005	<0.01	c	c
Total volatile organics	30	0.024	<0.01	<0.01	c	c
Benzene	30	<0.01	<0.01	<0.01	c	c
Methylene chloride	30	<0.01	<0.01	<0.01	c	c
Tetrachloroethene	30	10	2	5	c	c
Trichloroethylene	30	2	<0.01	<0.08	c	c
Toluene	30	<0.01	<0.01	<0.01	c	c
Total chlorinated hydrocarbons	30	0.024	<0.01	<0.01	c	c
Ammonia	30	15	3.2	9.8	c	c
Biochemical oxygen demand	30	100	<5	<50	c	c
Chemical oxygen demand	30	210	<20	<100	c	c
Hexavalent chromium	30	<0.01	<0.01	<0.01	c	c
Mercury	29	0.0041	0.0002	0.001	c	c
Total Kjeldahl nitrogen	30	24	5.8	14	c	c
Total suspended solids	30	190	<5	<60	c	c
Selenium	30	<0.1	<0.1	<0.1	c	c
Aluminum	30	0.74	0.12	0.27	c	c
Arsenic	30	<0.04	<0.04	<0.04	c	c
Barium	30	0.0689	0.0380	0.0491	c	c
Beryllium	30	<0.0004	<0.0004	<0.0004	c	c
Boron	30	0.051	0.021	0.034	c	c
Cadmium	30	<0.004	<0.004	<0.004	c	c
Calcium	30	46.7	34.0	41.1	c	c
Cerium	30	<0.02	<0.02	<0.02	c	c
Chromium, total	30	0.009	<0.006	<0.006	c	c
Cobalt	30	0.083	0.002	0.01	c	c
Copper	30	0.037	<0.006	<0.02	c	c
Gallium	30	<0.02	<0.02	<0.02	c	c
Iron	30	0.96	0.27	0.51	c	c
Lead	30	<0.02	<0.02	<0.02	c	c
Lithium	30	0.03	<0.02	<0.02	c	c
Magnesium	30	10.5	6.88	8.60	c	c
Manganese	30	0.116	0.057	0.089	c	c

Table 4.59 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Molybdenum	30	<0.006	<0.006	<0.006	c	c
Nickel	30	<0.008	<0.008	<0.008	c	c
Niobium	28	<0.01	<0.01	<0.01	c	c
Phosphorus	2	3.96	1.87	2.92	c	c
Potassium	30	9.6	3.9	6.6	c	c
Silver	30	0.021	<0.006	<0.007	c	c
Sodium	30	25.4	8.07	14.7	c	c
Strontium	30	0.137	0.084	0.11	c	c
Thorium	30	0.01	<0.01	<0.01	c	c
Thallium	30	<0.03	<0.03	<0.03	c	c
Titanium	29	0.12	<0.01	<0.03	c	c
Vanadium	30	0.004	<0.004	<0.004	c	c
Zinc	30	0.20	0.04	0.1	c	c
Zirconium	30	<0.004	<0.004	<0.004	c	c

^aAll units in mg/L unless otherwise indicated.

^bSanitary Sewer Industrial Discharge Permit limits.

^cNot applicable.

Table 4.60. City Flow Monitoring Station-SS4 (northeast of Y-12 Plant)
January 1, 1994 through June 27, 1994

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	30	12	8.0	-5.1	7.7	2.9	a	0.86	a
Beta activity (pCi/L)	30	23	11	-5.4	9.3	6.4	a	1.1	a
²³⁸ Pu (pCi/L)	30	0.10	0.16	-0.074	0.11	0	a	0.080	0
^{239/240} Pu (pCi/L)	30	0.26	0.24	-0.05	0.07	0	a	0.01	0
²³⁴ U (pCi/L)	30	22	3.4	1.3	0.45	3.3	a	0.66	0.66
²³⁵ U (%)	30	1.7	a	0.63	a	0.87	a	0.046	a
²³⁵ U (pCi/L)	30	0.80	0.39	0	0	0.10	a	0.03	0.02
²³⁶ U (pCi/L)	30	0.23	0.17	-0.023	0.047	0.041	a	0.010	0.0082
²³⁸ U (pCi/L)	30	18	2.8	0.82	0.40	1.8	a	0.56	0.29
Uranium, total (mg/L)	30	0.011	a	0.002	a	0.005	a	0.0004	a
Gamma activity (pCi/L)	30	3200	320	-16	23	30	a	110	a

^aNot applicable.

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Table 4.61. Union Valley Flow Monitoring Station-SS5 (east of Y-12 Plant)
January 1, 1994 through June 27, 1994

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
pH, standard units	30	8.1	7.0	c	c	c
Cyanide	30	0.027	<0.01	<0.01	c	c
Oil and grease	30	100	2.1	14	c	c
Phenols	30	0.18	<0.005	<0.03	c	c
Total volatile organics	29	0.092	<0.01	<0.02	c	c
Benzene	29	<0.01	<0.01	<0.01	c	c
Methylene chloride	29	<0.01	<0.01	<0.01	c	c
Tetrachloroethene	29	1	<0.001	<0.08	c	c
Trichloroethylene	29	<0.01	<0.01	<0.01	c	c
Toluene	29	12	<0.01	<0.4	c	c
Total chlorinated hydrocarbons	29	0.092	<0.01	<0.02	c	c
Ammonia	30	37	0.42	22	c	c
Biochemical oxygen demand	30	430	29	140	c	c
Chemical oxygen demand	30	670	64	280	c	c
Hexavalent chromium	30	0.02	<0.01	<0.01	c	c
Mercury	30	0.0010	<0.0002	<0.0003	c	c
Total Kjeldahl nitrogen	30	939	9.3	66	c	c
Total suspended solids	30	520	22	190	c	c
Selenium	30	<0.1	<0.1	<0.1	c	c
Aluminum	30	3.75	0.18	0.86	c	c
Arsenic	30	<0.04	<0.004	<0.04	c	c
Barium	30	0.138	0.036	0.0613	c	c
Beryllium	30	<0.0004	<0.0004	<0.0004	c	c
Boron	30	0.794	0.033	0.13	c	c
Cadmium	30	<0.004	<0.004	<0.004	c	c
Calcium	30	75.3	44.7	56.2	c	c
Cerium	30	<0.02	<0.02	<0.02	c	c
Chromium, total	30	0.084	<0.006	<0.01	c	c
Cobalt	30	0.235	0.014	0.086	c	c
Copper	30	0.193	0.011	0.046	c	c
Gallium	30	<0.02	<0.02	<0.02	c	c
Iron	30	4	0.21	0.83	c	c
Lead	30	<0.02	<0.02	<0.02	c	c
Lithium	30	0.08	<0.02	<0.02	c	c
Magnesium	30	15.7	6.64	10.7	c	c
Manganese	30	0.410	0.075	0.21	c	c

Table 4.61 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Molybdenum	30	0.028	<0.006	<0.007	<i>c</i>	<i>c</i>
Nickel	30	0.022	<0.008	<0.01	<i>c</i>	<i>c</i>
Niobium	28	<0.01	<0.01	<0.01	<i>c</i>	<i>c</i>
Phosphorus	2	8.01	3.23	5.62	<i>c</i>	<i>c</i>
Potassium	30	42.1	6.0	18	<i>c</i>	<i>c</i>
Silver	30	<0.006	<0.006	<0.006	<i>c</i>	<i>c</i>
Sodium	30	37.9	8.21	22.3	<i>c</i>	<i>c</i>
Strontium	30	0.176	0.094	0.13	<i>c</i>	<i>c</i>
Thorium	30	0.01	<0.01	<0.01	<i>c</i>	<i>c</i>
Thallium	30	<0.03	<0.03	<0.03	<i>c</i>	<i>c</i>
Titanium	29	2.22	<0.02	<0.2	<i>c</i>	<i>c</i>
Vanadium	30	0.005	<0.004	<0.004	<i>c</i>	<i>c</i>
Zinc	30	0.39	0.05	0.2	<i>c</i>	<i>c</i>
Zirconium	30	0.004	<0.004	<0.004	<i>c</i>	<i>c</i>

^aAll units in mg/L unless otherwise indicated.

^bSanitary Sewer Industrial Discharge Permit limits.

^cNot applicable.

Table 4.62. Union Valley Flow Monitoring Station-SS5 (east of Y-12 Plant)
January 1, 1994 through June 27, 1994

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	30	340	51	-7.0	7.3	1.0	<i>a</i>	11	<i>a</i>
Beta activity (pCi/L)	30	40	13	-2.0	9.3	11	<i>a</i>	1.6	<i>a</i>
²³⁸ Pu (pCi/L)	30	0.13	0.19	-0.072	0.084	0	<i>a</i>	0.0077	0
^{239/240} Pu (pCi/L)	30	0.07	0.08	-0.059	0.12	0	<i>a</i>	0.0053	0
²³⁴ U (pCi/L)	30	7.7	1.6	0.027	0.15	0.41	<i>a</i>	0.25	0.081
²³⁵ U (%)	26	1.1	<i>a</i>	0.19	<i>a</i>	0.30	<i>a</i>	0.043	<i>a</i>
²³⁵ U (pCi/L)	30	0.37	0.29	-0.056	0.080	0	<i>a</i>	0.016	0
²³⁶ U (pCi/L)	30	0.090	0.13	-0.059	0.12	0	<i>a</i>	0.0050	0
²³⁸ U (pCi/L)	30	3.7	0.75	0.06	0.08	1	<i>a</i>	0.2	0.16
Uranium, total (mg/L)	30	0.026	<i>a</i>	<0.001	<i>a</i>	<0.002	<i>a</i>	0.001	<i>a</i>
Gamma activity (pCi/L)	30	1000	100	-9.4	22	30	<i>a</i>	38	<i>a</i>

^aNot applicable.

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Table 4.63. East End Monitoring Station-SS6
June 28, 1994 through December 30, 1994

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
pH, standard units	26	8.1	7.1	c	6-9 ^d	0
Cyanide	26	<0.01	<0.01	<0.01	0.007	26 ^e
Oil and grease	26	8.6	<2.0	<4.0	50	0
Phenols	26	0.136	<0.005	<0.02	5.0	0
Total volatile organics	26	0.014	<0.01	<0.01	c	c
Benzene	26	<0.01	<0.01	<0.01	c	c
Methylene chloride	26	<0.01	<0.01	<0.01	c	c
Tetrachloroethene	26	<0.01	<0.01	<0.01	c	c
Trichloroethylene	26	<0.01	<0.01	<0.01	c	c
Toluene	26	<0.01	<0.01	<0.01	c	c
Total chlorinated hydrocarbons	26	0.014	<0.01	<0.01	c	c
Ammonia	26	16	<0.2	<9	c	c
Biochemical oxygen demand	26	91	19	51	300	0
Chemical oxygen demand	26	170	24	79	c	c
Hexavalent Chromium	25	<0.01	<0.01	<0.01	0.002	25 ^e
Mercury	26	0.0036	<0.0002	<0.001	0.1	0
Total Kjeldahl nitrogen	26	24	6.6	13	90	0
Total suspended solids	26	96	<5	<40	300	0
Selenium	26	<0.1	<0.1	<0.1	c	c
Aluminum	26	0.60	0.10	0.20	c	c
Arsenic	26	<0.04	<0.04	<0.04	0.1	0
Barium	26	0.278	0.0328	0.0526	c	c
Beryllium	26	<0.0004	<0.0004	<0.0004	c	c
Boron	26	0.065	0.017	0.025	c	c
Cadmium	26	<0.004	<0.004	<0.004	0.000024	26 ^e
Calcium	26	138	33	49	c	c
Cerium	26	<0.02	<0.02	<0.02	c	c
Chromium, total	26	0.006	<0.006	<0.006	c	c
Cobalt	26	<0.002	<0.002	<0.002	c	c
Copper	26	0.048	0.011	0.018	0.04	1
Gallium	26	<0.02	<0.02	<0.02	c	c
Iron	26	0.75	0.24	0.45	1.5	0
Lead	26	<0.02	<0.02	<0.02	0.0016	26 ^e
Lithium	26	0.03	<0.02	<0.02	c	c
Magnesium	26	12	7.64	9.0	c	c
Manganese	26	0.064	0.028	0.044	1.0	0

Table 4.63 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Molybdenum	26	<0.006	<0.006	<0.006	c	c
Nickel	26	<0.008	<0.008	<0.008	0.10	0
Niobium	2	<0.01	<0.01	<0.01	c	c
Phosphorus	0	c	c	c	c	c
Potassium	26	8.4	3.8	5.8	c	c
Silver	26	0.012	<0.006	<0.007	0.1	0
Sodium	26	84.2	8.85	21.5	c	c
Strontium	26	0.334	0.079	0.11	c	c
Thorium	26	<0.01	<0.01	<0.01	c	c
Thallium	26	<0.03	<0.03	<0.03	c	c
Titanium	26	<0.02	<0.02	<0.02	c	c
Vanadium	26	<0.004	<0.004	<0.004	c	c
Zinc	26	0.28	0.09	0.1	2.0	0
Zirconium	26	<0.004	<0.004	<0.004	c	c

^aAll units in mg/L unless otherwise indicated.

^bSanitary Sewer Industrial Discharge Permit limits.

^cNot applicable.

^dMinimum/maximum value.

^eThe detection limit of this parameter is above the reference value.

Table 4.64. East End Monitoring Station-SS6
June 28, 1994 through December 30, 1994

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	26	55	45	-5.2	-4.7	5.7	a	2.1	a
Beta activity (pCi/L)	26	71	49	-5.9	9.1	9.5	a	2.7	a
²³⁸ Pu (pCi/L)	26	0.25	0.32	-0.085	0.099	-0.026	a	0.015	-0.065
^{239/240} Pu (pCi/L)	26	0.19	0.17	-0.098	0.11	0	a	0.011	0
²³⁴ U (pCi/L)	26	5.2	1.1	1.5	0.76	2.9	a	0.23	0.58
²³⁵ U (%)	26	1.6	a	0.78	a	1.0	a	0.040	a
²³⁵ U (pCi/L)	26	0.47	0.40	-0.063	0.13	0.13	a	0.022	0.021
²³⁶ U (pCi/L)	26	0.16	0.14	-0.032	0.064	0.058	a	0.011	0.012
²³⁸ U (pCi/L)	26	3.4	1.1	0.29	0.30	1.3	a	0.15	0.22
Uranium, total (mg/L)	26	0.008	a	0.001	a	0.003	a	0.0003	a
Gamma activity (pCi/L)	26	650	65	-3.9	15	35	a	24	a

^aNot applicable.

Table 4.65. Y-12 calculated sanitary sewer concentrations
January 1, 1994 through June 27, 1994

Parameter	Number of samples	Concentration ^a				Reference value ^b	Number of values exceeding reference
		Max	Min	Av			
Flow, gal	30	1,802,880	266,550	785,678	c	c	
pH, standard units	30	8.3	6.1	7.5	6-9 ^d	0	
Cyanide	30	<0.01	<0.01	<0.01	0.007	0	
Oil and grease	30	14	<2'	<4	50	0	
Phenols	30	0.047	<0.001'	<0.01	5.0	0	
Total volatile organics	29	0.02	<0.01	<0.01	c	c	
Benzene	29	<0.01	<0.01	<0.01	c	c	
Methylene chloride	29	<0.01	<0.01	<0.01	c	c	
Tetrachloroethene	29	0.02	<0.01	<0.01	c	c	
Trichloroethylene	29	<0.01	<0.01	<0.01	c	c	
Toluene	29	<0.01	<0.010'	<0.010'	c	c	
Total chlorinated hydrocarbons	29	0.02	<0.010'	<0.010	c	c	
Ammonia	30	15.1	<0.2'	4	c	c	
Biochemical oxygen demand	30	96	<5'	<20	300	0	
Chemical oxygen demand	30	186	<5'	<20	c	c	
Hexavalent chromium	30	<0.01	<0.01	<0.01	0.002	30 ^y	
Mercury	29	0.0155	<0.0002	<0.002	0.1	0	
Total Kjeldahl nitrogen	30	21.6	<0.2'	1	90	0	
Total suspended solids	30	199.1	<5'	<20	300	0	
Selenium	30	<0.1	<0.1	<0.1	c	c	

Table 4.65 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Aluminum	30	0.83	<0.2'	0.09	c	c
Arsenic	30	<0.04	<0.04	<0.04	0.1	0
Barium	30	0.068	<0.004'	<0.04	c	c
Beryllium	30	<0.0004	<0.0004	<0.0004	c	c
Boron	30	0.035	<0.006'	<0.006'	c	c
Cadmium	30	<0.004	<0.004	<0.004	0.000024	30'
Calcium	30	44.6	4.9	37	c	c
Cerium	30	<0.02	<0.02	<0.02	c	c
Chromium, total	30	0.006	<0.006'	<0.005	c	c
Cobalt	30	0.076	<0.01'	<0.01'	c	c
Copper	30	0.035	<0.006'	<0.01	0.04	0
Gallium	30	<0.02	<0.02	<0.02	c	c
Iron	30	0.94	<0.06'	<0.4	1.5	0
Lead	30	<0.02	<0.02	<0.02	0.0016	0
Lithium	30	0.03	<0.01	<0.02	c	c
Magnesium	30	10.1	<0.04	<8	c	c
Manganese	30	0.107	9'	0.051	1.0	0
Molybdenum	30	0.006	<0.006'	<0.005	c	c
Nickel	30	<0.008	<0.008'	<0.006	0.10	0
Niobium	28	<0.01	<0.01	<0.01	c	c

Table 4.65 (continued)

Parameter	Number of samples	Concentration ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Phosphorus	2	3.4	1.5	2.4	c	c
Potassium	30	8.7	<0.6'	<1	c	c
Silver	30	<0.026	<0.006	<0.007	0.1	0
Sodium	30	23.5	<0.04'	<10	c	c
Strontium	30	0.15	<0.001'	<0.1	c	c
Thorium	30	<0.01	<0.01	<0.01	c	c
Thallium	30	<0.03	<0.03	<0.03	c	c
Titanium	29	0.035	<0.06'	<0.06'	c	c
Vanadium	30	<0.004	<0.004	<0.004	c	c
Zinc	30	0.2	<0.01'	<0.1	2.0	0
Zirconium	30	<0.004	<0.004	<0.004	c	c

^aAll units in mg/L unless otherwise indicated.

^bSanitary Sewer Industrial Discharge Permit limits.

^cNot applicable.

^dMinimum value/maximum value.

^eCalculated value was below the detection limit.

^fThe detection limit of this parameter is above the reference value.

**Table 4.66. Y-12 calculated sanitary sewer concentrations
January 1, 1994 through June 27, 1994**

Parameter	Number of samples	Concentration						Standard error	Percentage of DCG
		Max	+/-	Min	+/-	Median	+/-		
Alpha activity (pCi/L)	30	44.7	11	-36.8	2	3.1	<i>a</i>	2.2	<i>a</i>
Beta activity (pCi/L)	30	22.4	11	-37.7	3	4.20	<i>a</i>	2.1	<i>a</i>
²³⁸ Pu (pCi/L)	30	0.098	0.20	-0.142	0.19	0.006	<i>a</i>	0.01	0.015
^{239/240} Pu (pCi/L)	30	0.29	0.26	-0.20	0.28	0.0069	<i>a</i>	0.014	0.023
²³⁴ U (pCi/L)	30	24.90	3.82	1.33	0.46	4.03	<i>a</i>	0.76	0.81
²³⁵ U (%)	29	1.78	<i>a</i>	-3.87	<i>a</i>	0.90	<i>a</i>	0.19	<i>a</i>
²³⁵ U (pCi/L)	30	0.89	0.42	0	0	0.10	<i>a</i>	0.03	0.02
²³⁶ U (pCi/L)	30	0.26	0.18	-0.09	0.18	0.05	<i>a</i>	0.01	0.01
²³⁸ U (pCi/L)	30	20.02	3.09	-0.64	0.20	1.89	<i>a</i>	0.65	0.31
Uranium, total (mg/L)	30	0.087	<i>a</i>	<0.001 ^b	<i>a</i>	<0.005	<i>a</i>	0.003	<i>a</i>
Gamma activity (pCi/L)	30	3487	349	-19.2	23	34.6	<i>a</i>	127	<i>a</i>

^aNot applicable.

^bCalculated value was below the detection limit for this parameter.

Table 4.67. 1994 radionuclide concentrations at ORNL category outfalls

Radionuclide	No. detected/ No. total	Concentration (pCi/L)				DCG ^d	Percentage of DCG ^e
		Max ^a	Min ^a	Av ^b	Standard error ^c		
<i>Category I outfalls</i>							
Gross beta	21/24	210*	0.54	26*	11	<i>f</i>	<i>f</i>
<i>Category II outfalls</i>							
Gross beta	117/170	3,500*	-1.9	57*	22	<i>f</i>	<i>f</i>
Total rad Sr ^e	1/1	1,800*	1,800*	1,800	<i>f</i>	1,000	<i>f</i>

^aIndividual radionuclide concentrations significantly greater than zero are identified by an *.

^bAverage radionuclide concentrations significantly greater than zero are identified by an *.

^cStandard error of the mean.

^dDerived concentration guide for ingestion of water. From DOE Order 5400.5.

^eAverage concentration as a percentage of the derived concentration guide (DCG), calculated only when a DCG exists and the average concentration is significantly greater than zero.

^fNot applicable.

^gTotal rad Sr analyzed when gross beta > 810 pCi/L.

Table 4.68. ORNL NPDES radionuclide sampling and analysis plan for the category outfalls, 1994

Radionuclide	Collection frequency	Sample type	Analysis frequency
<i>Category I outfalls</i>			
Gross beta ^a	Yearly	Grab	Yearly
<i>Category II outfalls</i>			
Gross beta ^a	Quarterly	Grab	Quarterly

^aIf gross beta > 810 pCi/L, analyze for total rad Sr. -

Table 4.69. ORNL NPDES sampling and analysis plan for the facility and ambient locations, 1994

Analysis	Collection frequency	Sample type	Analysis frequency
<i>X01 (Sewage Treatment Plant)</i>			
Field measurements			
Chlorine, total residual	3/week	Grab, instant read	3/week
Dissolved oxygen	5/week	Grab, instant read	5/week
Downstream pH	Weekly	Grab, instant read	Weekly
Flow	Daily	Continuous	Daily
pH	Weekly	Grab, instant read	Weekly
Metals	Monthly	24-h composite	Monthly
Others			
Ammonia, as N	3/week	24-h composite	3/week
Biochemical oxygen demand	3/week	24-h composite	3/week
Cyanide, total	Monthly	Grab	Monthly
Fecal coliform	3/week	Grab	3/week
Oil and grease	3/week	Grab	3/week
Phenolics, total recoverable	Monthly	Grab	Monthly
Total suspended solids	3/week	24-h composite	3/week
Volatile organics	Monthly	Grab	Monthly
<i>X02 (Coal Yard Runoff Treatment Facility)</i>			
Anions	Monthly	24-h composite	Monthly
Field measurements			
Downstream pH	Weekly	Grab, instant read	Weekly
Flow	Daily	Continuous	Daily
pH	Weekly	Grab, instant read	Weekly
Temperature	Weekly	Grab, instant read	Weekly
Metals	Weekly	24-h composite	Weekly
Others			
Oil and grease	Weekly	Grab	Weekly
Total suspended solids	Weekly	24-h composite	Weekly
<i>X12 (Nonradiological Wastewater Treatment Facility)</i>			
Anions	Weekly	24-h composite	Weekly
Field measurements			
Downstream pH	Daily	Grab, instant read	Daily
Flow	Daily	Continuous	Daily
pH	Continuous	Continuous	Continuous
Temperature	Weekly	Grab, instant read	Weekly
Metals	Weekly	24-h composite	Weekly

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Table 4.69 (continued)

Analysis	Collection frequency	Sample type	Analysis frequency
Others			
Biochemical oxygen demand	Weekly	24-h composite	Weekly
Cyanide, total	Weekly	Grab	Weekly
Oil and grease	Weekly	Grab	Weekly
Phenolics, total recoverable	Weekly	Grab	Weekly
Total suspended solids	Weekly	24-h composite	Weekly
Total toxic organics	Weekly	Grab	Weekly
Volatile organics	Weekly	Grab	Weekly
<i>X13 (Melton Branch), X14 (White Oak Creek), X15 (White Oak Dam)</i>			
Anions	Monthly	24-h composite	Monthly
Field measurements			
Chlorine, total residual	Weekly	Grab, instant read	Weekly
Conductivity	Monthly	Grab, instant read	Monthly
Dissolved oxygen	Weekly	Grab, instant read	Weekly
Flow	Daily	Continuous	Daily
pH	Monthly	Grab, instant read	Monthly
Temperature	Monthly	Grab, instant read	Monthly
Turbidity	Monthly	Grab, instant read	Monthly
Metals	Monthly	24-h composite	Monthly
Others			
Ammonia, as N	Monthly	24-h composite	Monthly
Biochemical oxygen demand	Monthly	24-h composite	Monthly
Oil and grease	Weekly	Grab	Weekly
Phenolics, total recoverable ^a	Monthly	Grab	Monthly
Total dissolved solids	Monthly	Grab	Monthly
Total organic carbon	Monthly	Grab	Monthly
Total suspended solids	Monthly	24-h composite	Monthly
PCBs	Monthly	24-h composite	Monthly
Volatile organics	Monthly	Grab	Monthly

^aTotal recoverable phenolics not required at X15 (White Oak Dam).

Table 4.70. NPDES Permit Number TN 0002941, 1994 ORNL ambient and facility discharge points

Parameter	No. detected/ No. total	Concentration (mg/L)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
<i>Sewage Treatment Plant (X01)</i>					
<i>Flow rates (1 × 10⁶ L/d)—Max: 2.3, Min: 0.53, Avg: 0.98</i>					
Field measurements					
Chlorine, total residual	157/157	2.2	0.070	0.25	0.015
Dissolved oxygen	249/249	15	6.6	9.1	0.073
Downstream pH (SU)	52/52	8.0	7.0	7.6	0.023
pH (SU)	52/52	8.0	6.8	7.2	0.026
Metals					
Copper, total	5/13	0.011	<0.0070	-0.0081	0.00045
Mercury, total	8/13	0.00028	<0.000050	-0.00011	0.000021
Silver, total	0/13	<0.0050	<0.0050	-0.0050	0
Zinc, total	13/13	0.14	0.018	0.065	0.010
Others					
Ammonia, as N	151/156	5.2	<0.030	-0.74	0.085
Biochemical oxygen demand	0/156	<5.0	<5.0	-5.0	0
Cyanide, total	3/12	0.011	<0.0020	-0.0036	0.00091
Fecal coliform (colonies/100 mL) ^d	125/156	3,500	<1.0	-9.7	1.2
Oil and grease ^e	4/156	<5.0	<2.0	-2.8	0.10
Phenolics, total recoverable	1/12	0.0020	<0.0010	-0.0011	0.000083
Total suspended solids	10/156	25	<5.0	-5.3	0.16
Volatile organics					
Bromodichloromethane	2/14	U0.0050	U0.0010	-0.0044	0.00038
Trichloroethene	0/14	U0.0050	U0.0050	-0.0050	0
<i>Coal Yard Runoff Treatment Facility (X02)</i>					
<i>Flow rates (1 × 10⁶ L/d)—Max: 0.74, Min: 0, Avg: 0.14</i>					
Anions					
Sulfate, as SO ₄	14/14	2,500	750	1,600	110
Field measurements					
Downstream pH (SU)	249/249	8.3	6.9	7.8	0.013
pH (SU)	249/249	8.7	6.1	7.3	0.025
Temperature (°C)	249/249	29	1.8	18	0.42
Metals					
Arsenic, total	22/52	0.28	<0.050	-0.071	0.0056
Cadmium, total	0/52	<0.0050	<0.0050	-0.0050	0
Chromium, total	31/52	0.033	<0.0040	-0.012	0.0012
Copper, total	7/52	0.048	<0.0070	-0.0087	0.00092
Iron, total	50/52	8.2	<0.050	-0.50	0.15
Lead, total	0/52	<0.050	<0.050	-0.050	0
Manganese, total	50/52	0.40	<0.0010	-0.028	0.0079

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Table 4.70 (continued)

Parameter	No. detected/ No. total	Concentration (mg/L)			
		Max ^a	Min ^a	Av ^b	Standard error ^c
Nickel, total	1/52	0.011	<0.010	~0.010	0.000019
Selenium, total	0/52	<0.050	<0.050	~0.050	0
Silver, total	3/52	0.0082	<0.0050	~0.0051	0.000081
Zinc, total	42/52	0.14	<0.0050	~0.020	0.0034
Others					
Oil and grease ^c	0/51	<5.0	<2.0	~2.7	0.18
Total suspended solids	19/52	48	<5.0	~8.1	1.1
<i>Nonradiological Wastewater Treatment Facility (X12)</i>					
<i>Flow rates (1 × 10⁶ L/d)—Max: 3.6, Min: 1.2, Avg: 2.1</i>					
Anions					
Fluoride	52/52	1.5	0.90	1.2	0.017
Nitrate, as N	52/52	13	0.19	3.1	0.40
Sulfate, as SO ₄	52/52	230	51	120	4.7
Field measurements					
Downstream pH (SU)	249/249	8.3	6.7	7.7	0.016
pH (SU)	249/249	7.8	7.0	7.4	0.0088
Temperature (°C)	249/249	26	8.6	19	0.27
Metals					
Arsenic, total	0/52	<0.050	<0.050	~0.050	0
Cadmium, total	0/52	<0.0050	<0.0050	~0.0050	0
Chromium, total	26/52	0.013	<0.0040	~0.0060	0.00036
Copper, total	4/52	0.0089	<0.0070	~0.0071	0.000045
Iron, total	0/52	<0.050	<0.050	~0.050	0
Lead, total	0/52	<0.050	<0.050	~0.050	0
Mercury, total	21/52	0.00027	<0.000050	~0.000065	0.0000047
Nickel, total	0/52	<0.010	<0.010	~0.010	0
Phosphorus, total	45/52	2.6	0.13	~0.40	0.057
Selenium, total	0/52	<0.050	<0.050	~0.050	0
Silver, total	0/52	<0.0050	<0.0050	~0.0050	0
Zinc, total	41/52	0.028	<0.0050	~0.014	0.00093
Others					
Biochemical oxygen demand	1/52	6.4	<5.0	~5.0	0.027
Cyanide, total	3/52	0.031	<0.0020	~0.0027	0.00058
Oil and grease ^c	2/52	<5.0	<2.0	~2.8	0.18
Phenolics, total recoverable	0/52	<0.0010	<0.0010	~0.0010	0
Total suspended solids	0/52	<5.0	<5.0	~5.0	0
Total toxic organics	0/52	<0.010	<0.010	~0.010	0

Table 4.70 (continued)

Parameter	No. detected/ No. total	Concentration (mg/L)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
Volatile organics					
1,1-Dichloroethane	0/52	U0.0050	U0.0050	-0.0050	0
Benzene	0/52	U0.0050	U0.0050	-0.0050	0
Bromodichloromethane	0/52	U0.0050	U0.0050	-0.0050	0
Chlorobenzene	0/52	U0.0050	U0.0050	-0.0050	0
Chloroform	0/52	U0.0050	U0.0050	-0.0050	0
Methylene chloride	2/52	U0.0050	JB0.0013	-0.0049	0.000085
Tetrachloroethene	0/52	U0.0050	U0.0050	-0.0050	0
Trichloroethene	0/52	U0.0050	U0.0050	-0.0050	0
<i>Melton Branch (X13)</i>					
<i>Flow rates (1 × 10⁶ L/d)—Max: 570, Min: 0.15, Avg: 13</i>					
Anions					
Fluoride	12/12	2.5	0.13	1.2	0.26
Nitrate, as N	11/12	2.2	<0.10	-0.63	0.17
Sulfate, as SO ₄	12/12	230	13	110	22
Field measurements					
Chlorine, total residual	0/52	<0.010	<0.010	-0.010	0
Conductivity (mS/cm)	12/12	0.86	0.17	0.48	0.070
Dissolved oxygen	52/52	15	6.2	9.8	0.27
pH (SU)	12/12	7.9	7.3	7.7	0.054
Temperature (°C)	64/64	25	2.3	14	0.80
Turbidity (NTU)	12/12	25	3.0	13	2.1
Metals					
Aluminum, total	10/12	1.4	<0.050	-0.53	0.12
Arsenic, total	0/12	<0.050	<0.050	-0.050	0
Cadmium, total	0/12	<0.0050	<0.0050	-0.0050	0
Chromium, total	7/12	0.025	<0.0040	-0.0097	0.0021
Copper, total	3/12	0.012	<0.0070	-0.0080	0.00054
Iron, total	12/12	1.5	0.063	0.42	0.11
Lead, total	0/12	<0.050	<0.050	-0.050	0
Manganese, total	12/12	0.17	0.026	0.090	0.014
Mercury, total	6/12	0.00013	<0.000050	-0.000063	0.000068
Nickel, total	0/12	<0.010	<0.010	-0.010	0
Phosphorus, total	12/12	1.3	0.21	0.60	0.099
Silver, total	0/12	<0.0050	<0.0050	-0.0050	0
Zinc, total	12/12	0.082	0.010	0.041	0.0069

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Table 4.70 (continued)

Parameter	No. detected/ No. total	Concentration (mg/L)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
Others					
Ammonia, as N	12/12	0.19	0.031	0.069	0.015
Biochemical oxygen demand	1/12	12	<5.0	-5.6	0.58
Oil and grease ^c	1/52	<5.0	<2.0	-2.8	0.18
Phenolics, total recoverable	0/12	<0.0010	<0.0010	-0.0010	0
Total dissolved solids	12/12	570	170	330	39
Total organic carbon	12/12	4.1	1.9	2.8	0.20
Total suspended solids	7/12	89	<5.0	-18	7.1
PCBs					
Total aroclors	1/12	U0.0020	JB0.0010	-0.0019	0.000083
Volatile organics					
Chloroform	1/12	U0.0050	JB0.0010	-0.0047	0.00033
Trichloroethene	0/12	U0.0050	U0.0050	-0.0050	0
<i>White Oak Creek (X14)</i>					
<i>Flow rates (1 × 10⁶ L/d)—Max: 140, Min: 8.4, Avg: 23</i>					
Anions					
Fluoride	12/12	1.4	0.20	0.75	0.11
Nitrate, as N	12/12	2.1	0.12	1.1	0.14
Sulfate, as SO ₄	12/12	96	14	39	6.3
Field measurements					
Chlorine, total residual	0/52	<0.010	<0.010	-0.010	0
Conductivity (mS/cm)	12/12	0.60	0.20	0.34	0.031
Dissolved oxygen	52/52	14	7.0	9.6	0.20
pH (SU)	12/12	7.9	7.5	7.8	0.044
Temperature (°C)	64/64	24	6.8	16	0.63
Turbidity (NTU)	12/12	25	4.0	13	2.3
Metals					
Aluminum, total	10/12	1.5	<0.050	-0.30	0.12
Arsenic, total	1/12	0.052	<0.050	-0.050	0.00017
Cadmium, total	0/12	<0.0050	<0.0050	-0.0050	0
Chromium, total	7/12	0.016	<0.0040	-0.0078	0.0012
Copper, total	0/12	<0.0070	<0.0070	-0.0070	0
Iron, total	12/12	1.1	0.078	0.22	0.083
Lead, total	1/12	0.058	<0.050	-0.051	0.00067
Manganese, total	12/12	0.032	0.0015	0.014	0.0025
Mercury, total	8/12	0.00014	<0.000050	-0.000077	0.0000089
Nickel, total	0/12	<0.010	<0.010	-0.010	0

Table 4.70 (continued)

Parameter	No. detected/ No. total	Concentration (mg/L)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
Phosphorus, total	11/12	0.61	<0.20	-0.37	0.035
Silver, total	0/12	<0.0050	<0.0050	-0.0050	0
Zinc, total	12/12	0.047	0.015	0.030	0.0028
Others					
Ammonia, as N	12/12	0.077	0.030	0.047	0.0047
Biochemical oxygen demand	0/12	<5.0	<5.0	-5.0	0
Oil and grease ^e	2/52	<5.0	<2.0	-2.8	0.18
Phenolics, total recoverable	0/12	<0.0010	<0.0010	-0.0010	0
Total dissolved solids	12/12	290	130	180	14
Total organic carbon	12/12	1.8	1.3	1.5	0.048
Total suspended solids	3/12	35	<5.0	-7.6	2.5
PCBs					
Total aroclors	1/12	U0.0020	JB0.0010	-0.0019	0.000083
Volatile organics					
Chloroform	9/12	U0.0050	J0.0011	-0.0027	0.00042
Trichloroethene	0/12	U0.0050	U0.0050	-0.0050	0
<i>White Oak Dam (X15)</i>					
<i>Flow rates (1 × 10⁶ L/d)—Max: 550, Min: 11, Avg: 41</i>					
Anions					
Fluoride	12/12	1.0	0.20	0.59	0.080
Nitrate, as N	12/12	2.5	0.19	0.88	0.21
Sulfate, as SO ₄	12/12	97	13	43	6.3
Field measurements					
Chlorine, total residual	0/52	<0.010	<0.010	-0.010	0
Conductivity (mS/cm)	12/12	0.52	0.17	0.33	0.030
Dissolved oxygen	52/52	13	6.3	9.1	0.23
pH (SU)	12/12	8.9	7.2	8.1	0.13
Temperature (°C)	64/64	30	3.8	17	0.92
Turbidity (NTU)	12/12	52	6.0	23	3.9
Metals					
Aluminum, total	12/12	3.5	0.16	1.3	0.26
Arsenic, total	0/12	<0.050	<0.050	-0.050	0
Cadmium, total	0/12	<0.0050	<0.0050	-0.0050	0
Chromium, total	11/12	0.067	<0.0040	-0.020	0.0049
Copper, total	3/12	0.014	<0.0070	-0.0078	0.00059
Iron, total	12/12	3.5	0.23	1.2	0.27
Lead, total	0/12	<0.050	<0.050	-0.050	0
Manganese, total	12/12	0.24	0.017	0.10	0.020

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Table 4.70 (continued)

Parameter	No. detected/ No. total	Concentration (mg/L)			Standard error ^f
		Max ^a	Min ^a	Av ^b	
Mercury, total	7/12	0.00014	<0.000050	-0.000080	0.0000093
Nickel, total	0/12	<0.010	<0.010	-0.010	0
Phosphorus, total	11/12	0.63	0.17	-0.33	
Silver, total	0/12	<0.0050	<0.0050	-0.0050	0
Zinc, total	12/12	0.072	0.0087	0.027	0.0051
Others					
Ammonia, as N	10/12	0.12	<0.030	-0.069	0.0088
Biochemical oxygen demand	5/12	12	<5.0	-6.0	0.59
Oil and grease ^e	4/52	5.0	<2.0	-2.8	0.18
Total dissolved solids	12/12	270	78	180	15
Total organic carbon	12/12	3.6	1.8	2.9	0.18
Total suspended solids	11/12	110	<5.0	-41	10
PCBs					
Total aroclors	1/12	U2.0	JB0.0010	-0.17	0.17
Volatile organics					
Chloroform	0/12	U0.0050	U0.0050	-0.0050	0
Trichloroethene	0/12	U0.0050	U0.0050	-0.0050	0

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "U" indicates the value for an organic parameter was undetected at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; and "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank.

^bA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^cStandard error of the mean.

^dThe geometric mean is computed rather than the average.

^eNote that the analytical detection limit for oil and grease was 2 mg/L for January through September. The detection limit for October through December was 5 mg/L.

Table 4.71. ORNL NPDES sampling and analysis plan for the category outfalls and cooling systems, 1994

Analysis	Collection frequency	Sample type	Analysis frequency
<i>Category I outfalls</i>			
Field measurements			
Downstream pH	Yearly	Grab, instant read	Yearly
Flow	Yearly	Instantaneous	Yearly
pH	Yearly	Grab, instant read	Yearly
Temperature	Yearly	Grab, instant read	Yearly
Others			
Oil and grease	Yearly	Grab	Yearly
Total suspended solids	Yearly	Grab	Yearly
<i>Category II outfalls</i>			
Field measurements			
Downstream pH	Quarterly	Grab, instant read	Quarterly
Downstream temperature	Quarterly	Grab, instant read	Quarterly
Flow	Quarterly	Instantaneous	Quarterly
pH	Quarterly	Grab, instant read	Quarterly
Temperature	Quarterly	Grab, instant read	Quarterly
Others			
Oil and grease	Quarterly	Grab	Quarterly
Total suspended solids	Quarterly	Grab	Quarterly
<i>Category III outfalls</i>			
Field measurements			
Flow	Quarterly	Instantaneous	Quarterly
pH	Quarterly	Grab, instant read	Quarterly
<i>Cooling Systems</i>			
Field measurements			
Chlorine, total residual	Quarterly	Grab, instant read	Quarterly
Downstream pH	Quarterly	Grab, instant read	Quarterly
Flow	Quarterly	<i>a</i>	Quarterly
pH	Quarterly	Grab, instant read	Quarterly
Temperature	Quarterly	Grab, instant read	Quarterly
Metals	Quarterly	Grab	Quarterly

^aNot applicable.

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Table 4.72. NPDES Permit Number TN 0002941, 1994 ORNL categories and cooling systems

Parameter	No. detected/ No. total	Concentration (mg/L)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
<i>Category I outfalls</i>					
Field measurements					
Downstream pH (SU)	24/24	7.8	7.2	7.5	0.039
Flow (MGD)	24/24	0.043	0.00022	0.0065	0.0020
pH (SU)	24/24	7.8	7.3	7.6	0.032
Temperature (°C)	24/24	9.6	2.0	5.2	0.39
Others					
Oil and grease ^d	4/24	4.0	<2.0	-2.1	0.092
Total suspended solids	20/24	340	<5.0	-64	20
<i>Category II outfalls</i>					
Field measurements					
Downstream pH (SU)	170/170	8.7	7.0	7.8	0.021
Downstream temperature (°C)	34/34	27	5.7	16	0.93
Flow (MGD)	170/170	0.17	0.00022	0.020	0.0022
pH (SU)	170/170	8.9	6.5	7.7	0.023
Temperature (°C)	170/170	60	2.8	17	0.50
Others					
Oil and grease ^d	5/170	5.0	<2.0	-2.8	0.10
Total suspended solids	102/170	190	<5.0	-22	2.7
<i>Category III outfalls</i>					
Field measurements					
Flow (MGD)	53/53	0.17	0.00022	0.018	0.0048
pH (SU)	53/53	8.9	7.2	7.8	0.046
<i>Cooling Systems</i>					
Field measurements					
Chlorine, total residual	27/35	0.20	<0.010	-0.088	0.011
Downstream pH (SU)	34/34	8.4	7.4	7.9	0.056
Flow (MGD)	34/34	0.19	0.0026	0.039	0.012
pH (SU)	34/34	8.9	7.0	8.4	0.077
Temperature (°C)	34/34	37	8.1	24	1.0
Metals					
Chromium, total	27/34	0.061	<0.0040	-0.019	0.0026
Copper, total	29/34	0.26	<0.0070	-0.090	0.011
Zinc, total	34/34	0.95	0.015	0.20	0.034

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit.

^bA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^cStandard error of the mean.

^dNote that the analytical detection limit for Oil and grease was 2 mg/L for January through September. The detection limit for October through December was 5 mg/L.

Table 4.73. 1994 mercury concentrations in ORNL surface water

Location	No. detected/ No. total	Concentration ($\mu\text{g/L}$)			Standard error ^c	Percentage of TWQ ^d
		Max ^a	Min ^a	Av ^b		
<i>First Creek</i>						
Outfall 341	0/6	<0.050	<0.050	~0.050	0	2.1
<i>Fifth Creek</i>						
Outfall 261	0/6	<0.050	<0.050	~0.050	0	2.1
Outfall 363	0/6	<0.050	<0.050	~0.050	0	2.1
Outfall 367	0/6	<0.050	<0.050	~0.050	0	2.1
<i>White Oak Creek</i>						
Outfall 106	0/6	<0.050	<0.050	~0.050	0	2.1
Outfall 202	3/6	0.18	<0.050	~0.11	0.027	7.5
Outfall 207	3/6	0.43	<0.050	~0.22	0.077	18
Outfall 222	0/6	<0.050	<0.050	~0.050	0	2.1
Outfall 301	3/6	0.13	<0.050	~0.087	0.016	5.4
Outfall 302	3/6	0.12	<0.050	~0.082	0.014	5.0
Outfall 304	5/6	0.17	<0.050	~0.12	0.022	7.1
Headwaters	0/6	<0.050	<0.050	~0.050	0	2.1
Sewage Treatment Plant	0/6	<0.050	<0.050	~0.050	0	2.1

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit.

^bA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^cStandard error of the mean.

^dMaximum concentration as a percentage of the Tennessee General Water Quality (TWQ) standard, 2.4 $\mu\text{g/L}$, for the protection of fish and aquatic life.

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Table 4.74. 1994 monthly stream flows, ORNL

Month	Flow (10 ⁹ L)				Average ratio ^d
	Melton Branch 1	White Oak Creek ^a	White Oak Dam ^b	Clinch River ^c	
January	0.41	1.1	1.6	640	0.0025
February	1.4	1.1	2.7	1,000	0.0033
March	1.2	1.1	3.0	1,100	0.015
April	0.96	1.4	2.8	1,200	0.0024
May	0.049	0.39	0.59	210	0.0032
June	0.12	0.52	0.81	240	0.0048
July	0.063	0.46	0.66	240	0.0029
August	0.039	0.52	0.61	310	0.0021
September	0.018	0.38	0.63	440	0.0015
October	0.025	0.35	0.57	470	0.0013
November	0.073	0.44	0.59	440	0.0019
December	0.11	0.52	0.74	270	0.0043

^aWhite Oak Creek above its confluence with Melton Branch.

^bWhite Oak Creek at White Oak Dam.

^cClinch River at Melton Hill Dam.

^dFlow ratios (White Oak Creek at White Oak Dam:Clinch River at Melton Hill Dam) are calculated daily and averaged for the month.

Table 4.75. 1994 radionuclide concentrations in surface waters around ORNL

Radionuclide	No. detected/ No. total	Concentration (pCi/L)			Standard error ^c	DCG ^d	Percentage of DCG ^e
		Max ^a	Min ^a	Av ^b			
<i>Melton Hill Dam</i>							
⁶⁰ Co	1/12	35*	-19	4.0	4.9	5,000	<i>f</i>
¹³⁷ Cs	1/12	38	-27	5.6	5.7	3,000	<i>f</i>
Gross alpha	4/12	11*	-1.0	1.5	0.86	<i>f</i>	<i>f</i>
Gross beta	10/12	35*	1.1	8.1*	2.7	<i>f</i>	<i>f</i>
<i>White Oak Creek Headwaters</i>							
⁶⁰ Co	0/12	24	-62	-5.9	6.9	5,000	<i>f</i>
¹³⁷ Cs	0/12	24	14	0.97	4.1	3,000	<i>f</i>
Gross alpha	3/12	8.4*	-0.054	1.6*	0.75	<i>f</i>	<i>f</i>
Gross beta	6/12	14*	0.27	4.8*	1.2	<i>f</i>	<i>f</i>
<i>7500 Road Bridge</i>							
⁶⁰ Co	2/12	57*	-38	7.1	6.8	5,000	<i>f</i>
¹³⁷ Cs	9/12	100*	2.7	61*	8.8	3,000	2.0
³ H	12/12	16,000*	3,200*	8,600*	1,000	2,000,000	0.43
Total rad Sr	12/12	100*	43*	65*	4.7	1,000	6.5
<i>First Creek</i>							
⁶⁰ Co	1/12	32*	-30	5.0	4.8	5,000	<i>f</i>
¹³⁷ Cs	0/12	11	-27	-0.23	3.1	3,000	<i>f</i>
Total rad Sr	12/12	410*	59*	210*	33	1,000	21
<i>Fifth Creek</i>							
⁶⁰ Co	1/12	51*	-16	9.7*	5.4	5,000	0.19
¹³⁷ Cs	0/12	38	-11	7.1	4.1	3,000	<i>f</i>
Total rad Sr	12/12	30*	12*	20*	1.9	1,000	2.0
<i>Melton Branch 2</i>							
⁶⁰ Co	0/12	24	-5.4	5.6*	2.8	5,000	0.11
¹³⁷ Cs	0/12	16	-16	1.8	2.9	3,000	<i>f</i>
³ H	12/12	20,000*	3,000*	10,000*	1,600	2,000,000	0.50
Total rad Sr	6/12	5.7*	-2.1	2.0*	0.61	1,000	0.20
<i>Northwest Tributary</i>							
⁶⁰ Co	2/12	54*	-16	12*	6.6	5,000	0.24
¹³⁷ Cs	1/12	43*	-19	9.9*	5.0	3,000	0.33
Total rad Sr	12/12	73*	21*	45*	4.7	1,000	4.5

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Table 4.75 (continued)

Radionuclide	No. detected/ No. total	Concentration (pCi/L)			Standard error ^c	DCG ^d	Percentage of DCG ^e
		Max ^a	Min ^a	Av ^b			
<i>Raccoon Creek</i>							
⁶⁰ Co	1/12	46*	-30	4.0	5.2	5,000	<i>f</i>
¹³⁷ Cs	1/12	70*	-27	9.7	6.6	3,000	<i>f</i>
Total rad Sr	12/12	32*	1.6*	13*	2.7	1,000	1.3

^aIndividual radionuclide concentrations significantly greater than zero are identified by an *.

^bAverage radionuclide concentrations significantly greater than zero are identified by an *.

^cStandard error of the mean.

^dDerived concentration guide for ingestion of water. From DOE Order 5400.5.

^eAverage concentration as a percentage of the derived concentration guide (DCG), calculated only when a DCG exists and the average concentration is significantly greater than zero.

^fNot applicable.

Table 4.76. 1994 radionuclide concentrations at ORNL NPDES locations

Radionuclide	No. detected/ No. total	Concentration (pCi/L)				DCG ^d	Percentage of DCG ^e
		Max ^a	Min ^a	Av ^b	Standard error ^c		
<i>Sewage Treatment Plant (X01)</i>							
⁶⁰ Co	0/12	19	-62	1.8	6.5	5,000	<i>f</i>
¹³⁷ Cs	2/12	35*	-16	5.8	4.0	3,000	<i>f</i>
Gross beta	12/12	700*	230*	410*	51	<i>f</i>	<i>f</i>
³ H	11/12	1,500*	320	750*	100	2,000,000	0.038
Total rad Sr	12/12	320*	84*	180*	25	1,000	18
<i>Nonradiological Wastewater Treatment Facility (X12)</i>							
⁶⁰ Co	3/12	38*	-30	11	5.9	5,000	<i>f</i>
¹³⁷ Cs	12/12	1,800*	350*	860*	140	3,000	29
Gross alpha	10/12	35*	0.27	15*	3.5	<i>f</i>	<i>f</i>
Gross beta	12/12	1,800*	380*	1,100*	150	<i>f</i>	<i>f</i>
³ H	12/12	160,000*	32,000*	82,000*	9,900	2,000,000	4.1
Total rad Sr	12/12	650*	32*	230*	55	1,000	23
<i>Melton Branch 1 (X13)</i>							
⁶⁰ Co	1/12	65*	-16	8.1	6.8	5,000	<i>f</i>
¹³⁷ Cs	1/12	35*	-27	-0.68	4.6	3,000	<i>f</i>
³ H	12/12	1,400,000*	430,000*	720,000*	80,000	2,000,000	36
Total rad Sr	12/12	840*	180*	470*	57	1,000	47
<i>White Oak Creek (X14)</i>							
⁶⁰ Co	0/12	24	-30	4.4	4.7	5,000	<i>f</i>
¹³⁷ Cs	9/12	140*	-14	63*	12	3,000	2.1
³ H	12/12	81,000*	13,000*	41,000*	6,800	2,000,000	2.1
Total rad Sr	12/12	160*	54*	100*	9.3	1,000	10
<i>White Oak Dam (X15)</i>							
⁶⁰ Co	28/52	17*	-1.9	4.7*	0.56	5,000	0.093
¹³⁷ Cs	52/52	110*	7.0*	34*	3.1	3,000	1.1
Gross alpha	48/52	14*	0.054	6.1*	0.40	<i>f</i>	<i>f</i>
Gross beta	52/52	730*	210*	430*	14	<i>f</i>	<i>f</i>
³ H	12/12	210,000*	89,000*	140,000*	11,000	2,000,000	7.2
Total rad Sr	12/12	220*	140*	180*	6.5	1,000	18

^aIndividual radionuclide concentrations significantly greater than zero are identified by an *.

^bAverage radionuclide concentrations significantly greater than zero are identified by an *.

^cStandard error of the mean.

^dDerived concentration guide for ingestion of water. From DOE Order 5400.5.

^eAverage concentration as a percentage of the derived concentration guide (DCG), calculated only when a DCG exists and the average concentration is significantly greater than zero.

^fNot applicable.

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Table 4.77. 1994 sampling and analysis plan for ORNL surface waters receiving effluents

Station	Analysis	Collection frequency	Sample type	Analysis frequency
STP	Gamma scan, Gross beta, H-3, Total rad Sr	Weekly	Flow proportional composite	Monthly
7500 Road Bridge, MB1, MB2, WOC	Gamma scan, H-3, Total rad Sr	Weekly	Flow proportional composite	Monthly
First Creek, Fifth Creek, Raccoon Creek	Gamma scan, Total rad Sr	Weekly	Grab	Monthly
MH DAM	Gamma scan, Gross alpha, ^a Gross beta ^b	Weekly	Flow proportional composite	Monthly
NRWTF	Gamma scan, Gross alpha, Gross beta, H-3, Total rad Sr	Weekly	Flow proportional composite	Monthly
NWT	Gamma scan, Total rad Sr	Weekly	Flow proportional composite	Monthly
WOC Headwaters	Gamma scan, Gross alpha, ^a Gross beta ^b	Weekly	Flow proportional composite	Monthly
WOD	Gamma scan, Gross alpha, ^a Gross beta ^b	Weekly	Flow proportional composite	Weekly
WOD	H-3, Total rad Sr	Weekly	Flow proportional composite	Monthly

^aIf gross alpha > 27 pCi/L, analyze for Am-241, Cm-244, Pu-238, Pu-239, Th-228, Th-232, U-234, U-235, and U-238.

^bIf gross beta > 810 pCi/L, analyze for total rad Sr.

Table 4.78. 1994 NPDES Permit Number TN 0002950
 Discharge Point K-1407-J, Treatment Pond at K-25 Site

Parameter	Number of samples	Concentration			Reference value ^a	Number of values exceeding reference
		Max	Min	Av		
1,1,1-Trichloroethane, mg/L	12	<0.01	<0.0005	<0.0023	<i>b</i>	<i>c</i>
Acetone, mg/L	4	0.029	0.005	0.0127	<i>b</i>	<i>c</i>
Acetonitrile, mg/L	4	<0.01	0.003	0.007	<i>b</i>	<i>c</i>
Benzene	12	<0.01	<0.0007	<0.003	<i>b</i>	<i>c</i>
Bromoform, mg/L	12	<0.01	<0.0019	<0.0039	<i>b</i>	<i>c</i>
Cadmium, mg/L	4	0.002	<0.002	<0.002	0.69	0
Carbon tetrachloride, mg/L	12	<0.01	<0.0006	<0.0029	0.5	0
Chemical oxygen demand, mg/L	52	15	<5	<8.2	<i>b</i>	<i>c</i>
Chloride, mg/L	211	1,890	50	363	39,479	0
Chlorine, total residual, mg/L	104	0.2	<0.05	<0.052	0.14	1
Chlorodibromomethane	12	<0.01	<0.0008	<0.0031	<i>b</i>	<i>c</i>
Chloroform, mg/L	12	0.006	0.0011	0.0023	0.5	0
Chromium, mg/L	4	0.031	0.0012	0.0094	2.77	0
Copper, mg/L	4	0.019	0.0053	0.0106	2.15	0
Dichlorobromomethane, mg/L	12	<0.01	<0.0017	<0.0037	<i>b</i>	<i>c</i>
Ethylbenzene, mg/L	6	<0.01	<0.0005	<0.0052	<i>b</i>	<i>c</i>
Flow, MGD	continuous	0.4969	0	0.1364	<i>b</i>	<i>c</i>
Lead	4	0.018	<0.004	<0.008	0.69	0
Methylethylketone, mg/L	4	0.012	0.005	0.0092	<i>b</i>	<i>c</i>
Methylene chloride, mg/L	6	<0.01	<0.0012	<0.0056		
Naphthalene	12	<0.0009	<0.0009	<0.0009	<i>b</i>	
Nickel, mg/L	4	0.07	0.012	0.039	3.98	0
Oil and grease, mg/L	106	3.3	<2	<2.1	30	0
PCB, mg/L	126	0.0005	0.0001	0.0005	0.00014	0
pH continuous, standard units	1,100	8.7	6.6	<i>c</i>	6.0-9.0	0
Silver, mg/L	4	0.0067	0.0003	0.0021	0.43	0
Total suspended solids, mg/L	211	19	<1	<4.6	40	0
Temperature, °C	365	36	12.3	26.7	<i>d</i>	0
Tetrachloroethylene, mg/L	12	<0.01	<0.0004	<0.0028	0.7	0
Toluene, mg/L	6	<0.01	<0.0006	<0.0053	<i>b</i>	<i>c</i>
Total toxic organics, mg/L	4	0.0425	0.0051	0.025	2.13	0
Trichloroethylene, mg/L	12	0.025	0.001	0.006	0.5	0
Vinyl chloride, mg/L	12	<0.01	<0.0015	<0.0036	0.2	0
Zinc, mg/L	4	0.077	0.0067	0.0371	2.61	0

^aNPDES permit limit.

^bNon-limited parameter.

^cNot applicable.

^dEffluent must not cause the temperature of receiving stream to exceed 30.5°C.

Oak Ridge Reservation

Table 4.79. 1994 NPDES Permit Number TN 0002950
 Discharge Point K-1515-C, Holding Pond, K-25 Site

Parameter	Number of samples	Concentration			Reference value ^a	Number of values exceeding reference
		Max	Min	Av		
Aluminum, mg/L	52	1.6	0.16	0.78	2.0	0
Chlorine, total residual, mg/L	52	0.38	<0.05	<0.07	1.0	0
Flow, MGD	365	12.5329	0.0652	0.4495	<i>b</i>	<i>c</i>
pH, standard units	52	8	6.3	<i>c</i>	- 6.0-9.0	0
Settleable solids, mg/L	52	0.2	<0.1	<0.1	0.5	0
Suspended solids, mg/L	52	20	1	9.3	40	0

^aNPDES permit limit.

^bNon-limited parameter.

^cNot applicable.

Table 4.80. 1994 NPDES Permit Number TN 0002950, K-25 Site

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 05A</i>						
Flow, MGD	12	1.4400	0.0160	0.6593	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	8	<1	<2.8333	<i>b</i>	<i>b</i>
pH, standard units	12	7.8	7.0	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 100</i>						
Chlorine, total residual, mg/L	52	0.10	<0.05	<0.05	0.14	0
Flow, MGD	52	0.9695	0.0673	0.3381	<i>b</i>	0
Oil and grease, mg/L	52	5.2	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	52	71	<1	<8.1346	<i>b</i>	<i>b</i>
pH, standard units	52	8.9	6.6	<i>b</i>	6.0/9.0	0
<i>Discharge Point SD 110</i>						
Flow, GPD	4	115,900	105	38,164	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	706	21	246.75	<i>b</i>	<i>b</i>
pH, standard units	4	7.4	7.1	<i>b</i>	4.0/6.0	0
<i>Discharge Point SD 120</i>						
Flow, MGD	11	1.0858	0.0589	0.3044	<i>b</i>	<i>b</i>
Oil and grease, mg/L	11	2.1	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	11	24	1	11	<i>b</i>	<i>b</i>
pH, standard units	11	8	6.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 124</i>						
Chlorine, total residual, mg/L	47	0.14	<0.05	<0.06	0.14	0
Flow, GPD	48	34,560	54	3,858	<i>b</i>	<i>b</i>
Oil and grease, mg/L	48	8.6	<2.0	<2.2	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	48	120	<1	<4.3333	<i>b</i>	<i>b</i>
pH, standard units	48	8.5	6.4	<i>b</i>	6.0/9.0	0
<i>Discharge Point SD 130</i>						
Chlorine, total residual, mg/L	52	0.07	<0.05	<0.05	0.14	0
Flow, MGD	53	5.5088	0.0667	0.7639	<i>b</i>	<i>b</i>
Oil and grease, mg/L	53	2.7	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	53	29	3	8.7	<i>b</i>	<i>b</i>
pH, standard units	53	7.9	6.9	<i>b</i>	6.0/9.0	0

Oak Ridge Reservation

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 140</i>						
Flow, GPD	4	42,436	1,902	15,151	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	8	<1	<2.75	<i>b</i>	<i>b</i>
pH, standard units	4	7.7	7.0	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 142</i>						
Flow, GPD	12	129,600	63	28,057	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	21	<1	<5.75	<i>b</i>	<i>b</i>
pH, standard units	12	8.3	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 144</i>						
Flow, GPD	11	451,300	63	65,046	<i>b</i>	<i>b</i>
Oil and grease, mg/L	11	2.3	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	11	15	<1	<4.8181	<i>b</i>	<i>b</i>
pH, standard units	11	8.2	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 146</i>						
Flow, GPD	11	141,200	95	17,240	<i>b</i>	<i>b</i>
Oil and grease, mg/L	11	4.9	<2.0	<2.4	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	11	8	<1	<3	<i>b</i>	<i>b</i>
pH, standard units	11	8.4	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 148</i>						
Flow, GPD	12	15,697	48	3,048.75	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	3.1	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	2	<1	<1.1	<i>b</i>	<i>b</i>
pH, standard units	12	8.2	7.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 150</i>						
Flow, GPD	12	195,500	10,772	72,175	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	<2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	8	<1	<3.3	<i>b</i>	<i>b</i>
pH, standard units	12	7.9	6.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 152</i>						
Flow, MGD	2	0.5819	0.1592	0.3705	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	21	12	16.5	<i>b</i>	<i>b</i>
pH, standard units	2	7.7	7.6	<i>b</i>	4.0/9.0	0

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 154</i>						
Flow, MGD	12	0.348	0.0484	0.1361	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.4	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	16	<0.1	<5.1	<i>b</i>	<i>b</i>
pH, standard units	12	8.1	6.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 156</i>						
Flow, MGD	2	1.002	0.2327	0.6173	<i>b</i>	<i>b</i>
pH, standard units	2	8.1	7.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 158</i>						
Flow, GPD	5	25,920	571	6,363	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	5	5	<1	<2	<i>b</i>	<i>b</i>
pH, standard units	5	7.7	7.0	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 160</i>						
Flow, GPD	4	45,654	4,320	16,298	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	1	<1	<1	<i>b</i>	<i>b</i>
pH, standard units	4	7.8	6.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 162</i>						
Flow, MGD	9	0.3282	0.0629	0.1345	<i>b</i>	<i>b</i>
Oil and grease, mg/L	9	5.6	<2.0	<2.7	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	9	48	1	13.7	<i>b</i>	<i>b</i>
pH, standard units	9	8.3	6.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 168</i>						
Flow, GPD	3	380	95	190	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	3	2	1	1.3	<i>b</i>	<i>b</i>
pH, standard units	3	7.3	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 170</i>						
Chlorine, total residual, mg/L	52	<0.05	<0.05	<0.05	0.019	0
Flow, MGD	52	0.2592	0.1008	0.1624	<i>b</i>	<i>b</i>
Oil and grease, mg/L	52	3.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	52	38	<1	<1.9	<i>b</i>	<i>b</i>
pH, standard units	52	8.4	7	<i>b</i>	6.0/9.0	0

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Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 180</i>						
Chlorine, total residual, mg/L	52	<0.05	<0.05	<0.05	0.019	0
Flow, GPD	52	144,000	21,600	46,938.4615	<i>b</i>	<i>b</i>
Oil and grease, mg/L	52	3.6	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	52	6	<1	<2	<i>b</i>	<i>b</i>
pH, standard units	52	8.5	6.7	<i>b</i>	6.0/9.0	0
<i>Discharge Point SD 190</i>						
Chlorine, total residual, mg/L	52	0.12	<0.05	<0.05	0.019	3
Flow, MGD	53	5.0763	0.0969	0.4072	<i>b</i>	<i>b</i>
Oil and grease, mg/L	53	3.3	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	53	42	<1	<3.6226	<i>b</i>	<i>b</i>
pH, standard units	53	8	6.9	<i>b</i>	6.0/9.0	0
<i>Discharge Point SD 192</i>						
Flow, GPD	2	12,574	1,522	7,048	<i>b</i>	<i>b</i>
pH, standard units	2	7.8	7.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 194</i>						
Flow, GPD	2	9,224	1,522	5,373	<i>b</i>	<i>b</i>
pH, standard units	2	7.8	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 196</i>						
Flow, GPD	2	136,900	4565	70,732	<i>b</i>	<i>b</i>
pH, standard units	2	7.8	7.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 197</i>						
Flow, GPD	12	254,200	190	4,468.333	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	6.5	<2.0	<3.2	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	91	1	12.5	<i>b</i>	<i>b</i>
pH, standard units	12	8.7	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 198</i>						
Flow, GPD	5	72,000	1902	17,655	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	5	50	<1	<19.4	<i>b</i>	<i>b</i>
pH, standard units	5	8.5	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 200</i>						
Flow, MGD	12	25.7955	0.0046	2.5123	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	4.4	<2.0	<2.2	<i>b</i>	<i>b</i>

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
Total suspended solids, mg/L	12	14	<1	<6.8	<i>b</i>	<i>b</i>
pH, standard units	12	8.2	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 210</i>						
Flow, MGD	4	0.2319	0.0208	0.1199	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	6	2	4.3	<i>b</i>	<i>b</i>
pH, standard units	4	7.8	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 220</i>						
Flow, MGD	12	2,727	0.0008	227.2656	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	4.2	<2.0	<2.2	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	78	3	22.9	<i>b</i>	<i>b</i>
pH, standard units	12	8.4	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 230</i>						
Flow, MGD	12	1.0098	0.0017	0.2109	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	7.2	<2.0	<2.7	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	7	<1	<1.9	<i>b</i>	<i>b</i>
pH, standard units	12	8.3	7.0	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 240</i>						
Flow, MGD	12	0.8330	0.0039	0.1221	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	8.4	<2.0	<2.7	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	49	<1	<7.5	<i>b</i>	<i>b</i>
pH, standard units	12	7.9	6.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 264</i>						
Flow, GPD	2	11,345	3,804	7,574	<i>b</i>	<i>b</i>
pH, standard units	2	7.6	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 270</i>						
Flow, GPD	1	5,724	5,724	5,724	<i>b</i>	<i>b</i>
pH, standard units	1	7.1	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 280</i>						
Flow, GPD	2	2,946	380	1,663	<i>b</i>	<i>b</i>
pH, standard units	2	7.9	7.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 290</i>						
Flow, GPD	1	190	190	190	<i>b</i>	<i>b</i>
pH, standard units	1	7.3	7.3	<i>b</i>	4.0/9.0	0

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Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 294</i>						
Flow, GPD	2	28,276	6,955	17,616	<i>b</i>	<i>b</i>
pH, standard units	2	8.2	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 296</i>						
Flow, GPD	2	2,663	190	1,426	<i>b</i>	<i>b</i>
pH, standard units	2	7.9	7.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 297</i>						
Flow, GPD	1	114	114	114	<i>b</i>	<i>b</i>
pH, standard units	1	7.8	7.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 300</i>						
Flow, GPD	2	285	190	238	<i>b</i>	<i>b</i>
pH, standard units	2	7.3	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 310</i>						
Flow, GPD	2	476	38	257	<i>b</i>	<i>b</i>
pH, standard units	2	7.6	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 320</i>						
Flow, GPD	2	1,141	380	760	<i>b</i>	<i>b</i>
pH, standard units	2	7.1	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 322</i>						
Flow, GPD	2	9,371	380	4,876	<i>b</i>	<i>b</i>
pH, standard units	2	7.5	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 326</i>						
Flow, GPD	2	2,035	1,522	1,778	<i>b</i>	<i>b</i>
pH, standard units	2	7.6	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 330</i>						
Flow, GPD	4	643,900	1,902	196,649	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	3	<1	<2	<i>b</i>	<i>b</i>
pH, standard units	4	7.9	<7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 332</i>						
Flow, MGD	1	0.1373	0.1373	0.1373	<i>b</i>	<i>b</i>
pH, standard units	1	7.2	7.2	<i>b</i>	4.0/9.0	0

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 334</i>						
Flow, GPD	1	18,899	18,899	18,899	<i>b</i>	<i>b</i>
pH, standard units	1	8.1	8.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 340</i>						
Flow, GPD	2	92,802	40,236	66,519	<i>b</i>	<i>b</i>
pH, standard units	2	8.0	7.3	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 350</i>						
Flow, GPD	2	11,500	4,565	8,032	<i>b</i>	<i>b</i>
pH, standard units	2	7.9	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 352</i>						
Flow, GPD	4	380	38	290	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	44	<1	<13.5	<i>b</i>	<i>b</i>
pH, standard units	4	8.2	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 360</i>						
Flow, GPD	2	6,833.0000	1,332.0000	4,082.5000	<i>b</i>	<i>b</i>
pH, standard units	2	7.9	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 362</i>						
Flow, GPD	2	10,059	2,754	6,406.5	<i>b</i>	<i>b</i>
pH, standard units	2	7.2	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 370</i>						
Flow, GPD	1	4,565	4,565	4,565	<i>b</i>	<i>b</i>
pH, standard units	1	7.6	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 380</i>						
Flow, MGD	12	2.3493	0.0138	0.3919	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.5	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	5	<1	<1.9	<i>b</i>	<i>b</i>
pH, standard units	12	8.1	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 382</i>						
Flow, GPD	2	138,500	9,131	73,816	<i>b</i>	<i>b</i>
pH, standard units	2	7.6	6.8	<i>b</i>	4.0/9.0	0

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Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 390</i>						
Flow, MGD	9	1.972	0.0275	0.3718	<i>b</i>	<i>b</i>
Oil and grease, mg/L	9	<2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	9	36	2	8.7	<i>b</i>	<i>b</i>
pH, standard units	9	7.9	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 400</i>						
Flow, GPD	2	5,790	3,773	4,782	<i>b</i>	<i>b</i>
pH, standard units	2	8.1	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 410</i>						
Flow, GPD	2	4,019	380	2,200	<i>b</i>	<i>b</i>
pH, standard units	2	8.1	7.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 420</i>						
Flow, GPD	2	6,989	3,044	5,016	<i>b</i>	<i>b</i>
pH, standard units	2	7.6	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 430</i>						
Flow, GPD	12	5,184,600	8,640	841,165	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.4	<2.0	<2.0416	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	18	1	4.8	<i>b</i>	<i>b</i>
pH, standard units	12	8	6.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 440</i>						
Flow, MGD	12	1.7204	0.0008	0.2652	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.5	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	54	1	10.8	<i>b</i>	<i>b</i>
pH, standard units	12	8	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 450</i>						
Flow, GPD	2	12,729	3,744	8,236	<i>b</i>	<i>b</i>
pH, standard units	2	8.0	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 460</i>						
Flow, GPD	2	1,135	1,135	1,135	<i>b</i>	<i>b</i>
pH, standard units	2	8.1	7.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 470</i>						
Flow, GPD	2	3,044	380	1,712	<i>b</i>	<i>b</i>
pH, standard units	2	7.9	7.6	<i>b</i>	4.0/9.0	0

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 480</i>						
Flow, MGD	12	4.0072	0.0	1.4947	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.7	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	16	<1	<5.2	<i>b</i>	<i>b</i>
pH, standard units	12	7.9	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 490</i>						
Flow, MGD	12	4.0072	0.0	1.4947	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.7	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	16	<1	<5.2	<i>b</i>	<i>b</i>
pH, standard units	12	7.9	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 510</i>						
Flow, MGD	12	8.8794	0.0003	1.4437	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	12	<1	<3.7	<i>b</i>	<i>b</i>
pH, standard units	12	8.6	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 520</i>						
Flow, GPD	2	10,673	1,141	5,907	<i>b</i>	<i>b</i>
pH, standard units	2	7.2	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 522</i>						
Flow, GPD	2	7,609	571	4,090	<i>b</i>	<i>b</i>
pH, standard units	2	7.1	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 530</i>						
Flow, GPD	2	1,447	190	818	<i>b</i>	<i>b</i>
Oil and grease, mg/L	2	<2	<2	<2		
Suspended solids, mg/L	2	114	6	60		
pH, standard units	2	6.9	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 532</i>						
Flow, GPD	2	23,040	761	11,901	<i>b</i>	<i>b</i>
pH, standard units	2	8.0	7.3	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 540</i>						
Flow, GPD	2	4,320	380	2,350	<i>b</i>	<i>b</i>
pH, standard units	2	7.6	6.9	<i>b</i>	4.0/9.0	0

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Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 550</i>						
Flow, GPD	2	4,320	761	2,540	<i>b</i>	<i>b</i>
pH, standard units	2	7.2	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 560</i>						
Flow, GPD	11	661,600	13,905	227,405	<i>b</i>	<i>b</i>
Oil and grease, mg/L	11	5.5	<2.0	<2.4	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	11	12	<1	<3.8	<i>b</i>	<i>b</i>
pH, standard units	11	8.2	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 570</i>						
Flow, GPD	2	4,320	2,283	3,302	<i>b</i>	<i>b</i>
pH, standard units	2	7.3	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 580</i>						
Flow, MGD	1	0.2667	0.2667	0.2667	<i>b</i>	<i>b</i>
pH, standard units	1	6.9	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 590</i>						
Flow, GPD	2	9,511	4,565	7,038	<i>b</i>	<i>b</i>
pH, standard units	2	7.5	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 600</i>						
Flow, GPD	2	66,548	41,267	53,908	<i>b</i>	<i>b</i>
Oil and grease, mg/L	2	2	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	5	1	3	<i>b</i>	<i>b</i>
pH, standard units	2	7	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 610</i>						
Flow, MGD	9	2.6277	0.0083	0.5579	<i>b</i>	<i>b</i>
Oil and grease, mg/L	9	2.7	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	9	29	1	7.6	<i>b</i>	<i>b</i>
pH, standard units	9	8.4	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 620</i>						
Flow, GPD	2	3,804	380	2,092	<i>b</i>	<i>b</i>
pH, standard units	2	7.2	6.7	<i>b</i>	4.0/9.0	0

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 640</i>						
Flow, GPD	4	46,678	1,712	14,934	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	92	12	39.5	<i>b</i>	<i>b</i>
pH, standard units	4	8.0	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 650</i>						
Flow, GPD	2	2,283	761	1,522	<i>b</i>	<i>b</i>
pH, standard units	2	7.2	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 660</i>						
Flow, GPD	4	4,128	127	1,349	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	15	2	8.2	<i>b</i>	<i>b</i>
pH, standard units	4	8.2	7.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 670</i>						
Flow, GPD	3	1,522	380	888	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	3	8	2	4.7	<i>b</i>	<i>b</i>
pH, standard units	3	7.8	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 680</i>						
Flow, GPD	4	9,770	2,465	6,483	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	8	1	3.8	<i>b</i>	<i>b</i>
pH, standard units	4	8	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 690</i>						
Flow, MGD	12	6.6449	0.0022	1.0762	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	4	<2.0	<2.2	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	6	<1	<2.1	<i>b</i>	<i>b</i>
pH, standard units	12	7.7	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 692</i>						
Flow, GPD	2	2,283	95	1,189	<i>b</i>	<i>b</i>
pH, standard units	2	8	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 694</i>						
Flow, GPD	2	1,141	1,141	1,141	<i>b</i>	<i>b</i>
pH, standard units	2	7.7	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 696</i>						
Flow, GPD	2	95	95	95	<i>b</i>	<i>b</i>
pH, standard units	2	8	7.9	<i>b</i>	4.0/9.0	0

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Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 700</i>						
Flow, MGD	11	1.0015	0.0035	0.258	<i>b</i>	<i>b</i>
Oil and grease, mg/L	11	2.6	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	11	46	<1	<9.3	<i>b</i>	<i>b</i>
pH, standard units	11	8.2	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 702</i>						
Flow, GPD	2	7,200	48	3,624	<i>b</i>	<i>b</i>
pH, standard units	2	8.1	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 710</i>						
Flow, MGD	12	14.1581	0.0087	2.1954	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.5	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	65	<1	<7.7	<i>b</i>	<i>b</i>
pH, standard units	12	8.2	6.3	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 712</i>						
Flow, GPD	12	159,100	190	17,318	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	<2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	72	<1	<9.3	<i>b</i>	<i>b</i>
pH, standard units	12	8.5	7.3	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 720</i>						
Flow, GPD	9	474,000	19,848	158,075	<i>b</i>	<i>b</i>
Oil and grease, mg/L	9	2.6	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	9	28	1	10.6	<i>b</i>	<i>b</i>
pH, standard units	9	8.2	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 724</i>						
Flow, GPD	1	17,309	17,309	17,309	<i>b</i>	<i>b</i>
pH, standard units	1	6.4	6.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 730</i>						
Flow, GPD	2	3,804	95	1,950	<i>b</i>	<i>b</i>
pH, standard units	2	8.2	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 740</i>						
Flow, GPD	1	3,804	3,804	3,804	<i>b</i>	<i>b</i>
pH, standard units	1	6.9	6.9	<i>b</i>	4.0/9.0	0

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 750</i>						
Flow, GPD	6	116,400	380	34,674	<i>b</i>	<i>b</i>
Oil and grease, mg/L	6	<2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	6	4	1	2.2	<i>b</i>	<i>b</i>
pH, standard units	6	7.9	7.3	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 760</i>						
Flow, MGD	6	86,400	1,141	36,331	<i>b</i>	<i>b</i>
Oil and grease, mg/L	6	<2.0	<2.0	<2.0	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	6	4	<1	<1.7	<i>b</i>	<i>b</i>
pH, standard units	6	7.7	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 770</i>						
Flow, GPD	4	1,440	380	995	<i>b</i>	<i>b</i>
Oil and grease, mg/L	4	2.2	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	15	<1	<4.5	<i>b</i>	<i>b</i>
pH, standard units	4	7.8	7.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 780</i>						
Flow, GPD	3	30,436	5,707	19,657	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	3	91	6	37	<i>b</i>	<i>b</i>
pH, standard units	3	7.9	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 800</i>						
Flow, GPD	3	22,827	76	8,142	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	3	33	3	16.7	<i>b</i>	<i>b</i>
pH, standard units	3	8.1	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 810</i>						
Flow, GPD	2	4,565	2,283	3,424	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	30	1	15.5	<i>b</i>	<i>b</i>
pH, standard units	2	7.4	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 820</i>						
Flow, GPD	2	22,827	761	11,794	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	6	1	3.5	<i>b</i>	<i>b</i>
pH, standard units	2	7.8	7.6	<i>b</i>	4.0/9.0	0

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Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 830</i>						
Flow, MGD	2	0.1141	0.0114	0.0627	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	30	2	16	<i>b</i>	<i>b</i>
pH, standard units	2	7.5	7.2	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 850</i>						
Flow, GPD	2	7,609	2,283	4,946	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	7	5	6	<i>b</i>	<i>b</i>
pH standard units	2	8.9	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 860</i>						
Flow, GPD	1	1,902	1,902	1,902	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	1	11	11	11	<i>b</i>	<i>b</i>
pH, standard units	1	7.7	7.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 880</i>						
Flow, GPD	2	22,827	5,707	14,267	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	1	<1	<1	<i>b</i>	<i>b</i>
pH, standard units	2	7.8	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 890</i>						
Flow, GPD	2	22,827	4,565	13,696	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	2	14	1	7.5	<i>b</i>	<i>b</i>
pH, standard units	2	7.7	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 900</i>						
Flow, GPD	3	11,520	7,200	9,271	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	4	102	<1	<26.2	<i>b</i>	<i>b</i>
pH, standard units	4	7.6	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 910</i>						
Flow, GPD	2	22,827	7,609	15,218	<i>b</i>	<i>b</i>
pH, standard units	2	7.8	7.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 920</i>						
Flow, GPD	1	5,610	5,610	5,610	<i>b</i>	<i>b</i>
pH, standard units	1	7	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 930</i>						
Flow, GPD	2	62,655	1,141	31,898	<i>b</i>	<i>b</i>
pH, standard units	2	8	7.4	<i>b</i>	4.0/9.0	0

Table 4.80 (continued)

Parameter	Number of samples	Concentration			Reference ^a value	Number of values exceeding reference
		Max	Min	Av		
<i>Discharge Point SD 940</i>						
Flow, GPD	2	380	38	209	<i>b</i>	<i>b</i>
pH, standard units	2	7.5	7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 950</i>						
Flow, GPD	2	4,320	3,804	4,062	<i>b</i>	<i>b</i>
pH, standard units	2	7.1	6.9	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 960</i>						
Flow, GPD	2	2,663	1,522	2,092	<i>b</i>	<i>b</i>
pH, standard units	2	7.9	6.8	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 970</i>						
Flow, GPD	1	4,946	4,946	4,946	<i>b</i>	<i>b</i>
pH, standard units	1	7.1	7.1	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 980</i>						
Flow, GPD	1	285	285	285	<i>b</i>	<i>b</i>
pH, standard units	1	7.6	7.6	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 982</i>						
Flow, GPD	1	380	380	380	<i>b</i>	<i>b</i>
pH, standard units	1	7.5	7.5	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 990</i>						
Flow, GPD	1	4,223	4,223	4,223	<i>b</i>	<i>b</i>
pH, standard units	1	7.7	7.7	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 992</i>						
Flow, MGD	12	1.1986	0.1669	0.4688	<i>b</i>	<i>b</i>
Oil and grease, mg/L	12	2.7	<2.0	<2.1	<i>b</i>	<i>b</i>
Total suspended solids, mg/L	12	131	21	51.9	<i>b</i>	<i>b</i>
pH, standard units	12	7.7	4.4	<i>b</i>	4.0/9.0	0
<i>Discharge Point SD 996</i>						
Flow, GPD	2	32,853	190	16,522	<i>b</i>	<i>b</i>
pH, standard units	2	7.4	7.4	<i>b</i>	4.0/9.0	0

^aNPDES permit limit.^bNot applicable.

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Table 4.81. 1994 radionuclide concentrations at K-25 Site NPDES locations

Isotope	No. of samples	Concentration (pCi/L) ^a				DCG	Percentage of DCG	Sum of fractions of DCGs
		Max	Min	Median	Av			
<i>K-1407-J treated effluents from Central Neutralization Facility and TSCA Incinerator</i>								
²³⁴ U	12	2.52E+02	4.28E+00	6.60E+01	8.34E+01	5.00E+02	1.67E+01	1.67E-01
²³⁵ U	12	6.21E+01	-2.67E+01	1.00E+01	7.87E+00	6.00E+02	1.31E+00	1.31E-02
²³⁶ U	12	4.90E+00	0.00E+00	1.44E+00	1.80E+00	5.00E+02	3.60E-01	3.60E-03
²³⁸ U	12	2.10E+02	3.02E+00	5.85E+01	7.87E+01	6.00E+02	1.31E+01	1.31E-01
¹³⁷ Cs	12	5.22E+01	-1.04E+02	2.05E+01	7.75E+00	2.58E-01	2.58E-01	2.58E-03
⁹⁹ Tc	12	3.49E+03	-2.92E+02	1.57E+02	4.33E+02	1.00E+05	4.33E-01	4.33E-03
²³⁷ Np	12	1.79E+00	-4.38E-01	4.40E-01	6.23E-01	3.00E+01	2.08E+00	2.08E-02
²³⁸ Pu	12	4.08E-01	-1.28E+00	-7.50E-02	-9.25E-02	4.00E+01	-2.31E-01	-2.31E-03
²³⁹ Pu	12	7.66E-02	-8.53E-01	0.00E+00	-1.26E-01	3.00E+01	-4.20E-01	-4.20E-03
⁴⁰ K	12	4.11E+02	0.00E+00	0.00E+00	3.43E+01	7.00E+03	4.89E-01	4.89E-03
Gross alpha	12	1.07E+03	1.55E+00	4.67E+01	1.40E+02	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	8.10E+02	6.16E+00	-7.20E+01	1.47E+02	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								3.41E-01

^a1 pCi/L = 3.7E-2 Bq/L.

^bNot applicable.

Table 4.82. 1994 mercury concentrations in ORNL sediment

Location	No. detected/ No. total	Concentration (µg/g)			Standard error ^a
		Max	Min	Av	
<i>First Creek</i>					
Upstream Northwest Tributary	6/6	0.15	0.077	0.11	0.013
<i>Fifth Creek</i>					
Outfall 261	6/6	190	35	100	26
Outfall 362	6/6	16	4.4	11	1.7
<i>Melton Branch</i>					
Headwaters	5/6	0.12	<0.000050	-0.059	0.025
<i>White Oak Creek</i>					
Upstream Fifth Creek	6/6	7.5	1.8	4.4	0.83
Downstream First Creek	6/6	4.3	2.0	3.0	0.31
Headwaters	6/6	0.14	0.080	0.11	0.0088
Upstream Melton Branch	5/6	0.12	<0.000050	-0.058	0.017
Downstream White Oak Dam	6/6	0.23	0.056	0.16	0.026

^aStandard error of the mean.

Table 4.83. 1994 PCB concentrations in ORNL sediment

Parameter	No. detected/ No. total	Concentration ($\mu\text{g}/\text{kg}$)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
<i>Site 04-Confluence of Fifth Creek and White Oak Creek</i>					
Aroclor-1016	0/4	U110	U96	~100	4.9
Aroclor-1221	0/4	U110	U96	~100	4.9
Aroclor-1232	0/4	U110	U96	~100	4.9
Aroclor-1242	0/4	U110	U96	~100	4.9
Aroclor-1248	2/4	260	J12	~120	52
Aroclor-1254	4/4	750	J3.0	~380	200
Aroclor-1260	2/4	220	U190	~200	8.0
<i>Site 06-Upstream of Weir at 7500 Road Bridge</i>					
Aroclor-1016	0/4	U750	U130	~440	180
Aroclor-1221	0/4	U750	U130	~440	180
Aroclor-1232	0/4	U750	U130	~440	180
Aroclor-1242	0/4	U750	U130	~440	180
Aroclor-1248	0/4	U750	U130	~440	180
Aroclor-1254	4/4	2,200	J350	~1,000	420
Aroclor-1260	4/4	1,400	J500	~940	220
<i>Site 07-Upstream of Weir at Melton Branch</i>					
Aroclor-1016	0/4	U120	U110	~120	2.7
Aroclor-1221	0/4	U120	U110	~120	2.7
Aroclor-1232	0/4	U120	U110	~120	2.7
Aroclor-1242	0/4	U120	U110	~120	2.7
Aroclor-1248	0/4	U120	U110	~120	2.7
Aroclor-1254	2/4	U220	J7.0	~110	62
Aroclor-1260	0/4	U240	U220	~230	5.4
<i>Site 08-Melton Hill Lake southeast of 7600</i>					
Aroclor-1016	0/4	U96	U93	~95	0.77
Aroclor-1221	0/4	U96	U93	~95	0.77
Aroclor-1232	0/4	U96	U93	~95	0.77
Aroclor-1242	0/4	U96	U93	~95	0.77
Aroclor-1248	0/4	U96	U93	~95	0.77
Aroclor-1254	0/4	U190	U190	~190	1.5
Aroclor-1260	0/4	U190	U190	~190	1.5

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Table 4.83 (continued)

Parameter	No. detected/ No. total	Concentration (µg/kg)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
<i>Site 09-Melton Hill Lake west of PCB Storage Areas 7652 and 7656</i>					
Aroclor-1016	0/4	U110	U100	~110	1.7
Aroclor-1221	0/4	U110	U100	~110	1.7
Aroclor-1232	0/4	U110	U100	~110	1.7
Aroclor-1242	0/4	U110	U100	~110	1.7
Aroclor-1248	0/4	U110	U100	~110	1.7
Aroclor-1254	0/4	U220	U210	~220	3.4
Aroclor-1260	0/4	U220	U210	~220	3.4
<i>Site 10-White Oak Lake at mouth of White Oak Creek</i>					
Aroclor-1016	0/4	U390	U110	~250	80
Aroclor-1221	0/4	U390	U110	~250	80
Aroclor-1232	0/4	U390	U110	~250	80
Aroclor-1242	0/4	U390	U110	~250	80
Aroclor-1248	0/4	U390	U110	~250	80
Aroclor-1254	4/4	310	J72	~180	63
Aroclor-1260	4/4	360	J130	~240	58
<i>Site 11-Melton Hill Lake east of 7600 and south of 7709</i>					
Aroclor-1016	0/4	U150	U140	~150	2.6
Aroclor-1221	0/4	U150	U140	~150	2.6
Aroclor-1232	0/4	U150	U140	~150	2.6
Aroclor-1242	0/4	U150	U140	~150	2.6
Aroclor-1248	0/4	U150	U140	~150	2.6
Aroclor-1254	1/4	U300	J3.8	~220	72
Aroclor-1260	0/4	U310	U290	~300	5.1
<i>Site 12-Watts Bar Lake south of 7700, Tower Shielding Facility</i>					
Aroclor-1016	0/4	U100	U100	~100	0.98
Aroclor-1221	0/4	U100	U100	~100	0.98
Aroclor-1232	0/4	U100	U100	~100	0.98
Aroclor-1242	0/4	U100	U100	~100	0.98
Aroclor-1248	0/4	U100	U100	~100	0.98
Aroclor-1254	0/4	U210	U200	~200	2.0
Aroclor-1260	0/4	U210	U200	~200	2.0

Table 4.83 (continued)

Parameter	No. detected/ No. total	Concentration ($\mu\text{g}/\text{kg}$)			Standard error ^c
		Max ^a	Min ^a	Av ^b	
<i>Site 13-White Oak Dam</i>					
Aroclor-1016	0/4	U110	U100	~110	2.2
Aroclor-1221	0/4	U110	U100	~110	2.2
Aroclor-1232	0/4	U110	U100	~110	2.2
Aroclor-1242	0/4	U110	U100	~110	2.2
Aroclor-1248	0/4	U110	U100	~110	2.2
Aroclor-1254	3/4	U220	J0.49	~62	53
Aroclor-1260	2/4	U210	J4.1	~110	56
<i>Site 14-Headwaters of White Oak Creek</i>					
Aroclor-1016	0/4	U160	U100	~130	16
Aroclor-1221	0/4	U160	U100	~130	16
Aroclor-1232	0/4	U160	U100	~130	16
Aroclor-1242	0/4	U160	U100	~130	16
Aroclor-1248	0/4	U160	U100	~130	16
Aroclor-1254	4/4	J30	J0.16	~15	7.7
Aroclor-1260	1/4	U330	J30	~200	62

^aPrefix "U" indicates the value for an organic parameter was undetected at the analytical detection limit and "J" indicates the value was estimated at or below the analytical detection limit by the laboratory.

^bA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^cStandard error of the mean.



5. Environmental Surveillance

Table 5.1. External gamma averages, 1994

Location	Number of samples	Measurement ($\mu\text{R}/\text{hour}$)			Standard error of mean
		Min	Max	Mean ^a	
39	50	8.63	10.81	9.05	0.04
40	47	7.36	77.31	10.65	2.06
41	48	8.20	11.19	9.78	0.11
42	52	6.66	7.39	6.97	0.02
46	49	6.16	12.85	8.84	0.16
48	49	1.98	11.60	6.80	0.22
51	31	7.28	8.30	7.54	0.03

To convert microroentgens per hour to milliroentgens per year, multiply by 8.766.

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Table 5.2. ORR radionuclide concentrations in air, 1994

Determination	No. detected ^a / No. sampled	Concentration (10 ⁻¹⁵ μCi/mL) ^b			Standard error	DCG (inhalation)	DCG % ^c
		Min	Max	Av			
<i>PAMs</i>							
²⁴¹ Am	15/56	0.00E+00	4.53E-03	1.18E-03	1.53E-04	2.00E-14	5.89E-03
⁷ Be	56/56	4.11E+01	1.04E+02	7.97E+01	2.10E+00	5.00E-08	1.60E-04
²⁴⁴ Cm	1/56	0.00E+00	3.75E-03	1.68E-04	7.21E-05	4.00E-14	4.20E-04
⁶⁰ Co	5/56	0.00E+00	7.93E-02	1.86E-02	2.93E-03	4.00E-10	4.66E-06
¹³⁷ Cs	7/56	0.00E+00	6.95E-02	1.85E-02	2.49E-03	4.00E-10	4.62E-06
³ H	104/104	0.00E+00	1.73E+06	2.97E+04	1.68E+04	1.00E-07	2.97E-02
²³⁸ Pu	1/56	0.00E+00	1.45E-03	2.25E-04	4.79E-05	3.00E-14	7.48E-04
²³⁹ Pu	4/56	0.00E+00	1.16E-03	1.20E-04	3.16E-05	2.00E-14	6.00E-04
²²⁸ Th	47/56	0.00E+00	7.85E-03	2.25E-03	2.06E-04	5.00E-14	4.49E-03
²³⁰ Th	53/56	6.35E-05	5.54E-03	2.24E-03	1.83E-04	4.00E-14	5.60E-03
²³² Th	52/56	1.26E-05	5.62E-03	2.31E-03	1.92E-04	7.00E-15	3.31E-02
Total Sr	26/56	0.00E+00	1.04E-01	1.47E-02	2.46E-03	9.00E-12	1.64E-04
²³⁴ U	55/56	9.40E-04	1.60E-01	3.75E-02	4.29E-03	9.00E-14	4.17E-02
²³⁵ U	45/56	0.00E+00	3.13E-02	4.21E-03	7.65E-04	1.00E-13	4.21E-03
²³⁸ U	55/56	2.60E-03	3.80E-02	1.54E-02	1.17E-03	1.00E-13	1.54E-02
<i>RAMs</i>							
²⁴¹ Am	3/14	0.00E+00	1.97E-03	6.89E-04	1.90E-04	2.00E-14	3.44E-03
⁷ Be	14/14	5.19E+01	1.11E+02	8.31E+01	3.83E+00	5.00E-08	1.66E-04
²⁴⁴ Cm	0/14	0.00E+00	8.61E-04	1.88E-04	8.61E-05	4.00E-14	4.70E-04
⁶⁰ Co	2/14	0.00E+00	9.28E-02	2.08E-02	7.63E-03	4.00E-10	5.20E-06
¹³⁷ Cs	2/14	0.00E+00	6.89E-02	1.68E-02	5.02E-03	4.00E-10	4.20E-06
³ H	26/26	2.04E+02	3.29E+04	6.85E+03	1.63E+03	1.00E-07	6.85E-03
²³⁸ Pu	0/14	0.00E+00	1.90E-03	2.85E-04	1.37E-04	3.00E-14	9.50E-04
²³⁹ Pu	0/14	0.00E+00	3.93E-04	4.16E-05	3.02E-05	2.00E-14	2.08E-04
²²⁸ Th	12/14	2.11E-05	4.33E-03	1.96E-03	3.45E-04	5.00E-14	3.92E-03
²³⁰ Th	12/14	6.34E-05	4.60E-03	2.17E-03	3.85E-04	4.00E-14	5.44E-03
²³² Th	12/14	2.09E-05	3.93E-03	2.07E-03	3.17E-04	7.00E-15	2.95E-02
Total Sr	9/14	0.00E+00	1.81E-01	2.31E-02	1.24E-02	9.00E-12	2.57E-04
²³⁴ U	14/14	4.13E-03	5.10E-02	1.32E-02	3.20E-03	9.00E-14	1.46E-02
²³⁵ U	8/14	1.09E-04	9.88E-03	2.04E-03	6.78E-04	1.00E-13	2.04E-03
²³⁸ U	14/14	1.33E-03	1.07E-02	6.09E-03	8.01E-04	1.00E-13	6.09E-03

^aStatistically significant at 95% level of confidence.

^b1 μCi = 3.75E+04 Bq.

^cThe average is divided by the derived concentration guideline (DCG) for inhalation of that isotope, multiplied by 100, and presented in the table as the percentage of the DCG.

Table 5.3. Uranium concentrations in ambient air on the ORR

Sampling station	Concentration (10^{-15} $\mu\text{Ci/mL}$)		
	1992	1993	1994
35			
²³⁴ U	3.6E-02	4.2E-02	3.5E-02
²³⁵ U	0.0E+00	1.1E-02	3.0E-03
²³⁸ U	9.4E-03	2.2E-02	2.4E-02
37			
²³⁴ U	5.0E-03	5.4E-02	3.5E-02
²³⁵ U	8.6E-03	9.0E-03	3.0E-03
²³⁸ U	2.1E-02	1.8E-02	1.9E-02
38			
²³⁴ U	2.3E-02	3.7E-02	2.9E-02
²³⁵ U	0.0E+00	7.0E-03	4.0E-03
²³⁸ U	9.8E-03	1.7E-02	1.6E-02
39			
²³⁴ U	3.1E-02	4.1E-02	2.7E-02
²³⁵ U	4.7E-03	1.0E-02	5.0E-03
²³⁸ U	1.9E-02	1.6E-02	9.0E-03
40			
²³⁴ U	1.2E-01	1.1E-01	8.9E-02
²³⁵ U	8.7E-03	1.0E-03	9.0E-03
²³⁸ U	1.8E-02	2.1E-02	1.6E-02
42			
²³⁴ U	5.0E-02	2.5E-02	1.9E-02
²³⁵ U	0.0E+00	3.0E-03	2.0E-03
²³⁸ U	1.5E-03	2.2E-02	1.5E-02
46			
²³⁴ U	2.1E-01	1.0E-01	4.4E-02
²³⁵ U	5.2E-02	1.2E-02	6.0E-03
²³⁸ U	3.2E-02	1.8E-02	1.5E-02
48			
²³⁴ U	3.2E-02	5.2E-02	2.3E-02
²³⁵ U	5.9E-03	1.0E-02	1.0E-03
²³⁸ U	1.2E-02	2.1E-02	1.1E-02
51			
²³⁴ U	3.4E-02	4.3E-02	1.0E-02
²³⁵ U	2.9E-03	9.0E-03	2.0E-03
²³⁸ U	1.1E-02	1.4E-02	6.0E-03
52			
²³⁴ U	2.7E-02	3.3E-02	1.6E-02
²³⁵ U	5.0E-03	7.0E-03	2.0E-02
²³⁸ U	7.4E-03	1.6E-02	6.0E-03

Table 5.4. Uranium in ambient air at the Y-12 Plant, 1994

Station No.	No. of samples	7-day concentration ($\mu\text{g}/\text{m}^3$) ^a		
		Max	Min	Av
1	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
2	51	0.00047	0.00002	0.00005
3	51	0.00014	0.00002	0.00005
4	51	0.00173	0.00001	0.00012
5	51	0.00080	0.00002	0.00009
6	46	0.00016	0.00002	0.00005
7	50	0.00025	0.00002	0.00007
8	51	0.00030	0.00003	0.00008
9	50	0.00021	0.00002	0.00005
10	44	0.00013	0.00002	0.00004
11	51	0.00013	0.00001	0.00004
12	51	0.00017	0.00002	0.00005

^aSampler down; no samples taken.

Table 5.5. Fluorides in ambient air at the Y-12 Plant, 1994

Station No.	No. of samples	7-day concentration ($\mu\text{g}/\text{m}^3$)				Percentage of standard ^b
		Max	Min	Av	Tenn. std ^a	
1	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>	1.6	<i>c</i>
2	51	0.0280	0.0047	0.0102	1.6	<2
3	51	0.0144	0.0054	0.0085	1.6	<1
4	51	0.0102	0.0046	0.0081	1.6	<1
5	51	0.0126	0.0045	0.0077	1.6	<1
6	44	0.0137	0.0038	0.0088	1.6	<1
7	42	0.0140	0.0071	0.0085	1.6	<1
8	51	0.0142	0.0062	0.0084	1.6	<1
9	51	0.0112	0.0040	0.0077	1.6	<1
10	43	0.0200	0.0040	0.0090	1.6	<2
11	51	0.0102	0.0051	0.0079	1.6	<1

^aTennessee standard 7-day average = 1.6 $\mu\text{g}/\text{m}^3$.

^bPercentage of standard calculated using the annual 7-day average fluoride concentration.

^cSampler down; no samples taken.

Table 5.6. 1994 total suspended particulates in air at the Y-12 Plant TSP monitoring stations

Station	No. of samples	Concentration ($\mu\text{g}/\text{m}^3$)					Number of exceedences
		Max	Min	Av	Tenn. std ^a	Max % of std	
East	53	148.49	6.95	41.54	260	57.11	0
West	31	73.95	5.63	24.90	260	28.44	0

^aTSP is no longer regulated; however, the maximum measurements are still compared with the previous primary air quality standard of $260 \mu\text{g}/\text{m}^3$ per 24 hours.

Table 5.7. 1994 PM10 concentrations in air at the Y-12 Plant PM10 monitoring stations

Station	No. of samples	Concentration ($\mu\text{g}/\text{m}^3$)					Number of exceedences
		Max	Min	Av	Tenn. std ^a	Max % of std	
West	50	20.70	1.20	9.88	150	13.80	0
East	45	45.59	3.61	16.60	150	30.39	0
East collocated	60	50.03	1.02	17.81	150	33.35	0

^aMaximum measurements are compared with the Tennessee primary air quality standard at $150 \mu\text{g}/\text{m}^3$ per 24 hours.

Table 5.8. 1994 results of the Y-12 Plant ambient air mercury monitoring program

Monitoring site	Number	Mercury vapor concentration ($\mu\text{g}/\text{m}^3$)			
		Max	Min	1994 av ^a	1986-88 av ^a
Station No. 2 (east end of Y-12 Plant)	37	0.017	<0.001	0.006	0.010
Station No. 8 (west end of Y-12 Plant)	36	0.026	0.003	0.009	0.033
Bldg. 9404-13 (SW of Bldg. 9201-4)	39	0.128	0.010	0.056	0.145
Bldg. 9805-1 (SE of Bldg. 9201-4)	40	0.280	0.006	0.088	0.099
Reference site, Rain Gage No. 2 (1988 ^b)	47	0.016	0.002	0.006	c
(1989 ^d)	47	0.015	<0.001	0.005	c

^aNESHAP 30-day average standard equals $1 \mu\text{g}/\text{m}^3$. ACGIH 8-hour day, 40-hour work week standard equals $50 \mu\text{g}/\text{m}^3$.

^bData for February 9 through December 31, 1988.

^cNot applicable.

^dData for January 1 through October 31, 1989.

Table 5.9. Radionuclide concentrations measured at ORNL perimeter air monitoring stations, 1994 (10^{-15} $\mu\text{Ci/mL}$)^a
Total number of observations = 84

Parameter	Station			
	1	2	3	7
²⁴¹ Am	0.00E+00	0.00E+00	6.70E-03 ^b	0.00E+00
⁷ Be	2.68E+01 ^b	2.85E+01 ^b	3.50E+01 ^b	2.24E+01 ^b
²⁴⁴ Cm	0.00E+00	0.00E+00	4.95E-03	0.00E+00
⁶⁰ Co	6.65E-02	3.93E-02	5.15E-02	0.00E+00
¹³⁷ Cs	1.40E-02	4.91E-02	1.03E-02	4.66E-02
³ H			8.74E+04	6.30E+04
¹³¹ I	2.28E+00 ^b	1.21E+00	2.01E+00	1.97E+00 ^b
¹³³ I	2.09E+00 ^b	2.03E+00 ^b	3.07E+00 ^b	1.96E+00
¹³⁵ I	9.85E+00	7.73E+00	1.16E+01 ^b	7.57E+00 ^b
²¹² Pb	2.13E+01 ^b	1.15E+02 ^b	6.00E+01	
²³⁸ Pu	0.00E+00	0.00E+00	1.03E-04	2.80E-04
²³⁹ Pu	0.00E+00	0.00E+00	0.00E+00	1.86E-04
Sr, total	0.00E+00	3.14E-02	2.78E-01	1.86E-03
²²⁸ Th	2.10E-02	4.32E-03	1.03E-02	7.74E-03
²³⁰ Th	1.75E-02	7.50E-03	1.34E-02	8.85E-03
²³² Th	1.63E-02	5.30E-03	1.03E-02	4.57E-03
²³⁴ U	6.18E-02	4.32E-02	5.77E-02	4.47E-02
²³⁵ U	3.61E-03	1.77E-03	9.48E-03	4.75E-03
²³⁸ U	2.68E-02	2.26E-02	3.09E-02	3.08E-02

^a1 μCi = $3.7\text{E}+4$ Bq.

^bStatistically significant at 95% level of confidence.

Table 5.10. Summary of ambient air pollutants measured at the K-25 Site, 1994

Parameter	Sampling locations	Collection frequency ^a	Analysis frequency ^b
<i>Criteria pollutants</i>			
TSP ^c	K1, 2, 3, 4, 5, 6 ^d	Weekly	Weekly
PM10	K4	Weekly	Weekly
Lead	K1, 2, 3, 4, 5, 6	Weekly	Monthly ^e
<i>Hazardous air pollutant carcinogen metals</i>			
Arsenic	K1, 2, 3, 4, 5, 6	Weekly	Monthly ^e
Beryllium	K1, 2, 3, 4, 5, 6	Weekly	Monthly ^e
Cadmium	K1, 2, 3, 4, 5, 6	Weekly	Monthly ^e
Chromium (total)	K1, 2, 3, 4, 5, 6	Weekly	Monthly ^e
<i>Organic compounds</i>			
PCBs	TSCA 1, 2 ^f		
Furan	TSCA 1, 2 ^f		
Dioxin	TSCA 1, 2 ^f		
Hexachlorobenzene	TSCA 1, 2 ^f		
<i>Radionuclides</i>			
Uranium (total)	K1, 2, 3, 4, 5, 6 TSCA 1, 2 ^f	Weekly	Monthly ^e

^a24-hour sample every sixth day from midnight to midnight.

^b"Weekly" frequency is analysis of each 24-hour sample; "Monthly" is composite sample analyses of all 24-hour samples per month for each sampler.

^cTSP is no longer regulated by Tennessee or National Ambient Air Quality Standards (NAAQS).

^dSampling station K6 became operational in October of 1994.

^eInitially, all analyses of data from station K6 are of the weekly samples.

^fActivated automatically if a TSCA Incinerator operational upset occurs.

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Table 5.11. Total suspended particulates in ambient air at the K-25 Site, 1994

Station	Number of samples	Annual summary of TSP concentrations ($\mu\text{g}/\text{m}^3$)			Max percentage of primary standard ^a	
		24-hour max	24-hour min	Annual av	Annual	24-hour
K1	59	86.78	7.41	26.53	35.37	33.38
K2	57	86.91	5.95	23.42	31.23	33.43
K3	61	80.45	6.30	24.78	33.04	30.94
K4	58	157.52 ^b	6.04	34.70	46.27	60.58
K5	57	85.48	8.07	27.71	36.95	32.88
K6	9	49.90	6.71	16.73	22.31	19.19

^aTSP is no longer regulated; however, previous Tennessee and national primary standards were $260 \mu\text{g}/\text{m}^3$ per 24 hours and $75 \mu\text{g}/\text{m}^3$ per year geometric mean; secondary standards were $150 \mu\text{g}/\text{m}^3$ per 24 hours and $60 \mu\text{g}/\text{m}^3$ per year.

^bExceeds previous 24-hour secondary TSP standard (1 exceedence was allowed per year).

Table 5.12. PM10 particulates in ambient air at the K-25 Site, 1994

Station	Number of samples	Annual summary of PM10 concentrations ($\mu\text{g}/\text{m}^3$)			Max percentage of standard ^a	
		24-hour max	24-hour min	Annual av	Annual	24-hour
PM10	59	60.32	3.98	24.30	48.60	40.31

^aPM10 Tennessee and national primary and secondary standards are $150 \mu\text{g}/\text{m}^3$ per 24 hours and $50 \mu\text{g}/\text{m}^3$ per year geometric average.

Table 5.13. Lead concentrations in ambient air at the K-25 Site, 1994

Station	Quarterly averages of monthly composites ($\mu\text{g}/\text{m}^3$)				Max individual measures ^a	Min individual measures ^a	Percentage of quarterly standard ^b
	1	2	3	4			
K1	0.00593	0.004054	0.005048	0.002242	0.008500	0.000776	0.40
K2	0.00443	0.004119	0.003269	0.001753	0.005669	0.000784	0.30
K3	0.00513	0.003432	0.003338	0.002653	0.006860	0.000935	0.34
K4	0.00454	0.003420	0.003501	0.003222	0.006440	0.000375	0.30
K5	0.00740	0.003110	<0.003748	0.002522	0.01297	<0.000001	0.49
K6	c	c	c	<0.000001	0.000255	<0.000001	<0.01

^aMaximum/minimum individual monthly composite results.

^bTennessee and national air quality standard for lead is $1.5 \mu\text{g}/\text{m}^3$ quarterly arithmetic average.

^cNot applicable.

Table 5.14. Hazardous air pollutant carcinogen metals in ambient air^a at the K-25 Site, 1994

Parameter	Number of samples (all stations)	Annual summary of monthly composites ($\mu\text{g}/\text{m}^3$)		
		Monthly max	Monthly min	Annual av ^b
Arsenic	309	0.001301	<0.000001	<0.000276
Beryllium	309	<0.000001	<0.000001	<0.000001
Cadmium	309	0.004676	<0.000001	0.001963
Chromium	309	0.004452	<0.000001	<0.000711

^aThere are no Tennessee or national ambient air quality standards for hazardous air pollutant carcinogen metals.

^bThis result is from the station with the highest annual average.

Table 5.15. Uranium in ambient air at the K-25 Site, 1994

Station	Number of samples	Annual summary of monthly composites ($\mu\text{g}/\text{m}^3$)		
		24-hour max ^a	24-hour min ^a	Annual av ^b
K1	60	0.000876	<0.000001	<0.000167
K2	59	0.001602	<0.000001	<0.000403
K3	61	0.000071	<0.000001	<0.000025
K4	60	0.000768	<0.000001	<0.000255
K5	60	0.000254	<0.000001	<0.000033
K6	9	0.000020	<0.000001	<0.000001

^aQuarterly max/min results is of individual monthly composite analyses.

^bThe annual standard for naturally occurring uranium is 1×10^{-1} pCi/m³, which is equivalent to 0.15 $\mu\text{g}/\text{m}^3$.

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Table 5.16. Surface water sampling measurements exceeding Tennessee water quality criteria at the Y-12 Plant, 1994

Parameter	Location	Number of samples	Concentration (mg/L)			Water quality criteria (mg/L)	Number of measurements exceeding criteria
			Detection limit	Max	Av		
Acrylonitrile	Station 17	245	0.010	<0.010	<0.010	0.0067	245
Beryllium	Station 17	245	0.0004	<0.002	<0.0004	0.0013	1
Copper	Station 17	245	0.006	<0.03	<0.007	0.018	2
Lead	Station 17	245	0.02	<0.1	<0.02	0.082	1
Selenium	Station 17	245	0.1	<0.5	<0.1	0.020	245
Silver	Station 17	245	0.006	<0.03	<0.006	0.004	245
Mercury	Station 17	245	0.0002	0.0090	0.0012	0.00015 ^a	245
Chromium	Station 17	245	0.006	<0.03	<0.006	0.016	1
Cadmium	Station 17	245	0.0004	<0.02	<0.004	0.004	1
Zinc	Station 17	245	0.01	0.22	<0.01	0.117	5
Mercury	Rogers Quarry (Outfall 302)	52	0.0002	<0.0002	<0.0002	0.00015	52
Selenium	Rogers Quarry (Outfall 302)	52	0.1	<0.1	<0.1	0.020	52

^aThe Tennessee water quality standard for recreation is 0.00015 mg/L. The freshwater fish and aquatic life standards are 0.024 mg/L for maximum concentrations and 0.000012 mg/L for continuous concentrations.

Table 5.17. Results of radiological analysis of ORR soil samples, 1994 (pCi/g)^a

Parameter	Station								
	35	37	38	39	40	42	46	48	51
²⁴¹ Am	<i>b</i>	0.02	<i>b</i>	0.01	0.03	<i>b</i>	0.02	<i>b</i>	<i>b</i>
⁷ Be	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
²⁴⁴ Cm	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
⁶⁰ Co	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	0.07
¹³⁷ Cs	<i>b</i>	0.76	0.12	0.13	0.13	<i>b</i>	0.08	<i>b</i>	<i>b</i>
Gross alpha	1.82	1.59	2.42	2.08	1.74	1.39	1.55	1.42	0.86
Gross beta	3.78	2.65	4.19	3.92	3.38	3.24	2.84	3.78	1.84
⁴⁰ K	2.33	2.74	3.51	3.38	2.43	4.05	2.5	3.92	3.38
²³⁸ Pu	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	0.01	0.01	0.02	<i>b</i>	<i>b</i>
²³⁹ Pu	<i>b</i>	<i>b</i>	<i>b</i>	0.02	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
Sr, total	0.74	0.77	0.66	0.59	0.61	0.66	0.68	0.43	0.22
²²⁸ Th	0.29	0.27	0.29	0.18	0.3	0.27	0.23	0.22	0.27
²³⁰ Th	0.08	0.08	0.12	0.08	0.08	0.1	0.09	0.08	0.06
²³² Th	0.84	0.08	0.11	0.07	0.83	0.1	0.05	0.08	0.06
²³⁴ U	0.22	0.19	0.19	0.24	0.1	0.24	0.21	0.13	0.1
²³⁵ U	0.03	0.01	0.01	0.01	0.005	<i>b</i>	<i>b</i>	0.01	0.03
²³⁸ U	0.11	0.06	0.09	0.07	0.06	0.09	0.07	0.06	0.04

^a1 pCi = 3.7E-02 Bq.^bNot detected.Table 5.18. Concentrations of radionuclides and fluoride in hay from the ORR, 1994^a

Analyte	Area		
	1, 2, 3	2, 4, 5	6
⁷ Be	1.3E-08	1.4E-08	6.2E-11
⁶⁰ Co	5.2E-11	1.7E-12	2.7E-12
¹³⁷ Cs	2.7E-11	5.9E-11	6.7E-12
¹²⁹ I	1.4E-11	2.7E-11	4.0E-12
⁴⁰ K	6.0E-09	3.3E-09	1.5E-08
³ H	3.7E-10	6.8E-09	4.4E-10
Gross alpha	4.4E-10	4.7E-10	1.4E-10
Gross beta	4.1E-09	4.7E-09	1.3E-08
Fluoride	1.0E+00	1.2E+00	7.1E-01

^aAll radionuclide data are given in curies per kilogram (1 pCi/ = 3.7E-02 Bq).
Fluorine data are given in micrograms per gram.

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Table 5.19. Results of radiological samples of vegetables grown on the ORR, 1994 (pCi/g)^a

Parameter	Station								
	35	37	38	39	40	42	46	48	51
<i>Tomatoes</i>									
⁶⁰ Co	6.8E-05	—	1.5E-04	2.6E-04	2.3E-04	2.6E-04	—	3.8E-04	—
¹³⁷ Cs	8.1E-05	—	3.2E-04	—	9.5E-05	—	2.7E-05	1.2E-04	1.5E-04
Gross alpha	1.3E-03	—	1.4E-03	—	—	6.2E-04	4.9E-04	3.0E-04	2.8E-03
Gross beta	1.8E-01	1.5E-01	1.7E-01	1.5E-01	1.5E-01	1.5E-01	1.8E-01	1.5E-01	1.5E-01
⁴⁰ K	2.7E-01	2.0E-01	2.4E-01	2.2E-01	2.7E-01	2.8E-01	2.2E-01	2.8E-01	2.0E-01
²³⁴ U	7.6E-05	6.9E-05	4.7E-05	6.2E-06	8.4E-05	6.4E-05	2.7E-05	4.5E-05	3.1E-05
²³⁵ U	1.8E-05	1.5E-05	6.8E-06	9.5E-06	2.7E-06	3.4E-05	3.1E-06	2.7E-05	6.1E-06
²³⁸ U	1.5E-05	2.7E-05	5.0E-05	1.9E-05	1.1E-05	2.0E-05	1.2E-05	3.6E-05	1.1E-05
<i>Lettuce</i>									
⁷ Be	1.4E-02	2.7E-03	3.3E-02		1.3E-03		7.5E-03	1.0E-02	1.3E-03
⁶⁰ Co	4.0E-04	0.0E+00	2.1E-03		3.5E-03		1.0E-03	9.4E-04	9.4E-04
¹³⁷ Cs	5.1E-03	3.7E-03	5.1E-03		1.4E-03		2.9E-03	5.2E-03	1.0E-03
Gross alpha	1.0E-01	6.0E-02	1.4E-01		1.2E-01		1.3E-01	1.9E-01	5.9E-02
Gross beta	4.5E+00	4.0E+00	3.7E+00		3.6E+00		3.6E+00	3.9E+00	4.4E+00
⁴⁰ K	3.5E+00	3.3E+00	4.0E+00		3.5E+00		2.8E+00	3.9E+00	3.2E+00
²³⁴ U	3.7E-03	4.8E-03	1.5E-02		1.0E-02		1.2E-02	1.2E-02	1.2E-02
²³⁵ U	3.1E-04	1.0E-03	3.6E-03		2.7E-03		0.0E+00	6.7E-04	4.3E-03
²³⁸ U	4.6E-03	3.2E-03	9.7E-03		3.5E-03		8.2E-03	7.1E-03	8.1E-04
<i>Turnips</i>									
⁷ Be	2.7E-03			2.2E-02	1.6E-02		2.2E-02		7.3E-02
⁶⁰ Co	3.2E-03			6.8E-03	1.6E-03		-2.7E-04		-2.2E-03
¹³⁷ Cs	5.4E-04			3.0E-03	-2.2E-03		5.4E-04		2.2E-03
Gross alpha	1.1E-02			1.1E-02	-2.4E-03		-4.3E-02		1.6E-02
Gross beta	1.8E+00			1.7E+00	1.5E+00		1.5E+00		1.8E+00
⁴⁰ K	6.5E-01			2.6E+00	2.3E+00		1.4E+00		2.3E+00
²³⁴ U	-3.2E-04			5.1E-03	4.1E-03		-7.6E-04		2.4E-03
²³⁵ U	-1.0E-03			4.1E-03	-1.1E-03		-2.7E-04		-7.6E-04
²³⁸ U	-1.0E-03			1.6E-03	3.0E-03		-6.2E-04		-1.1E-03

^a1 pCi = 3.7E-02 Bq.

Table 5.20. Concentrations of total radioactive strontium ($^{89}\text{Sr} + ^{90}\text{Sr}$) in raw milk, 1994 (pCi/L)^a

Station	No. detected/ No. of samples	Detected concentration			Standard error of mean
		Max	Min	Av	
Buttermilk Road	12/12	2.27	0.84	1.43 ^b	0.13
Powell	12/12	2.59	0.59	1.67 ^b	0.19
Clinton	11/11	4.32	0.59	2.01 ^b	0.34
Frost Bottom	12/12	3.24	0.92	2.08 ^b	0.18
Solway	6/6	5.94	0.70	3.33 ^b	0.71
Network summary	53/53	5.94	0.59	2.10 ^b	0.28

^a1 pCi = 3.7E-02 Bq.

^bAverage is significantly greater than zero at the 95% confidence level. The average value for EPA Region IV is 1.8 pCi/L (U.S. EPA 1993a).

WIND ROSE for Y-12 tower MTE (@10m) for 1994

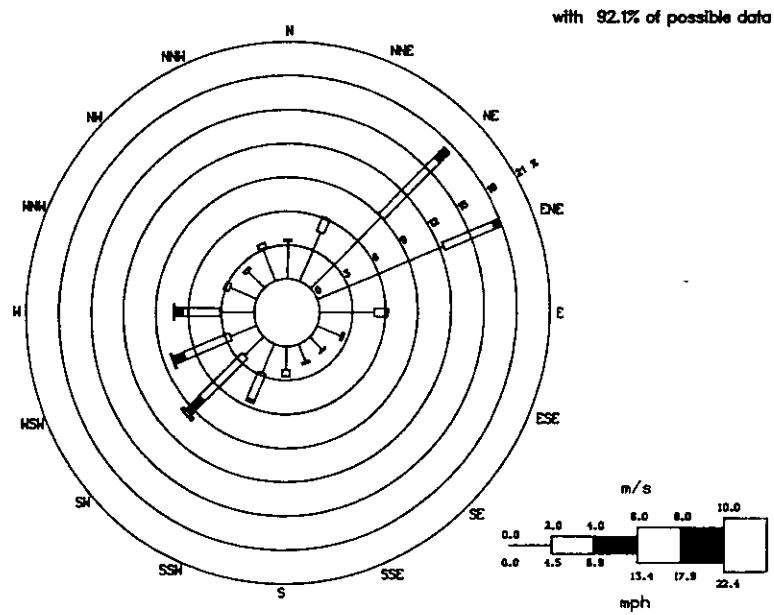


Fig. 5.1. Wind rose for Y-12 tower MTE (@10 m) for 1994.

WIND ROSE for Y-12 tower MTE (@30m) for 1994

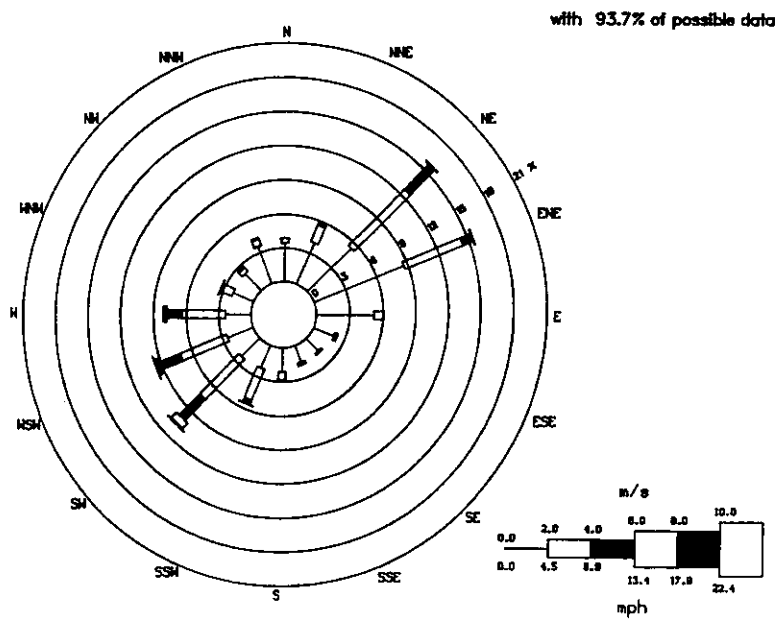


Fig. 5.2. Wind rose for Y-12 tower MTE (@30 m) for 1994.

WIND ROSE for Y-12 tower MTE (@100m) for 1994

with 99.5% of possible data

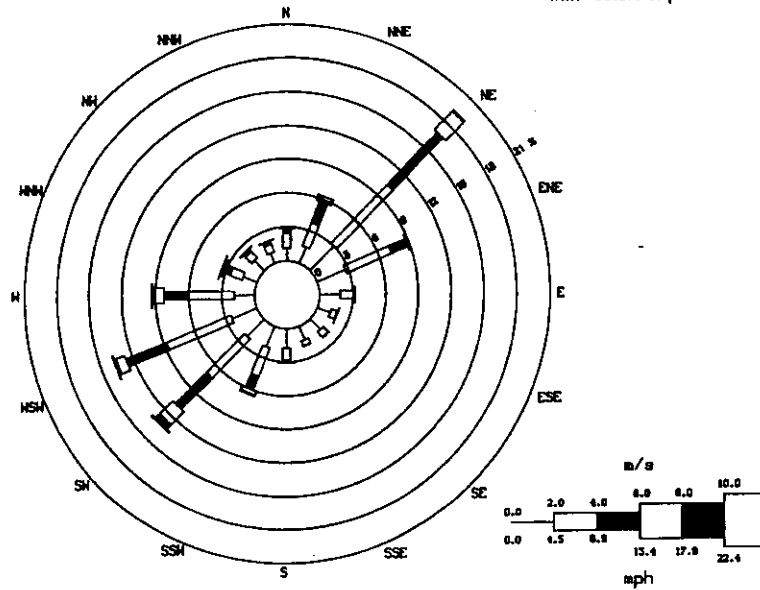


Fig. 5.3. Wind rose for Y-12 tower MTE (@100 m) for 1994.

WIND ROSE for Y-12 tower MTW (@10m) for 1994

with 98.2% of possible data

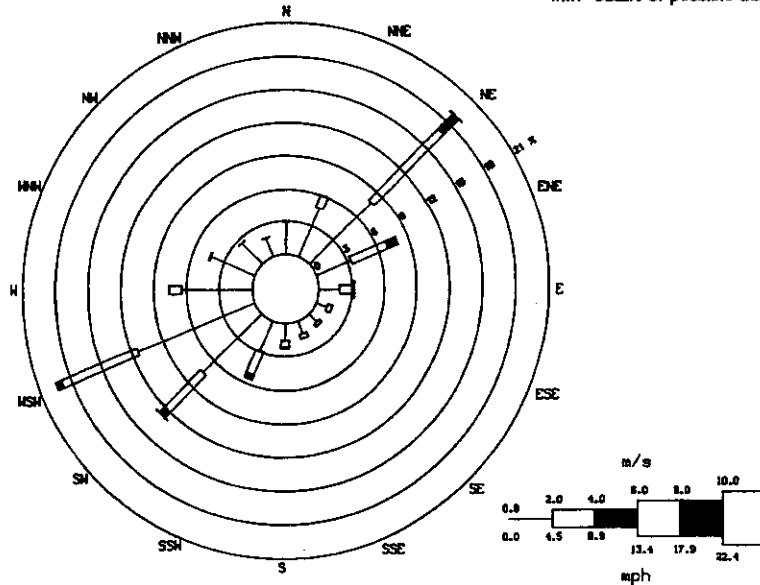


Fig. 5.4. Wind rose for Y-12 tower MTW (@10 m) for 1994.

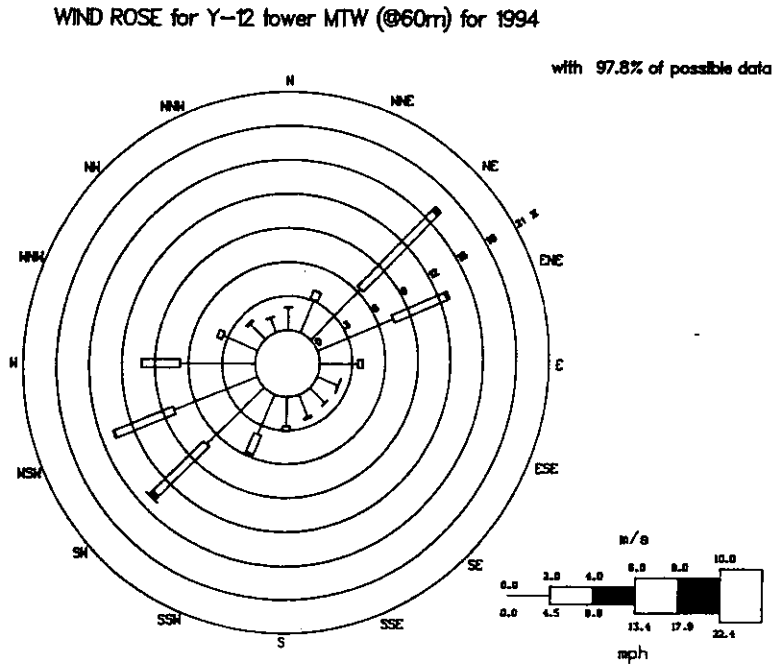


Fig. 5.5. Wind rose for Y-12 tower MTW (@60 m) for 1994.

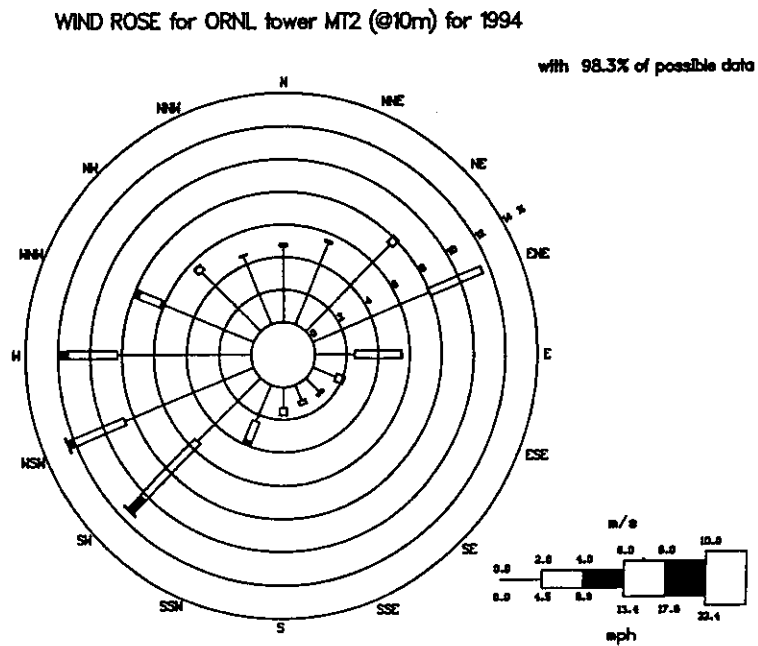


Fig. 5.6. Wind rose for ORNL tower MT2 (@10 m) for 1994.

WIND ROSE for ORNL tower MT2 (@30m) for 1994

with 98.4% of possible data

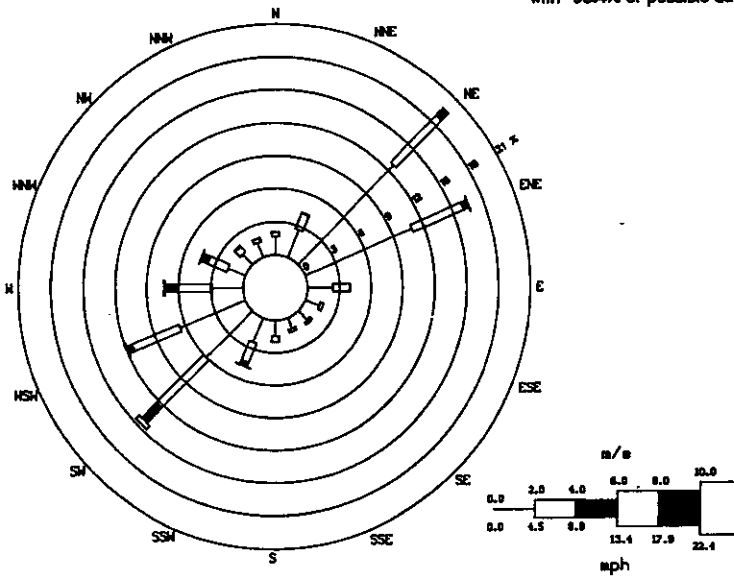


Fig. 5.7. Wind rose for ORNL tower MT2 (@30 m) for 1994.

WIND ROSE for ORNL tower MT2 (@100m) for 1994

with 98.3% of possible data

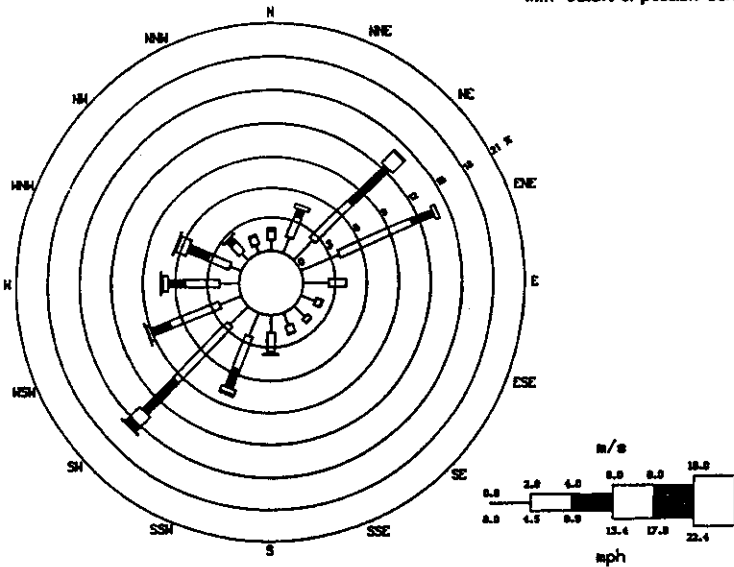


Fig. 5.8. Wind rose for ORNL tower MT2 (@100 m) for 1994.

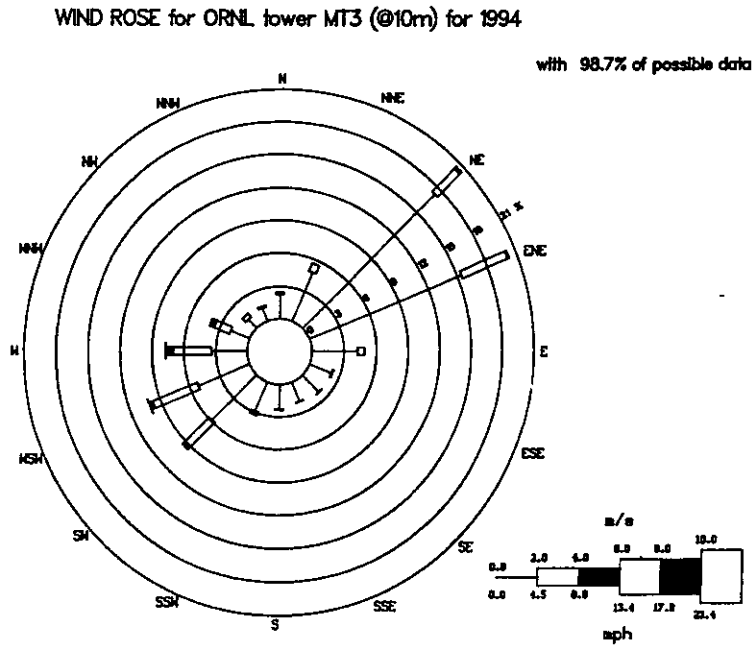


Fig. 5.9. Wind rose for ORNL tower MT3 (@10 m) for 1994.

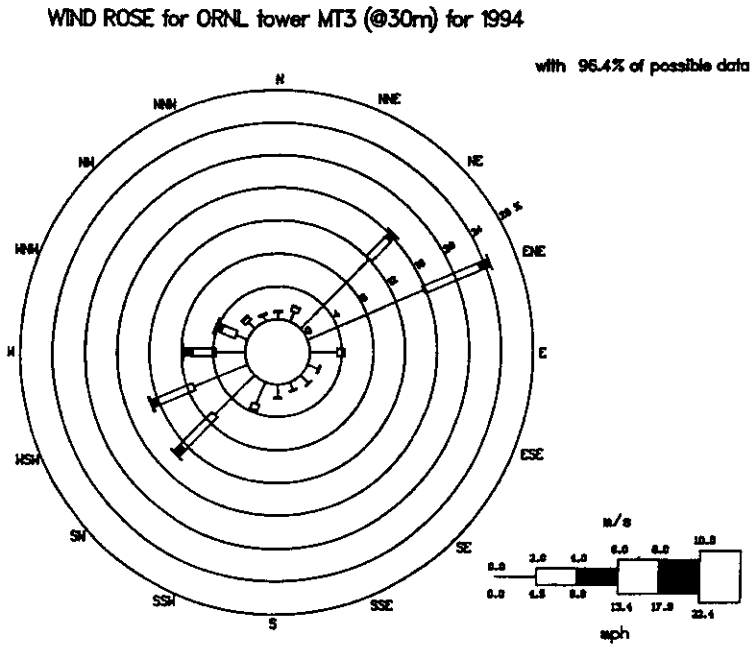


Fig. 5.10. Wind rose for ORNL tower MT3 (@30 m) for 1994.

WIND ROSE for ORNL tower MT4 (@10m) for 1994

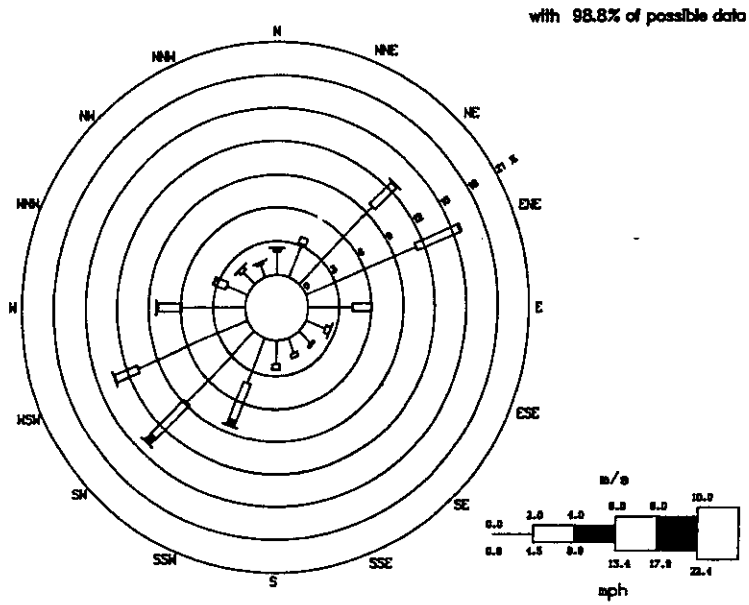


Fig. 5.11. Wind rose for ORNL tower MT4 (@10 m) for 1994.

WIND ROSE for ORNL tower MT4 (@30m) for 1994

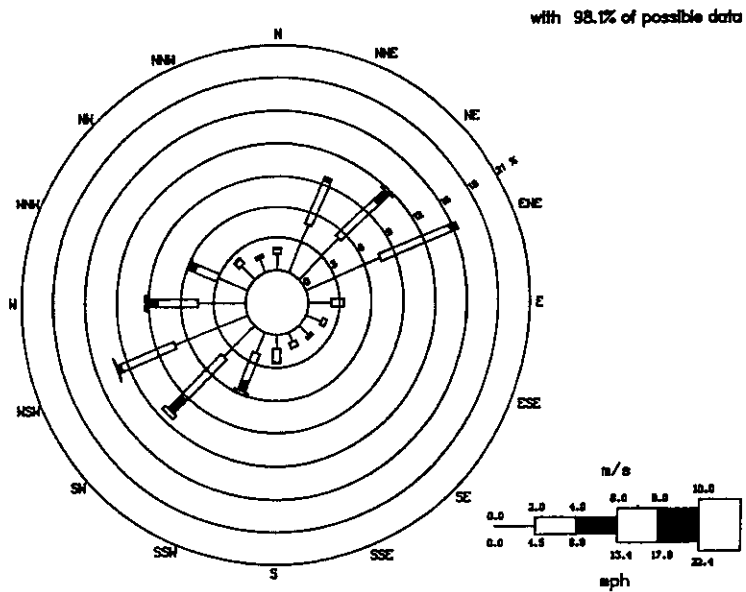


Fig. 5.12. Wind rose for ORNL tower MT4 (@30 m) for 1994.

WIND ROSE for K-25 tower MT1 (@10m) for 1994

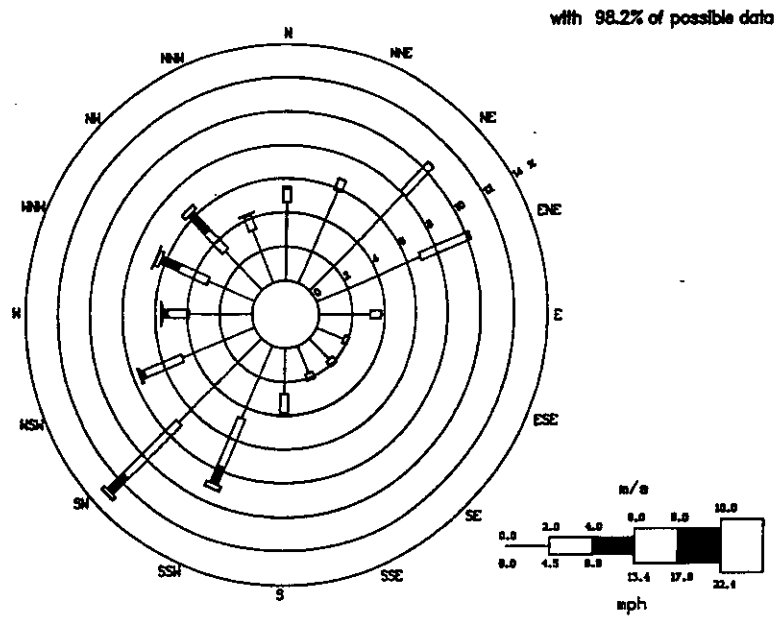


Fig. 5.13. Wind rose for K-25 tower MT1 (@10 m) for 1994.

WIND ROSE for K-25 tower MT1 (@60m) for 1994

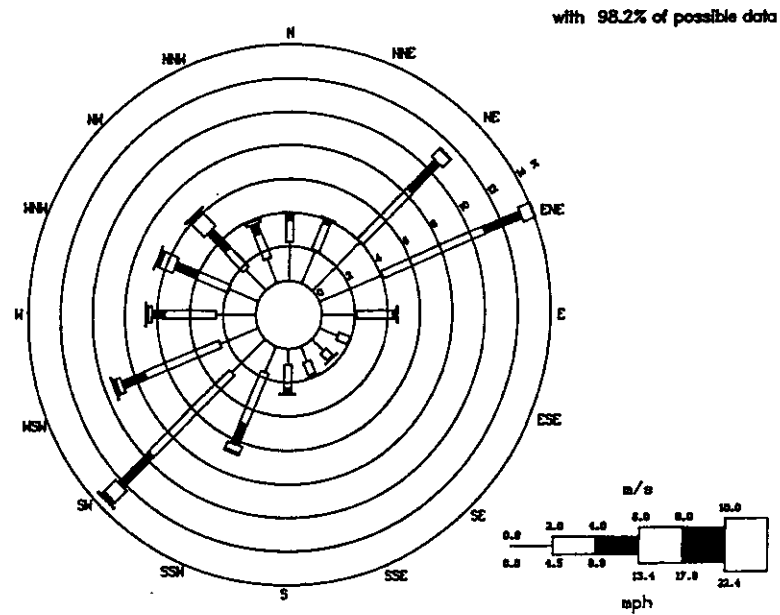


Fig. 5.14. Wind rose for K-25 tower MT1 (@60 m) for 1994.

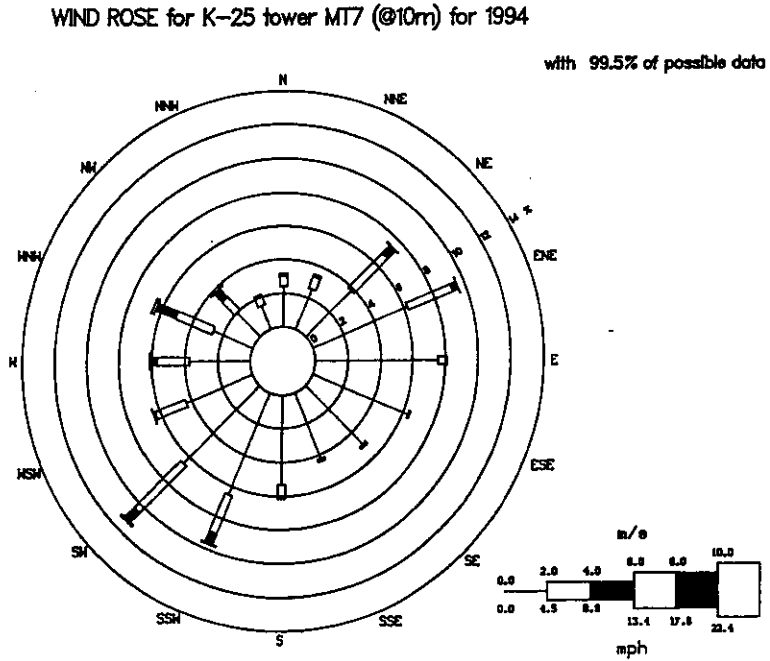


Fig. 5.15. Wind rose for K-25 tower MT7 (@10 m) for 1994.

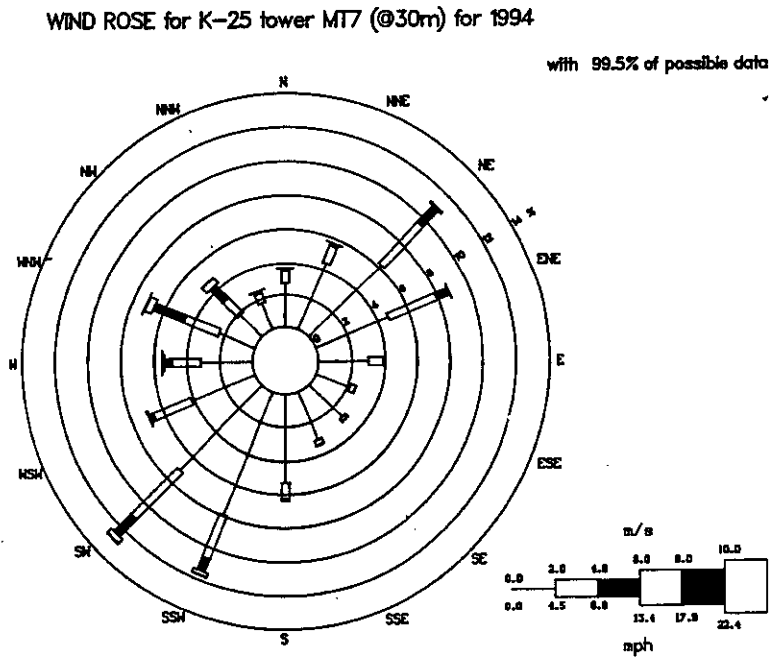


Fig. 5.16. Wind rose for K-25 tower MT7 (@30 m) for 1994.

Table 5.21. ORR high-volume station concentrations ($\mu\text{Ci}/\text{mL}$)^a

Parameter	Station 35				Station 37			
	Min	Max	Av	Standard error	Min	Max	Av	Standard error
²⁴¹ Am	0	4.53E-03	1.10E-03	5.94E-04	2.76E-04	3.31E-03	1.59E-03	4.69E-04
⁷ Be	4.88E+01	1.02E+02	7.99E+01	6.09E+00	5.20E+01	9.42E+01	7.95E+01	6.26E+00
²⁴⁴ Cm	0	1.04E-04	1.49E-05	1.49E-05	0	3.37E-04	7.96E-05	5.29E-05
⁶⁰ Co	0	6.59E-02	2.10E-02	9.22E-03	2.09E-03	2.21E-02	1.46E-02	2.69E-03
¹³⁷ Cs	0	6.95E-02	2.72E-02	1.11E-02	0	3.56E-02	1.58E-02	5.72E-03
³ H	2.29E+03	3.00E+05	3.52E+04	2.22E-11	0	1.11E+04	4.67E+03	1.05E-12
²³⁹ Pu	0	5.17E-04	2.07E-04	9.80E-05	0	6.16E-04	1.02E-04	8.62E-05
²³⁹ Pu	0	2.71E-04	6.68E-05	4.39E-05	0	1.16E-03	1.69E-04	1.65E-04
²³⁸ Th	1.46E-04	2.39E-03	1.43E-03	3.05E-04	5.01E-04	2.56E-03	1.58E-03	2.63E-04
²³² Th	1.92E-04	4.34E-03	1.95E-03	4.74E-04	3.34E-04	2.83E-03	1.68E-03	3.09E-04
²³² Th	3.13E-04	3.52E-03	1.73E-03	4.02E-04	1.52E-04	3.63E-03	1.95E-03	4.85E-04
Total Sr	2.92E-03	2.55E-02	1.39E-02	2.87E-03	1.35E-03	3.40E-02	1.06E-02	4.61E-03
²³⁴ U	1.12E-02	6.30E-02	3.50E-02	7.80E-03	1.16E-02	6.46E-02	3.48E-02	7.71E-03
²³⁵ U	0	1.42E-02	3.75E-03	1.91E-03	4.71E-04	1.03E-02	3.48E-03	1.24E-03
²³⁸ U	8.13E-03	3.80E-02	2.37E-02	4.30E-03	5.25E-03	3.37E-02	1.87E-02	3.56E-03
²⁴¹ Am	0	3.46E-03	1.01E-03	4.42E-04	0	1.65E-03	6.42E-04	2.29E-04
⁷ Be	6.58E+01	9.81E+01	8.25E+01	4.87E+00	5.22E+01	9.65E+01	7.67E+01	5.35E+00
²⁴⁴ Cm	0	3.75E-03	6.06E-04	5.25E-04	0	1.23E-03	3.25E-04	1.66E-04
⁶⁰ Co	0	3.75E-02	9.24E-03	5.38E-03	0	4.38E-02	7.81E-03	6.10E-03
¹³⁷ Cs	0	2.95E-02	5.49E-03	4.20E-03	0	3.32E-02	1.28E-02	5.20E-03
³ H	0	3.21E+04	9.53E+03	2.54E-12	0	3.82E+04	1.11E+04	3.31E-12
²³⁹ Pu	0	4.23E-04	1.80E-04	6.33E-05	0	1.19E-03	2.48E-04	1.65E-04

Table 5.21 (continued)

Parameter	Station 35					Station 37				
	Min	Max	Av	Standard error		Min	Max	Av	Standard error	
²³⁹ Pu	0	1.62E-04	5.04E-05	2.59E-05		0	3.19E-04	1.36E-04	5.62E-05	
²³⁸ Th	3.78E-04	7.85E-03	2.71E-03	9.20E-04		1.53E-04	2.30E-03	1.27E-03	3.23E-04	
²³⁰ Th	2.31E-04	4.64E-03	2.11E-03	6.23E-04		3.16E-04	3.05E-03	1.55E-03	4.67E-04	
²³² Th	1.26E-05	5.62E-03	2.51E-03	7.02E-04		1.97E-04	2.84E-03	1.42E-03	3.62E-04	
Total Sr	0	3.01E-02	1.20E-02	4.29E-03		2.71E-03	2.47E-02	1.20E-02	3.18E-03	
²³⁴ U	1.23E-02	6.11E-02	2.88E-02	6.72E-03		8.08E-03	8.70E-02	2.70E-02	1.05E-02	
²³⁵ U	0	1.13E-02	3.57E-03	1.52E-03		6.77E-04	2.14E-02	5.15E-03	2.77E-03	
²³⁸ U	4.18E-03	2.54E-02	1.57E-02	3.02E-03		2.60E-03	1.82E-02	8.73E-03	2.01E-03	
²⁴¹ Am	0	2.29E-03	9.31E-04	2.96E-04		1.60E-04	2.82E-03	1.01E-03	3.71E-04	
⁷ Be	4.73E+01	1.04E+02	8.10E+01	6.88E+00		4.11E+01	9.83E+01	7.52E+01	7.23E+00	
²⁴⁴ Cm	0	0	0	0		0	8.88E-04	1.40E-04	1.25E-04	
⁶⁰ Co	0	7.93E-02	2.27E-02	1.08E-02		0	7.51E-02	3.25E-02	1.09E-02	
¹³⁷ Cs	0	4.65E-02	1.93E-02	5.91E-03		2.29E-03	5.46E-02	2.36E-02	7.01E-03	
¹ H	0	4.31E+04	1.01E+04	3.58E+04		0	7.09E+04	1.17E+04	5.21E-12	
²³⁹ Pu	0	4.86E-04	1.82E-04	8.11E-05		0	1.41E-03	3.54E-04	2.19E-04	
²³⁹ Pu	0	3.89E-04	6.42E-05	5.48E-05		0	6.74E-04	1.56E-04	9.46E-05	
²³⁸ Th	1.44E-03	4.29E-03	3.22E-03	3.80E-04		0	5.20E-03	2.13E-03	6.44E-04	
²³⁰ Th	1.30E-03	5.06E-03	3.27E-03	5.59E-04		2.94E-04	3.98E-03	2.05E-03	4.66E-04	
²³² Th	1.33E-03	4.76E-03	3.31E-03	5.69E-04		4.62E-04	3.77E-03	2.00E-03	4.19E-04	
Total Sr	0	2.25E-02	1.09E-02	3.87E-03		8.02E-03	8.12E-02	2.51E-02	9.84E-03	
²³⁴ U	3.38E-02	1.60E-01	8.86E-02	2.02E-02		9.40E-04	3.48E-02	1.94E-02	4.47E-03	
²³⁵ U	2.35E-03	3.13E-02	9.01E-03	3.81E-03		0	7.42E-03	1.51E-03	1.01E-03	
²³⁸ U	8.04E-03	3.27E-02	1.61E-02	3.76E-03		7.02E-03	2.40E-02	1.47E-02	2.17E-03	

Table 5.21 (continued)

Parameter	Station 35				Station 37			
	Min	Max	Av	Standard error	Min	Max	Av	Standard error
²⁴¹ Am	4.00E-04	4.27E-03	1.91E-03	5.85E-04	0	2.72E-03	1.23E-03	3.72E-04
⁷ Be	4.87E+01	9.70E+01	8.22E+01	6.37E+00	4.94E+01	1.02E+02	8.09E+01	6.88E+00
²⁴ Cm	0	4.21E-05	6.01E-06	6.01E-06	0	6.84E-04	1.73E-04	9.44E-05
⁶⁰ Co	0	5.73E-02	2.84E-02	8.37E-03	0	4.82E-02	1.29E-02	8.35E-03
¹³⁷ Cs	0	6.51E-02	2.73E-02	8.04E-03	0	3.97E-02	1.65E-02	6.35E-03
³ H	0	1.96E+04	7.16E+03	1.95E-12	0	1.73E+06	1.49E+05	1.32E-10
²³⁸ Pu	0	9.30E-04	2.33E-04	1.25E-04	0	1.45E-03	2.89E-04	2.07E-04
²³⁹ Pu	0	9.49E-04	1.82E-04	1.33E-04	0	4.79E-04	1.35E-04	8.74E-05
²³² Th	7.16E-04	5.67E-03	3.08E-03	6.73E-04	2.12E-05	4.99E-03	2.55E-03	5.60E-04
²³⁰ Th	8.21E-04	4.39E-03	2.64E-03	3.93E-04	6.35E-05	5.54E-03	2.71E-03	6.70E-04
²³³ Th	4.63E-04	4.86E-03	2.85E-03	5.66E-04	1.69E-04	4.58E-03	2.75E-03	6.10E-04
Total-Sr	1.05E-03	1.04E-01	2.27E-02	1.38E-02	0	4.74E-02	1.07E-02	6.79E-03
²³⁵ U	2.09E-02	7.21E-02	4.39E-02	6.68E-03	1.02E-02	5.45E-02	2.29E-02	5.90E-03
²³⁵ U	1.36E-03	1.82E-02	5.73E-03	2.21E-03	0	3.21E-03	1.49E-03	5.62E-04
²³⁸ U	5.56E-03	2.52E-02	1.46E-02	2.39E-03	4.87E-03	2.62E-02	1.10E-02	2.67E-03
				RAMs				
²⁴¹ Am	0	1.97E-03	7.52E-04	3.19E-04	0	1.49E-03	6.26E-04	2.31E-04
⁷ Be	6.28E+01	9.62E+01	8.12E+01	4.09E+00	5.19E+01	1.11E+02	8.50E+01	6.76E+00
²⁴ Cm	0	8.61E-04	2.39E-04	1.55E-04	0	5.69E-04	1.37E-04	8.59E-05
⁶⁰ Co	0	9.28E-02	2.57E-02	1.39E-02	0	5.19E-02	1.59E-02	7.24E-03
¹³⁷ Cs	2.04E+02	3.29E+04	6.32E+03	2.42E-12	3.64E+02	2.89E+04	7.37E+03	2.26E-12
³ H	0	6.89E-02	1.79E-02	9.42E-03	0	3.07E-02	1.57E-02	4.47E-03
²³⁸ Pu	0	1.90E-03	3.53E-04	2.63E-04	0	6.40E-04	2.17E-04	1.01E-04

Table 5.21 (continued)

Parameter	Station 35				Station 37			
	Min	Max	Av	Standard error	Min	Max	Av	Standard error
²³⁹ Pu	0	3.93E-04	5.61E-05	5.61E-05	0	1.89E-04	2.71E-05	2.71E-05
²³⁸ Th	2.11E-05	3.96E-03	1.84E-03	4.91E-04	3.55E-04	4.33E-03	2.08E-03	5.21E-04
²³⁰ Th	6.34E-05	3.14E-03	1.82E-03	3.62E-04	3.76E-04	4.60E-03	2.53E-03	6.85E-04
²³² Th	1.69E-04	3.93E-03	1.93E-03	4.56E-04	2.09E-05	3.79E-03	2.20E-03	4.71E-04
Total Sr	0	1.81E-01	4.01E-02	2.39E-02	0	1.16E-02	6.08E-03	1.91E-03
²³⁵ U	4.13E-03	2.14E-02	1.03E-02	2.28E-03	4.42E-03	5.10E-02	1.60E-02	6.03E-03
²³⁸ U	1.09E-04	3.64E-03	1.65E-03	5.38E-04	2.25E-04	9.88E-03	2.42E-03	1.29E-03
²³⁴ U	1.33E-03	1.07E-02	5.89E-03	1.24E-03	3.28E-03	1.07E-02	6.30E-03	1.11E-03

²³⁵U = 3.75E+04 Bq.

Table 5.22. Total suspended particulate concentrations in air at the Y-12 Plant, 1994 ($\mu\text{g}/\text{m}^3$)^a

Date	First Quarter		Second Quarter		Third Quarter		Fourth Quarter				
	East	West	Date	East	West	Date	East	West			
1/2	19.95 ^c	17.52 ^c	4/2	26.81 ^c	25.33	7/1	148.49 ^c	26.78	10/5	60.66	b
1/8	b	10.39	4/8	29.30 ^c	25.38	7/7	43.20	16.43	10/11	37.14	b
1/14	11.48 ^c	10.09	4/14	42.71	38.88	7/13	18.51	16.41	10/17	42.89	b
1/20	b	b	4/20	114.57	73.95	7/19	27.13 ^c	26.65	10/23	24.73	b
1/26	36.31	24.19 ^c	4/26	99.43	63.54	7/25	48.89	b	10/29	36.32	b
2/1	30.81	10.45	5/2	78.83	31.00	7/31	42.15	b	11/4	55.06	b
2/7	29.40	25.38	5/8	25.06	b	8/6	33.21	b	11/10	38.16	b
2/13	16.70	6.30	5/14	47.23	40.34	8/12	62.52	b	11/16	57.19	b
2/19	26.29	18.49	5/20	56.05	32.30	8/18	28.63	b	11/22	42.34	b
2/25	37.89	b	5/26	50.51	28.86 ^c	8/24	38.58 ^c	b	11/28	b	b
3/3	22.11	15.21	6/1	54.46	31.74 ^c	8/30	50.79	b	12/4	b	b
3/9	16.24	11.30	6/7	27.98	18.02	9/5	34.46	b	12/10	b	b
3/15	47.81	21.92	6/13	46.35	26.36	9/11	48.13	b	12/16	b	b
3/21	28.80 ^c	29.48	6/19	32.46	24.21	9/17	22.72	b	12/22	b	b
3/27	6.95	5.63	6/25	23.70	19.50	9/23	34.34	b	12/28	b	b
						9/29	39.32	b			

^aPrevious Tennessee primary air quality standard = 260 $\mu\text{g}/(\text{m}^3/24 \text{ h})$. Previous Tennessee secondary air quality standard = 150 $\mu\text{g}/(\text{m}^3/24 \text{ h})$.

^bInvalid sample or no sample (downtime).

^cSampler exceeded 60 cfm.

Table 5.23. PM-10 concentrations in air at the Y-12 Plant, 1994 ($\mu\text{g}/\text{m}^3$)^a

Date	First quarter			Second quarter			Third quarter			Fourth quarter					
	West	East	East collocated	Date	West	East	East collocated	Date	West	East	East collocated	Date	West	East	East collocated
1/2	12.28	14.59	14.84	4/2	11.32	17.00	18.87	7/1	20.70	45.59	50.03	10/5	9.14	11.08	14.86
1/8	4.80	5.14	1.02	4/8	10.58	15.14	15.48	7/7	7.54	13.73	16.20	10/11	6.81	6.64	10.05
1/14	4.01	4.70	4.62	4/14	8.86	12.36	12.85	7/13	b	11.38	12.72	10/17	7.34	8.31	14.19
1/20	b	b	b	4/20	14.19	24.65	26.32	7/19	b	17.40	18.64	10/23	7.97	5.75	12.62
1/26	15.94	21.14	20.14	4/26	15.57	28.24	29.86	7/25	b	28.63	31.47	10/29	11.32	b	16.20
2/1	1.20	7.08	7.07	5/2	12.02	20.26	21.29	7/31	b	28.19	30.68	11/4	13.58	b	22.43
2/7	10.40	16.64	19.80	5/8	7.96	9.87	10.27	8/6	b	22.57	24.75	11/10	5.92	b	10.53
2/13	7.48	8.90	12.05	5/14	15.30	23.15	25.18	8/12	19.74	35.05	37.40	11/16	13.58	b	21.83
2/19	b	10.34	11.85	5/20	15.30	22.64	25.02	8/18	6.73	14.93	16.75	11/22	6.10	b	11.47
2/25	b	9.67	10.16	5/26	16.33	27.44	29.24	8/24	13.19	25.83	27.97	11/28	2.04	b	3.40
3/3	7.02	10.32	10.14	6/1	15.45	24.91	28.78	8/30	7.82	b	19.53	12/4	5.06	b	8.57
3/9	3.06	6.41	6.80	6/7	9.67	16.36	17.17	9/5	b	b	24.91	12/10	4.56	b	8.56
3/15	4.41	8.46	9.44	6/13	14.28	24.15	25.68	9/11	b	b	31.55	12/16	7.23	b	13.28
3/21	12.22	19.03	20.12	6/19	14.05	20.95	22.55	9/17	b	b	12.74	12/22	6.10	b	8.87
3/27	1.90	3.61	3.94	6/25	12.87	18.87	21.73	9/23	15.23	11.51	22.66	12/28	14.77	b	23.66
								9/29	7.84	8.30	13.47				

^aTennessee primary air quality standard = 150 $\mu\text{g}/(\text{m}^3/24 \text{ h})$.^bInvalid sample or no sample (down time).

Table 5.24. 1994 average monthly fluoride concentrations in ambient air at the Y-12 Plant^a
($\mu\text{g}/\text{m}^3$)

Date	Station										
	1	2	3	4	5	6	7	8	9	10	11
January	b	0.0102	0.0089	<0.0075	0.0073	0.0063	<0.0088	<0.0068	<0.0061	<0.0064	<0.0074
February	b	<0.0160	<0.0075	<0.0081	<0.0074	<0.0077	<0.0091	<0.0081	<0.0076	<0.0083	<0.0083
March	b	<0.0101	<0.0091	<0.0084	<0.0084	<0.0078	<0.0087	<0.0093	<0.0083	<0.0105	<0.0076
April	b	<0.0096	<0.0078	<0.0079	<0.0072	<0.0076	<0.0088	<0.0081	<0.0074	<0.0083	<0.0080
May	b	<0.0097	<0.0088	<0.0081	<0.0077	<0.0079	<0.0085	<0.0087	<0.0077	<0.0081	<0.0087
June	b	<0.0094	<0.0082	<0.0082	<0.0076	<0.0073	<0.0081	<0.0082	<0.0081	<0.0083	<0.0080
July	b	<0.0094	<0.0091	<0.0081	<0.0078	<0.0071	<0.0080	<0.0087	<0.0077	<0.0079	<0.0079
August	b	<0.0094	<0.0079	<0.0081	<0.0085	<0.0074	<0.0090	<0.0091	<0.0081	<0.0187	<0.0078
September	b	<0.0093	<0.0083	<0.0080	<0.0073	<0.0123	<0.0079	<0.0083	<0.0073	b	<0.0076
October	b	<0.0092	<0.0079	<0.0079	<0.0072	<0.0104	<0.0075	<0.0081	<0.0074	<0.0074	<0.0076
November	b	<0.0090	<0.0078	<0.0079	<0.0075	<0.0115	b	<0.0081	<0.0073	<0.0072	<0.0076
December	b	<0.0118	<0.0105	<0.0082	<0.0081	<0.0130	b	<0.0090	<0.0084	<0.0076	<0.0083

^aTennessee standard for 30-day average = 1.2 $\mu\text{g}/\text{m}^3$.

^bNo sample or downtime.

Table 5.25. 1994 average monthly total uranium concentrations in ambient air at the Y-12 Plant ($\mu\text{g}/\text{m}^3$)

Date	Station												
	1	2	3	4	5	6	7	8	9	10	11	12	
January	a	0.00003	<0.00003	0.00004	0.00003	<0.00003	0.00004	0.00006	0.00003	0.00004	0.00003	0.00004	0.00004
February	a	0.00004	<0.00005	0.00008	0.00008	<0.00007	0.00005	0.00006	0.00012	0.00005	0.00005	0.00005	0.00009
March	a	0.00005	0.00005	0.00008	0.00008	<0.00006	0.00005	0.00012	0.00006	0.00004	0.00005	0.00005	0.00008
April	a	0.00006	0.00006	0.00012	0.00012	0.00009	0.00006	0.00006	0.00003	0.00003	0.00003	0.00003	0.00006
May	a	0.00005	0.00005	0.00012	0.00012	0.00009	0.00008	0.00011	0.00005	0.00004	0.00004	0.00004	0.00005
June	a	0.00004	0.00006	0.00009	0.00009	0.00006	0.00007	0.00006	0.00004	0.00004	0.00003	0.00003	0.00005
July	a	0.00004	0.00007	0.00012	0.00012	<0.00003	0.00007	0.00005	0.00004	0.00003	0.00003	0.00003	0.00003
August	a	0.00005	<0.00004	0.00006	0.00006	<0.00002	0.00008	0.00005	0.00004	0.00005	0.00002	0.00002	0.00005
September	a	0.00003	0.00005	0.00005	0.00005	0.00005	0.00008	0.00013	0.00007	0.00008	0.00004	0.00004	0.00004
October	a	0.00014	<0.00005	0.00007	0.00007	0.00004	0.00006	0.00007	0.00004	0.00003	0.00004	0.00004	0.00006
November	a	0.00005	0.00008	0.00009	0.00009	0.00008	0.00011	0.00011	0.00007	0.00006	0.00005	0.00005	0.00006
December	a	0.00004	<0.00004	0.00048	0.00048	<0.00004	0.00005	0.00007	0.00005	0.00006	0.00004	0.00004	0.00004

^aInvalid sample or no sample (downtime).

Table 5.26. 1994 monthly average percentage of ²³⁵U in total uranium in ambient air, Y-12 Plant

Date	Station												
	1	2	3	4	5	6	7	8	9	10	11	12	
January	a	3.2	8.9	16.0	11.9	3.0	b	b	2.3	1.2	2.3	2.3	5.6
February	a	2.2	5.4	7.4	3.1	3.6	b	2.0	1.7	1.3	2.4	2.4	0.9
March	a	9.4	14.6	13.2	8.1	3.1	4.3	2.0	5.3	6.6	9.4	9.4	4.2
April	a	6.5	6.1	7.5	13.2	3.0	2.5	5.3	5.8	2.0	2.0	2.0	2.5
May	a	3.1	5.5	2.4	7.5	2.8	3.3	4.1	6.2	1.8	1.9	1.9	1.2
June	a	2.4	3.9	2.6	6.0	2.6	1.8	2.9	2.3	2.0	1.6	1.6	1.8
July	a	3.5	9.7	3.1	8.7	3.3	b	1.1	1.2	6.0	0.7	0.7	1.9
August	a	2.2	5.1	5.4	13.2	b	4.9	2.6	2.4	5.8	3.3	3.3	3.1
September	a	1.5	3.1	3.1	5.8	4.8	8.1	2.2	3.3	1.4	1.9	1.9	1.4
October	a	1.5	2.4	1.3	3.7	3.2	2.3	1.4	1.7	1.7	1.0	1.0	1.0
November	a	2.0	5.2	2.8	5.3	3.8	2.5	1.5	2.3	2.2	1.3	1.3	1.4
December	a	1.5	5.8	1.7	7.4	3.2	5.1	2.4	1.9	1.8	1.2	1.2	1.4

^aInvalid sample or no sample (downtime).

^bNot analyzed. Total U concentration for these samples were less than detectable.

Table 5.27. 1994 total suspended particulates in air at the Y-12 Plant

Date	Quarter											
	1			2			3			4		
	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date
East	West		East	West		East	West		East	West		
1/2	19.95 ^b	17.52 ^b	4/2	26.81 ^b	25.33	7/1	148.49 ^b	26.78	10/5	60.66	c	
1/8	c	10.39	4/8	29.30 ^b	25.38	7/7	43.20	16.43	10/11	37.14	c	
1/14	11.48 ^b	10.09	4/14	42.71	38.88	7/13	18.51	16.41	10/17	42.89	c	
1/20	b	c	4/20	114.57	73.95	7/19	27.13 ^b	26.65	10/23	24.73	c	
1/26	36.31	24.19 ^b	4/26	99.43	63.54	7/25	48.89	c	10/29	36.32	c	
2/1	30.81	10.45	5/2	78.83	31.00	7/31	42.15	c	11/4	55.06	c	
2/7	29.40	25.38	5/8	25.06	c	8/6	33.21	c	11/10	38.16	c	
2/13	16.70	6.30	5/14	47.23	40.34	8/12	62.52	c	11/16	57.19	c	
2/19	26.29	18.49	5/20	56.05	32.30	8/18	28.63	c	11/22	42.34	c	
2/25	37.89	c	5/26	50.51	28.86 ^b	8/24	38.58 ^b	c	11/28	c	c	
3/3	22.11	15.21	6/1	54.46	31.74 ^b	8/30	50.79	c	12/4	c	c	
3/9	16.24	11.30	6/7	27.98	18.02	9/5	34.46	c	12/10	c	c	
3/15	47.81	21.92	6/13	46.35	26.36	9/11	48.13	c	12/16	c	c	
3/21	28.80 ^b	29.48	6/19	32.46	24.21	9/17	22.72	c	12/22	c	c	
3/27	6.95	5.63	6/25	23.70	19.50	9/23	34.34	c	12/28	c	c	
						9/29	39.32	c				

^aPrevious Tennessee primary air quality standards = 260 $\mu\text{g}/(\text{m}^3/24 \text{ h})$. Previous Tennessee secondary air quality standard = 150 $\mu\text{g}/(\text{m}^3/24 \text{ h})$.

^bSampler exceeded 60 cfm.

^cInvalid samples or no sample (downtime).

Table 5.28. 1994 PM-10 concentrations in air at the Y-12 Plant

Date	Quarter											
	1			2			3			4		
	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date	Concentration ($\mu\text{g}/\text{m}^3$) ^a		Date
East	West	East collocated	East	West	East collocated	East	West	East collocated	East	West	East collocated	
1/2	12.28	14.59	14.84	11.32	17.00	18.87	20.70	45.59	50.03	9.14	11.08	14.86
1/8	4.80	5.14	1.02	10.58	15.14	15.48	7.54	13.73	16.20	6.81	6.64	10.05
1/14	4.01	4.70	4.62	8.86	12.36	12.85	b	11.38	12.72	7.34	8.31	14.19
1/20	b	b	b	14.19	24.65	26.32	b	17.40	18.64	7.97	5.75	12.62
1/26	15.94	21.14	20.14	15.57	28.24	29.86	b	28.63	31.47	11.32	b	16.20
2/1	1.20	7.08	7.07	12.02	20.26	21.29	b	28.19	30.68	13.58	b	22.43
2/7	10.40	16.64	19.80	7.96	9.87	10.27	b	22.57	24.75	5.92	b	10.53
2/13	7.48	8.90	12.05	15.30	23.15	25.18	19.74	35.05	37.40	13.58	b	21.83
2/19	b	10.34	11.85	15.30	22.64	25.02	6.73	14.93	16.75	6.10	b	11.47
2/25	b	9.67	10.16	16.33	27.44	29.24	13.19	25.83	27.97	2.04	b	3.40
3/3	7.02	10.32	10.14	15.45	24.91	28.78	7.82	b	19.53	5.06	b	8.57
3/9	3.06	6.41	6.80	9.67	16.36	17.17	b	b	24.91	4.56	b	8.56
3/15	4.41	8.46	9.44	14.28	24.15	25.68	b	b	31.55	7.23	b	13.28
3/21	12.22	19.03	20.12	14.05	20.95	22.55	b	b	12.74	6.10	b	8.87
3/27	1.90	3.61	3.94	12.87	18.87	21.73	15.23	11.51	22.66	14.77	b	23.66
							7.84	8.30	13.47			

^aTennessee primary air quality standards = 150 $\mu\text{g}/(\text{m}^3/24 \text{ h})$.

^bInvalid samples or no sample (downtime).

Table 5.29. ORNL radionuclide concentrations in air, 1994

Determination	No. detected/ No. sampled ^b	Concentration (10 ⁻¹⁵ $\mu\text{Ci}/\text{mL}$) ^a			Standard error	DCG (inhalation)	DCG %	DCG % ^c (round off)
		Min	Max	Av				
²⁴¹ Am	1/4	0	6.70E-03	1.68E-03	1.68E-03	2.00E-14	0.008375	0.00838
⁷ Be	4/4	2.24E+01	3.50E+01	2.82E+01	2.63E+00	5.00E-08	0.00005634	0.00006
²⁴⁴ Cm	0/4	0	4.95E-03	1.24E-03	1.24E-03	4.00E-14	0.0030925	0.00309
⁶⁰ Co	0/4	0	6.65E-02	3.93E-02	1.42E-02	4.00E-10	9.8275E-06	0
¹³⁷ Cs	0/4	1.03E-02	4.91E-02	3.00E-02	1.03E-02	4.00E-10	7.4975E-06	0
³ H	13/15	5.39E+03	5.50E+05	8.42E+04	3.75E+04	1.00E-07	0.08415	0.08415
¹³¹ I	4/97	0	1.76E+01	1.86E+00	0.3034	4.00E-10	0.000465	0.00046
¹³¹ I	4/97	0	1.66E+01	2.29E+00	0.3521	2.00E-09	0.0001145	0.00011
¹³¹ I	3/97	0	6.78E+01	9.16E+00	1.2663	1.00E-08	0.0000916	0.00009
²¹² Pb	4/11	5.26E+00	3.05E+02	6.10E+01	28.4617	8.00E-11	0.07625	0.07625
²³⁸ Pu	0/4	0	2.80E-04	9.57E-05	6.60E-05	3.00E-14	0.00031887	0.00032
²³⁸ Pu	0/4	0	1.86E-04	4.66E-05	4.66E-05	2.00E-14	0.000233	0.00023
²³² Th	4/4	4.32E-03	2.10E-02	1.08E-02	3.60E-03	5.00E-14	0.02168	0.02168
²³² Th	4/4	7.46E-03	1.75E-02	1.18E-02	2.28E-03	4.00E-14	0.0295	0.0295
²³² Th	4/4	4.57E-03	1.63E-02	9.12E-03	2.72E-03	7.00E-15	0.13032857	0.13033
Total Sr	1/4	0	2.78E-01	7.79E-02	6.72E-02	9.00E-12	0.00086533	0.00086
²³⁵ U	4/4	4.32E-02	6.18E-02	5.19E-02	4.64E-03	9.00E-14	0.0576111	0.05761
²³⁵ U	4/4	1.77E-03	9.48E-03	4.90E-03	1.65E-03	1.00E-13	0.004904	0.0049
²³⁸ U	4/4	2.26E-02	3.09E-02	2.78E-02	1.97E-03	1.00E-13	0.02776	0.02776

^a1 $\mu\text{Ci} = 3.75\text{E}+04$ Bq.^bStatistically significant at 95% level of confidence.^cThe average is divided by the derived concentration guide (DCG) for inhalation of that isotope, multiplied by 100, and presented in the table as the percentage of the DCG.

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Table 5.30. 1994 sampling and analysis plan for ORNL reference surface waters:
Melton Hill Dam and White Oak Creek headwaters

Parameter	Collection frequency	Sample type	Analysis frequency
Anions			
Fluoride	Monthly	Flow proportional composite	Monthly
Nitrate, as N	Monthly	Flow proportional composite	Monthly
Sulfate, as SO ₄	Monthly	Flow proportional composite	Monthly
Field Measurements			
Conductivity	Monthly	Grab, instant read	Monthly
Dissolved oxygen	Monthly	Grab, instant read	Monthly
pH	Monthly	Grab, instant read	Monthly
Temperature	Monthly	Grab, instant read	Monthly
Turbidity	Monthly	Grab, instant read	Monthly
Metals			
Aluminum	Monthly	Flow proportional composite	Monthly
Arsenic	Monthly	Flow proportional composite	Monthly
Cadmium	Monthly	Flow proportional composite	Monthly
Chromium	Monthly	Flow proportional composite	Monthly
Copper	Monthly	Flow proportional composite	Monthly
Iron	Monthly	Flow proportional composite	Monthly
Lead	Monthly	Flow proportional composite	Monthly
Manganese	Monthly	Flow proportional composite	Monthly
Nickel	Monthly	Flow proportional composite	Monthly
Phosphorus	Monthly	Flow proportional composite	Monthly
Silver	Monthly	Flow proportional composite	Monthly
Zinc	Monthly	Flow proportional composite	Monthly
Others			
Oil and grease	Monthly	Grab	Monthly
Total dissolved solids	Monthly	Grab	Monthly
Total organic carbon	Monthly	Grab	Monthly
Total suspended solids	Monthly	Flow proportional composite	Monthly

Table 5.31. 1994 analyses for ORNL reference surface waters

Parameter	Number detected/ number total	Concentration (mg/L)			Standard error ^c	DWS ^d	Percent of DWS ^e
		Max ^a	Min ^a	Av ^b			
<i>Melton Hill Dam</i>							
Anions							
Fluoride	11/12	0.43	<0.10	-0.17	0.032	4	4.2
Nitrate, as N	11/12	2.7	0.22	-0.81	0.19	10	8.1
Sulfate, as SO ₄	12/12	24	16	19	0.67	250	7.5
Field Measurements							
Conductivity (mS/cm)	12/12	0.31	0.20	0.25	0.011	<i>f</i>	<i>f</i>
Dissolved oxygen (ppm)	12/12	13	6.6	10	0.46	<i>f</i>	<i>f</i>
pH (SU)	12/12	8.6	7.0	7.8	0.11	<i>f</i>	<i>f</i>
Temperature (°C)	12/12	21	6.3	14	1.6	<i>f</i>	<i>f</i>
Turbidity (NTU)	12/12	23	7.0	13	1.7	<i>f</i>	<i>f</i>
Metals							
Aluminum, total	10/12	2.0	<0.050	-0.33	0.15	0.2	160
Arsenic, total	0/12	<0.050	<0.050	-0.050	0	0.05	100
Cadmium, total	0/12	<0.0050	<0.0050	-0.0050	0	0.01	50
Chromium, total	5/12	0.0098	<0.0040	-0.0057	0.00068	0.05	11
Copper, total	1/12	0.0074	<0.0070	-0.0070	0.000033	1.3	0.54
Iron, total	12/12	2.3	0.078	0.33	0.18	0.3	110
Lead, total	0/12	<0.050	<0.050	-0.050	0	0.05	100
Manganese, total	11/12	0.56	<0.0010	-0.076	0.044	0.05	150
Nickel, total	0/12	<0.010	<0.010	-0.010	0	0.1	10
Phosphorus, total	7/12	0.48	<0.20	-0.28	0.026	<i>f</i>	<i>f</i>
Silver, total	0/12	<0.0050	<0.0050	-0.0050	0	0.05	10
Zinc, total	4/12	0.024	<0.0050	-0.0078	0.0019	5	0.16
Others							
Oil and grease ^f	2/12	<5.0	<2.0	-2.8	0.37	<i>f</i>	<i>f</i>
Total dissolved solids	12/12	150	100	130	4.1	500	27
Total organic carbon	12/12	2.3	1.3	1.8	0.080	<i>f</i>	<i>f</i>
Total suspended solids	4/12	64	<5.0	-11	4.9	<i>f</i>	<i>f</i>
<i>White Oak Creek Headwaters</i>							
Anions							
Fluoride	5/12	0.91	<0.10	-0.19	0.066	4	4.7
Nitrate, as N ^h	11/12	<1.0	0.10	-0.22	0.073	10	2.2
Sulfate, as SO ₄	12/12	4.4	1.9	2.8	0.24	250	1.1
Field Measurements							
Conductivity (mS/cm)	12/12	0.32	0.083	0.20	0.025	<i>f</i>	<i>f</i>
Dissolved oxygen (ppm)	12/12	14	8.0	11	0.44	<i>f</i>	<i>f</i>

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Table 5.31 (continued)

Parameter	Number detected/ number total	Concentration (mg/L)			Standard error ^c	DWS ^d	Percent of DWS ^e
		Max ^a	Min ^a	Av ^b			
pH (SU)	12/12	8.4	7.1	7.6	0.096	<i>f</i>	<i>f</i>
Temperature (°C)	12/12	18	7.8	13	1.0	<i>f</i>	<i>f</i>
Turbidity (NTU)	11/12	75	0	15	5.6	<i>f</i>	<i>f</i>
Metals							
Aluminum, total	9/12	1.7	<0.050	~0.36	0.14	0.2	180
Arsenic, total	0/12	<0.050	<0.050	~0.050	0	0.05	100
Cadmium, total	0/12	<0.0050	<0.0050	~0.0050	0	0.01	50
Chromium, total	6/12	0.020	<0.0040	~0.0079	0.0017	0.05	16
Copper, total	1/12	0.014	<0.0070	~0.0076	0.00058	1.3	0.58
Iron, total	12/12	1.5	0.061	0.36	0.13	0.3	120
Lead, total	0/12	<0.050	<0.050	~0.050	0	0.05	100
Manganese, total	12/12	0.22	0.0068	0.055	0.018	0.05	110
Nickel, total	0/12	<0.010	<0.010	~0.010	0	0.1	10
Phosphorus, total	7/12	0.39	<0.20	~0.25	0.019	<i>f</i>	<i>f</i>
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0	0.05	10
Zinc, total	7/12	0.031	<0.0050	~0.0089	0.0021	5	0.18
Others							
Oil and grease ^f	1/12	<5.0	<2.0	~2.5	0.34	<i>f</i>	<i>f</i>
Total dissolved solids	12/12	140	51	100	9.4	500	21
Total organic carbon	12/12	1.8	0.63	1.1	0.11	<i>f</i>	<i>f</i>
Total suspended solids	9/12	140	<5.0	~30	13	<i>f</i>	<i>f</i>

^aPrefix "<" indicates the value of a parameter (excluding organics) was not quantifiable at the analytical detection limit.

^bA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^cStandard error of the mean.

^dDrinking water standards. From 40 CFR Parts 141 and 143, and the Tennessee General Water Quality Criteria for Domestic Water Supply.

^eAverage concentration as a percentage of the drinking water standards, calculated when a reference exists and the parameter is a contaminant.

^fNot applicable.

^gNote that the analytical detection limit for oil and grease was 2 mg/L for January through September. The detection limit for October through December was 5 mg/L.

^hNote that the analytical detection limit for Nitrate, as N was 1 mg/L for January. The detection limit for February through December was 0.1 mg/L.

Table 5.32. 1994 EMP surface water sampling locations

BCK 0.6	Bear Creek downstream from all DOE inputs
BCK 9.4	Bear Creek downstream from the Y-12 Plant burial grounds
CRK 16	Clinch River downstream from all DOE inputs
CRK 23	Water supply intake for the K-25 Site
CRK 32	Clinch River downstream from ORNL
CRK 58	Water supply intake for Knox County
CRK 66	Melton Hill Reservoir above City of Oak Ridge water intake
CRK 80	Melton Hill Reservoir—Oak Ridge Marina
CRK 84	Melton Hill Reservoir above all DOE inputs—Anderson County Filtration Plant
EFK 5.4	East Fork Poplar Creek downstream from floodplain
EFK 23.4	East Fork Poplar Creek downstream from the Y-12 Plant
HC	Hinds Creek (reference site for East Fork Poplar Creek)
MEK 0.2	Melton Branch downstream from ORNL
MEK 2.1	Melton Branch upstream from ORNL
MIK 0.1	Mitchell Branch downstream from the K-25 Site
MIK 1.4	Mitchell Branch upstream from the K-25 Site
PCK 2.2	Poplar Creek downstream from the K-25 Site
PCK 22	Poplar Creek upstream from the K-25 Site and East Fork Poplar Creek
TRK 915	Water supply intake for City of Kingston
WCK 1.0	White Oak Lake at White Oak Dam
WCK 2.6	White Oak Creek downstream from ORNL
WCK 6.8	White Oak Creek upstream from ORNL

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Table 5.33. 1994 sampling and analysis plan parameters for EMP surface water locations^a

<i>Anions</i>	<i>Others</i>	<i>Volatile organics</i>
Chloride	Alkalinity	1,1,1-Trichloroethane
Fluoride	Ammonia, as N	1,1,2,2-Tetrachloroethane
Nitrate	Biochemical oxygen demand	1,1,2-Trichloroethane
Sulfate, as SO ₄	Chemical oxygen demand	1,1-Dichloroethane
	Color	1,1-Dichloroethene
<i>Metals</i>	Cyanide, total	1,2-Dichloroethane
Aluminum	Total dissolved solids	1,2-Dichloroethene, total
Antimony	Total hardness	1,2-Dichloropropane
Arsenic	Total suspended solids	2-Butanone
Barium		2-Hexanone
Beryllium	<i>Radionuclides</i>	4-Methyl-2-pentanone
Cadmium	⁶⁰ Co	Acetone
Calcium	¹³⁷ Cs	Benzene
Chromium	Gross alpha ^b	Bromodichloromethane
Cobalt	Gross beta	Bromoform
Copper	³ H	Bromomethane
Iron	⁹⁹ Tc	Carbon disulfide
Lead	Total uranium	Carbon tetrachloride
Magnesium	Total rad Sr	Chlorobenzene
Manganese		Chloroethane
Mercury	<i>Field measurements</i>	Chloroform
Nickel	Chlorine, total residual	Chloromethane
Phosphorus	Conductivity	cis-1,3-Dichloropropene
Potassium	Dissolved oxygen	Dibromochloromethane
Selenium	pH	Ethylbenzene
Silver	Temperature	Methylene chloride
Sodium		Styrene
Thallium		Tetrachloroethene
Uranium		Toluene
Vanadium		trans-1,3-Dichloropropene
Zinc		Trichloroethene
		Vinyl chloride
		Xylene, total

^aSample type: Field Measurements—Grab, instant read: anions, metals, radionuclides, others, and volatile organics. Collection frequency: bimonthly. Analysis frequency: bimonthly.

^bIf Gross alpha > 3 pCi/L (20% of EPA drinking water limit), report ²³⁴U, ²³⁵U, and ²³⁸U from the Total Uranium sample results and do isotopic analysis for ²²⁸Th, ²³⁰Th, ²³²Th, ²³⁸Pu, ²³⁹Pu, ²³⁷Np, ²⁴¹Am, and ²⁴⁴Cm, as needed to identify cause.

Table 5.34. 1994 EMP radionuclide concentrations at ORNL category outfalls

Radionuclide	No. detected/ No. total	Concentration (pCi/L)				DCG ^d	Percentage of DCG ^e
		Max ^a	Min ^a	Av ^b	Standard error ^c		
<i>Category I outfalls</i>							
⁶⁰ Co	1/4	5.1*	1.1	2.7*	0.94	5,000	0.054
¹³⁷ Cs	0/4	4.3	0.27	2.0*	0.86	3,000	0.068
³ H	4/4	1,800*	1,600*	1,700*	40	2,000,000	0.086
<i>Category II outfalls</i>							
⁶⁰ Co	21/103	9.2*	-16	1.6*	0.31	5,000	0.032
¹³⁷ Cs	10/103	300*	-3.5	10*	4.6	3,000	0.34
³ H	67/103	780,000*	-490	9,600	7,600	2,000,000	<i>f</i>

^aIndividual radionuclide concentrations significantly greater than zero are identified by an *.

^bAverage radionuclide concentrations significantly greater than zero are identified by an *.

^cStandard error of the mean.

^dDerived concentration guide for ingestion of water. From DOE Order 5400.5.

^eAverage concentration as a percentage of the derived concentration guide (DCG), calculated only when a DCG exists and the average concentration is significantly greater than zero.

^fNot applicable.

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Table 5.35. 1994 Surface water analyses at EMP surface water locations^a

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
<i>Bear Creek downstream from all possible DOE inputs (BCK 0.6)</i>						
Anions (mg/L)						
Chloride	6/6	29	4.8	10	3.8	<i>f</i>
Fluoride	6/6	0.35	0.18	0.23	0.024	<i>f</i>
Nitrate	6/6	22	5.9	12	2.2	<i>f</i>
Sulfate, as SO ₄	6/6	35	16	24	3.4	<i>f</i>
Field measurements						
Conductivity (mS/cm)	6/6	0.44	0.22	0.32	0.033	<i>f</i>
Dissolved oxygen (ppm)	6/6	11	8.3	9.9	0.40	5
pH (SU)	6/6	8.8	7.5	8.0	0.18	<i>f</i>
Temperature (°C)	6/6	20	6.2	14	2.1	<i>f</i>
Metals (mg/L)						
Aluminum, total	5/6	0.40	<0.050	~0.20	0.063	<i>f</i>
Barium, total	6/6	0.093	0.044	0.063	0.0070	<i>f</i>
Beryllium, total	1/6	0.0010	<0.0010	~0.0010	0	<i>f</i>
Calcium, total	6/6	55	31	42	3.7	<i>f</i>
Chromium, total	1/6	0.0098	<0.0040	~0.0050	0.00097	0.016
Iron, total	6/6	0.49	0.085	0.22	0.060	<i>f</i>
Magnesium, total	6/6	16	8.8	12	1.2	<i>f</i>
Manganese, total	5/6	0.032	<0.0010	~0.021	0.0046	<i>f</i>
Mercury, total	3/6	0.000098	<0.000050	~0.000069	0.0000093	0.0024
Phosphorus, total	3/6	0.44	<0.20	~0.29	0.043	<i>f</i>
Potassium, total	4/6	3.0	<2.0	~2.4	0.19	<i>f</i>
Sodium, total	6/6	11	2.9	5.4	1.2	<i>f</i>
Thallium, total	1/6	0.0056	<0.0050	~0.0051	0.00010	<i>f</i>
Uranium, total	6/6	0.038	0.016	0.024	0.0031	<i>f</i>
Vanadium, total	2/6	0.023	<0.0020	~0.0056	0.0035	<i>f</i>
Zinc, total	1/6	0.011	<0.0050	~0.0060	0.0010	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	160	85	120	13	<i>f</i>
Ammonia, as N (mg/L)	4/6	0.084	<0.030	~0.047	0.0090	<i>f</i>
Chemical oxygen demand (mg/L)	1/6	19	<5.0	~7.3	2.3	<i>f</i>
Color (CPU)	3/6	6.0	<2.0	~3.0	0.63	<i>f</i>
Total dissolved solids (mg/L)	6/6	240	110	200	21	<i>f</i>
Total hardness (mg/L)	6/6	200	110	160	17	<i>f</i>
Total suspended solids (mg/L)	2/6	10	<5.0	~5.8	0.83	<i>f</i>
Radionuclides (pCi/L)^f						
Gross alpha	6/6	11*	5.4*	8.3*	0.81	<i>f</i>
Gross beta	6/6	21*	10*	14*	1.6	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
³ H	2/6	950*	-590	170	220	f
⁹⁹ Tc	5/6	23*	0.54	13*	3.6	f
Total rad Sr	2/6	3.5*	0.027	1.7*	0.53	f
Total uranium	6/6	23*	6.2*	11*	2.5	f
²³⁴ U	6/6	8.4*	1.9*	3.8*	0.98	f
²³⁵ U	3/6	0.68*	-0.27	0.21	0.12	f
²³⁸ U	14* 6/6		4.1*	7.3*	1.5	f
Volatile organics (µg/L)						
2-Butanone	3/6	U10	J3.0	-8.7	1.1	f
Acetone	1/6	U10	J3.0	-8.8	1.2	f
<i>Bear Creek downstream from the Y-12 Plant burial grounds (BCK 9.4)</i>						
Anions (mg/L)						
Chloride	6/6	37	17	30	3.4	f
Fluoride	6/6	0.70	0.41	0.49	0.044	f
Nitrate	6/6	270	37	110	37	f
Sulfate, as SO ₄	6/6	32	23	27	1.5	f
Field measurements						
Conductivity (mS/cm)	6/6	0.86	0.28	0.54	0.084	f
Dissolved oxygen (ppm)	6/6	12	7.9	10	0.62	5
pH (SU)	6/6	8.0	7.1	7.8	0.14	f
Temperature (°C)	6/6	21	5.1	13	2.5	f
Metals (mg/L)						
Aluminum, total	4/6	0.59	<0.050	-0.22	0.087	f
Barium, total	6/6	0.18	0.087	0.12	0.017	f
Beryllium, total	1/6	0.0012	<0.0010	-0.0010	0.000033	f
Calcium, total	6/6	140	61	92	13	f
Chromium, total	1/6	0.0091	<0.0040	-0.0049	0.00085	0.016
Iron, total	4/6	0.50	<0.050	-0.22	0.074	f
Magnesium, total	6/6	24	9.5	16	2.7	f
Manganese, total	6/6	0.10	0.0049	0.033	0.014	f
Mercury, total	2/6	0.000081	<0.000050	-0.000057	0.0000052	0.0024
Nickel, total	1/6	0.011	<0.010	-0.010	0.00017	1.4
Phosphorus, total	4/6	0.39	<0.20	-0.26	0.029	f
Potassium, total	6/6	5.2	2.1	3.6	0.51	f
Sodium, total	6/6	20	8.8	16	1.7	f
Uranium, total	6/6	0.18	0.11	0.13	0.011	f
Vanadium, total	3/6	0.023	<0.0020	-0.0058	0.0034	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	240	120	170	21	f
Ammonia, as N (mg/L)	6/6	1.2	0.031	0.25	0.19	f
Chemical oxygen demand (mg/L)	3/6	13	<5.0	~6.8	1.3	f
Color (CPU)	3/6	4.0	<2.0	~3.0	0.45	f
Total dissolved solids (mg/L)	6/6	670	260	430	66	f
Total hardness (mg/L)	6/6	460	200	290	44	f
Total suspended solids (mg/L)	1/6	14	<5.0	~6.5	1.5	f
Radionuclides (pCi/L)^g						
Gross alpha	6/6	65*	30*	49*	4.7	f
Gross beta	6/6	140*	32*	73*	17	f
³ H	3/6	810*	110	450*	110	f
⁹⁹ Tc	6/6	140*	24*	80*	19	f
Total rad Sr	1/6	3.2*	-0.22	0.79	0.52	f
Total uranium	6/6	76*	51*	60*	3.5	f
²³⁴ U	6/6	25*	18*	20*	1.1	f
²³⁵ U	6/6	1.8*	0.86*	1.2*	0.15	f
²³⁸ U	6/6	49*	32*	38*	2.5	f
Volatile organics (µg/L)						
1,2-Dichloroethene, total	5/6	9.6	12.8	-4.7	1.0	f
2-Butanone	3/6	U10	12.0	-8.4	1.3	f
Tetrachloroethene	2/6	U5.0	11.2	-4.0	0.68	f
Trichloroethene	4/6	U5.0	11.3	-2.7	0.73	f
<i>Clinch River downstream from all DOE inputs (CRK 16)</i>						
Anions (mg/L)						
Chloride	6/6	4.3	2.2	3.3	0.34	f
Fluoride	5/6	0.14	<0.10	-0.11	0.0065	f
Nitrate	6/6	2.1	1.1	1.7	0.14	f
Sulfate, as SO ₄	6/6	18	11	16	0.99	f
Field measurements						
Conductivity (mS/cm)	6/6	0.28	0.16	0.23	0.016	f
Dissolved oxygen (ppm)	6/6	11	7.5	9.7	0.58	f
pH (SU)	6/6	8.6	7.5	8.0	0.15	f
Temperature (°C)	6/6	29	7.0	18	3.1	f
Metals (mg/L)						
Aluminum, total	6/6	1.7	0.16	0.77	0.26	f
Barium, total	6/6	0.25	0.026	0.069	0.036	f
Cadmium, total	1/6	0.0066	<0.0050	-0.0053	0.00027	0.01
Calcium, total	6/6	32	19	27	1.9	f

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Iron, total	6/6	1.6	0.17	0.83	0.27	<i>f</i>
Magnesium, total	6/6	8.4	5.1	7.2	0.49	<i>f</i>
Manganese, total	6/6	0.16	0.041	0.081	0.021	<i>f</i>
Mercury, total	2/6	0.00024	<0.000050	-0.000088	0.000031	0.002
Phosphorus, total	3/6	0.49	<0.20	-0.27	0.047	<i>f</i>
Potassium, total	3/6	2.5	<2.0	-2.1	0.080	<i>f</i>
Sodium, total	6/6	4.0	1.7	3.1	0.32	<i>f</i>
Uranium, total	6/6	0.00030	0.00010	0.00022	0.000031	<i>f</i>
Vanadium, total	2/6	0.0038	<0.0020	-0.0024	0.00029	<i>f</i>
Zinc, total	3/6	0.012	<0.0050	-0.0070	0.0011	<i>f</i>
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	98	58	85	6.4	<i>f</i>
Ammonia, as N (mg/L)	5/6	0.054	<0.030	-0.043	0.0036	<i>f</i>
Chemical oxygen demand (mg/L)	2/6	16	<5.0	-7.2	1.8	<i>f</i>
Color (CPU)	3/6	13	<2.0	-5.7	1.9	<i>f</i>
Total dissolved solids (mg/L)	6/6	160	77	130	11	500
Total hardness (mg/L)	6/6	150	67	110	11	<i>f</i>
Total suspended solids (mg/L)	6/6	45	7.0	20	6.6	<i>f</i>
Radionuclides (pCi/L) ^g						
⁶⁰ Co	1/6	5.4*	-6.8	0.63	1.8	<i>f</i>
¹³⁷ Cs	1/6	4.3*	-2.4	0.90	1.1	<i>f</i>
Gross alpha	2/6	2.7	0.30	1.2*	0.35	<i>f</i>
Gross beta	6/6	6.2*	1.5*	4.1*	0.75	<i>f</i>
³ H	1/6	3,000*	27	660	460	<i>f</i>
Total rad Sr	1/6	1.6*	-30	-4.2	5.1	<i>f</i>
Total uranium	5/6	1.0*	0.054	0.55*	0.13	<i>f</i>
²³⁴ U	1/1	0.51*	0.51*	0.51	<i>f</i>	<i>f</i>
²³⁵ U	1/1	0.19*	0.19*	0.19	<i>f</i>	<i>f</i>
²³⁸ U	1/1	0.32*	0.32*	0.32	<i>f</i>	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	3/6	B10	JB3.0	-8.0	1.3	<i>f</i>

Water supply intake for the K-25 Site (CRK 23)

Anions (mg/L)						
Chloride	6/6	4.2	2.5	3.3	0.24	<i>f</i>
Fluoride	5/6	0.16	<0.10	-0.12	0.0092	<i>f</i>
Nitrate	6/6	4.4	0.77	2.3	0.52	<i>f</i>
Sulfate, as SO ₄	6/6	26	16	19	1.6	<i>f</i>

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Field measurements						
Conductivity (mS/cm)	6/6	0.26	0.19	0.23	0.012	<i>f</i>
Dissolved oxygen (ppm)	6/6	12	7.9	10	0.76	<i>f</i>
pH (SU)	6/6	8.1	7.6	7.9	0.079	<i>f</i>
Temperature (°C)	6/6	24	5.7	15	2.8	<i>f</i>
Metals (mg/L)						
Aluminum, total	6/6	0.47	0.10	0.19	0.058	<i>f</i>
Barium, total	6/6	0.041	0.025	0.030	0.0024	<i>f</i>
Calcium, total	6/6	33	26	29	1.0	<i>f</i>
Iron, total	6/6	0.68	0.12	0.31	0.093	<i>f</i>
Magnesium, total	6/6	8.9	6.6	7.8	0.36	<i>f</i>
Manganese, total	6/6	0.38	0.032	0.10	0.056	<i>f</i>
Mercury, total	2/6	0.00025	<0.000050	-0.000084	0.000033	0.002
Phosphorus, total	6/6	0.48	0.20	0.28	0.044	<i>f</i>
Sodium, total	6/6	4.6	2.9	3.6	0.32	<i>f</i>
Uranium, total	5/6	0.00079	<0.00010	-0.00026	0.00011	<i>f</i>
Vanadium, total	1/6	0.0024	<0.0020	-0.0021	0.000067	<i>f</i>
Zinc, total	2/6	0.0084	<0.0050	-0.0057	0.00056	<i>f</i>
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	110	83	94	4.3	<i>f</i>
Ammonia, as N (mg/L)	4/6	0.067	<0.030	-0.044	0.0060	<i>f</i>
Chemical oxygen demand (mg/L)	3/6	7.0	<5.0	-5.5	0.34	<i>f</i>
Color (CPU)	4/6	9.0	<2.0	-4.3	1.2	<i>f</i>
Total dissolved solids (mg/L)	6/6	150	120	130	5.9	500
Total hardness (mg/L)	6/6	120	100	110	3.7	<i>f</i>
Total suspended solids (mg/L)	6/6	23	6.0	14	2.6	<i>f</i>
Radionuclides (pCi/L)^g						
Gross alpha	1/6	2.2*	0.24	0.76*	0.30	<i>f</i>
Gross beta	6/6	5.4*	2.4*	3.8*	0.51	<i>f</i>
³ H	2/6	3,800*	-140	820	610	<i>f</i>
⁹⁹ Tc	2/6	13*	-5.7	4.3	2.7	<i>f</i>
Total rad Sr	1/6	13	-0.76	2.8	2.0	<i>f</i>
Total uranium	5/6	0.81*	0.27*	0.52*	0.088	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	2/6	JB10	JB5.2	-9.2	0.80	<i>f</i>
Toluene	1/6	U5.0	J1.0	-4.3	0.67	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
<i>Clinch River downstream from ORNL (CRK 32)</i>						
Anions (mg/L)						
Chloride	6/6	4.5	2.6	3.4	0.27	f
Fluoride	5/6	0.16	<0.10	-0.13	0.0085	f
Nitrate	6/6	5.6	0.75	2.6	0.68	f
Sulfate, as SO ₄	6/6	22	16	19	1.0	f
Field measurements						
Conductivity (mS/cm)	6/6	0.28	0.19	0.24	0.014	f
Dissolved oxygen (ppm)	6/6	12	7.0	9.7	0.85	f
pH (SU)	6/6	8.0	7.6	7.8	0.070	f
Temperature (°C)	6/6	24	6.6	15	2.6	f
Metals (mg/L)						
Aluminum, total	6/6	0.32	0.060	0.15	0.037	f
Barium, total	6/6	0.046	0.025	0.033	0.0031	f
Calcium, total	6/6	34	26	29	1.2	f
Cobalt, total	1/6	0.0045	<0.0040	-0.0041	0.000083	f
Iron, total	6/6	0.44	0.15	0.21	0.046	f
Magnesium, total	6/6	9.0	6.7	7.8	0.42	f
Manganese, total	6/6	0.065	0.028	0.048	0.0055	f
Mercury, total	2/6	0.00025	<0.000050	-0.000087	0.000033	0.002
Phosphorus, total	5/6	0.47	<0.20	-0.28	0.041	f
Potassium, total	1/6	2.0	<2.0	-2.0	0	f
Sodium, total	6/6	5.1	2.9	3.7	0.40	f
Uranium, total	4/6	0.00025	<0.00010	-0.00015	0.000026	f
Vanadium, total	1/6	0.0028	<0.0020	-0.0021	0.00013	f
Zinc, total	2/6	0.029	<0.0050	-0.010	0.0039	f
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	100	83	96	3.1	f
Ammonia, as N (mg/L)	6/6	0.16	0.036	0.066	0.020	f
Chemical oxygen demand (mg/L)	3/6	6.0	<5.0	-5.3	0.21	f
Color (CPU)	3/6	7.0	<2.0	-3.2	0.83	f
Total dissolved solids (mg/L)	6/6	160	110	140	7.6	500
Total hardness (mg/L)	6/6	120	100	110	3.9	f
Total suspended solids (mg/L)	4/6	17	<5.0	-7.7	2.0	f
Radionuclides (pCi/L) ^f						
Gross alpha	4/6	3.0*	0.24	1.3*	0.39	f
Gross beta	6/6	10*	3.2*	5.6*	1.2	f
³ H	3/6	4,600*	190	1,200	700	f
⁹⁹ Tc	1/6	12	0.81	5.5*	1.8	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Total rad Sr	2/6	2.7*	-3.2	0.56	0.86	f
Total uranium	5/6	1.6*	0.22	0.59*	0.21	f
²³⁴ U	1/1	0.18*	0.18*	0.18	f	f
Volatile organics (µg/L)						
2-Butanone	3/6	U10	JB2.0	-8.1	1.3	f
<i>Water supply intake for Knox County (CRK 58)</i>						
Anions (mg/L)						
Chloride	6/6	3.9	2.6	3.2	0.21	f
Fluoride	5/6	0.14	<0.10	-0.11	0.0063	f
Nitrate	6/6	13	0.82	3.5	1.9	f
Sulfate, as SO ₄	6/6	22	14	18	1.3	f
Field measurements						
Conductivity (mS/cm)	6/6	0.28	0.19	0.23	0.015	f
Dissolved oxygen (ppm)	6/6	12	8.5	10	0.63	f
pH (SU)	6/6	8.9	7.7	8.3	0.20	f
Temperature (°C)	6/6	28	6.1	18	3.5	f
Metals (mg/L)						
Aluminum, total	5/6	1.6	<0.050	-0.41	0.25	f
Barium, total	6/6	0.032	0.024	0.029	0.0015	f
Calcium, total	6/6	33	25	29	1.2	f
Iron, total	6/6	1.4	0.052	0.44	0.22	f
Magnesium, total	6/6	9.1	6.1	7.7	0.50	f
Manganese, total	6/6	0.080	0.021	0.057	0.0099	f
Mercury, total	2/6	0.00021	<0.000050	-0.000079	0.000026	0.002
Phosphorus, total	3/6	0.48	<0.20	-0.26	0.046	f
Potassium, total	1/6	2.6	<2.0	-2.1	0.10	f
Sodium, total	6/6	4.9	2.6	3.6	0.42	f
Thallium, total	1/6	1.1	<0.0050	-0.19	0.18	f
Uranium, total	5/6	0.00023	<0.00010	-0.00015	0.000023	f
Vanadium, total	3/6	0.0035	<0.0020	-0.0026	0.00027	f
Zinc, total	1/6	0.0069	<0.0050	-0.0053	0.00032	f
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	100	73	89	4.3	f
Ammonia, as N (mg/L)	6/6	0.061	0.034	0.043	0.0041	f
Chemical oxygen demand (mg/L)	3/6	12	<5.0	-6.8	1.1	f
Color (CPU)	3/6	13	<2.0	-5.0	1.8	f
Total dissolved solids (mg/L)	6/6	150	110	130	7.0	500
Total hardness (mg/L)	6/6	120	91	110	5.2	f
Total suspended solids (mg/L)	4/6	30	<5.0	-12	4.1	f

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Radionuclides (pCi/L)^a						
⁶⁰ Co	1/6	4.1*	-5.9	1.0	1.4	<i>f</i>
Gross beta	4/6	8.6*	-1.1	3.2*	1.4	<i>f</i>
³ H	2/6	2,700*	-190	510	460	<i>f</i>
⁹⁹ Tc	1/6	20*	-1.1	4.1	3.2	<i>f</i>
Total rad Sr	2/6	24*	-0.22	4.3	4.0	<i>f</i>
Total uranium	4/6	3.5*	0.16	0.90	0.53	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	3/6	B10	JB2.0	-8.1	1.3	<i>f</i>
<i>Melton Hill Reservoir above City of Oak Ridge water intake (CRK 66)</i>						
Anions (mg/L)						
Chloride	6/6	4.1	2.5	3.1	0.24	<i>f</i>
Fluoride	5/6	0.14	<0.10	-0.11	0.0065	<i>f</i>
Nitrate	6/6	2.7	0.86	1.8	0.25	<i>f</i>
Sulfate, as SO ₄	6/6	22	15	19	1.2	<i>f</i>
Field measurements						
Conductivity (mS/cm)	6/6	0.28	0.19	0.24	0.015	<i>f</i>
Dissolved oxygen (ppm)	6/6	12	9.6	11	0.38	<i>f</i>
pH (SU)	6/6	8.6	7.7	8.1	0.16	<i>f</i>
Temperature (°C)	6/6	29	5.6	18	3.6	<i>f</i>
Metals (mg/L)						
Aluminum, total	5/6	1.8	<0.050	-0.42	0.28	<i>f</i>
Barium, total	6/6	0.036	0.026	0.030	0.0016	<i>f</i>
Calcium, total	6/6	32	27	29	0.84	<i>f</i>
Chromium, total	1/6	0.0042	<0.0040	-0.0040	0.000033	0.05
Cobalt, total	1/6	0.0045	<0.0040	-0.0041	0.000083	<i>f</i>
Iron, total	5/6	2.3	<0.050	-0.55	0.35	<i>f</i>
Magnesium, total	6/6	9.3	7.2	8.0	0.38	<i>f</i>
Manganese, total	6/6	0.090	0.021	0.054	0.012	<i>f</i>
Mercury, total	2/6	0.00024	<0.000050	-0.000083	0.000031	0.002
Phosphorus, total	3/6	0.49	<0.20	-0.28	0.048	<i>f</i>
Potassium, total	2/6	2.3	<2.0	-2.1	0.050	<i>f</i>
Sodium, total	6/6	4.9	2.6	3.6	0.40	<i>f</i>
Uranium, total	5/6	0.0010	<0.00010	-0.00035	0.00014	<i>f</i>
Vanadium, total	2/6	0.0051	<0.0020	-0.0027	0.00051	<i>f</i>
Zinc, total	1/6	0.014	<0.0050	-0.0065	0.0015	<i>f</i>
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	98	83	91	3.1	<i>f</i>
Ammonia, as N (mg/L)	6/6	0.067	0.030	0.041	0.0055	<i>f</i>

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Chemical oxygen demand (mg/L)	4/6	9.0	<5.0	~6.7	0.67	<i>f</i>
Color (CPU)	3/6	14	<2.0	~4.7	2.0	<i>f</i>
Total dissolved solids (mg/L)	6/6	150	110	130	6.3	500
Total hardness (mg/L)	6/6	120	100	110	3.2	<i>f</i>
Total suspended solids (mg/L)	4/6	36	<5.0	~11	5.0	<i>f</i>
Radionuclides (pCi/L) ^f						
⁶⁰ Co	1/6	6.5*	-1.1	1.5	1.3	<i>f</i>
Gross alpha	1/6	1.1*	-0.081	0.46*	0.20	<i>f</i>
Gross beta	4/6	4.9*	1.6*	2.5*	0.49	<i>f</i>
³ H	2/6	3,200*	-430	640	550	<i>f</i>
⁹⁹ Tc	1/6	7.6*	-2.7	2.0	1.4	<i>f</i>
Total uranium	3/6	1.4*	0.19	0.72*	0.22	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	3/6	B10	JB1.0	~8.1	1.5	<i>f</i>
<i>Melton Hill Reservoir — Oak Ridge Marina (CRK 80)</i>						
Anions (mg/L)						
Chloride	6/6	3.6	2.4	2.9	0.21	<i>f</i>
Fluoride	6/6	0.35	0.12	0.18	0.038	<i>f</i>
Nitrate	6/6	3.0	0.73	2.1	0.36	<i>f</i>
Sulfate, as SO ₄	6/6	22	17	19	0.76	<i>f</i>
Field measurements						
Conductivity (mS/cm)	6/6	0.27	0.12	0.21	0.021	<i>f</i>
Dissolved oxygen (ppm)	6/6	12	7.2	10	0.69	<i>f</i>
pH (SU)	6/6	8.5	7.7	8.0	0.12	<i>f</i>
Temperature (°C)	6/6	26	6.9	15	2.9	<i>f</i>
Metals (mg/L)						
Aluminum, total	6/6	0.62	0.20	0.41	0.069	<i>f</i>
Barium, total	6/6	0.052	0.023	0.032	0.0042	<i>f</i>
Beryllium, total	1/6	0.0014	<0.0010	~0.0011	0.000067	<i>f</i>
Calcium, total	6/6	32	23	29	1.3	<i>f</i>
Chromium, total	1/6	0.0076	<0.0040	~0.0046	0.00060	0.05
Iron, total	6/6	1.3	0.13	0.58	0.16	<i>f</i>
Magnesium, total	6/6	9.6	5.8	8.0	0.56	<i>f</i>
Manganese, total	6/6	1.7	0.022	0.33	0.27	<i>f</i>
Mercury, total	2/6	0.000074	<0.000050	~0.000057	0.0000045	0.002
Nickel, total	2/6	0.014	<0.010	~0.011	0.00067	<i>f</i>
Phosphorus, total	3/6	0.52	<0.20	~0.28	0.052	<i>f</i>
Potassium, total	2/6	2.3	<2.0	~2.1	0.054	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Sodium, total	6/6	5.2	2.5	3.6	0.39	f
Uranium, total	4/6	0.0016	<0.00010	-0.00041	0.00024	f
Vanadium, total	4/6	0.023	<0.0020	-0.0057	0.0035	f
Zinc, total	1/6	0.0079	<0.0050	-0.0055	0.00048	f
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	100	75	89	3.5	f
Ammonia, as N (mg/L)	6/6	0.10	0.030	0.052	0.012	f
Chemical oxygen demand (mg/L)	3/6	22	<5.0	-8.7	2.7	f
Color (CPU)	4/6	15	<2.0	-6.7	2.2	f
Total dissolved solids (mg/L)	6/6	140	110	130	3.7	500
Total hardness (mg/L)	6/6	150	89	120	8.1	f
Total suspended solids (mg/L)	6/6	34	7.0	14	4.2	f
Radionuclides (pCi/L) ^g						
⁶⁰ Co	4/6	5.7*	-0.27	3.5*	1.1	f
¹³⁷ Cs	1/6	5.7*	-1.1	1.0	1.0	f
Gross alpha	2/6	2.6*	0.41	1.2*	0.35	f
Gross beta	3/6	4.6*	0.81	2.7*	0.76	f
³ H	1/6	540*	-430	-14	170	f
Total rad Sr	3/6	3.2*	-0.81	1.2	0.60	f
Total uranium	4/6	0.84*	-0.62	0.48*	0.22	f
Volatile organics (µg/L)						
2-Butanone	3/6	B11	JB6.2	-9.5	0.69	f
Acetone	1/6	U10	J7.0	-9.5	0.50	f
Xylene, total	1/6	U5.0	J1.4	-4.4	0.60	f
<i>Melton Hill Reservoir above all DOE inputs (CRK 84)</i>						
Anions (mg/L)						
Chloride	6/6	3.7	2.4	3.0	0.22	f
Fluoride	4/6	0.15	<0.10	-0.12	0.0079	f
Nitrate	6/6	3.0	0.73	2.2	0.33	f
Sulfate, as SO ₄	6/6	22	14	18	1.2	f
Field measurements						
Conductivity (mS/cm)	6/6	0.30	0.19	0.24	0.017	f
Dissolved oxygen (ppm)	6/6	11	8.4	9.3	0.42	f
pH (SU)	6/6	8.2	7.6	8.0	0.092	f
Temperature (°C)	6/6	20	7.3	14	2.2	f
Metals (mg/L)						
Aluminum, total	5/6	1.1	<0.050	-0.40	0.16	f
Barium, total	6/6	0.033	0.026	0.030	0.0012	f
Beryllium, total	1/6	0.0012	<0.0010	-0.0010	0.000033	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Calcium, total	6/6	32	26	29	0.97	<i>f</i>
Chromium, total	1/6	0.0079	<0.0040	-0.0048	0.00064	0.05
Iron, total	6/6	1.4	0.11	0.47	0.20	<i>f</i>
Magnesium, total	6/6	9.5	6.9	8.4	0.46	<i>f</i>
Manganese, total	6/6	0.20	0.031	0.094	0.027	<i>f</i>
Mercury, total	2/6	0.000078	<0.000050	-0.000056	0.0000046	0.002
Phosphorus, total	4/6	0.51	<0.20	-0.29	0.048	<i>f</i>
Potassium, total	1/6	2.2	<2.0	-2.0	0.033	<i>f</i>
Sodium, total	6/6	5.1	2.4	3.4	0.40	<i>f</i>
Uranium, total	4/6	0.00020	<0.00010	-0.00013	0.000016	<i>f</i>
Vanadium, total	2/6	0.024	<0.0020	-0.0058	0.0036	<i>f</i>
Zinc, total	1/6	0.0063	<0.0050	-0.0052	0.00022	<i>f</i>
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	110	90	97	2.9	<i>f</i>
Ammonia, as N (mg/L)	6/6	0.097	0.035	0.051	0.0095	<i>f</i>
Chemical oxygen demand (mg/L)	2/6	16	<5.0	-6.8	1.8	<i>f</i>
Color (CPU)	4/6	9.0	<2.0	-4.7	1.3	<i>f</i>
Total dissolved solids (mg/L)	6/6	140	130	130	1.1	500
Total hardness (mg/L)	6/6	120	100	110	2.6	<i>f</i>
Total suspended solids (mg/L)	5/6	29	<5.0	-11	3.8	<i>f</i>
Radionuclides (pCi/L) ^f						
⁶⁰ Co	1/6	4.1	-0.54	2.3*	0.81	<i>f</i>
Gross alpha	1/6	1.3	0	0.66*	0.20	<i>f</i>
Gross beta	2/6	4.1*	0.30	2.2*	0.55	<i>f</i>
⁹⁹ Tc	1/6	6.5*	-2.7	0.86	1.4	<i>f</i>
Total rad Sr	2/6	3.2*	-0.27	1.4*	0.58	<i>f</i>
Total uranium	4/6	1.9*	0.027	0.62*	0.27	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	3/6	B12	JB6.5	-9.9	0.76	<i>f</i>
Acetone	1/6	U10	J9.7	-10	0.050	<i>f</i>
<i>East Fork Poplar Creek downstream from the Y-12 Plant (EFK 23.4)</i>						
Anions (mg/L)						
Chloride	6/6	99	17	37	13	<i>f</i>
Fluoride	6/6	1.5	0.55	0.97	0.16	<i>f</i>
Nitrate	6/6	23	15	19	1.2	<i>f</i>
Sulfate, as SO ₄	6/6	100	46	73	9.2	<i>f</i>
Field measurements						
Conductivity (mS/cm)	6/6	0.59	0.15	0.41	0.066	<i>f</i>
Dissolved oxygen (ppm)	6/6	10	8.0	9.4	0.35	5

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
pH (SU)	6/6	8.2	7.4	8.0	0.13	<i>f</i>
Temperature (°C)	6/6	27	11	19	2.6	<i>f</i>
Metals (mg/L)						
Aluminum, total	4/6	0.39	<0.050	-0.17	0.058	<i>f</i>
Barium, total	6/6	0.061	0.043	0.052	0.0028	<i>f</i>
Beryllium, total	1/6	0.0013	<0.0010	-0.0011	0.000050	<i>f</i>
Calcium, total	6/6	71	42	57	4.3	<i>f</i>
Chromium, total	1/6	0.013	<0.0040	-0.0055	0.0015	0.016
Iron, total	6/6	0.38	0.085	0.17	0.045	<i>f</i>
Magnesium, total	6/6	12	7.9	9.5	0.69	<i>f</i>
Manganese, total	6/6	0.065	0.031	0.051	0.0054	<i>f</i>
Mercury, total	6/6	0.0011	0.00025	0.00048	0.00013	0.0024
Nickel, total	1/6	0.14	<0.010	-0.032	0.022	1.4
Phosphorus, total	3/6	0.46	<0.20	-0.31	0.049	<i>f</i>
Potassium, total	4/6	2.7	<2.0	-2.3	0.12	<i>f</i>
Sodium, total	6/6	42	9.1	21	4.9	<i>f</i>
Uranium, total	6/6	0.053	0.0095	0.037	0.0070	<i>f</i>
Vanadium, total	3/6	0.023	<0.0020	-0.0061	0.0034	<i>f</i>
Zinc, total	6/6	0.067	0.025	0.038	0.0064	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	130	88	100	6.4	<i>f</i>
Ammonia, as N (mg/L)	6/6	1.2	0.034	0.36	0.20	<i>f</i>
Biochemical oxygen demand (mg/L)	1/6	8.2	<5.0	-5.5	0.53	<i>f</i>
Chemical oxygen demand (mg/L)	3/6	10	<5.0	-6.8	0.87	<i>f</i>
Color (CPU)	2/6	2.0	<2.0	-2.0	0	<i>f</i>
Total dissolved solids (mg/L)	6/6	370	230	300	22	<i>f</i>
Total hardness (mg/L)	6/6	220	150	180	11	<i>f</i>
Total suspended solids (mg/L)	2/6	10	<5.0	-5.8	0.83	<i>f</i>
Radionuclides (pCi/L) ^g						
⁶⁰ Co	2/6	9.2*	-1.4	4.3*	1.7	<i>f</i>
¹³⁷ Cs	1/6	15*	-1.4	2.7	2.4	<i>f</i>
Gross alpha	6/6	24*	3.8*	12*	3.2	<i>f</i>
Gross beta	6/6	16*	8.1*	13*	1.3	<i>f</i>
⁹⁹ Tc	4/6	12*	2.2	7.2*	1.6	<i>f</i>
Total rad Sr	1/6	1.6*	-0.027	0.60*	0.25	<i>f</i>
Total uranium	6/6	24*	4.9*	13*	3.2	<i>f</i>
²³⁴ U	6/6	8.4*	2.1*	4.6*	1.0	<i>f</i>
²³⁵ U	5/6	0.62*	-0.054	0.25*	0.091	<i>f</i>
²³⁸ U	6/6	15*	2.2*	8.5*	2.3	<i>f</i>

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
<i>Volatile organics (µg/L)</i>						
2-Butanone	2/6	B11	JB8.5	-9.9	0.33	<i>f</i>
Chloroform	4/6	U5.0	J1.0	-2.5	0.81	<i>f</i>
Tetrachloroethene	1/6	U5.0	J1.7	-4.5	0.55	<i>f</i>
<i>East Fork Poplar Creek downstream from floodplain (EFK 5.4)</i>						
<i>Anions (mg/L)</i>						
Chloride	6/6	16	9.9	13	0.92	<i>f</i>
Fluoride	6/6	0.86	0.30	0.53	0.092	<i>f</i>
Nitrate	6/6	19	9.4	14	1.4	<i>f</i>
Sulfate, as SO ₄	6/6	39	23	28	2.6	<i>f</i>
<i>Field measurements</i>						
Conductivity (mS/cm)	6/6	0.40	0.23	0.35	0.027	<i>f</i>
Dissolved oxygen (ppm)	6/6	13	7.6	10	0.75	5
pH (SU)	6/6	8.8	7.7	8.1	0.16	<i>f</i>
Temperature (°C)	6/6	24	7.1	16	2.6	<i>f</i>
<i>Metals (mg/L)</i>						
Aluminum, total	4/6	0.22	<0.050	-0.12	0.031	<i>f</i>
Barium, total	6/6	0.039	0.026	0.031	0.0021	<i>f</i>
Calcium, total	6/6	46	35	42	1.6	<i>f</i>
Iron, total	5/6	0.32	<0.050	-0.17	0.046	<i>f</i>
Magnesium, total	6/6	8.9	6.2	7.3	0.45	<i>f</i>
Manganese, total	6/6	0.026	0.012	0.018	0.0024	<i>f</i>
Mercury, total	3/6	0.00027	<0.000050	-0.000097	0.000035	0.0024
Phosphorus, total	6/6	0.62	0.27	0.46	0.059	<i>f</i>
Potassium, total	4/6	3.2	<2.0	-2.6	0.21	<i>f</i>
Sodium, total	6/6	13	7.2	10	0.84	<i>f</i>
Uranium, total	6/6	0.0095	0.0040	0.0065	0.00098	<i>f</i>
Vanadium, total	1/6	0.0021	<0.0020	-0.0020	0.000017	<i>f</i>
Zinc, total	3/6	0.013	<0.0050	-0.0068	0.0013	0.117
<i>Others</i>						
Alkalinity (Mg CaCO ₃ /L)	6/6	120	100	110	3.2	<i>f</i>
Ammonia, as N (mg/L)	6/6	0.24	0.037	0.082	0.033	<i>f</i>
Chemical oxygen demand (mg/L)	3/6	8.0	<5.0	-5.7	0.49	<i>f</i>
Color (CPU)	4/6	3.0	<2.0	-2.3	0.21	<i>f</i>
Total dissolved solids (mg/L)	6/6	260	170	200	14	<i>f</i>
Total hardness (mg/L)	6/6	200	130	150	10	<i>f</i>
Total suspended solids (mg/L)	2/6	7.0	<5.0	-5.7	0.42	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Radionuclides (pCi/L)^f						
¹³⁷ Cs	2/6	7.8*	-0.54	2.5	1.3	f
Gross alpha	6/6	11*	1.0*	4.1*	1.5	f
Gross beta	6/6	8.1*	2.3*	5.2*	0.97	f
⁹⁹ Tc	1/6	7.3*	-1.6	3.2*	1.3	f
Total rad Sr	1/6	2.2*	-22	-3.0	3.9	f
Total uranium	6/6	5.4*	1.9*	3.6*	0.48	f
²³⁴ U	3/3	1.6*	1.3*	1.5*	0.091	f
²³⁵ U	1/3	0.17*	0.0027	0.087	0.048	f
²³⁸ U	3/3	3.8*	1.6*	2.5*	0.66	f
Volatile organics (µg/L)						
2-Butanone	3/6	B10	JB2.0	-8.3	1.3	f
<i>Hinds Creek (reference site for East Fork Poplar Creek) (HC)</i>						
Anions (mg/L)						
Chloride	6/6	4.2	2.8	3.3	0.20	f
Fluoride	4/6	0.45	<0.10	-0.19	0.055	f
Nitrate	6/6	3.3	0.37	2.0	0.49	f
Sulfate, as SO ₄	6/6	17	8.5	11	1.4	f
Field measurements						
Chlorine, total residual (ppm)	1/5	<0.010	0.010	-0.010	0	f
Conductivity (mS/cm)	6/6	0.44	0.21	0.28	0.035	f
Dissolved oxygen (ppm)	6/6	11	7.9	9.5	0.48	5
pH (SU)	6/6	8.2	7.5	8.0	0.099	f
Temperature (°C)	6/6	22	8.4	15	2.2	f
Metals (mg/L)						
Aluminum, total	5/6	1.7	<0.050	-0.58	0.25	f
Barium, total	6/6	0.054	0.032	0.042	0.0037	f
Beryllium, total	1/6	0.0011	<0.0010	-0.0010	0.000017	f
Calcium, total	6/6	49	32	40	2.9	f
Chromium, total	1/6	0.0083	<0.0040	-0.0047	0.00072	0.016
Iron, total	6/6	1.8	0.055	0.59	0.26	f
Magnesium, total	6/6	16	6.1	11	1.6	f
Manganese, total	6/6	0.072	0.012	0.030	0.0090	f
Mercury, total	3/6	0.00024	<0.000050	-0.000087	0.000031	0.0024
Nickel, total	1/6	0.010	<0.010	-0.010	0	1.4
Phosphorus, total	3/6	0.47	<0.20	-0.26	0.043	f
Potassium, total	5/6	2.8	<2.0	-2.4	0.12	f
Sodium, total	6/6	2.9	1.6	2.3	0.22	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Uranium, total	2/6	0.00043	<0.00010	-0.00016	0.000055	f
Vanadium, total	3/6	0.026	<0.0020	-0.0064	0.0039	f
Zinc, total	1/6	0.0068	<0.0050	-0.0053	0.00030	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	180	90	140	14	f
Ammonia, as N (mg/L)	3/6	0.036	<0.030	-0.032	0.00095	f
Chemical oxygen demand (mg/L)	3/6	11	<5.0	-6.8	0.98	f
Color (CPU)	6/6	12	2.0	4.5	1.5	f
Total dissolved solids (mg/L)	6/6	220	130	170	14	f
Total hardness (mg/L)	6/6	200	110	150	15	f
Total suspended solids (mg/L)	5/6	31	<5.0	-14	4.2	f
Radionuclides (pCi/L) ^f						
¹³⁷ Cs	1/6	4.9*	-4.6	-0.41	1.4	f
Gross alpha	3/6	2.2	-0.30	0.99*	0.41	f
Gross beta	5/6	3.2*	1.9*	2.6*	0.23	f
³ H	1/6	760*	-240	180	180	f
⁹⁹ Tc	1/6	1.4*	-3.5	-0.99	0.88	f
Total rad Sr	3/6	2.4*	-0.11	1.3*	0.42	f
Total uranium	3/6	2.1*	0.027	0.67*	0.30	f
Volatile organics (µg/L)						
1,1,1-Trichloroethane	1/6	U5.0	J2.0	-4.5	0.50	f
2-Butanone	3/6	U10	JB7.6	-9.4	0.38	f
Acetone	1/6	37	U10	-15	4.5	f
Benzene	1/6	U5.0	J1.2	-4.4	0.63	f
<i>Melton Branch downstream from ORNL (MEK 0.2)</i>						
Anions (mg/L)						
Chloride	6/6	38	5.5	17	4.9	f
Fluoride	6/6	2.8	0.11	1.3	0.49	f
Nitrate	5/6	5.1	<0.10	-2.3	0.75	f
Sulfate, as SO ₄	6/6	280	15	120	47	f
Field measurements						
Conductivity (mS/cm)	6/6	0.82	0.11	0.41	0.10	f
Dissolved oxygen (ppm)	6/6	12	7.9	10	0.68	5
pH (SU)	6/6	8.3	6.1	7.7	0.32	f
Temperature (°C)	6/6	25	1.1	14	3.5	f
Metals (mg/L)						
Aluminum, total	5/6	2.2	<0.050	-0.65	0.34	f
Barium, total	6/6	0.082	0.044	0.066	0.0064	f
Beryllium, total	1/6	0.0015	<0.0010	-0.0011	0.000083	f

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Calcium, total	6/6	100	38	63	12	<i>f</i>
Chromium, total	2/6	0.0059	<0.0040	-0.0045	0.00033	0.016
Copper, total	2/6	0.010	<0.0070	-0.0076	0.00049	0.018
Iron, total	6/6	2.4	0.080	0.67	0.37	<i>f</i>
Magnesium, total	6/6	24	5.0	13	3.5	<i>f</i>
Manganese, total	6/6	0.25	0.076	0.15	0.031	<i>f</i>
Mercury, total	1/6	0.000089	<0.000050	-0.000057	0.0000065	0.0024
Nickel, total	2/6	0.013	<0.010	-0.011	0.00050	1.4
Phosphorus, total	5/6	1.6	<0.20	-0.81	0.24	<i>f</i>
Potassium, total	4/6	3.9	<2.0	-2.9	0.35	<i>f</i>
Sodium, total	6/6	27	4.5	12	3.4	<i>f</i>
Uranium, total	4/6	0.00054	<0.00010	-0.00030	0.000073	<i>f</i>
Vanadium, total	3/6	0.024	<0.0020	-0.0065	0.0035	<i>f</i>
Zinc, total	4/6	0.084	<0.0050	-0.043	0.015	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	110	65	90	7.1	<i>f</i>
Ammonia, as N (mg/L)	4/6	0.066	<0.030	-0.039	0.0056	<i>f</i>
Chemical oxygen demand (mg/L)	4/6	18	<5.0	-9.7	2.3	<i>f</i>
Color (CPU)	4/6	17	<2.0	-6.3	2.4	<i>f</i>
Total dissolved solids (mg/L)	6/6	580	130	330	75	<i>f</i>
Total hardness (mg/L)	6/6	370	110	220	45	<i>f</i>
Total suspended solids (mg/L)	5/6	150	<5.0	-43	22	<i>f</i>
Radionuclides (pCi/L) ^f						
⁶⁰ Co	2/6	10*	-0.81	2.9	1.7	<i>f</i>
Gross alpha	3/6	2.6*	0.92	1.5*	0.28	<i>f</i>
Gross beta	6/6	1,800*	620*	1,200*	180	<i>f</i>
³ H	6/6	1,500,000*	570,000*	930,000*	140,000	<i>f</i>
⁹⁹ Tc	1/6	15*	-1.4	4.0	2.4	<i>f</i>
Total rad Sr	6/6	760*	270*	550*	76	<i>f</i>
Total uranium	5/6	1.1*	0.27*	0.64*	0.11	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	3/6	U10	JB7.5	-9.5	0.40	<i>f</i>
Acetone	2/6	34	J4.4	-13	4.3	<i>f</i>
Melton Branch upstream from ORNL (MEK 2.1)						
Anions (mg/L)						
Chloride	6/6	11	1.5	3.5	1.5	<i>f</i>
Fluoride	2/6	0.18	<0.10	-0.12	0.015	<i>f</i>
Nitrate	4/6	0.74	<0.10	-0.42	0.11	<i>f</i>
Sulfate, as SO ₄	6/6	13	7.1	10	1.0	<i>f</i>

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Field measurements						
Conductivity (mS/cm)	6/6	0.47	0.10	0.25	0.056	<i>f</i>
Dissolved oxygen (ppm)	6/6	12	6.2	9.7	0.93	5
pH (SU)	6/6	7.8	6.0	7.4	0.29	<i>f</i>
Temperature (°C)	6/6	22	2.3	14	3.1	<i>f</i>
Metals (mg/L)						
Aluminum, total	5/6	3.1	<0.050	~1.0	0.44	<i>f</i>
Barium, total	6/6	0.078	0.030	0.050	0.0070	<i>f</i>
Beryllium, total	1/6	0.0014	<0.0010	~0.0011	0.000067	<i>f</i>
Calcium, total	6/6	71	24	45	8.3	<i>f</i>
Chromium, total	2/6	0.0052	<0.0040	~0.0043	0.00020	0.016
Iron, total	5/6	2.1	<0.050	~0.78	0.30	<i>f</i>
Magnesium, total	6/6	7.3	2.9	5.2	0.73	<i>f</i>
Manganese, total	5/6	0.33	<0.0010	~0.089	0.050	<i>f</i>
Mercury, total	1/6	0.000067	<0.000050	~0.000053	0.0000028	0.0024
Nickel, total	1/6	0.011	<0.010	~0.010	0.00017	1.4
Phosphorus, total	2/6	0.48	<0.20	~0.28	0.050	<i>f</i>
Potassium, total	3/6	2.2	<2.0	~2.1	0.033	<i>f</i>
Sodium, total	6/6	7.9	1.4	4.1	0.94	<i>f</i>
Thallium, total	1/6	0.0050	<0.0050	~0.0050	0	<i>f</i>
Uranium, total	3/6	0.00032	<0.00010	~0.00019	0.000042	<i>f</i>
Vanadium, total	2/6	0.023	<0.0020	~0.0061	0.0034	<i>f</i>
Zinc, total	1/6	0.012	<0.0050	~0.0062	0.0012	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	190	55	130	25	<i>f</i>
Ammonia, as N (mg/L)	4/6	0.12	<0.030	~0.048	0.015	<i>f</i>
Chemical oxygen demand (mg/L)	3/6	15	<5.0	~8.3	1.7	<i>f</i>
Color (CPU)	3/6	21	<2.0	~7.2	3.1	<i>f</i>
Total dissolved solids (mg/L)	6/6	230	97	160	24	<i>f</i>
Total hardness (mg/L)	6/6	200	68	130	23	<i>f</i>
Total suspended solids (mg/L)	5/6	100	<5.0	~30	15	<i>f</i>
Radionuclides (pCi/L) ^f						
⁶⁰ Co	2/6	6.5*	-0.57	2.4*	1.0	<i>f</i>
¹³⁷ Cs	2/6	5.4*	-2.4	1.3	1.2	<i>f</i>
Gross alpha	2/6	1.1	-0.32	0.48*	0.23	<i>f</i>
Gross beta	6/6	4.1*	2.2*	2.9*	0.29	<i>f</i>
³ H	3/6	1,000*	190	550*	120	<i>f</i>
⁹⁹ Tc	1/6	7.8*	-1.6	1.9	1.4	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Total rad Sr	2/6	3.5*	-0.27	1.6*	0.55	f
Total uranium	3/6	3.2*	0.22	1.2*	0.44	f
Volatile organics (µg/L)						
2-Butanone	3/6	B10	JB7.6	-9.5	0.39	f
Acetone	2/6	24	J6.9	-12	2.5	f
<i>Mitchell Branch downstream from the K-25 Site (MIK 0.1)</i>						
Anions (mg/L)						
Chloride	6/6	22	4.6	11	2.6	f
Fluoride	6/6	0.32	0.20	0.26	0.022	f
Nitrate	6/6	2.6	0.96	1.7	0.22	f
Sulfate, as SO ₄	6/6	36	17	26	3.1	f
Field measurements						
Conductivity (mS/cm)	6/6	0.48	0.16	0.32	0.045	f
Dissolved oxygen (ppm)	6/6	12	8.1	10	0.68	f
pH (SU)	6/6	8.9	7.1	7.7	0.26	f
Temperature (°C)	6/6	23	6.8	17	2.5	f
Metals (mg/L)						
Aluminum, total	5/6	0.93	<0.050	-0.41	0.15	f
Barium, total	6/6	0.040	0.031	0.037	0.0015	f
Calcium, total	6/6	55	29	40	4.2	f
Chromium, total	4/6	0.0062	<0.0040	-0.0049	0.00035	f
Copper, total	2/6	0.012	<0.0070	-0.0080	0.00082	f
Iron, total	6/6	1.3	0.15	0.59	0.17	f
Magnesium, total	6/6	10	5.3	8.2	0.73	f
Manganese, total	6/6	0.20	0.080	0.13	0.017	f
Mercury, total	2/6	0.00025	<0.000050	-0.000090	0.000033	f
Nickel, total	1/6	0.014	<0.010	-0.011	0.00067	f
Phosphorus, total	5/6	0.46	<0.20	-0.29	0.038	f
Potassium, total	2/6	2.7	<2.0	-2.1	0.11	f
Sodium, total	6/6	12	3.5	6.0	1.3	f
Thallium, total	1/6	0.0061	<0.0050	-0.0052	0.00018	f
Uranium, total	6/6	0.018	0.0056	0.012	0.0019	f
Vanadium, total	2/6	0.0032	<0.0020	-0.0023	0.00020	f
Zinc, total	5/6	0.024	<0.0050	-0.012	0.0032	f
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	150	80	120	11	f
Ammonia, as N (mg/L)	6/6	0.086	0.040	0.059	0.0080	f
Chemical oxygen demand (mg/L)	2/6	10	<5.0	-6.2	0.83	f
Color (CPU)	4/6	15	<2.0	-6.7	2.1	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Total dissolved solids (mg/L)	6/6	200	140	180	14	f
Total hardness (mg/L)	6/6	190	100	140	14	f
Total suspended solids (mg/L)	4/6	14	<5.0	-8.5	1.5	f
Radionuclides (pCi/L) ^e						
¹³⁷ Cs	1/6	2.7*	-1.9	0.45	0.65	f
Gross alpha	6/6	14*	7.0*	10*	1.2	f
Gross beta	6/6	41*	8.9*	21*	5.8	f
³ H	1/6	300	-160	71	86	f
⁹⁹ Tc	5/6	25*	-7.0	14*	4.4	f
²³⁰ Th	1/1	1.1*	1.1*	1.1	f	f
Total rad Sr	4/6	86*	0.59	16	14	f
Total uranium	6/6	14*	7.0*	9.7*	1.0	f
²³⁴ U	6/6	11*	4.3*	6.5*	0.90	f
²³⁵ U	5/5	0.51*	0.19*	0.30*	0.059	f
²³⁸ U	6/6	3.5*	2.2*	2.9*	0.24	f
Volatile organics (µg/L)						
1,2-Dichloroethene, total	5/6	43	U5.0	-20	5.7	f
2-Butanone	2/6	JB10	JB7.7	-9.6	0.38	f
Chloroform	5/6	U5.0	J1.0	-2.4	0.61	f
Trichloroethene	6/6	54	15	27	6.3	f
Vinyl chloride	5/6	U10	J1.0	-4.2	1.3	f
<i>Mitchell Branch upstream from the K-25 Site (MIK 1.4)</i>						
Anions (mg/L)						
Chloride	6/6	2.3	1.2	1.8	0.15	f
Fluoride	6/6	0.24	0.12	0.19	0.017	f
Nitrate	3/6	1.0	<0.10	-0.36	0.14	f
Sulfate, as SO ₄	6/6	25	13	19	1.6	f
Field measurements						
Conductivity (mS/cm)	6/6	0.29	0.10	0.18	0.031	f
Dissolved oxygen (ppm)	6/6	13	8.6	10	0.63	f
pH (SU)	6/6	7.5	7.0	7.3	0.067	f
Temperature (°C)	6/6	20	3.9	14	2.4	f
Metals (mg/L)						
Aluminum, total	6/6	1.3	0.093	0.59	0.21	f
Barium, total	6/6	0.059	0.030	0.044	0.0041	f
Calcium, total	6/6	26	12	20	2.2	f
Chromium, total	1/6	0.013	<0.0040	-0.0055	0.0015	f
Cobalt, total	2/6	0.0043	<0.0040	-0.0041	0.000054	f
Iron, total	6/6	1.9	0.11	0.92	0.28	f

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Magnesium, total	6/6	7.6	3.5	5.6	0.64	f
Manganese, total	6/6	0.51	0.051	0.20	0.068	f
Mercury, total	2/6	0.00023	<0.000050	-0.000084	0.000029	f
Phosphorus, total	3/6	0.38	<0.20	-0.25	0.032	f
Potassium, total	4/6	3.1	<2.0	-2.5	0.17	f
Silver, total	1/6	0.011	<0.0050	-0.0060	0.0010	f
Sodium, total	6/6	5.7	1.9	3.5	0.59	f
Uranium, total	3/6	0.00030	<0.00010	-0.00017	0.000034	f
Vanadium, total	1/6	0.0046	<0.0020	-0.0024	0.00043	f
Zinc, total	3/6	0.14	<0.0050	-0.028	0.022	f
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	100	33	66	10	f
Ammonia, as N (mg/L)	4/6	0.047	<0.030	-0.035	0.0027	f
Chemical oxygen demand (mg/L)	5/6	24	<5.0	-10	3.1	f
Color (CPU)	5/6	30	<2.0	-11	4.4	f
Total dissolved solids (mg/L)	6/6	140	51	100	13	f
Total hardness (mg/L)	6/6	110	41	76	10	f
Total suspended solids (mg/L)	3/6	26	<5.0	-11	3.3	f
Radionuclides (pCi/L) ^f						
¹³⁷ Cs	1/6	8.9*	-7.3	0.72	2.3	f
Gross alpha	2/6	1.4	-0.081	0.55*	0.22	f
Gross beta	6/6	13*	2.2*	5.7*	1.7	f
³ H	2/6	3,000*	-300	530	510	f
⁹⁹ Tc	3/6	12*	-2.2	4.5*	2.2	f
Total uranium	4/6	0.86*	0.16	0.49*	0.097	f
Volatile organics (µg/L)						
2-Butanone	3/6	U10	JB1.0	-7.6	1.4	f
Acetone	1/6	U10	J5.0	-9.2	0.83	f
<i>Poplar Creek downstream from the K-25 Site (PCK 2.2)</i>						
Anions (mg/L)						
Chloride	6/6	12	1.6	6.4	1.4	f
Fluoride	6/6	0.41	0.11	0.23	0.041	f
Nitrate	6/6	7.5	1.2	4.2	0.93	f
Sulfate, as SO ₄	6/6	31	17	24	2.6	f
Field measurements						
Conductivity (mS/cm)	6/6	0.41	0.12	0.24	0.039	f
Dissolved oxygen (ppm)	6/6	13	7.8	10	0.87	5
pH (SU)	6/6	8.6	7.3	7.7	0.21	f
Temperature (°C)	6/6	25	5.0	17	3.2	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^c
		Max ^b	Min ^b	Av ^c		
Metals (mg/L)						
Aluminum, total	6/6	1.2	0.19	0.54	0.15	<i>f</i>
Barium, total	6/6	0.039	0.029	0.036	0.0015	<i>f</i>
Calcium, total	6/6	37	15	29	3.3	<i>f</i>
Chromium, total	1/6	0.0046	<0.0040	-0.0041	0.00010	0.016
Cobalt, total	1/6	0.0052	<0.0040	-0.0042	0.00020	<i>f</i>
Iron, total	6/6	1.5	0.23	0.69	0.19	<i>f</i>
Magnesium, total	6/6	8.9	4.3	6.9	0.64	<i>f</i>
Manganese, total	6/6	0.12	0.064	0.081	0.0085	<i>f</i>
Mercury, total	2/6	0.00026	<0.000050	-0.000093	0.000034	0.0024
Phosphorus, total	4/6	0.47	0.026	-0.24	0.059	<i>f</i>
Potassium, total	3/6	2.4	<2.0	-2.2	0.089	<i>f</i>
Uranium, total	6/6	0.0043	0.0012	0.0029	0.00044	<i>f</i>
Vanadium, total	2/6	0.0042	<0.0020	-0.0025	0.00036	<i>f</i>
Zinc, total	3/6	0.014	<0.0050	-0.0076	0.0015	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	120	35	84	13	<i>f</i>
Ammonia, as N (mg/L)	6/6	0.070	0.032	0.049	0.0070	<i>f</i>
Biochemical oxygen demand (mg/L)	2/6	13	<5.0	-6.7	1.3	<i>f</i>
Chemical oxygen demand (mg/L)	5/6	10	<5.0	-8.0	0.68	<i>f</i>
Color (CPU)	5/6	14	<2.0	-7.0	2.1	<i>f</i>
Total dissolved solids (mg/L)	6/6	190	66	140	18	<i>f</i>
Total hardness (mg/L)	6/6	150	49	110	14	<i>f</i>
Total suspended solids (mg/L)	6/6	19	7.0	14	2.0	<i>f</i>
Radionuclides (pCi/L)^e						
¹³⁷ Cs	2/6	16*	-1.1	4.2	2.5	<i>f</i>
Gross alpha	6/6	5.7*	1.4*	3.1*	0.79	<i>f</i>
Gross beta	5/6	12*	0.30	5.1*	1.8	<i>f</i>
³ H	1/6	380*	-190	50	78	<i>f</i>
⁹⁹ Tc	2/6	7.6*	-8.1	2.1	2.5	<i>f</i>
Total rad Sr	1/6	1.9*	0.30	0.95*	0.21	<i>f</i>
Total uranium	6/6	4.1*	0.68*	2.1*	0.48	<i>f</i>
²³⁴ U	2/2	2.1*	1.1*	1.6	0.49	<i>f</i>
²³⁵ U	1/2	0.35*	0.073	0.21	0.14	<i>f</i>
²³⁸ U	2/2	1.5*	1.0*	1.3	0.27	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	2/6	JB10	JB2.0	-8.7	1.3	<i>f</i>
Acetone	1/6	13	U10	-11	0.50	<i>f</i>
Carbon disulfide	1/6	20	U5.0	-7.5	2.5	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Chloroform	2/6	JB7.7	J4.0	~5.3	0.51	f
Trichloroethene	1/6	U5.0	J1.1	~4.4	0.65	f
<i>Poplar Creek upstream from the K-25 Site and East Fork Poplar Creek (PCK 22)</i>						
Anions (mg/L)						
Chloride	6/6	5.1	2.0	3.2	0.45	f
Fluoride	4/6	0.20	<0.10	~0.14	0.016	f
Nitrate	6/6	2.0	0.44	1.1	0.25	f
Sulfate, as SO ₄	6/6	48	22	36	3.5	f
Field measurements						
Conductivity (mS/cm)	6/6	0.39	0.13	0.24	0.039	f
Dissolved oxygen (ppm)	6/6	13	7.4	9.7	0.80	5
pH (SU)	6/6	8.3	7.3	7.7	0.17	f
Temperature (°C)	6/6	22	4.9	14	2.7	f
Metals (mg/L)						
Aluminum, total	5/6	0.71	<0.050	~0.35	0.11	f
Barium, total	6/6	0.054	0.031	0.042	0.0038	f
Calcium, total	6/6	38	20	27	2.9	f
Iron, total	6/6	1.0	0.19	0.53	0.12	f
Magnesium, total	6/6	12	6.6	8.4	0.84	f
Manganese, total	6/6	0.22	0.077	0.12	0.022	f
Mercury, total	2/6	0.00025	<0.000050	~0.000085	0.000033	0.0024
Phosphorus, total	5/6	0.47	<0.20	~0.27	0.041	f
Potassium, total	2/6	2.6	<2.0	~2.2	0.10	f
Sodium, total	6/6	5.2	2.6	3.7	0.39	f
Uranium, total	3/6	0.00030	<0.00010	~0.00016	0.000032	f
Vanadium, total	1/6	0.0024	<0.0020	~0.0021	0.000067	f
Zinc, total	2/6	0.015	<0.0050	~0.0069	0.0016	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	150	45	80	17	f
Ammonia, as N (mg/L)	5/6	0.16	<0.030	~0.064	0.020	f
Biochemical oxygen demand (mg/L)	1/6	6.3	<5.0	~5.2	0.22	f
Chemical oxygen demand (mg/L)	3/6	9.0	<5.0	~6.3	0.67	f
Color (CPU)	5/6	10	<2.0	~5.2	1.4	f
Total dissolved solids (mg/L)	6/6	190	110	140	12	f
Total hardness (mg/L)	6/6	160	80	110	13	f
Total suspended solids (mg/L)	4/6	23	<5.0	~11	2.8	f

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Radionuclides (pCi/L)^f						
⁶⁰ Co	1/6	4.1*	-1.4	0.32	0.92	<i>f</i>
¹³⁷ Cs	1/6	11	-1.4	2.5	1.8	<i>f</i>
Gross alpha	4/6	3.5*	-0.86	0.96	0.59	<i>f</i>
Gross beta	4/6	4.9*	0.54	2.4*	0.63	<i>f</i>
⁹⁹ Tc	1/6	16	-0.81	5.8*	2.6	<i>f</i>
Total rad Sr	1/6	22	0.30	4.4	3.4	<i>f</i>
Total uranium	4/6	1.0*	0.22	0.58*	0.12	<i>f</i>
²³⁴ U	1/1	0.59*	0.59*	0.59	<i>f</i>	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	2/6	JB10	JB8.1	-9.7	0.32	<i>f</i>
<i>Water supply intake for City of Kingston (TRK 915)</i>						
Anions (mg/L)						
Chloride	6/6	9.2	3.5	5.8	0.88	<i>f</i>
Fluoride	5/6	0.19	<0.10	-0.13	0.013	<i>f</i>
Nitrate	6/6	3.1	1.1	1.8	0.33	<i>f</i>
Sulfate, as SO ₄	6/6	68	7.7	20	9.7	<i>f</i>
Field measurements						
Conductivity (mS/cm)	6/6	0.19	0.13	0.17	0.011	<i>f</i>
Dissolved oxygen (ppm)	6/6	13	7.2	9.8	1.0	<i>f</i>
pH (SU)	6/6	8.7	7.6	7.9	0.18	<i>f</i>
Temperature (°C)	6/6	28	5.0	17	3.3	<i>f</i>
Metals (mg/L)						
Aluminum, total	6/6	2.2	0.092	0.65	0.33	<i>f</i>
Barium, total	6/6	0.047	0.018	0.029	0.0048	<i>f</i>
Calcium, total	6/6	22	15	18	1.1	<i>f</i>
Chromium, total	1/6	0.0053	<0.0040	-0.0042	0.00022	0.05
Cobalt, total	1/6	0.0052	<0.0040	-0.0042	0.00020	<i>f</i>
Iron, total	6/6	2.9	0.15	0.85	0.43	<i>f</i>
Magnesium, total	6/6	7.0	3.5	4.5	0.53	<i>f</i>
Manganese, total	6/6	0.16	0.036	0.083	0.020	<i>f</i>
Mercury, total	2/6	0.00022	<0.000050	-0.000082	0.000028	0.002
Phosphorus, total	3/6	0.46	<0.20	-0.25	0.042	<i>f</i>
Potassium, total	1/6	2.4	<2.0	-2.1	0.067	<i>f</i>
Sodium, total	6/6	7.4	3.1	5.0	0.71	<i>f</i>
Uranium, total	3/6	0.00020	<0.00010	-0.00014	0.000018	<i>f</i>
Vanadium, total	1/6	0.0066	<0.0020	-0.0028	0.00077	<i>f</i>
Zinc, total	4/6	0.016	<0.0050	-0.0088	0.0019	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	78	40	55	5.1	f
Ammonia, as N (mg/L)	6/6	0.52	0.038	0.13	0.079	f
Biochemical oxygen demand (mg/L)	1/6	5.5	<5.0	-5.1	0.083	f
Chemical oxygen demand (mg/L)	4/6	11	<5.0	-6.8	0.98	f
Color (CPU)	4/6	16	<2.0	-6.0	2.3	f
Total dissolved solids (mg/L)	6/6	110	64	88	7.9	500
Total hardness (mg/L)	6/6	83	54	62	4.2	f
Total suspended solids (mg/L)	6/6	29	6.0	14	3.6	f
Radionuclides (pCi/L)^f						
Gross alpha	1/6	1.2*	-0.49	0.28	0.27	f
Gross beta	5/6	18*	-0.27	4.7	2.6	f
⁹⁹ Tc	1/6	14*	-0.27	5.0*	2.3	f
Total rad Sr	3/6	2.7*	-18	-2.0	3.1	f
Total uranium	3/6	3.2*	0.16	0.90	0.48	f
Volatile organics (µg/L)						
2-Butanone	3/6	JB10	JB2.0	-8.2	1.3	f
Acetone	1/6	U10	J3.0	-8.8	1.2	f
<i>White Oak Lake at White Oak Dam (WCK 1.0)</i>						
Anions (mg/L)						
Chloride	6/6	22	4.7	12	2.3	f
Fluoride	6/6	0.99	0.18	0.64	0.13	f
Nitrate	6/6	2.6	0.56	1.5	0.33	f
Sulfate, as SO ₄	6/6	81	14	46	9.5	f
Field measurements						
Conductivity (mS/cm)	6/6	0.44	0.17	0.32	0.036	f
Dissolved oxygen (ppm)	6/6	14	7.2	9.8	0.97	5
pH (SU)	6/6	8.9	7.4	8.3	0.22	f
Temperature (°C)	6/6	29	5.9	17	3.6	f
Metals (mg/L)						
Aluminum, total	6/6	1.8	0.067	0.83	0.26	f
Barium, total	6/6	0.050	0.028	0.042	0.0038	f
Calcium, total	6/6	47	23	39	3.5	f
Chromium, total	6/6	0.021	0.0073	0.012	0.0022	0.016
Iron, total	6/6	1.8	0.17	0.87	0.24	f
Magnesium, total	6/6	10	3.6	7.5	0.88	f
Manganese, total	6/6	0.16	0.038	0.098	0.020	f
Mercury, total	1/6	0.00021	<0.000050	-0.000077	0.000027	0.0024

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Phosphorus, total	5/6	0.48	<0.20	~0.35	0.041	<i>f</i>
Potassium, total	2/6	3.2	<2.0	~2.4	0.22	<i>f</i>
Silver, total	1/6	0.0055	<0.0050	~0.0051	0.000083	0.004
Sodium, total	6/6	19	4.5	14	2.2	<i>f</i>
Thallium, total	1/6	0.0070	<0.0050	~0.0053	0.00033	<i>f</i>
Uranium, total	6/6	0.0040	0.00030	0.0022	0.00061	<i>f</i>
Vanadium, total	5/6	<0.020	0.0021	~0.0055	0.0029	<i>f</i>
Zinc, total	5/6	0.035	<0.0050	~0.020	0.0042	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	130	63	110	9.5	<i>f</i>
Ammonia, as N (mg/L)	6/6	0.19	0.045	0.072	0.023	<i>f</i>
Biochemical oxygen demand (mg/L)	3/6	6.9	<5.0	~5.8	0.37	<i>f</i>
Chemical oxygen demand (mg/L)	3/6	24	<5.0	~10	3.0	<i>f</i>
Color (CPU)	5/6	16	<2.0	~9.5	2.5	<i>f</i>
Total dissolved solids (mg/L)	6/6	250	92	190	23	<i>f</i>
Total hardness (mg/L)	6/6	170	74	130	14	<i>f</i>
Total suspended solids (mg/L)	6/6	49	5.0	26	7.6	<i>f</i>
Radionuclides (pCi/L) ^f						
⁶⁰ Co	4/6	10*	1.4	5.3*	1.2	<i>f</i>
¹³⁷ Cs	6/6	140*	11*	49*	18	<i>f</i>
Gross alpha	6/6	6.8*	1.7*	4.6*	0.72	<i>f</i>
Gross beta	6/6	540*	380*	450*	34	<i>f</i>
³ H	6/6	240,000*	100,000*	160,000*	24,000	<i>f</i>
⁹⁹ Tc	6/6	26*	4.3*	13*	3.3	<i>f</i>
Total rad Sr	6/6	210*	150*	180*	9.0	<i>f</i>
Total uranium	6/6	6.2*	2.2*	4.5*	0.67	<i>f</i>
²³⁴ U	5/5	5.4*	2.5*	4.0*	0.60	<i>f</i>
²³⁵ U	3/5	0.27*	-0.014	0.15*	0.046	<i>f</i>
²³⁸ U	5/5	1.4*	0.30*	0.80*	0.18	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	1/6	JB10	U10	~10	0	<i>f</i>

White Oak Creek downstream from ORNL (WCK 2.6)

Anions (mg/L)						
Chloride	6/6	110	6.8	26	17	<i>f</i>
Fluoride	6/6	1.1	0.32	0.77	0.12	<i>f</i>
Nitrate	6/6	6.9	2.0	4.5	0.67	<i>f</i>
Sulfate, as SO ₄	6/6	45	17	29	4.2	<i>f</i>

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^c
		Max ^b	Min ^b	Av ^c		
Field measurements						
Conductivity (mS/cm)	6/6	0.56	0.20	0.36	0.051	<i>f</i>
Dissolved oxygen (ppm)	6/6	10	8.2	9.4	0.39	5
pH (SU)	6/6	8.1	7.7	7.9	0.054	<i>f</i>
Temperature (°C)	6/6	23	5.5	16	2.7	<i>f</i>
Metals (mg/L)						
Aluminum, total	5/6	2.5	<0.050	-0.68	0.38	<i>f</i>
Barium, total	6/6	0.11	0.032	0.051	0.013	<i>f</i>
Calcium, total	6/6	47	30	38	2.3	<i>f</i>
Chromium, total	2/6	0.0067	<0.0040	-0.0048	0.00053	0.016
Copper, total	2/6	0.020	<0.0070	-0.0093	0.0021	0.018
Iron, total	6/6	3.5	0.098	0.86	0.54	<i>f</i>
Magnesium, total	6/6	9.2	4.8	7.4	0.61	<i>f</i>
Manganese, total	6/6	0.20	0.011	0.061	0.029	<i>f</i>
Mercury, total	3/6	0.00011	<0.000050	-0.000074	0.000011	0.0024
Nickel, total	1/6	0.012	<0.010	-0.010	0.00033	1.4
Phosphorus, total	6/6	0.47	0.25	0.38	0.029	<i>f</i>
Potassium, total	5/6	3.1	<2.0	-2.5	0.19	<i>f</i>
Sodium, total	6/6	53	0.43	19	7.3	<i>f</i>
Uranium, total	6/6	0.0066	0.00070	0.0028	0.0010	<i>f</i>
Vanadium, total	2/6	0.024	<0.0020	-0.0065	0.0036	<i>f</i>
Zinc, total	6/6	0.11	0.034	0.054	0.012	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	120	73	100	6.8	<i>f</i>
Ammonia, as N (mg/L)	4/6	0.13	<0.030	-0.054	0.016	<i>f</i>
Chemical oxygen demand (mg/L)	2/6	12	<5.0	-7.2	1.4	<i>f</i>
Color (CPU)	3/6	12	<2.0	-4.5	1.7	<i>f</i>
Total dissolved solids (mg/L)	6/6	310	130	190	28	<i>f</i>
Total hardness (mg/L)	6/6	130	88	120	6.4	<i>f</i>
Total suspended solids (mg/L)	2/6	140	<5.0	-28	22	<i>f</i>
Radionuclides (pCi/L) ^g						
⁶⁰ Co	2/6	4.1*	-0.27	2.6*	0.66	<i>f</i>
¹³⁷ Cs	6/6	84*	13*	47*	9.8	<i>f</i>
Gross alpha	6/6	5.1*	2.1*	3.9*	0.55	<i>f</i>
Gross beta	6/6	430*	140*	280*	52	<i>f</i>
³ H	6/6	86,000*	13,000*	46,000*	13,000	<i>f</i>
Total rad Sr	6/6	190*	54*	120*	26	<i>f</i>
Total uranium	5/6	5.7*	0.76	3.3*	0.77	<i>f</i>

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Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
²³⁴ U	4/4	3.8*	2.1*	3.1*	0.36	f
²³⁸ U	4/4	1.8*	0.38*	1.0*	0.36	f
Volatile organics (µg/L)						
2-Butanone	3/6	B10	J3.0	-8.8	1.2	f
Chloroform	4/6	U5.0	J1.6	-3.1	0.63	f
<i>White Oak Creek upstream from ORNL (WCK 6.8)</i>						
Anions (mg/L)						
Chloride	6/6	5.2	0.91	1.7	0.70	f
Fluoride	2/6	0.16	<0.10	-0.12	0.012	f
Nitrate	5/6	0.90	<0.10	-0.54	0.12	f
Sulfate, as SO ₄	6/6	5.2	1.9	3.1	0.59	f
Field measurements						
Conductivity (mS/cm)	6/6	0.32	0.095	0.22	0.036	f
Dissolved oxygen (ppm)	6/6	12	8.8	10	0.42	5
pH (SU)	6/6	8.1	7.4	7.8	0.11	f
Temperature (°C)	6/6	17	7.7	13	1.4	f
Metals (mg/L)						
Aluminum, total	4/6	1.3	<0.050	-0.31	0.20	f
Barium, total	6/6	0.098	0.024	0.069	0.012	f
Calcium, total	6/6	31	11	24	3.1	f
Chromium, total	1/6	0.0050	<0.0040	-0.0042	0.00017	0.016
Iron, total	3/6	1.2	<0.050	-0.26	0.19	f
Magnesium, total	6/6	15	4.4	11	1.8	f
Manganese, total	5/6	0.041	<0.0010	-0.014	0.0061	f
Mercury, total	1/6	0.000087	<0.000050	-0.000056	0.0000062	0.0024
Phosphorus, total	5/6	0.45	<0.20	-0.31	0.042	f
Sodium, total	6/6	2.7	0.40	0.84	0.37	f
Uranium, total	3/6	0.00090	<0.00010	-0.00025	0.00013	f
Vanadium, total	1/6	0.0042	<0.0020	-0.0024	0.00037	f
Zinc, total	1/6	0.0075	<0.0050	-0.0054	0.00042	0.117
Others						
Alkalinity (Mg CaCO ₃ /L)	6/6	140	40	100	17	f
Ammonia, as N (mg/L)	4/6	0.035	<0.030	-0.032	0.00087	f
Chemical oxygen demand (mg/L)	2/6	6.0	<5.0	-5.2	0.17	f
Color (CPU)	3/6	9.0	<2.0	-4.3	1.5	f
Total dissolved solids (mg/L)	6/6	190	41	130	22	f
Total hardness (mg/L)	6/6	140	45	110	16	f
Total suspended solids (mg/L)	2/6	17	<5.0	-7.2	2.0	f

Table 5.35 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d	TWQC ^e
		Max ^b	Min ^b	Av ^c		
Radionuclides (pCi/L) ^f						
Gross alpha	4/6	2.6*	0	0.95*	0.39	<i>f</i>
Gross beta	2/6	2.6*	-0.59	1.2*	0.47	<i>f</i>
⁹⁹ Tc	1/6	8.4*	-1.4	1.5	1.5	<i>f</i>
Total uranium	1/6	0.73	0.24	0.42*	0.072	<i>f</i>
Volatile organics (µg/L)						
2-Butanone	1/6	B11	U10	~10	0.17	<i>f</i>

^aAll values were included in the calculations. Only parameters that have one or more samples detected are listed in the table. The sampling and analysis plan contains a complete list of analyses performed.

^bPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "U" indicates the value for an organic parameter was undetected at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "B" indicates the compound was found in the laboratory blank; and "JB" indicates the value was estimated at or below the analytical detection limit by the laboratory and the compound was found in the laboratory blank.

^cA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^dStandard error of the mean.

^eTennessee General Water Quality Criteria for Domestic Water Supplies, as amended (CRK 16, CRK 23, CRK 32, CRK 58, CRK 66, CRK 80, CRK 84, TRK 915) or Tennessee General Water Quality Criteria for Freshwater Fish and Aquatic Life, as amended (BCK 0.6, BCK 9.4, EFK 23.4, EFK 5.4, HC, MEK 0.2, MEK 2.1, PCK 2.2, PCK 22, WCK 1.0, WCK 2.5, WCK 6.8).

^fNot applicable.

^gIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

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Table 5.36. 1994 NPDES Permit Number TN 0002950
 Discharge Point K-1203, Sewage Treatment Plant, K-25 Site

Parameter	Number of samples	Concentration			Reference value ^a	Number of values exceeding reference
		Max	Min	Av		
Ammonia nitrogen, mg/L	159	1.49	<0.02	0.2535	7	0
Biological oxygen demand, mg/L	159	16	<5	5.9	20	0
Chlorine, total residual, mg/L	327	0.12	<0.05	<0.05	0.24	0
Dissolved oxygen, mg/L	374	13.4	5.2	8.7	5 ^b	0
Fecal coliform, Colonies/100 mL	157	11,000	<1	5.4	400	6
Flow, MGD	<i>c</i>	1.683	0.1509	0.3756	<i>d</i>	<i>e</i>
pH, standard units	372	8.2	6.9	<i>e</i>	6.0–9.0	0
Settleable solids, mg/L	266	0.2	<0.1	<0.1	0.5	0
Suspended solids, mg/L	159	26	<1	4.8	45	0

^aNPDES permit limit.

^bDaily minimum.

^cContinuous.

^dNon-limited parameter.

^eNot applicable.

Table 5.37. 1994 K-25 Site parameters detected at K-1710

Parameter	Number detected/ number of samples	Detected results ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Alkalinity	4/4	130	60	86	c	
Calcium hardness	c/4	110	48	75	c	
Chemical oxygen demand	3/4	15	<5	<8.8	c	
Chloride	4/4	50	3	18	c	
Color (nm)	c/4	500	500	500	c	
Conductivity (µmho/cm)	c/4	380	150	250	c	
Dissolved oxygen	4/4	11	5.7	7.8	5.0 min	0
Dissolved solids	4/4	230	130	170	c	
Fluoride	1/4	0.5	<0.1	<0.2	c	
Iron	4/4	0.46	0.17	0.3	c	
Lead	3/4	0.035	0.00055	<0.012	0.082	0
Manganese	4/4	0.25	0.05	0.13	c	
Nickel	4/4	<0.05	0.0025	<0.016	1.4	0
Nitrate	4/4	10	1	3.6	c	
Potassium	4/4	3.7	1.6	2.4	c	
Sodium	4/4	13	2.3	6	c	
Sulfate	4/4	33	14	27	c	
Suspended solids	4/4	6	3	5	c	
Temperature (°C)	c/4	22	7.7	16	c	
Total phosphate as phosphorus	4/4	0.4	0.06	0.2	c	
Uranium	6/12	<0.015	0.001	<0.0066	c	
Zinc	3/4	0.08	0.0061	<0.028	0.12	0
pH (standard units)	c/4	7.7	7.2	c	6.5-8.5	0

^aUnits in mg/L unless otherwise noted.

^bAll reference values are Tennessee water quality standards for fish and aquatic life.

^cNot applicable.

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Table 5.38. 1994 K-25 Site parameters detected at K-716

Parameter	Number detected/ number of samples	Detected results ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Alkalinity	c/4	110	62	85	c	
Calcium hardness	c/4	78	66	72	c	
Chemical oxygen demand	3/4	12	<5	<8.8	c	
Chloride	4/4	50	4	16	c	
Color (nm)	c/4	500	500	500	c	
Conductivity (µmho/cm)	c/4	260	200	230	c	
Dissolved oxygen	4/4	10.8	5.8	8.6	5.0 min	0
Dissolved solids	4/4	170	130	150	c	
Fluoride	3/4	0.2	<0.1	<0.13	c	
Iron	4/4	0.39	0.13	0.31	c	
Lead	3/4	0.023	0.0002	<0.0087	0.082	0
Manganese	4/4	0.082	0.027	0.063	c	
Mercury	1/4	0.00027	<0.0002	<0.00022	0.0024	0
Nickel	2/4	<0.05	0.0015	<0.016	1.4	0
Nitrate	4/4	6.3	0.52	2.9	c	
Potassium	4/4	2.2	1.6	1.8	c	
Silver	1/4	<0.01	<0.0001	<0.0028	0.004	0
Sodium	4/4	5.1	3.2	4.6	c	
Sulfate	4/4	28	20	25	c	
Suspended solids	4/4	11	3	8	c	
Temperature (°C)	c/4	25	9.2	17	c	
Total phosphate as phosphorus	4/4	0.3	0.05	0.14	c	
Uranium	8/12	<0.015	0.002	<0.0067	c	
Zinc	3/4	0.093	0.0014	<0.031	0.120	0
pH (standard units)	4/4	8.1	7.7	c	6.5-8.5	

^aUnits in mg/L unless otherwise noted.

^bAll reference values are Tennessee water quality criteria for fish and aquatic life.

^cNot applicable.

Table 5.39. 1994 K-25 Site parameters detected at K-1007-B

Parameter	Number detected/ number of samples	Detected results ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Alkalinity	c/4	100	55	85	c	
Biological oxygen demand	1/4	6.3	<5	<5.3	c	
Calcium hardness	c/4	81	46	68	c	
Chemical oxygen demand	3/4	24	<5	<15	c	
Chloride	4/4	54	9.9	25	c	
Color (nm)	c/4	500	500	500	c	
Conductivity (µmho/cm)	c/4	260	150	206	c	
Dissolved oxygen	4/4	10	7.3	9.3	5.0 min	0
Dissolved solids	4/4	160	110	140	c	
Fluoride	2/4	0.2	<.1	<0.13	c	
Iron	4/4	0.56	0.061	0.3	c	
Lead	3/4	0.02	0.0011	<0.0091	0.082	0
Manganese	4/4	0.087	0.047	0.067	c	
Nickel	2/4	<0.05	0.0044	<0.016	1.4	0
Nitrate	2/4	<1	<.1	<.42	c	
Potassium	4/4	2.4	2	2.2	c	
Selenium	1/4	0.011	<0.002	<0.007	0.02	0
Silver	2/4	<0.01	0.00012	<0.0028	0.004	0
Sodium	4/4	4.1	2.6	3.2	c	
Sulfate	4/4	27	11	17	c	
Suspended solids	4/4	22	6	13	c	
Temperature (°C)	c/4	28	9.9	19	c	
Thallium	1/4	<0.01	<0.0001	<0.0028	c	
Total phosphate as phosphorus	4/4	0.16	0.1	0.13	c	
Uranium	5/12	<0.015	<0.001	<0.0058	c	
Vanadium	2/4	<0.5	0.0012	<0.13	c	
Zinc	2/4	0.11	<0.0055	<0.035	0.12	0
pH (standard units)	c/4	8.4	7.8	8.4	6.5-8.5	2

^aUnits in mg/L unless otherwise noted.

^bAll reference values are Tennessee water quality standards for fish and aquatic life.

^cNot applicable.

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Table 5.40. 1994 K-25 Site parameters detected at K-1700

Parameter	Number detected/ number of samples	Detected results ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
1,1 Dichloroethane (µg/L)	1/4	<10	1J	<6.5J	c	
1,1 Dichloroethene (µg/L)	1/4	<10	1J	<6.5J	c	
1,2 Dichloroethene (µg/L)	4/4	38	18	25	c	
Alkalinity	c/4	150	100	120	c	
Calcium hardness	c/4	130	95	110	c	
Chemical oxygen demand	3/4	12	<5	<8.8	c	
Chloroform (µg/L)	4/4	2J	1J	1.8J	c	
Chloride	4/4	55	5	33	c	
Color (nm)	c/4	500	500	500	c	
Conductivity (µmho/cm)	c/4	360	250	320	c	
Dissolved oxygen	4/4	12	6.4	8.8	5.0 min	0
Dissolved solids	4/4	240	170	210	c	
Fluoride	4/4	0.2	0.1	0.18	c	
Iron	4/4	0.48	0.29	0.39	c	
Lead	3/4	0.0066	0.0036	<0.0051	0.082	0
Manganese	4/4	0.19	0.094	0.14	c	
Nickel	2/4	0.021	<0.0056	<0.023	1.4	0
Nitrate	4/4	4.2	0.27	1.5	c	
Phosphate	4/4	0.37	0.1	0.26	c	
Potassium	4/4	2.8	1.9	2.5	c	
Sodium	4/4	11	4.5	6.9	c	
Sulfate	4/4	45	19	30	c	
Suspended solids	4/4	9	3	5.5	c	
Temperature (°C)	c/4	21	12	17	c	
Tetrachloroethene	1/4	<10	1J	<6.5J	c	
Trichloroethene	4/4	57	26	36	c	
Uranium	8/12	<0.015	0.008	<0.013	c	
Vanadium	1/4	<0.5	0.0013	<0.13	c	
Vinyl chloride (µg/L)	3/4	<10	3J	<5.5J	c	
Zinc	3/4	0.12	0.015	<0.043	0.12	1
pH (standard units)	c/4	7.9	7.4	c	6.5–8.5	0

^aUnits in mg/L unless otherwise noted.

^bAll reference values are Tennessee water quality standards for fish and aquatic life.

^cNot applicable.

Table 5.41. 1994 K-25 Site parameters detected at K-901-A

Parameter	Number detected/ number of samples	Detected results ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Acetone	1/4	0.11	<0.010	<0.035	c	
Alkalinity	c/4	150	110	130	c	
Biological oxygen demand	1/4	5.1	<5	<5	c	
Calcium hardness	c/4	110	79	94	c	
Chemical oxygen demand	3/4	12	<5	<8.8	c	
Chloride	4/4	64	2	19	c	
Color (nm)	c/4	500	500	500	c	
Conductivity (umho/cm)	c/4	290	220	260	c	
Dissolved oxygen	4/4	11	3	6.5	5.0 min	1
Dissolved solids	4/4	170	140	160	c	
Fluoride	2/4	0.2	<0.1	<0.13	c	
Iron	4/4	0.83	0.27	20	c	
Lead	2/4	<0.004	<0.0005	<0.0018	0.082	0
Manganese	4/4	0.084	0.031	0.059	c	
Methylene chloride	1/4	<0.01	0.001J	<0.065	c	
Nickel	1/4	<0.05	.0025	<0.016	1.4	0
Nitrate	3/4	<1.0	0.14	<0.37	c	
pH (standard units)	c/4	8.2	7.4	c	6.5/8.5	0
Potassium	4/4	2.2	1.2	1.5	c	
Sodium	4/4	1.4	0.76	1.1	c	
Sulfate	4/4	11	5	8.4	c	
Suspended solids	3/4	16	<1	<8.8	c	
Temperature (°C)	c/4	26	9.1	19	c	
Total phosphate as phosphorus	4/4	0.15	0.06	0.12	c	
Trichloroethene	1/4	<0.01	0.002	<0.008	c	
Uranium	8/12	<0.015	0.001	<0.0077		
Zinc	2/4	<0.02	0.0051	<0.009	0.12	0

^aUnits in mg/L, unless otherwise noted.

^bAll reference values are Tennessee water quality standards for fish and aquatic life.

^cNot applicable.

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Table 5.42. 1994 K-25 Site parameters detected at WFPC

Parameter	Number detected/ number of samples	Detected results ^a			Reference value ^b	Number of values exceeding reference
		Max	Min	Av		
Alkalinity	c/4	140	53	85	c	
Calcium hardness	c/4	100	51	69	c	
Chemical oxygen demand	1/4	18	<5	<10	c	
Chloride	4/4	45	2	15	c	
Color	c/4	500	500	500	c	
Conductivity	c/4	330	170	230	c	
Dissolved oxygen	4/4	11	5.1	7.5	5.0 min	0
Dissolved solids	4/4	190	120	160	c	
Fluoride	1/4	0.2	0.1	<0.13	c	
Iron	4/4	1.1	0.32	0.56	c	
Lead	3/4	0.0063	0.0062	<0.0035	0.082	0
Manganese	4/4	0.22	0.078	0.14	c	
Nickel	2/4	0.016	0.0019	<0.018	1.4	0
Nitrate	3/4	4.4	0.41	<1.7	c	
Potassium	4/4	2.8	1.5	2.1	c	
Sodium	4/4	6	2.7	3.7	c	
Sulfate	4/4	35	19	29	c	
Suspended solids	4/4	20	4	9.3	c	
Temperature (°C)	c/4	21	7.5	15	c	
Total phosphate as phosphorus	4/4	.17	.03	0.088	c	
Uranium	1/12	<0.015	0.001	<0.0045	c	
Zinc	2/4	0.067	0.0033	<0.024	0.12	0
pH	c/4	7.8	7.2	c	6.5–8.5	0

^aUnits are in mg/L unless otherwise noted.

^bAll reference values are Tennessee water quality standards for fish and aquatic life.

^cNot applicable.

Table 5.43. Radionuclide concentrations at K-25 Site discharges and surface water monitoring locations

Radionuclide	Number of samples	Concentration (pCi/L)				DCG	Percent of DCG	Sum of the fractions of the DCGs
		Max	Min	Median	Av			
<i>West Fork Poplar Creek (upstream of the K-25 Site)</i>								
²³⁴ U	12	1.17E+00	-4.20E-01	1.62E-01	1.63E-01 ^a	5.00E+02	3.26E-02	<i>b</i>
²³⁵ U	12	4.57E+01	-1.02E+01	1.19E+01	1.33E+01 ^a	6.00E+02	2.22E+00	<i>b</i>
²³⁶ U	12	7.79E-02	-1.82E-01	-1.31E-01	-1.53E-02 ^a	5.00E+02	-3.05E-03	<i>b</i>
²³⁸ U	12	1.65E-01	-2.34E-01	0.00E+00	-5.18E-02 ^a	6.00E+02	-8.63E-03	<i>b</i>
¹³⁷ Cs	12	7.35E+01	-7.11E+01	-1.82E-01	7.42E-01 ^a	3.00E+03	2.47E-02	<i>b</i>
⁹⁹ Tc	12	2.52E+01	-4.09E+02	3.57E+01	3.35E+00 ^a	1.00E+05	3.35E-03	<i>b</i>
²³⁷ Np	12	2.37E-01	-1.74E-01	0.00E+00	5.23E-03 ^a	3.00E+01	1.74E-02	<i>b</i>
²³⁸ Pu	12	3.73E-01	-2.03E-01	0.00E+00	1.25E-03 ^a	4.00E+01	3.13E-03	<i>b</i>
²³⁹ Pu	12	2.03E-01	-2.20E-01	0.00E+00	1.15E-02 ^a	3.00E+01	3.82E-02	<i>b</i>
Gross alpha	12	2.49E+00	-1.85E+00	1.60E-01	2.34E-01 ^a	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	4.52E+00	-2.96E+00	2.80E+00	2.19E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								3.32E-02
<i>K-716 (Poplar Creek)</i>								
²³⁴ U	12	1.28E+00	-1.21E-01	5.30E-01	5.35E-01 ^a	5.00E+02	1.07E-01	<i>b</i>
²³⁵ U	12	6.73E+01	-1.84E+01	3.90E+00	1.28E+01 ^a	6.00E+02	2.13E+00	<i>b</i>
²³⁶ U	12	6.25E-02	-1.70E-01	-5.50E-02	-1.29E-02 ^a	5.00E+02	-2.59E-03	<i>b</i>
²³⁸ U	12	1.05E+00	0.00E+00	2.80E-01	4.22E-01 ^a	6.00E+02	7.04E-02	<i>b</i>
¹³⁷ Cs	12	3.48E+01	-7.79E+00	2.75E+00	6.17E+00 ^a	3.00E+03	2.06E-01	<i>b</i>
⁹⁹ Tc	12	1.76E+02	-3.92E+02	1.09E-01	7.79E+00 ^a	1.00E+05	7.79E-03	<i>b</i>
²³⁷ Np	12	3.49E-01	-1.75E-01	0.00E+00	3.98E-02 ^a	3.00E+01	1.33E-01	<i>b</i>
²³⁸ Pu	12	7.48E-01	-2.03E-01	0.00E+00	9.14E-02 ^a	4.00E+01	2.29E-01	<i>b</i>
²³⁹ Pu	12	1.50E+00	-2.15E-01	0.00E+00	1.39E-01 ^a	3.00E+01	4.65E-01	<i>b</i>
⁴⁰ K	12	5.22E+02	0.00E+00	0.00E+00	4.35E+01 ^a	7.00E+03	6.21E-01	<i>b</i>
Gross alpha	12	3.35E+00	1.67E-01	9.90E-01	1.31E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	7.25E+00	-5.95E-01	2.56E+00	2.93E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								3.96E-02
<i>K-901A (settling basin for surface water runoff)</i>								
²³⁴ U	12	3.21E+00	1.79E-01	8.03E-01	1.21E+00 ^a	5.00E+02	2.41E-01	<i>b</i>
²³⁵ U	12	2.98E+01	-1.41E+01	1.23E+01	9.37E+00 ^a	6.00E+02	1.56E+00	<i>b</i>
²³⁶ U	12	1.36E-01	-5.71E-02	0.00E+00	2.92E-02 ^a	5.00E+02	5.85E-02	<i>b</i>
²³⁸ U	12	2.28E+00	0.00E+00	6.57E-01	7.08E-01 ^a	6.00E+02	1.18E-01	<i>b</i>
¹³⁷ Cs	12	3.48E+01	-2.25E+01	1.25E-01	-1.95E-01 ^a	3.00E+03	-6.50E-03	<i>b</i>
⁹⁹ Tc	12	1.66E+02	-1.64E+02	2.13E+00	2.45E+00 ^a	1.00E+05	2.45E-03	<i>b</i>
²³⁷ Np	12	6.98E-01	-1.77E-01	1.84E-01	1.83E-01 ^a	3.00E+01	6.08E-01	<i>b</i>
²³⁸ Pu	12	9.35E-01	-1.48E+00	0.00E+00	-4.72E-02 ^a	4.00E+01	-1.18E-01	<i>b</i>
²³⁹ Pu	12	7.48E-01	-8.82E-01	0.00E+00	-4.04E-03 ^a	3.00E+01	-1.35E-02	<i>b</i>

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Table 5.43 (continued)

Radionuclide	Number of samples	Concentration (pCi/L)				DCG	Percent of DCG	Sum of the fractions of the DCGs
		Max	Min	Median	Av			
²³⁴ Th	12	5.75E+02	0.00E+00	0.00E+00	4.79E+01	1.00E+04	4.79E-01	<i>b</i>
⁴⁰ K	12	4.66E+02	0.00E+00	0.00E+00	3.88E+01	7.00E+03	5.55E-01	<i>b</i>
Gross alpha	12	4.02E+00	-8.48E-01	1.48E+00	1.40E+00	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	3.61E+02	4.79E+00	1.01E+01	4.04E+01	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								3.43E-02
<i>K-1007-B (settling basin for surface water runoff)</i>								
²³⁴ U	12	2.04E+00	3.87E-01	7.98E-01	1.01E+00 ^a	5.00E+02	2.02E-01	<i>b</i>
²³⁵ U	12	5.18E+01	-2.72E+01	2.03E+00	5.28E+00 ^a	6.00E+02	8.80E-01	<i>b</i>
²³⁶ U	12	2.97E-01	-6.20E-02	0.00E+00	4.06E-02 ^a	5.00E+02	8.12E-03	<i>b</i>
²³⁸ U	12	1.34E+00	-4.12E-01	2.96E-01	2.80E-01 ^a	6.00E+02	4.67E-02	<i>b</i>
¹³⁷ Cs	12	3.71E+01	-1.21E+01	5.58E+00	7.46E+00 ^a	3.00E+03	2.49E-01	<i>b</i>
⁹⁹ Tc	12	1.67E+02	-4.18E+02	-6.00E-02	-1.99E+01 ^a	1.00E+05	-1.99E-02	<i>b</i>
²³⁷ Np	12	2.40E-01	-1.87E-01	3.95E-02	5.55E-02 ^a	3.00E+01	1.85E-01	<i>b</i>
²³⁸ Pu	12	9.75E-01	-1.40E+00	0.00E+00	-4.32E-02 ^a	4.00E+01	-1.08E-01	<i>b</i>
²³⁹ Pu	12	7.80E-01	-8.70E-01	0.00E+00	6.55E-02 ^a	3.00E+01	2.18E-01	<i>b</i>
²³⁴ Th	12	7.27E+02	0.00E+00	0.00E+00	6.06E+01 ^a	1.00E+04	6.06E-01	<i>b</i>
⁴⁰ K	12	4.39E+02	0.00E+00	0.00E+00	3.66E+01 ^a	7.00E+03	5.23E-01	<i>b</i>
Gross alpha	12	2.76E+01	-4.52E+00	7.71E-01	3.05E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	3.42E+01	-3.55E+00	6.64E-01	7.70E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								2.79E-02
<i>K-1203 Sewage Treatment Plant</i>								
²³⁴ U	12	2.26E+01	3.34E+00	7.43E+00	9.48E+00	5.00E+02	1.90E+00	1.90E-02
²³⁵ U	12	1.23E+02	-5.33E+01	8.10E+00	1.39E+01	6.00E+02	2.31E+00	2.31E-02
²³⁶ U	12	5.71E-01	0.00E+00	5.69E-02	1.52E-01	5.00E+02	3.03E-02	3.03E-04
²³⁸ U	12	1.96E+00	6.73E-02	4.80E-01	6.59E-01	6.00E+02	1.10E-01	1.10E-03
¹³⁷ Cs	12	8.33E+01	-4.99E+01	4.60E+01	9.78E+00	3.00E+03	3.26E-01	3.26E-03
⁹⁹ Tc	12	2.16E+02	-5.48E+02	-2.20E+00	-3.11E+01	1.00E+05	-3.11E-02	-3.11E-04
²³⁷ Np	12	1.08E+00	0.00E+00	3.60E-01	4.10E-01	3.00E+01	1.37E+00	1.37E-02
²³⁸ Pu	12	3.95E-01	-1.47E+00	-3.90E-02	-1.12E-01	4.00E+01	-2.81E-01	-2.81E-03
²³⁹ Pu	12	7.43E-01	-8.62E-01	0.00E+00	-5.57E-02	3.00E+01	-1.86E-01	-1.86E-03
²³⁴ Th	12	1.01E+03	0.00E+00	0.00E+00	1.43E+02	1.00E+04	1.43E+00	1.43E-02
^{234m} Pa	12	4.60E+02	0.00E+00	0.00E+00	3.83E+01	7.00E+04	5.48E-02	5.48E-04
⁴⁰ K	12	5.68E+02	0.00E+00	0.00E+00	4.73E+01	7.00E+03	6.76E-01	6.76E-03
Gross alpha	12	1.94E+01	2.21E+00	8.29E+00	8.50E+00	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	1.59E+01	4.15E+00	1.05E+01	9.30E+00	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								7.70E-02
<i>K-1515-C (filter backwash from the Sanitary Water Treatment Facility)</i>								
²³⁴ U	12	6.19E+00	-1.56E-01	1.70E-01	6.55E-01 ^a	5.00E+02	1.31E-01	1.31E-03
²³⁵ U	12	4.15E+01	-1.52E+01	-7.62E-01	4.88E+00 ^a	6.00E+02	8.13E-01	8.13E-03

Table 5.43 (continued)

Radionuclide	Number of samples	Concentration (pCi/L)				DCG	Percent of DCG	Sum of the fractions of the DCGs
		Max	Min	Median	Av			
²³⁶ U	12	7.81E-02	-6.04E-02	0.00E+00	7.34E-03 ^a	5.00E+02	1.47E-03	1.47E-05
²³⁸ U	12	7.03E-01	-3.89E-01	0.00E+00	4.79E-02 ^a	6.00E+02	7.98E-03	7.98E-05
¹³⁷ Cs	12	9.77E+01	-3.03E+01	8.62E-01	5.58E+00 ^a	3.00E+03	1.86E-01	1.86E-03
⁹⁹ Tc	12	1.90E+02	-3.97E+02	2.29E-01	9.97E+00 ^a	1.00E+05	9.97E-03	9.97E-05
²³⁷ Np	12	5.84E-01	-3.50E-01	0.00E+00	9.26E-02 ^a	3.00E+01	3.09E-01	3.09E-03
²³⁸ Pu	12	3.88E-01	-1.31E+00	0.00E+00	-1.15E-01 ^a	4.00E+01	-2.89E-01	-2.89E-03
²³⁹ Pu	12	2.13E-01	-8.39E-01	0.00E+00	-9.87E-02 ^a	3.00E+01	-3.29E-01	-3.29E-03
²²⁸ Th	12	6.55E+02	0.00E+00	0.00E+00	5.46E+01 ^a	4.00E+02	1.36E+01	1.36E-01
²³⁴ Th	12	8.95E+02	0.00E+00	0.00E+00	7.46E+01	1.00E+04	7.46E-01	7.46E-03
¹⁴³ Ce	12	1.78E+03	0.00E+00	0.00E+00	1.48E+02	3.00E+04	4.94E-01	4.94E-03
Gross alpha	12	1.38E+01	-3.29E+00	2.17E-01	1.18E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	9.23E+00	-9.32E+00	2.82E+00	1.96E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								1.57E-01
<i>K-1700 (Mitchell Branch)</i>								
²³⁴ U	12	9.65E+00	4.05E+00	6.00E+00	6.83E+00	5.00E+02	1.37E+00	<i>b</i>
²³⁵ U	12	2.68E+01	-1.11E+01	4.68E+00	4.87E+00 ^a	6.00E+02	8.11E-01	<i>b</i>
²³⁶ U	12	5.36E-01	0.00E+00	1.04E-01	1.73E-01 ^a	5.00E+02	3.46E-02	<i>b</i>
²³⁸ U	12	6.23E+00	5.54E-01	3.62E+00	3.53E+00	6.00E+02	5.88E-01	<i>b</i>
¹³⁷ Cs	12	6.93E+01	-6.28E+01	3.36E+00	2.77E+00 ^a	3.00E+03	9.23E-02	<i>b</i>
⁹⁹ Tc	12	3.42E+02	-4.43E+02	1.02E+01	-7.37E+00 ^a	1.00E+05	-7.37E-03	<i>b</i>
²³⁷ Np	12	9.61E-01	-1.75E-01	1.24E-01	3.08E-01 ^a	3.00E+01	1.03E+00	<i>b</i>
²³⁸ Pu	12	8.34E-01	-2.18E-01	-3.74E-02	4.17E-02 ^a	4.00E+01	1.04E-01	<i>b</i>
²³⁹ Pu	12	8.10E-01	-4.37E-01	0.00E+00	7.26E-02 ^a	3.00E+01	2.42E-01	<i>b</i>
²³⁴ Th	12	8.41E+02	0.00E+00	0.00E+00	7.01E+01	1.00E+04	7.01E-01	<i>b</i>
¹⁴³ Ce	12	2.84E+03	0.00E+00	0.00E+00	2.37E+02	3.00E+04	7.89E-01	<i>b</i>
Gross alpha	12	1.54E+01	3.56E+00	1.03E+01	1.07E+01	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	2.40E+01	2.01E+00	1.78E+01	1.74E+01 ^a	<i>b</i>	<i>b</i>	<i>b</i>
All listed isotopes								5.75E-02
<i>K-1710 (Poplar Creek upstream of the K-25 Site)</i>								
²³⁴ Th	12	3.37E+02	0.00E+00	0.00E+00	2.81E+01	1.00E+04	2.80E-01	<i>b</i>
²³⁴ U	12	1.77E+00	0.00E+00	0.00E+00	6.49E-01 ^a	5.00E+02	1.30E-01	<i>b</i>
²³⁵ U	12	5.09E+01	-3.13E+01	2.92E+00	2.42E+00 ^a	6.00E+02	4.03E-01	<i>b</i>
²³⁶ U	12	9.84E-02	-1.33E-01	-3.84E-02	-9.28E-03 ^a	5.00E+02	-1.86E-03	<i>b</i>
²³⁸ U	12	1.53E+00	-1.33E-01	2.50E-01	3.68E-01 ^a	6.00E+02	6.14E-02	<i>b</i>
¹³⁷ Cs	12	1.16E+01	-5.23E+01	-1.54E+00	-6.72E+00 ^a	3.00E+03	-2.24E-01	<i>b</i>
⁹⁹ Tc	12	1.52E+02	-4.60E+02	1.47E+01	-1.94E+00 ^a	1.00E+05	-1.94E-03	<i>b</i>
²³⁷ Np	12	3.28E-01	-3.79E-01	-4.09E-02	-1.34E-02 ^a	3.00E+01	-4.46E-02	<i>b</i>
²³⁸ Pu	12	1.39E-01	-2.11E-01	0.00E+00	-8.50E-04 ^a	4.00E+01	-2.13E-03	<i>b</i>

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Table 5.43 (continued)

Radionuclide	Number of samples	Concentration (pCi/L)				DCG	Percent of DCG	Sum of the fractions of the DCGs
		Max	Min	Median	Av			
²³⁹ Pu	12	8.21E-01	-2.12E-01	0.00E+00	1.37E-01 ^a	3.00E+01	4.57E-01	<i>b</i>
⁴⁰ K	12	3.97E+02	0.00E+00	0.00E+00	3.31E+01	7.00E+03	4.73E-01	<i>b</i>
Gross alpha	12	3.56E+00	-3.16E-01	6.44E-01	1.07E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>
Gross beta	12	7.18E+00	-1.85E+00	2.45E+00	2.56E+00 ^a	<i>b</i>	<i>b</i>	<i>b</i>

^aThis calculated value indicates sampling results that are at or below the detection limits and/or below background activities.

^bNot applicable.

Table 5.44. 1994 sampling and analysis plan for ORNL off-site treated water monitoring

Station	Analysis	Collection frequency	Sample type	Analysis frequency
Gallaher	Gamma scan, gross alpha, gross beta, ³ H, ²³⁸ Pu, ²³⁹ Pu, Total rad Sr, Total U	Weekly	Time proportional composite	Quarterly
Kingston	Gamma scan, gross alpha, gross beta, ³ H, ²³⁸ Pu, ²³⁹ Pu, Total rad Sr, Total U	Weekly	Composite of daily grabs	Quarterly

Table 5.45. 1994 analyses for ORNL off-site treated water monitoring

Parameter	No. detected/ No. total	Concentration			Standard error ^c	DWS ^d	Percent of DWS ^e
		Max ^a	Min ^a	Av ^b			
<i>Gallagher</i>							
Metals (mg/L)							
Uranium, total ^f	4/4	0.00017	0.000038	0.000094*	0.000028	g	g
Radionuclides (pCi/L)							
⁶⁰ Co	0/4	0.57	-0.000027	0.30*	0.12	200	0.15
¹³⁷ Cs	2/4	43*	-0.000027	11	11	120	g
Gross alpha	2/4	1.6*	0.041	0.69	0.33	15	g
Gross beta	4/4	38*	1.0*	11	8.8	50	g
³ H	2/4	810	54	510*	160	20,000	2.6
²³⁸ Pu	2/4	0.12	-0.0051	0.054	0.033	1.6	g
²³⁹ Pu	0/4	0.12	-0.076	-0.00081	0.042	1.2	g
Total rad Sr	3/4	0.43*	0.11	0.30*	0.069	8	3.8
Total U ^g	4/4	0.11	0.025	0.062*	0.018	20	0.31
<i>Kingston</i>							
Metals (mg/L)							
Uranium, total ^f	4/4	0.00050	0.000029	0.00019	0.00011	g	g
Radionuclides (pCi/L)							
⁶⁰ Co	0/4	0.14	-0.41	-0.054	0.12	200	g
¹³⁷ Cs	1/4	0.19	-0.054	0.061	0.054	120	g
Gross alpha	3/4	0.51*	0.089*	0.27*	0.099	15	1.8
Gross beta	4/4	2.2*	0.65*	1.5*	0.35	50	3.1
³ H	0/4	270	-350	-120	140	20,000	g
²³⁸ Pu	0/4	0.021	-0.051	-0.0071	0.016	1.6	g
²³⁹ Pu	0/4	0.0073	-0.015	-0.0023	0.0047	1.2	g
Total rad Sr	2/4	0.21*	0.051	0.11*	0.037	8	1.3
Total U ^g	4/4	0.33	0.019	0.1	0.070	20	g

^aIndividual radionuclide concentrations significantly greater than zero are identified by an *.

^bAverage radionuclide concentrations significantly greater than zero are identified by an *.

^cStandard error of the mean.

^dDrinking Water Standards (from 40 CFR Parts 141 and 143, and the Tennessee General Water Quality Criteria for Domestic Water Supply). For radionuclides that do not have a drinking water standard, 4% of DCG for ingestion of water (from DOE Order 5400.5) is used.

^eAverage concentration as a percentage of drinking water standards, calculated when a reference exists and the parameter is a contaminant. For radionuclides, percentage of DWS is calculated only when a reference exists and the average concentration is significantly greater than zero.

^fLaboratory method does not permit a test of significance for the maximum and minimum values.

^gNot applicable.

^hActivity derived from mass assuming natural abundance of ²³⁴U, ²³⁵U, and ²³⁸U.

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Table 5.46. Summary of constituents detected in off-site residential groundwater during 1994

Parameter	No. detected/ No. total	Max	Min	Av	Reference value	Number of values exceeding reference [ref] ^a
Anions, unfiltered (mg/L)						
Chloride	35/35	69	0.91	6.9	250	0[3]
Fluoride	19/35	7.2	0.054	0.91	4	2[2]
Nitrate	33/35	13	0.28	2.9	10	2[2]
Sulfate, as SO ₄	35/35	53	1.9	12	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	35/35	1.8	0.11	0.49	<i>b</i>	[<i>b</i>]
Temperature (°C)	35/35	23	4.9	15	30.5	0[1]
pH (SU)	35/35	8.8	7.0	7.5	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Barium, total	35/35	0.17	0.0030	0.073	2	0[2]
Calcium, total	35/35	110	1.6	43	<i>b</i>	[<i>b</i>]
Copper, total	16/35	0.044	0.0073	0.016	1.3	0[2]
Iron, total	13/35	2.6	0.066	0.35	0.3	3[3]
Lead, total	3/35	0.014	0.0046	0.0084	0.05	0[1]
Magnesium, total	35/35	30	0.60	12	<i>b</i>	[<i>b</i>]
Manganese, total	17/35	0.27	0.0012	0.030	0.05	3[3]
Mercury, total	8/35	0.000091	0.000057	0.000078	0.002	0[1]
Sodium, total	35/35	460	0.49	40	<i>b</i>	[<i>b</i>]
Uranium, total	23/35	0.0015	0.00012	0.00045	<i>b</i>	[<i>b</i>]
Vanadium, total	1/35	0.0020	0.0020	0.0020	<i>b</i>	[<i>b</i>]
Zinc, total	31/35	0.72	0.0057	0.12	5	0[3]
Radionuclides, unfiltered (pCi/L)^c						
Gross alpha	11/35	2.4*	0.92*	1.5	15	0[2]
Gross beta	25/35	17*	1.5*	3.6	50	0[2]
Total rad Sr	8/35	5.1*	1.2*	3.1	8	0[2]

^aIf a reference limit exists, the source is coded as follows: (1) Rules of Tennessee Department of Environmental and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended; (2) 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended; (3) 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended; (4) DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

^bNot applicable.

^cIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 5.47. 1994 EMP sediment sampling locations

BCK 0.6	Bear Creek downstream from all DOE inputs
BCK 9.4	Bear Creek downstream from Y-12 Plant burial grounds
CRK 16	Clinch River downstream from all DOE inputs
CRK 32	Clinch River downstream from ORNL
CRK 80	Melton Hill Reservoir—Oak Ridge Marina
CRK 84	Melton Hill Reservoir above all DOE inputs—Anderson County Filtration Plant
EFK 5.4	East Fork Poplar Creek downstream from floodplain
EFK 23.4	East Fork Poplar Creek downstream from the Y-12 Plant
HC	Hinds Creek (reference site for East Fork Poplar Creek)
MEK 2.1	Melton Branch upstream from ORNL
MIK 0.1	Mitchell Branch downstream from the K-25 Site
MIK 1.4	Mitchell Branch upstream from the K-25 Site
PCK 2.2	Poplar Creek downstream from the K-25 Site
PCK 22	Poplar Creek upstream from the K-25 Site and East Fork Poplar Creek
WCK 1.0	White Oak Lake at White Oak Dam
WCK 6.8	White Oak Creek upstream from ORNL

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Table 5.48. 1994 sampling and analysis plan parameters for EMP sediment locations^a

<i>Metals/inorganics</i>	<i>Pesticides/PCBs</i>	<i>Radionuclides</i>
Aluminum	Aldrin	²⁴¹ Am
Antimony	Alpha-BHC	²⁴⁴ Cm
Arsenic	Beta-BHC	Gross alpha
Barium	Delta-BHC	Gross beta
Beryllium	Gamma-BHC (Lindane)	⁶⁰ Co
Cadmium	Chlordane (technical)	¹³⁷ Cs
Calcium	4,4'-DDD	²³⁷ Np
Chromium	4,4'-DDE	²³⁸ Pu
Cobalt	4,4'-DDT	²³⁹ Pu
Copper	Dieldrin	⁹⁰ Sr
Iron	Endosulfan I	⁹⁹ Tc
Lead	Endosulfan II	²³⁰ Th
Magnesium	Endosulfan sulfate	²³² Th
Manganese	Endrin	²³⁴ U
Mercury	Endrin aldehyde	²³⁵ U
Nickel	Heptachlor	²³⁸ U
Potassium	Heptachlor epoxide	
Selenium	Methoxychlor	
Silver	Toxaphene	
Sodium	PCB-1016	
Thallium	PCB-1221	
Uranium	PCB-1232	
Vanadium	PCB-1242	
Zinc	PCB-1248	
	PCB-1254	
	PCB-1260	
	2,4-D	
	2,4,5-TP (Silvex)	
<i>Semivolatile organics</i>		
1,2-Dichlorobenzene	4-Methylphenol	Dibenzofuran
1,2,4-Trichlorobenzene	4-Nitroaniline	Diethylphthalate
1,3-Dichlorobenzene	4-Nitrophenol	Dimethylphthalate
1,4-Dichlorobenzene	4-Chloro-3-methylphenol	Fluoranthene
2-Chloronaphthalene	4,6-Dinitro-2-methylphenol	Fluorene
2-Chlorophenol	Acenaphthene	Hexachlorobenzene
2-Methylnaphthalene	Acenaphthylene	Hexachlorobutadiene
2-Methylphenol	Anthracene	Hexachlorocyclopentadiene
2-Nitroaniline	Benzo(a)anthracene	Hexachloroethane
2-Nitrophenol	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene
2,4-Dimethylphenol	Benzo(b)fluoranthene	Isoporone
2,4-Dinitrophenol	Benzo(g,h,i)perylene	N-nitroso-di-n-propylamine
2,4-Dinitrotoluene	Benzo(k)fluoranthene	N-Nitrosodiphenylamine
2,4,5-Trichlorophenol	bis(2-Chloroethyl)ether	Naphthalene
2,4,6-Trichlorophenol	bis(2-Chloroisopropyl)ether	Nitrobenzene
2,6-Dinitrotoluene	bis(2-Ethylhexyl)phthalate	Pentachlorophenol
3-Nitroaniline	Butylbenzylphthalate	Phenanthrene
3,3'-Dichlorobenzidine	Carbazole	Phenol
4-Bromophenyl-phenylether	Chrysene	Pyrene
4-Chloroaniline	Di-n-octylphthalate	
4-Chlorophenyl-phenylether	Dibenz(a,h)anthracene	

^aCollection frequency: annually. Sample type: grab. Analysis frequency: annually.

Table 5.49. 1994 concentrations at EMP sediment locations^a

Parameter	Concentration ^b
<i>Bear Creek downstream from all DOE inputs (BCK 0.6)</i>	
Metals (g/kg)	
Aluminum, total	13
Barium, total	0.14
Beryllium, total	0.00067
Calcium, total	1.7
Chromium, total	0.013
Cobalt, total	0.013
Copper, total	0.0039
Iron, total	16
Lead, total	0.012
Magnesium, total	1.4
Manganese, total	1.4
Mercury, total	0.00011
Nickel, total	0.013
Potassium, total	0.96
Selenium, total	0.00051
Sodium, total	0.046
Thallium, total	0.00015
Uranium, total	0.0016
Vanadium, total	0.026
Zinc, total	0.024
PCBs (µg/kg)	
Aroclor-1260	16.0
Radionuclides (pCi/g) ^c	
Gross alpha	4.3*
Gross beta	7.8*
⁹⁹ Tc	0.11*
²²⁸ Th	0.49*
²³⁰ Th	0.21*
²³² Th	0.43*
²³⁴ U	0.38*
²³⁵ U	0.017*
²³⁸ U	0.57*
Semivolatile organics (µg/kg)	
Di-n-butylphthalate	JB67
Diethyl phthalate	JB43

Table 5.49 (continued)

Parameter	Concentration ^b
<i>Bear Creek downstream from Y-12 Plant burial grounds (BCK 9.4)</i>	
Metals (g/kg)	
Aluminum, total	8.4
Barium, total	0.10
Beryllium, total	0.00072
Cadmium, total	0.0034
Calcium, total	5.1
Chromium, total	0.014
Cobalt, total	0.012
Copper, total	0.0074
Iron, total	13
Lead, total	0.015
Magnesium, total	1.3
Manganese, total	1.3
Mercury, total	0.00032
Nickel, total	0.019
Potassium, total	1.1
Selenium, total	0.00057
Sodium, total	0.045
Thallium, total	0.0001
Uranium, total	0.013
Vanadium, total	0.020
Zinc, total	0.031
PCBs (µg/kg)	
Aroclor-1248	J12
Aroclor-1254	J37
Aroclor-1260	J33
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.014*
¹³⁷ Cs	0.062*
Gross alpha	6.2*
Gross beta	13*
²³⁷ Np	0.059*
⁹⁹ Tc	0.35*
²²⁸ Th	0.32*
²³⁰ Th	0.14*
²³² Th	0.32*

Table 5.49 (continued)

Parameter	Concentration ^b
²³⁴ U	2.1*
²³⁵ U	0.086*
²³⁸ U	3.2*
Semivolatile organics (µg/kg)	
Benzyl butyl phthalate	1500
<i>Clinch River downstream from all DOE inputs (CRK 16)</i>	
Metals (g/kg)	
Aluminum, total	17
Barium, total	0.094
Beryllium, total	0.00066
Calcium, total	8.5
Chromium, total	0.014
Cobalt, total	0.011
Copper, total	0.0087
Iron, total	14
Lead, total	0.020
Magnesium, total	3.8
Manganese, total	1.1
Mercury, total	0.000094
Nickel, total	0.01
Potassium, total	1.2
Selenium, total	0.00046
Sodium, total	0.044
Thallium, total	0.00025
Uranium, total	0.00085
Vanadium, total	0.029
Zinc, total	0.041
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.030*
²⁴⁴ Cm	0.030*
Gross alpha	4.3*
Gross beta	7.0*
²²⁸ Th	0.54*
²³⁰ Th	0.35*
²³² Th	0.46*

Table 5.49 (continued)

Parameter	Concentration ^b
²³⁴ U	0.35*
²³⁵ U	0.0086*
²³⁸ U	0.27*
Semivolatile organics (µg/kg)	
Benzyl butyl phthalate	JB240
Bis(2-ethylhexyl) phthalate	JB95
Di-n-butylphthalate	JB10
Diethyl phthalate	J52
<i>Clinch River downstream from ORNL (CRK 32)</i>	
Metals (g/kg)	
Aluminum, total	13
Barium, total	0.075
Beryllium, total	0.00077
Calcium, total	27
Chromium, total	0.014
Cobalt, total	0.0088
Copper, total	0.015
Iron, total	15
Lead, total	0.021
Magnesium, total	3.3
Manganese, total	0.74
Mercury, total	0.00015
Nickel, total	0.016
Potassium, total	1.8
Selenium, total	0.00067
Sodium, total	0.064
Thallium, total	0.00017
Uranium, total	0.00042
Vanadium, total	0.021
Zinc, total	0.049
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.051*
²⁴⁴ Cm	0.024*
⁶⁰ Co	0.15*
¹³⁷ Cs	8.6*
Gross alpha	9.7*
Gross beta	20*

Table 5.49 (continued)

Parameter	Concentration ^b
²³⁹ Pu	0.022*
⁹⁹ Tc	0.41*
²²⁸ Th	0.54*
²³⁰ Th	0.26*
²³¹ Th	0.38*
²³⁴ U	0.32*
²³⁵ U	0.0051*
²³⁸ U	0.21*

Melton Hill Reservoir—Oak Ridge Marina (CRK 80)

Metals (g/kg)

Aluminum, total	12
Barium, total	0.065
Beryllium, total	0.00073
Calcium, total	14
Chromium, total	0.012
Cobalt, total	0.0079
Copper, total	0.0075
Iron, total	16
Lead, total	0.012
Magnesium, total	2.2
Manganese, total	0.39
Mercury, total	0.00012
Nickel, total	0.011
Potassium, total	1.8
Selenium, total	0.0004
Sodium, total	0.054
Thallium, total	0.00012
Uranium, total	0.00063
Vanadium, total	0.022
Zinc, total	0.039

Radionuclides (pCi/g)^c

¹³⁷ Cs	0.041*
Gross alpha	2.7*
Gross beta	6.5*
²²⁸ Th	0.17*
²³⁰ Th	0.10*
²³² Th	0.15*

Table 5.49 (continued)

Parameter	Concentration ^b
²³⁴ U	0.19*
²³⁵ U	0.010*
²³⁸ U	0.24*
Semivolatile organics (µg/kg)	
Bis(2-ethylhexyl) phthalate	JB76
Di-n-butylphthalate	JB120

Melton Hill Reservoir above all DOE inputs (CRK 84)

Metals (g/kg)

Aluminum, total	9.7
Barium, total	0.093
Beryllium, total	0.00082
Calcium, total	1.7
Chromium, total	0.011
Cobalt, total	0.0074
Copper, total	0.0079
Iron, total	12
Lead, total	0.016
Magnesium, total	1.4
Manganese, total	0.63
Mercury, total	0.0001
Nickel, total	0.012
Potassium, total	1.1
Selenium, total	0.00056
Sodium, total	0.029
Thallium, total	0.00012
Uranium, total	0.0006
Vanadium, total	0.019
Zinc, total	0.055

Radionuclides (pCi/g)^c

¹³⁷ Cs	0.049*
Gross alpha	5.1*
Gross beta	7.0*
²²⁸ Th	0.27*
²³⁰ Th	0.19*
²³² Th	0.27*
²³⁴ U	0.14*
²³⁸ U	0.17*

Table 5.49 (continued)

Parameter	Concentration ^b
Semivolatile organics (µg/kg)	
Di-n-butylphthalate	JB56
Diethyl phthalate	J74
Fluoranthene	J60
Phenanthrene	J53
Pyrene	J44
<i>East Fork Poplar Creek downstream from the Y-12 Plant (EFK 23.4)</i>	
Metals (g/kg)	
Aluminum, total	13
Barium, total	0.10
Beryllium, total	0.00074
Cadmium, total	0.0016
Calcium, total	19
Chromium, total	0.023
Cobalt, total	0.0081
Copper, total	0.033
Iron, total	17
Lead, total	0.022
Magnesium, total	4.9
Manganese, total	0.59
Mercury, total	0.018
Nickel, total	0.025
Potassium, total	0.22
Selenium, total	0.00025
Sodium, total	0.068
Thallium, total	0.00019
Uranium, total	0.014
Vanadium, total	0.021
Zinc, total	0.20
PCBs (µg/kg)	
Aroclor-1248	160
Aroclor-1254	360
Aroclor-1260	540
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.030*
¹³⁷ Cs	0.19*
Gross alpha	11*
Gross beta	18*

Table 5.49 (continued)

Parameter	Concentration ^b
⁹⁹ Tc	0.11*
²²⁸ Th	0.57*
²³⁰ Th	0.70*
²³² Th	0.49*
²³⁴ U	3.0*
²³⁵ U	0.15*
²³⁸ U	3.0*
Semivolatile organics (µg/kg)	
Benzo(a)anthracene	J1,600
Benzo(a)pyrene	J2,200
Benzo(b)fluoranthene	J2,400
Benzo(ghi)perylene	J1,200
Benzo(k)fluoranthene	J2,200
Chrysene	J1,900
Fluoranthene	J5,300
Indeno(1,2,3-cd)pyrene	J1,000
Phenanthrene	J2,400
Pyrene	J3,200
<i>East Fork Poplar Creek downstream from floodplain (EFK 5.4)</i>	
Metals (g/kg)	
Aluminum, total	3.4
Barium, total	0.031
Calcium, total	1.4
Chromium, total	0.018
Cobalt, total	0.0044
Copper, total	0.0081
Iron, total	10
Lead, total	0.024
Magnesium, total	0.41
Manganese, total	0.34
Mercury, total	0.010
Nickel, total	0.012
Potassium, total	0.33
Selenium, total	0.00036
Sodium, total	0.040
Thallium, total	0.000063

Table 5.49 (continued)

Parameter	Concentration ^b
Uranium, total	0.0051
Vanadium, total	0.015
Zinc, total	0.044
PCBs (µg/kg)	
Aroclor-1254	J22
Aroclor-1260	28
Radionuclides (pCi/g) ^c	
²⁴⁴ Cm	0.013*
¹³⁷ Cs	0.35*
Gross alpha	5.4*
Gross beta	7.0*
⁹⁹ Tc	0.19*
²²⁸ Th	0.20*
²³⁰ Th	0.38*
²³² Th	0.21*
²³⁴ U	1.6*
²³⁵ U	0.068*
²³⁸ U	1.4*

Hinds Creek (reference site for East Fork Poplar Creek) (HC)

Metals (g/kg)	
Aluminum, total	7.0
Barium, total	0.068
Beryllium, total	0.00055
Calcium, total	2.1
Chromium, total	0.01
Cobalt, total	0.0072
Copper, total	0.0069
Iron, total	11
Lead, total	0.014
Magnesium, total	1.0
Manganese, total	0.82
Mercury, total	0.0001
Nickel, total	0.0076
Potassium, total	0.72
Selenium, total	0.00048
Sodium, total	0.027
Thallium, total	0.000081

Table 5.49 (continued)

Parameter	Concentration ^b
Uranium, total	0.00035
Vanadium, total	0.015
Zinc, total	0.031
Radionuclides (pCi/g) ^c	
¹³⁷ Cs	0.068*
Gross alpha	3.2*
Gross beta	7.3*
⁹⁹ Tc	0.10*
²²⁸ Th	0.35*
²³⁰ Th	0.19*
²³² Th	0.30*
²³⁴ U	0.16*
²³⁸ U	0.14*

Melton Branch upstream from ORNL (MEK 2.1)

Metals (g/kg)

Aluminum, total	12
Barium, total	0.20
Beryllium, total	0.0013
Calcium, total	2.7
Chromium, total	0.047
Cobalt, total	0.019
Copper, total	0.012
Iron, total	40
Lead, total	0.021
Magnesium, total	2.6
Manganese, total	2.0
Mercury, total	0.000078
Nickel, total	0.026
Potassium, total	1.3
Selenium, total	0.00031
Sodium, total	0.036
Thallium, total	0.00012
Uranium, total	0.00049
Vanadium, total	0.044
Zinc, total	0.043
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.032*
¹³⁷ Cs	0.068*

Table 5.49 (continued)

Parameter	Concentration ^b
Gross alpha	7.0*
Gross beta	12*
²²⁸ Th	0.49*
²³⁰ Th	0.16*
²³² Th	0.30*
²³⁴ U	0.21*
²³⁸ U	0.13*
Semivolatile organics (µg/kg)	
Diethyl phthalate	JB110
<i>Mitchell Branch downstream from the K-25 Site (MIK 0.1)</i>	
Metals (g/kg)	
Aluminum, total	14
Barium, total	0.11
Beryllium, total	0.00076
Cadmium, total	0.0011
Calcium, total	9.0
Chromium, total	0.04
Cobalt, total	0.0098
Copper, total	0.099
Iron, total	24
Lead, total	0.05
Magnesium, total	3.9
Manganese, total	1.1
Mercury, total	0.0013
Nickel, total	0.20
Potassium, total	1.6
Selenium, total	0.00053
Sodium, total	0.061
Thallium, total	0.0002
Uranium, total	0.02
Vanadium, total	0.027
Zinc, total	0.18
PCBs (µg/kg)	
Aroclor-1254	930
Aroclor-1260	1500
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.070*
¹³⁷ Cs	0.46*

Table 5.49 (continued)

Parameter	Concentration ^b
Gross alpha	21*
Gross beta	89*
²³⁷ Np	0.16*
²³⁹ Pu	0.27*
⁹⁹ Tc	81*
²²⁸ Th	0.38*
²³⁰ Th	1.2*
²³² Th	0.41*
²³⁴ U	12*
²³⁵ U	0.49*
²³⁸ U	6.8*

Mitchell Branch upstream from the K-25 Site (MIK 1.4)

Metals (g/kg)

Aluminum, total	8.4
Barium, total	0.079
Beryllium, total	0.00059
Calcium, total	1.0
Chromium, total	0.016
Cobalt, total	0.010
Copper, total	0.014
Iron, total	13
Lead, total	0.0072
Magnesium, total	2.0
Manganese, total	0.30
Mercury, total	0.000099
Nickel, total	0.043
Potassium, total	1.7
Selenium, total	0.00041
Sodium, total	0.040
Thallium, total	0.00011
Uranium, total	0.0008
Vanadium, total	0.018
Zinc, total	0.025

PCBs (μg/kg)

Aroclor-1254	12.0
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Radionuclides (pCi/g)^c

²⁴¹ Am	0.030*
¹³⁷ Cs	0.38*

Table 5.49 (continued)

Parameter	Concentration ^b
Gross alpha	4.3*
Gross beta	7.6*
⁹⁹ Tc	0.24*
²²⁸ Th	0.24*
²³⁰ Th	0.062*
²³² Th	0.18*
²³⁴ U	0.51*
²³⁵ U	0.046*
²³⁸ U	0.27*
Semivolatile organics (µg/kg)	
Benzo(a)pyrene	J190
Benzo(b)fluoranthene	J210
Benzo(k)fluoranthene	J170
Benzyl butyl phthalate	JB170
Chrysene	J260
Di-n-butylphthalate	JB110
Fluoranthene	J350
Pyrene	J240

Poplar Creek downstream from the K-25 Site (PCK 2.2)

Metals (g/kg)

Aluminum, total	17
Barium, total	0.085
Calcium, total	1.2
Chromium, total	0.017
Cobalt, total	0.011
Copper, total	0.012
Iron, total	20
Lead, total	0.015
Magnesium, total	1.5
Manganese, total	0.67
Mercury, total	0.0008
Nickel, total	0.018
Potassium, total	1.4
Selenium, total	0.00054
Sodium, total	0.063
Thallium, total	0.00019

Table 5.49 (continued)

Parameter	Concentration ^b
Uranium, total	0.0021
Vanadium, total	0.032
Zinc, total	0.044
PCBs (µg/kg)	
Aroclor-1254	J33
Aroclor-1260	J34
Radionuclides (pCi/g) ^c	
Gross alpha	4.3*
Gross beta	8.9*
⁹⁹ Tc	0.89*
²²⁸ Th	0.54*
²³⁰ Th	0.30*
²³² Th	0.57*
²³⁴ U	0.84*
²³⁵ U	0.043*
²³⁸ U	0.68*
Semivolatile organics (µg/kg)	
Benzyl butyl phthalate	J140
Di-n-butylphthalate	JB100
Diethyl phthalate	JB99
<i>Poplar Creek upstream from the K-25 Site and East Fork (PCK 22)</i>	
Metals (g/kg)	
Aluminum, total	8.7
Barium, total	0.078
Beryllium, total	0.00071
Calcium, total	1.6
Chromium, total	0.011
Cobalt, total	0.013
Copper, total	0.013
Iron, total	14
Lead, total	0.014
Magnesium, total	1.3
Manganese, total	0.94
Mercury, total	0.00011
Nickel, total	0.021
Potassium, total	0.95

Table 5.49 (continued)

Parameter	Concentration ^b
Selenium, total	0.00054
Sodium, total	0.039
Thallium, total	0.00025
Uranium, total	0.00072
Vanadium, total	0.018
Zinc, total	0.07
Pesticides ($\mu\text{g}/\text{kg}$)	
4,4'-DDE	10.61
Radionuclides (pCi/g) ^c	
⁶⁰ Co	0.051*
¹³⁷ Cs	0.14*
Gross alpha	3.2*
Gross beta	9.7*
²²⁸ Th	0.49*
²³⁰ Th	0.22*
²³² Th	0.41*
²³⁴ U	0.27*
²³⁵ U	0.010*
²³⁸ U	0.17*
Semivolatile organics ($\mu\text{g}/\text{kg}$)	
2-Methylnaphthalene	1300

White Oak Lake at White Oak Dam (WCK 1.0)

Metals (g/kg)	
Aluminum, total	16
Barium, total	0.047
Beryllium, total	0.00057
Calcium, total	1.9
Chromium, total	0.026
Cobalt, total	0.0084
Copper, total	0.010
Iron, total	23
Lead, total	0.017
Magnesium, total	1.8
Manganese, total	0.54
Mercury, total	0.00015
Nickel, total	0.012
Potassium, total	2.2

Table 5.49 (continued)

Parameter	Concentration ^b
Selenium, total	0.00070
Sodium, total	0.054
Thallium, total	0.00015
Uranium, total	0.00072
Vanadium, total	0.032
Zinc, total	0.033
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.70*
²⁴⁴ Cm	0.041*
⁶⁰ Co	0.26*
¹³⁷ Cs	12*
Gross alpha	3.8*
Gross beta	32*
⁹⁹ Tc	0.65*
²²⁸ Th	0.70*
²³⁰ Th	0.24*
²³² Th	0.59*
²³⁴ U	0.26*
²³⁵ U	0.015*
²³⁸ U	0.30*
Semivolatile organics (µg/kg)	
Benzyl butyl phthalate	J110
Di-n-butylphthalate	JB63
Diethyl phthalate	JB42
<i>White Oak Creek upstream from ORNL (WCK 6.8)</i>	
Metals (g/kg)	
Aluminum, total	4.8
Barium, total	0.053
Beryllium, total	0.00046
Calcium, total	2.2
Chromium, total	0.0069
Cobalt, total	0.0040
Copper, total	0.0042
Iron, total	4.5
Lead, total	0.091
Magnesium, total	0.76
Manganese, total	0.094
Mercury, total	0.00019

Table 5.49 (continued)

Parameter	Concentration ^b
Nickel, total	0.0048
Potassium, total	0.38
Selenium, total	0.00046
Sodium, total	0.016
Thallium, total	0.000066
Uranium, total	
Vanadium, total	0.012
Zinc, total	0.030
PCBs	
Aroclor-1260	J32
Radionuclides (pCi/g) ^c	
²⁴¹ Am	0.019*
¹³⁷ Cs	0.095*
Gross alpha	2.5*
Gross beta	2.7*
⁹⁹ Tc	0.14*
²²⁸ Th	0.15*
²³⁰ Th	0.097*
²³² Th	0.073*
²³⁴ U	0.22*
²³⁵ U	0.020*
²³⁸ U	0.17*

^aAll values were included in the calculations. Only parameters that have one or more samples detected are listed in the table. The sampling and analysis plan contains a complete list of analyses performed.

^bPrefix "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; prefix "JB" indicates the value was estimated at or below the analytical detection limit by the laboratory and the compound was detected in the laboratory blank.

^cIndividual radionuclide concentrations significantly greater than zero are identified by an *.

Table 5.50. 1994 selected results of radiological analysis of sediment at the K-25 Site

Sample point	Alpha	Beta	²³⁴ U	²³⁵ U	²³⁶ U	²³⁸ U	⁹⁹ Tc	^{234m} Pa	²³⁴ Th	¹³⁷ Cs	²³⁷ Np	²³⁹ Pu	²³⁹ Pu	⁴⁰ K
SS-1	4.4	-3.0	0.14	0.073	0.0	0.21	-0.55	4.9	0.53	0.027	0.0	-0.083	0.055	5.0
SS-2	-0.025	-12	0.18	0.12	0.0	0.31	0.86	3.0	2.7	0.099	0.0	-0.055	0.0	11
SS-3	32	97	20	2.1	0.54	12	83	44	25	0.49	0.1	-0.024	0.024	6.9
SS-4	4.4	3.4	0.25	0.11	0.01	0.13	-3.5	10	2.7	0.088	0.0	-0.047	0.0	5.4
SS-5	6.4	2.7	0.37	0.13	0.0	0.29	2.5	2.0	0.97	-0.0096	0.16	0.065	0.016	9.3
SS-6	6.9	5.4	2.3	0.21	0.083	1.5	5.0	2.1	2.1	1.5	0.0	-0.028	0.0	9.2
SS-7	5.1	-2.6	0.0	0.0041	0.013	0.078	-2.2	-7.8	1.7	0.46	0.064	-0.12	0.0	3.9

Table 5.51. 1994 selected results of sediment analysis at the K-25 Site^a

Sample point	Aroclor ^b 1254	Dibenzofuran ^b	Cadmium	Lead	Mercury	Nickel	Silver	Uranium
SS-1	<140	<12,000	0.38	38	0.11	8.5	0.3	<11.0
SS-2	<180	160J	0.12	7.3	0.31	7.5	<0.1	<11
SS-3	10,000J	<24,000	0.25	16	1.2	89	<0.14	43
SS-4	<190	<16,000	<0.078	12	<0.025	15	<0.078	<9.2
SS-5	<140	<1,200	0.21	7.3	0.22	5.0	0.17	<6.6
SS-6	109J	<1,400	0.34	19	6.0	22	0.34	<11
SS-7	<410	<34,000	<0.15	7.6	0.23	4.3	<0.15	<10

^aUnits are µg/g unless otherwise indicated.

^bUnits are µg/kg.

Table 5.52. 1994 selected results of radiological analysis of soil at the K-25 Site (pCi/g)

Sample point	Alpha	Beta	²³⁴ U	²³⁵ U	²³⁶ U	²³⁸ U	⁹⁹ Tc	^{234m} Pa	²³⁴ Th	¹³⁷ Cs	²³⁷ Np	²³⁸ Pu	²³⁹ Pu	⁴⁰ K
S-1	3.4	-2.0	0.37	0.069	0.0071	0.27	-1.4	13	2.3	0.098	0.0	-0.014	0.0	10
S-2	5.2	5.8	0.62	0.22	0.0	0.3	-1.3	4.4	1.3	0.26	0.014	0.039	0.0	2.9
S-3	4	-0.96	0.42	0.13	0.032	0.39	0.35	4.4	0.92	0.39	0.0	0.065	0.032	3.5
S-4	4.1	9.4	1.1	0.21	0.017	0.53	-1.5	-4.7	3.1	0.18	-0.032	0.03	0.0	5.6
S-5	4.1	2.7	1.6	0.18	0.017	0.94	-0.2	5.2	1.1	0.19	0.0	0	0.0	10
S-6	3.6	0.45	0.32	0.14	0.0	0.3	0.61	7.7	1.9	0.19	-0.048	0.03	0.0	8.8
S-7	1.5	-4.1	0.26	0.036	0.0	0.14	-2.2	4.3	0.34	0.27	-0.018	0.017	0.0	5.7

Table 5.53. 1994 selected results of soil analysis at the K-25 Site^a

Sample point	Aroclor ^b 1260	Cadmium	Aroclor ^b 1254	Uranium	Nickel	Lead	Mercury
S-1	60J	0.16	<140	<5.8	9.1	17	0.072
S-2	<140J	0.11	<140	<5.2	27	35	0.093
S-3	<140	<0.14	<140	<6.6	6.3	18	0.11
S-4	<150	0.24	<150	<5.8	33	43	0.12
S-5	120J	0.34	<150	<6.5	28	38	0.15
S-6	<160	<0.13	<160	<6	5.7	12	0.12
S-7	<130	<0.14	26J	<6.7	3.9	11	0.062

^aUnits are µg/g unless otherwise indicated.

^bUnits are µg/kg.

Oak Ridge Reservation

Table 5.54. Average radionuclide concentrations in hay from the ORR, 1994

OBS	Station	Analysis	Type	Frequency	N	Mean
1	1,2, and 3	⁷ Be	0	2	2	1.311E-08
2	1,2, and 3	⁶⁰ Co	0	2	2	5.270E-11
3	1,2, and 3	¹³⁷ Cs	0	2	2	2.703E-11
4	1,2, and 3	Fluoride	0	2	2	1.025E+00
5	1,2, and 3	Gross alpha	0	2	2	4.459E-10
6	1,2, and 3	Gross beta	0	2	2	4.189E-09
7	1,2, and 3	¹²⁹ I	0	2	2	1.486E-11
8	1,2, and 3	⁴⁰ K	0	2	2	6.081E-09
9	1,2, and 3	Tritium	0	2	2	-3.784E-09
10	2,4, and 5	⁷ Be	0	2	2	1.486E-08
11	2,4, and 5	⁶⁰ Co	0	2	2	-1.757E-11
12	2,4, and 5	¹³⁷ Cs	0	2	2	5.946E-11
13	2,4, and 5	Fluoride	0	2	2	1.200E+00
14	2,4, and 5	Gross alpha	0	2	2	4.730E-10
15	2,4, and 5	Gross beta	0	2	2	4.730E-09
16	2,4, and 5	¹²⁹ I	0	2	2	2.703E-11
17	2,4, and 5	⁴⁰ K	0	2	2	3.378E-09
18	2,4, and 5	Tritium	0	2	2	6.892E-09
19	6	⁷ Be	0	2	2	6.216E-11
20	6	⁶⁰ Co	0	2	2	2.703E-12
21	6	¹³⁷ Cs	0	2	2	6.757E-12
22	6	Fluoride	0	2	2	7.150E-01
23	6	Gross alpha	0	2	2	1.486E-10
24	6	Gross beta	0	2	2	1.392E-08
25	6	¹²⁹ I	0	2	2	4.054E-12
26	6	⁴⁰ K	0	2	2	1.541E-08
27	6	Tritium	0	2	2	-4.459E-09

Table 5.55. 1994 Summary of milk results

Analysis	Samples	Max	Min	Av	Standard	Significant
<i>Buttermilk Road</i>						
¹³¹ I	12	0.050	-0.100	0.01077	0.01000	<i>a</i>
Total Sr	12	0.084	0.031	0.05131	0.00500	
Tritium	12	17.000	-63.000	-7.75000	6.31000	
<i>Broadacres</i>						
¹³¹ I	13	0.040	-0.030	0.00508	0.00661	
Total Sr	13	0.096	0.022	0.06175	0.00697	<i>a</i>
Tritium	13	16.000	-66.000	-7.00000	6.19873	
<i>Clinton</i>						
¹³¹ I	12	0.05	-0.060	0.0022	0.00926	
Total Sr	12	0.16	0.022	0.0745	0.00656	<i>a</i>
Tritium	12	12.00	-42.000	-11.5500	5.81121	
<i>Frost Bottom</i>						
¹³¹ I	13	0.04	-0.100	-0.00417	0.01145	
Total Sr	13	0.12	0.034	0.07800	0.00656	<i>a</i>
Tritium	13	24.00	-52.000	-2.83333	5.81121	
<i>Solway</i>						
¹³¹ I	6	0.01	-0.100	-0.02000	0.01966	
Total Sr	6	0.22	0.026	0.12333	0.02636	<i>a</i>
Tritium	6	1.00	-25.000	-9.50000	3.67650	

^aAverage was significant at a 95% confidence level.

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Table 5.56. Parameters detected in sunfish from Poplar Creek and Clinch River locations, 1994

	PCK 2.2	CRK 16	CRK 32	CRK 66	CRK 80	CRK 84
<i>Metals</i>						
Antimony					✓	
Arsenic				✓	✓	✓
Chromium	✓		✓	✓	✓	✓
Copper	✓	✓	✓	✓	✓	✓
Lead				✓	✓	✓
Mercury	✓	✓	✓	✓	✓	✓
Nickel	✓	✓	✓			
Selenium			✓	✓	✓	✓
Silver	✓					✓
Uranium	✓		✓			
Zinc	✓	✓	✓	✓	✓	✓
<i>Pesticides</i>						
4,4'-DDE	✓					✓
<i>PCBs</i>						
Aroclor-1254	✓	✓	✓			✓
Aroclor-1260		✓				✓
<i>Radionuclides</i>						
¹³⁷ Cs	✓	✓	✓	✓		✓
Total Rad Sr	✓	✓	✓	✓	✓	✓

Table 5.57. Parameters detected in catfish from two Clinch River locations, 1994

	CRK 16	CRK 32
<i>Metals</i>		
Copper	✓	✓
Mercury	✓	✓
Nickel		✓
Silver	✓	✓
Zinc		✓
<i>Pesticides</i>		
Dieldrin	✓	
<i>PCBs</i>		
Aroclor-1248		✓
Aroclor-1254	✓	✓
Aroclor-1260	✓	✓
<i>Radionuclides</i>		
¹³⁷ Cs	✓	✓

Table 5.58. 1994 concentrations in sunfish tissue^a

Parameter	No. detected/ No. total	Concentration			Standard error ^d
		Max ^b	Min ^b	Av ^c	
<i>Poplar Creek downstream from the K-25 Site (PCK 2.2)</i>					
Metals (mg/kg wet wt)					
Chromium, total	1/6	0.062	<0.039	~0.043	0.0038
Copper, total	6/6	0.35	0.21	0.25	0.022
Mercury, total	6/6	0.14	0.026	0.073	0.018
Nickel, total	2/6	0.25	<0.096	~0.13	0.025
Thallium, total	1/6	9.2	<0.020	~1.6	1.5
Uranium, total	1/6	1.9	<0.0030	~0.32	0.32
Zinc, total	6/6	13	11	12	0.31
Pesticides (µg/kg wet wt)					
4,4'-DDE	1/6	U71	J3.5	~55	10
PCBs (µg/kg wet wt)					
Aroclor-254	4/6	U710	J27	~260	140
Radionuclides (pCi/g ash wt) ^e					
¹³⁷ Cs	3/3	1.0*	0.78*	0.87*	0.077
Total rad Sr	3/3	2.4*	1.1*	1.6*	0.39
Radionuclides (pCi/g wet wt) ^e					
¹³⁷ Cs	3/3	0.016*	0.0098*	0.013*	0.0019
Total rad Sr	3/3	0.042*	0.017*	0.026*	0.0082
<i>Clinch River downstream from all DOE inputs (CRK 16)</i>					
Metals (mg/kg wet wt)					
Copper, total	6/6	0.40	0.17	0.24	0.033
Mercury, total	5/6	0.17	<0.0050	~0.091	0.025
Nickel, total	1/6	0.37	<0.093	~0.14	0.046
Zinc, total	6/6	17	8.8	13	1.3
PCBs (µg/kg wet wt)					
Aroclor-1254	1/6	U730	J58	~530	99
Aroclor-1260	1/6	U730	J53	~530	100
Radionuclides (pCi/g ash wt) ^e					
¹³⁷ Cs	3/3	2.2*	1.5*	1.8*	0.23
Total rad Sr	3/3	1.2*	0.84*	0.98*	0.11
Radionuclides (pCi/g wet wt) ^e					
¹³⁷ Cs	3/3	0.024*	0.016*	0.020*	0.0022
Total rad Sr	3/3	0.013*	0.0096*	0.011*	0.00091

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Table 5.58 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d
		Max ^b	Min ^b	Av ^c	
<i>Clinch River downstream from ORNL (CRK 32)</i>					
Metals (mg/kg wet wt)					
Chromium, total	1/6	0.078	<0.038	-0.049	0.0065
Copper, total	6/6	1.5	0.20	0.49	0.21
Mercury, total	1/6	0.14	<0.0050	-0.028	0.023
Nickel, total	2/6	0.42	<0.096	-0.20	0.066
Uranium, total	1/6	0.0040	<0.0030	-0.0032	0.00017
Zinc, total	6/6	13	9.2	11	0.59
PCBs (µg/kg wet wt)					
Aroclor-1254	4/6	U770	J26	-240	130
Radionuclides (pCi/g ash wt) ^e					
¹³⁷ Cs	3/3	59*	38*	48*	6.3
Total rad Sr	2/3	5.9*	-0.22	3.5	1.9
Radionuclides (pCi/g wet wt) ^e					
¹³⁷ Cs	3/3	0.66*	0.35*	0.47*	0.098
Total rad Sr	2/3	0.070*	-0.0013	0.043	0.022
<i>Melton Hill Reservoir above city of Oak Ridge water intake (CRK 66)</i>					
Metals (mg/kg wet wt)					
Arsenic, total	6/6	0.82	0.48	0.63	0.050
Chromium, total	6/6	0.31	0.22	0.27	0.014
Copper, total	6/6	0.38	0.20	0.26	0.026
Lead, total	6/6	0.96	0.54	0.79	0.065
Mercury, total	6/6	0.063	0.038	0.049	0.0034
Selenium, total	6/6	1.7	0.99	1.4	0.099
Zinc, total	6/6	18	10	13	1.2
Radionuclides (pCi/g ash wt) ^e					
¹³⁷ Cs	2/3	0.68*	0.081	0.41	0.18
Total rad Sr	3/3	0.22*	0.12*	0.17*	0.030
Radionuclides (pCi/g wet wt) ^e					
¹³⁷ Cs	2/3	0.0078*	0.00093	0.0046	0.0020
Total rad Sr	3/3	0.0023*	0.0013*	0.0018*	0.00027

Table 5.58 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d
		Max ^b	Min ^b	Av ^c	
<i>Melton Hill Reservoir—Oak Ridge Marina (CRK 80)</i>					
Metals (mg/kg wet wt)					
Antimony, total	1/6	<0.50	0.050	~0.42	0.073
Arsenic, total	1/6	0.51	<0.050	~0.42	0.074
Chromium, total	6/6	0.28	0.028	0.22	0.040
Copper, total	6/6	0.34	0.18	0.24	0.024
Lead, total	6/6	0.91	0.50	0.75	0.057
Mercury, total	6/6	0.083	0.046	0.061	0.0056
Selenium, total	6/6	1.3	0.94	1.2	0.049
Silver, total	4/6	0.14	<0.048	~0.089	0.016
Zinc, total	6/6	15	9.2	12	0.87
Radionuclides (pCi/g ash wt) ^e					
Total rad Sr	1/3	0.12*	-0.022	0.055	0.042
Radionuclides (pCi/g wet wt) ^e					
Total rad Sr	1/3	0.0012*	-0.00021	0.00057	0.00042
<i>Melton Hill Reservoir above all DOE inputs—Anderson County Filtration Plant (CRK 84)</i>					
Metals (mg/kg wet wt)					
Arsenic, total	3/6	0.87	<0.47	~0.56	0.063
Chromium, total	6/6	0.31	0.24	0.26	0.010
Copper, total	6/6	0.24	0.17	0.22	0.012
Lead, total	5/6	1.2	<0.49	~0.75	0.11
Mercury, total	6/6	0.090	0.055	0.072	0.0055
Selenium, total	6/6	1.6	1.0	1.2	0.092
Silver, total	3/6	0.12	<0.047	~0.066	0.012
Zinc, total	6/6	17	8.4	12	1.2
Pesticides (µg/kg wet wt)					
4,4'-DDE	2/6	U70	J2.9	~42	12
PCBs (µg/kg wet wt)					
Aroclor-1254	1/6	U700	J28	~510	100
Aroclor-1260	2/6	U700	J20	~420	130
Radionuclides (pCi/g ash wt) ^e					
¹³⁷ Cs	1/3	0.68*	0.054	0.36	0.18
Total rad Sr	3/3	0.18*	0.12*	0.16*	0.022

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Table 5.58 (continued)

Parameter	No. detected/ No. total	Concentration			Standard error ^d
		Max ^b	Min ^b	Av ^c	
Radionuclides (pCi/g wet wt) ^e					
¹³⁷ Cs	1/3	0.0043*	0.00047	0.0029	0.0012
Total rad Sr	3/3	0.0016*	0.0012*	0.0013*	0.00012

^aAll values were included in the calculations. Only parameters that have detections in one or more samples are listed in the table. The sampling and analysis plan contains a complete list of analyses performed.

^bPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "U" indicates the value for an organic parameter was undetected at the analytical detection limit; and "J" indicates the value was estimated at or below the analytical detection limit by the laboratory.

^cA tilde (~) indicates that estimated values and/or detection limits were used in the calculation.

^dStandard error of the mean.

^eIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 5.59. 1994 concentrations in catfish tissues^a

Parameter	Concentration ^b
<i>Clinch River downstream from all DOE inputs (CRK 16)</i>	
Metals (mg/kg wet wt)	
Copper, total	0.34
Mercury, total	0.13
Silver, total	0.091
Zinc, total	5.0
Pesticides (µg/kg wet wt)	
Dieldrin	J4.2
PCBs (µg/kg wet wt)	
Aroclor-1254	J100
Aroclor-1260	J190
Radionuclides (pCi/g ash wt) ^c	
¹³⁷ Cs	3.2*
Radionuclides (pCi/g wet wt) ^c	
¹³⁷ Cs	0.032*
<i>Clinch River downstream from ORNL (CRK 32)</i>	
Metals (mg/kg wet wt)	
Copper, total	0.33
Mercury, total	0.078
Silver, total	0.096
Zinc, total	6.2
PCBs (µg/kg wet wt)	
Aroclor-1248	J8.6
Aroclor-1254	J170
Aroclor-1260	390
Radionuclides (pCi/g ash wt) ^c	
¹³⁷ Cs	2.0*
Radionuclides (pCi/g wet wt) ^c	
¹³⁷ Cs	0.019*

^aOnly parameters that are listed in the table. The sampling and analysis plan contains a complete list of analyses performed.

^bPrefix "J" indicates the value was estimated at or below the analytical detection limit by the laboratory.

^cIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

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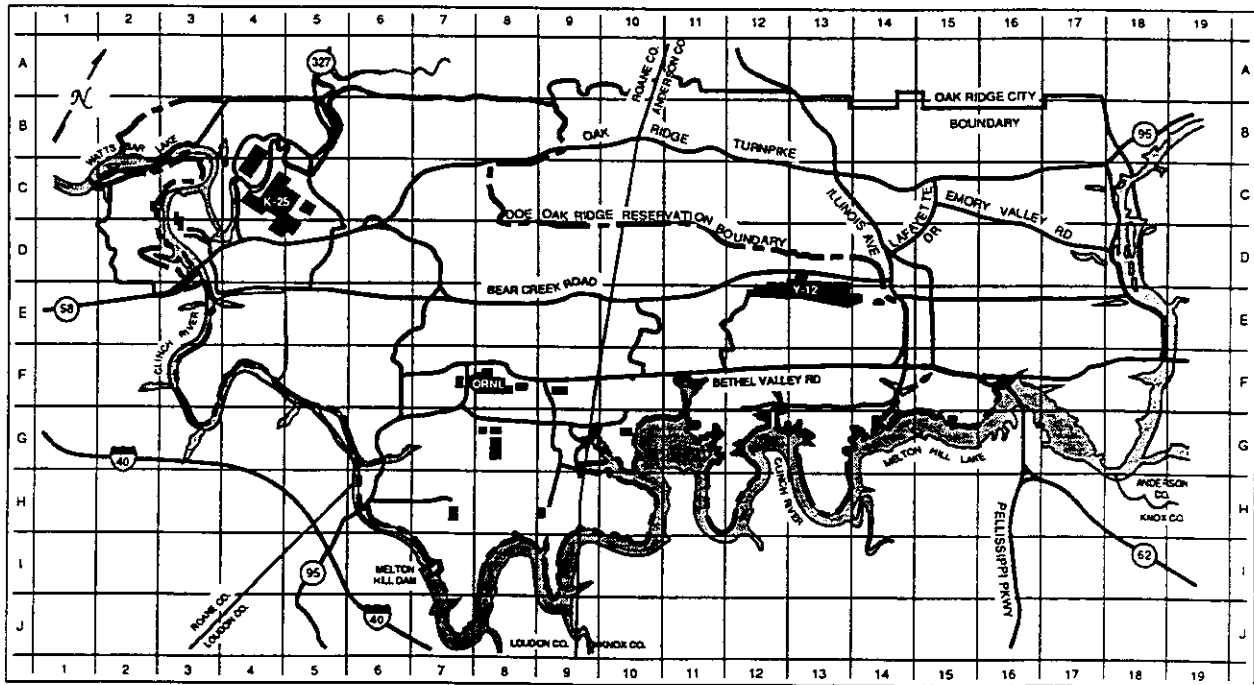
Table 5.60. Data for deer retained at the checking station during the 1994 ORR hunts

Identification number	Sex	Weight (lb)	Antler points	Age (years)	Map grid location	Isotopes (pCi/g)	
						⁹⁰ Sr ^a	¹³⁷ Cs
231	M	86	4	1.5	6B	32 ± 7	0.17 ^b
248	M	101	3	1.5	10D	300 ± 30	0.41 ^b
283	M	73	4	1.5	6D	400 ± 30	17 ^b
289	M	100	6	2.5	7H	66 ± 5	0.04 ^b
291	M	141	10	2.5	9G	140 ± 10	0.52 ^b
409	F	78		2.5	10H	500 ± 30	860 ^a
429	M	120	6	2.5	3D	46 ± 5	0.38 ^b
441	M	83	4	1.5	9F	62 ± 8	0.31 ^b

^aResults are from laboratory analyses performed after the hung.

^bResults are from gamma spectrometry in the field.

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NOTE: Grid shown is Oak Ridge administrative grid.

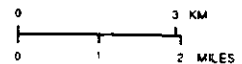


Fig. 5.17. Grid map used to locate sites where deer were taken during the 1994 ORR hunts.

6. Dose

6. Dose

Table 6.1. Monitored and sampled release point parameters and receptor locations used in the dose calculations

Source name	Type	Release height (m)	Inner diameter (m)	Gas exit velocity (m/s)	Gas exit temperature (°C)	Distance (m) and direction to maximally exposed individual	
						Plant	ORR
<i>Y-12 Plant</i>							
All	Point	20	0	0	Ambient	1080 NNE	1080 NNE
<i>ORNL</i>							
2026	Point	22.9	1.05	10.4	Ambient	4060 SSW	9300 NE
3020	Point	61.0	1.96	5.6	Ambient	4060 SSW	9300 NE
3039	Point	76.2	5.68	2.6	Ambient	4060 SSW	9300 NE
7025	Point	4.0	0.3	13.6	Ambient	5710 SW	7550 NNE
7512	Point	30.5	0.91	8.8	Ambient	3720 SW	9640 NNE
7911	Point	76.2	3.43	2.7	Ambient	3720 SW	9640 NNE
7830	Point	4.6	0.21	6.7	Ambient	2350 SW	10990 NNE
7877	Point	13.9	0.51	10.6	Ambient	2350 SW	10990 NNE
2000	Point	15.2	0.66	8.9	Ambient	4060 SSW	9300 NE
3018	Point	61.0	4.11	0.2	Ambient	4060 SSW	9300 NE
3074	Point	4.0	0.26	10.2	Ambient	4060 SSW	9300 NE
3544	Point	9.5	0.27	16.6	Ambient	4060 SSW	9300 NE
2523	Point	7.0	0.3	5.1	57.2	4060 SSW	9300 NE
<i>K-25 Site</i>							
K-1435	Point	30.5	1.37	5.6	79.1	5180 WSW	13000 ENE
K-1015	Point	3.7	0	0	Ambient	4340 WSW	14000 ENE
K-31/K-33	Point	25.9	0	0	Ambient	3330 WSW	14800 ENE
K-31	Point	19.8	0	0	Ambient	3330 WSW	14800 ENE

Table 6.2. Calculated radiation doses to maximally exposed off-site individuals from airborne releases during 1994

Plant	Total effective dose equivalents [mrem (mSv)]	
	Plant max	ORR max
ORNL	1.0E-01 (1.0E-03) ^a	3.0E-02 (3.0E-04)
K-25 Site	1.0E-01 (1.0E-03) ^b	2.0E-02 (2.0E-04)
Y-12 Plant	1.7E+00 (1.7E-02) ^c	1.7E+00 (1.7E-02)
Entire ORR	<i>d</i>	1.7E+00 (1.7E-02) ^e

^aThe maximally exposed individual is located 4060 m (2.5 miles) SSW of the 3039 stack and 3720 m (2.3 miles) SW of the 7911 stack.

^bThe maximally exposed individual is located 5180 m (3.2 miles) WSW of the K-1435 stack.

^cThe maximally exposed individual is located 1080 m (0.7 miles) NNE of the Y-12 Plant release point.

^dNot applicable.

^eThe maximally exposed individual for the entire ORR is the Y-12 Plant maximally exposed individual.

Table 6.3. Calculated collective EDEs from airborne releases during 1994

Plant	Effective dose equivalents	
	Person-rem ^a	Person-Sv
ORNL	3	0.03
K-25 Site	4	0.04
Y-12 Plant	13	0.13
ORR	19	0.19

^aThe collective effective dose equivalents to the 879,546 persons residing within 80 km (50 miles) of the ORR.

Table 6.4. Potential maximum individual EDEs from use of off-site waters (mrem)^{a,b}

Location	Eating fish	Swimming	Boating	Using shoreline	Total
Clinch River above all DOE input (CRK 84)	6.0E-03 3.0E-01	6.0E-05	3.0E-05	5.0E-02	5.0E-02/4.0E-01
Clinch River at Oak Ridge Marina (CRK 80)	1.0E-03 1.2E+00	4.0E-04	2.0E-04	4.0E-01	4.0E-01/1.6E+00
Clinch River above Oak Ridge city water intake (CRK 66)	1.0E-02 2.0E-01	2.0E-04	5.0E-05	9.0E-02	1.0E-01/3.0E-01
Clinch River at Knox County water intake (CRK 58)	c 1.0E+00	1.0E-04	3.0E-05	6.0E-02	c/1.1E+00
Clinch River below ORNL (CRK 32)	6.0E-01 2.0E-01	7.0E-05	6.0E-08	7.1E-04	6.0E-01/2.0E-01
Clinch River at K-25 Site water intake (CRK 23)	c	5.0E-05	3.0E-08	4.0E-03	c/1.0E-01
Clinch River below all DOE inputs (CRK 16)	6.0E-02 5.0E-01	1.0E-04	5.0E-05	1.0E-01	2.0E-01/7.0E-01
Tennessee River at Kingston Water Plant intake (TRK 915)	c 2.0E-01	1.0E-07	7.0E-08	8.0E-04	c/2.0E-01
Poplar Creek above union with East Fork Poplar Creek (PCK 22)	c 5.0E-01	8.0E-05	4.0E-05	1.0E-01	c/6.0E-01
Poplar Creek below the K-25 Site (PCK 2.2)	1.0E-01 1.6E+00	8.0E-05	4.0E-05	3.0E-01	4.0E-01/1.9E+00

^aTo convert mrem to mSv, divide the given values by 100.

^bAll values are based on measured concentrations of radionuclides in water except the first set of values for eating fish, which are based on measured concentrations of radionuclides in fish.

^cNot sampled.

Table 6.5. Average EDEs from ingesting vegetables grown at ORR ambient air monitoring stations

Vegetable	EDE [mrem (mSv)]	
	All reported radionuclides	Excluding ⁴⁰ K
Tomatoes	4.0E-02 (4.0E-04)	3.0E-04 (3.0E-06)
Lettuce	8.7E-01 (8.7E-03)	6.0E-02 (6.0E-04)
Turnips	1.7E+00 (1.7E-02)	4.0E-02 (4.0E-04)
Total	2.7E+00 (2.7E-02)	1.0E-01 (1.0E-03)

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Table 6.6. 1994 total dose rate for aquatic organisms (rad/day)^{a,b}

Measurement location	Fish		Crustacea		Muskrat	
	Average	Maximum	Average	Maximum	Average	Maximum
<i>ORNL</i>						
Melton Branch (X13)	1.7E-03	4.1E-03	4.6E-04	1.9E-03	5.8E-03	1.2E-02
White Oak Creek (X14)	8.0E-04	1.6E-03	1.5E-04	2.9E-04	1.5E-03	2.5E-03
White Oak Dam (X15)	9.5E-04	1.7E-03	2.6E-04	5.9E-04	2.5E-03	3.3E-03
7500 Road Bridge	6.5E-04	1.5E-03	1.2E-04	1.1E-03	1.0E-03	1.7E-03
First Creek	7.4E-04	1.7E-03	1.2E-04	7.2E-04	2.7E-03	5.3E-03
Fifth Creek	1.5E-04	5.3E-04	1.6E-04	7.9E-04	2.8E-04	4.9E-04
Melton Branch 2	5.6E-05	2.2E-04	8.9E-05	3.7E-04	4.1E-05	1.3E-04
Northwest Tributary	3.3E-04	1.0E-03	2.2E-04	9.1E-04	6.3E-04	1.2E-03
Raccoon Creek	4.6E-05	9.8E-04	7.6E-06	8.0E-04	1.7E-04	6.9E-04
<i>Y-12 Plant</i>						
East Fork Poplar Creek (Station 17)	5.4E-05	3.9E-04	3.2E-04	2.5E-03	9.9E-04	2.3E-02
Bear Creek (Outfall 304)	5.2E-05	6.4E-04	3.0E-04	2.3E-03	1.2E-03	1.8E-01
Rogers Quarry (Outfall 302)	3.2E-05	3.3E-04	2.9E-04	2.6E-03	7.4E-04	3.8E-02
<i>K-25 Site</i>						
Mitchell Branch (K-1700)	2.3E-04	2.7E-03	1.1E-04	3.3E-03	1.7E-04	7.3E-04
Poplar Creek (Sewage Treatment Plant, K-1203)	1.3E-04	9.9E-04	8.4E-05	2.0E-03	2.9E-04	1.9E-03
Clinch River (Holding Pond, K-901-A)	3.0E-05	3.7E-04	5.0E-05	1.3E-03	1.2E-04	5.2E-04

^aTotal dose rate includes the contribution of internally deposited radionuclides, sediment exposure (derived from water concentrations), and water immersion.

^bTo convert from rad/day to Gy/day divide by 100.

Table 6.7. Summary of estimated radiation dose equivalents to an adult during 1994 at locations of maximum exposure

Pathway	Location	Effective dose equivalent	
		mrem	mSv
Gaseous effluents	Maximally exposed resident to		
Inhalation plus direct radiation from air, ground, and food chains	Y-12 Plant	1.7	0.017
	ORNL	0.1	0.001
	K-25 Site	0.1	0.001
	ORR	1.7	0.017
Liquid effluents			
Drinking water	Gallaher Water Plant	0.3	0.003
Eating fish	Poplar Creek, PCK 2.2	1.6	0.016
Other activities	Clinch River	0.4	0.004
Eating deer		5.1	0.051
Direct radiation	Clinch River shoreline	1 ^a	0.01
	Poplar Creek (K-25 Site)	1	0.01

^aThis likely is an overestimate of the potential dose because the source of direct radiation was remediated during 1994.

Table 6.8. Trends in total effective dose equivalent for selected pathways

Pathway	Effective dose equivalent (mrem) ^a				
	1990	1991	1992	1993	1994
All air	2	2	1.3	1.4	1.7
Fish consumption	0.3	0.3	0.4	0.2	1.6
Drinking water (Kingston)	0.04	0.1	0.05	0.07	0.04
Direct radiation (Clinch River)	1 ^b	1 ^b	1 ^b	1 ^b	1 ^c
Direct radiation (Poplar Creek)			11 ^b	1	1

^aTo convert mrem to mSv, divide by 100.

^bThese values have been corrected by removing the contribution of natural background radiation and by using International Commission on Radiological Protection recommendations for converting external exposure to effective dose equivalent.

^cThis is an overestimate of the potential dose because the source of the direct radiation was remediated during 1993 and 1994.

Table 6.9. Chemical reference doses and slope factors used in drinking water and fish intake analysis

Chemical	Reference dose or slope factor	Reference ^a
Acetone	1.00E-01	RfD
Aluminum	6.00E-03	SMCL
Antimony	4.00E-04	RfD
Arsenic	3.00E-04	RfD
Barium	7.00E-02	RfD
Beryllium	5.00E-03	RfD
2-Butanone	6.00E-01	RfD
Cadmium	5.00E-04	RfD
Chloride	7.14E+00	SMCL
Chromium (VI)	5.00E-03	RfD
Copper	4.00E-02	MCL
4,4'-DDE	3.40E-01	SF
Dieldrin	1.60E+01	SF
Fluoride	6.00E-02	RfD
Iron	9.00E-03	SMCL
Lead	4.00E-04	MCL
Manganese	5.00E-03	RfD
Mercury	5.70E-05	MCL
Nickel	2.00E-02	RfD
PCBs	7.70E+00	SF
Selenium	5.00E-03	RfD
Silver	5.00E-03	RfD
Sulfate	7.14E+00	SMCL
Thallium	8.00E-05	RfD
Toluene	2.00E-01	RfD
Uranium	3.00E-03	RfD
Vanadium	7.00E-03	RfD
Zinc	3.00E-01	RfD

^aRfD: reference dose ($\text{mg kg}^{-1} \text{day}^{-1}$); SMCL: secondary maximum contaminant level; MCL: maximum contaminant level; SF: slope factor ($\text{kg mg}^{-1} \text{day}^{-1}$).

Table 6.10. Chemical hazard quotients for drinking water

Chemical	Hazard quotient			
	CRK 84 ^a	CRK 58 ^b	CRK 23 ^c	CRK 16 ^d
<i>Metals</i>				
Aluminum	-1.90E+00	-1.95E+00	9.05E-01	3.67E+00
Barium	1.22E-02	1.18E-02	1.22E-02	2.82E-02
Beryllium	-5.71E-03			
Cadmium				-3.03E-01
Chromium	-2.74E-02			
Iron	1.49E+00	1.40E+00	9.84E-01	2.63E+00
Manganese	5.37E-01	3.26E-01	5.71E-01	4.63E-01
Mercury	-2.81E-02	-3.96E-02	-4.21E-02	-4.41E-02
Thallium		-6.79E+01		
Uranium	-1.24E-03	-1.43E-03	-2.48E-03	2.10E-03
Vanadium	-2.37E-02	-1.06E-02	-8.57E-03	-9.80E-03
Zinc	-4.95E-04	-5.05E-05	-5.43E-04	-6.67E-04
<i>Anions</i>				
Chloride	1.20E-02	1.28E-02	1.32E-02	1.32E-02
Fluoride	-5.71E-02	-5.24E-02	-5.71E-02	-5.24E-02
Nitrate	3.93E-02	6.25E-02	4.11E-02	3.04E-02
Sulfate	7.20E-02	7.20E-02	7.60E-02	6.40E-02
<i>Volatile organics</i>				
2-Butanone	-4.71E-04	-3.86E-04	-4.38E-04	-3.81E-04
Acetone	-2.86E-03			
Toluene			-6.14E-04	

^aMelton Hill Reservoir above all DOE inputs.

^bWater supply intake for Knox County.

^cWater supply intake for K-25 Site.

^dClinch River downstream of all DOE inputs.

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Table 6.11. Chemical hazard quotients (HQs) for metals and estimated dose/chronic daily intake (I/CDIs) for carcinogens in fish^a

Parameters	Sunfish						Catfish	
	CRK 84 ^b	CRK 80 ^c	CRK 66 ^d	CRK 32 ^e	CRK 16 ^f	PCK 2.2 ^g	CRK 32 ^e	CRK 16 ^f
<i>HQs for metals</i>								
Antimony		-8.70E-01						
Arsenic	-1.55E+00	-1.16E+00	1.74E+00					
Chromium	4.31E-02	3.65E-02	4.47E-02	-8.12E-03		-7.13E-03		
Copper	4.56E-03	4.97E-03	5.39E-03	1.02E-02	4.97E-03	5.18E-03	6.84E-03	7.04E-03
Lead	-1.55E+00	1.55E+00	1.64E+00					
Mercury	1.05E+00	8.87E-01	7.12E-01	-4.07E-01	-1.32E+00	1.06E+00	1.13E+00	1.89E+00
Nickel				-8.29E-03	-5.80E-03	-5.39E-03		
Selenium	1.99E-01	1.99E-01	2.32E-01					
Silver	-1.09E-02	-1.47E-02					1.59E-02	1.51E-02
Thallium						-1.66E+01		
Uranium				-8.84E-04		-8.84E-02		
Zinc	3.31E-02	3.31E-02	3.59E-02	3.04E-02	3.59E-02	3.31E-02	1.71E-02	1.38E-02
<i>I/CDIs for carcinogens (pesticides and PCBs)</i>								
4,4'-DDE	-1.18E+00					-1.55E+00		
Dieldrin								J5.57E+00
Aroclor-1248							J5.49E+00	
Aroclor-1254	-3.25E+02			-1.53E+02	-3.38E+02	-1.66E+02	J1.08E+02	J6.38E+01
Aroclor-1260	-2.68E+02				-3.38E+02		2.49E+02	J1.21E+02

^aA tilde “~” indicates that estimated values and/or detection limits were used in the calculation. A “J” indicates that the laboratory estimated the value at or below the analytical detection limit.

^bMelton Hill Reservoir, above all DOE inputs, Anderson Country Filtration Plant.

^cMelton Hill Reservoir, Oak Ridge Marina, above ORNL.

^dMelton Hill Reservoir, above the city of Oak Ridge intake.

^eClinch River, downstream of ORNL.

^fClinch River, downstream of all DOE inputs.

^gPoplar Creek, downstream of the K-25 Site.

7. Groundwater

Table 7.1. Summary of the comprehensive groundwater monitoring program at the Y-12 Plant, 1994

Hydrogeologic regime/waste disposal site	Requirements ^a	Number of wells	Analytical parameters ^b
<i>Bear Creek Hydrogeologic Regime</i>			
Bear Creek Springs	EXP	3	Standard + (beta for SS-1 and SS-4)
Bear Creek surface water	EXP	6	Standard + (beta for NT-1, BCK-9.40, and BCK-11.97)
Exit pathway—Traverse A	EXP	5	Standard + (beta for GW-683 and GW-684)
Exit pathway—Traverse B	EXP	6	Standard + (beta for GW-694 and GW-706)
Exit pathway—Traverse C	EXP	8	Standard
Exit pathway—Traverse W	EXP/RCRA-CM	6	COMP and T-DCE
Oil Landfarm	RCRA-AM/SMP	10	Standard + (U and beta at GW-085, GW-537; MET at GW-537; COMP at GW-43, GW-44, and GW-84)
Rust Spoil Area	RCRA-AM	2	Standard
S-3 Site	RCRA-CM/SMP	10	T-DCE + COMP + (STD for GW-345, GW-347, GW-348; MET at GW-347)
Spoil Area I	RCRA-AM/SMP	2	Standard + (beta for GW-315)
Y-12 Burial Grounds	RCRA-AM/SMP	19	Standard + (CMP for GW-40, GW-42, GW-47, GW-79, GW-80, GW-162, GW-372, GW-373, GW-642; MET at GW-053; beta at GW-061)
Above Grade Low-Level Storage Facility	BMP	3	Standard + (²³⁴ U, ²³⁵ U, ²³⁸ U)
<i>East Fork Poplar Creek Hydrogeologic Regime</i>			
Surface water	BMP	2	Standard
Beta-4 Security Pit	GRID	4	Standard
Exit pathway—Traverse J	EXP	5	Standard
Grid B-2	GRID	2	Standard
Grid C-1	GRID	2	Standard
Grid D-1	GRID	2	Standard
Grid D-2	GRID	2	Standard
Grid E-1	GRID	2	Standard
Grid E-2	GRID	2	Standard
Grid E-3	GRID	3	Standard
Grid F-2	GRID	2	Standard
Grid F-3	GRID	2	Standard

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Table 7.1 (continued)

Hydrogeologic regime/waste disposal site	Requirements ^a	Number of wells	Analytical parameters ^b
Grid G-1	GRID	2	Standard
Grid G-2	GRID	2	Standard
Grid G-3	GRID	2	Standard
Grid H-2	GRID	2	Standard
Grid H-3	GRID	2	Standard
Grid I-1	GRID	2	Standard
Grid I-2	GRID	2	Standard + TPH
Grid J-3	GRID	2	Standard
Grid J-4	GRID	2	Standard
Grid K-1	GRID	3	Standard
Grid K-2	GRID	3	Standard
Grid K-3	GRID	1	Standard
New Hope Pond	RCRA-AM/BMP	15	Standard
Rust Garage Area	UST	6	Standard + TPH
S-2 Site	GRID	3	Standard
U.S. Geological Survey Sites/ exit pathway/Union Valley	EXP	14	Standard + (RAD, BNA at GW-169, GW-170, GW-171, GW-172, GW-230, GW-232)
Waste Coolant Facilities/ Salvage Yard/Fire Training Facility	GRID	8	Standard
<i>Chestnut Ridge Hydrogeologic Regime</i>			
Springs	BMP	1	Standard + AOC + ORP + OMP
Ash Disposal Basin	BMP	4	Standard + TOX + TOC
Chestnut Ridge Security Pits	RCRA-AM	10	Standard
East Chestnut Ridge Waste Pile	BMP	4	Standard
Kerr Hollow Quarry	RCRA-DM	7	Standard + REP + PHEN
Landfill II	SWDF	3	Standard + AOC + ORP + (U and OMP at GW-539)
Chestnut Ridge Borrow Area Waste Pile	BMP	7	Standard + AOC + ORP + (U and beta for GW-295 only)

Table 7.1 (continued)

Hydrogeologic regime/waste disposal site	Requirements ^a	Number of wells	Analytical parameters ^b
Landfill IV	SWDF	5	Standard + AOC + ORP + (RAD at GW-521)
Landfill V	SWDF	5	Standard + AOC + ORP + U + OMP
Landfill VI	SWDF	7	Standard + AOC + ORP
Landfill VII	SWDF	4	Standard + AOC + ORP + OMP + U + TPH
Rogers Quarry	BMP	4	Standard + BNA
Sediment Disposal Basin	RCRA-DM	8	Standard + REP + BNA
United Nuclear Site	ROD	6	Standard + U + Ra

^aBMP = best management practices monitoring; EXP = exit-pathway monitoring under DOE Order 5400.1; RCRA-AM = RCRA Assessment Monitoring at interim status units; RCRA-DM = RCRA Detection Monitoring at interim status units; RCRA-CM = RCRA post-closure corrective action monitoring; SMP = Y-12 Plant Environmental Restoration Program's Surveillance and Maintenance Program; GRID = grid well monitoring locations under DOE Order 5400.1; UST = petroleum underground storage tank locations; SWDF = monitoring for solid waste disposal facilities under TDEC Rule 1200-1-7-.04; ROD = CERCLA record of decision post-closure monitoring.

^bStandard = ICP metals scan; Cd, Cr, Pb by atomic absorption spectroscopy; Hg; U (total); VOCs; major anions; gross alpha; gross beta; pH; conductance; TSS; TDS; turbidity; standard field parameters, including dissolved oxygen, water level, pH, temperature, conductance, and redox potential. COMP = RCRA corrective action monitoring parameters, including Standard plus ²⁴¹Am, ¹²⁹I, ²³⁷Np, ²³⁸Pu, total radium, total strontium, ⁹⁹Tc, ³H, ²³⁴U, ²³⁵U, and ²³⁸U. Beta = beta-emitting isotopes, including total strontium, ⁹⁹Tc, and ³H. TPH = total petroleum hydrocarbons. REP = four replicate analyses for pH, conductance, TOC, and TOX. PHEN = phenols. TOX = total organic halides. TOC = total organic carbon. ORP = other parameters required by TDEC Rule 1200-1-7-.04, including chemical oxygen demand, cyanide, TOC, and TOX. U = isotopic uranium analysis, including ²³⁴U, ²³⁵U, and ²³⁸U. OMP = other miscellaneous permit-required parameters including ammonia (as N), gamma activity, and *trans*-1,2-dichloroethene. Ra = total radium. BNA = base/neutral/acid extractable organic compounds (semivolatile organics). AOC = additional VOC list required by TDEC Rule 1200-1-7-.04. T-DCE = *trans*-1,2-dichloroethene.

Table 7.2. Description of surface-water and spring monitoring stations included in the Exit-Pathway Monitoring Program

Locations	Description
NT-13 (background)	Tributary that enters Bear Creek at BCK 6.76 and represents drainage from a relatively undisturbed catchment that has not been impacted by waste-disposal activities in Bear Creek Valley.
BCK 0.63	Upstream of the confluence with East Fork Poplar Creek. Represents essentially all surface-water discharge from the Bear Creek watershed.
BCK 4.55	Location of NPDES monitoring site 304. Site represents surface-water discharge from at least one area of the Bear Creek floodplain known to be contaminated with uranium and PCBs. Formal perimeter monitoring location for the ORR.
BCK 9.40	Represents surface-water discharge from area of Bear Creek watershed impacted by waste-disposal activities.
BCK 11.97	Approximately 500 ft downstream of the confluence of NT-02 and Bear Creek. Measures contaminant load to Bear Creek from NT-02.
NT-1	North Tributary (NT)-1 to Bear Creek, which probably receives groundwater inputs from S-3 Site contamination.
SS-1	Located on south side of Bear Creek at the confluence with NT-1, near headwaters of Bear Creek.
SS-4	Discharges on southside of Bear Creek Road at contact between the Knox Group and the Maynardville Limestone. Location is about 500 ft west of exit-pathway Picket B.
SS-5	Large spring located on south side of Bear Creek Road near contact between the Knox Group and the Maynardville Limestone. Location is coincident with exit-pathway Picket A.
SCR 4.3SP	Chestnut Branch spring number 1. Large spring downgradient of several active and inactive waste management units on Chestnut Ridge.

Table 7.3. History of CERCLA operable units, waste management units, and underground storage tanks included in the 1994 Comprehensive Groundwater Monitoring Program; Upper East Fork Poplar Creek Hydrogeologic Regime

Site	Historical regulatory classification ^a	Historical data
New Hope Pond	TSD unit	Built in 1963. Regulated flow of water in UEFPC before exiting the Y-12 Plant grounds. Sediments include PCBs, mercury, and uranium but not hazardous according to toxicity characteristic leaching procedure. Closed under RCRA in 1990
Abandoned Nitric Acid Pipeline	SWMU	Used from 1951 to 1983. Transported liquid nitric acid wastes and dissolved uranium from Y-12 Plant process areas to the S-3 Site. Leaks were the release mechanisms to groundwater
Salvage Yard Scrap Metal Storage Area	SWMU	Used from 1950 to present for scrap metal storage. Some metals contaminated with low levels of depleted or enriched uranium. Runoff and infiltration are the principal release mechanisms to groundwater
Salvage Yard Oil/Solvent Drum Storage Area	SWMU	Primary wastes included waste oils, solvents, uranium, and beryllium. Both closed under RCRA. Leaks and spills represent the primary contamination mechanisms for groundwater
Salvage Yard Oil Storage Tanks	SWMU	Used from 1978 to 1986. Two tanks used to store PCB-contaminated oils, both within a diked area
Salvage Yard Drum Deheader Facility	SWMU	Used from 1959 to 1989. Sump tanks 2063-U, 2328-U, and 2329-U received residual drum contents. Sump leakage is a likely release mechanism to groundwater
S-2 Site	SWMU	Used from 1945 to 1951. An unlined reservoir received liquid wastes. Infiltration is the primary release mechanism to groundwater
Waste Coolant Processing Area	SWMU	Former biodegradation facility used to treat waste coolants from various machining processes. Closed under RCRA in 1988
Building 8I-10 Area	NA	Staging facility. Potential historical releases to groundwater from leaks and spills of liquid wastes or mercury
Coal Pile Trench	SWMU	Located beneath the current steam plant coal pile. Disposals included solid materials (primarily alloys). Trench leachate is a potential release mechanism to groundwater
Interim Drum Yard	SWMU	Diked outdoor storage area once used to store drums of liquid and solid wastes. Partially closed under RCRA in 1988
Beta-4 Security Pits	SWMU	Used from 1968 to 1972 for disposal of classified materials, scrap metals, and liquid wastes. Site is closed and capped. Primary release mechanism to groundwater is infiltration
Rust Garage Area	SWMU/UST	Former vehicle and equipment maintenance area, including four former petroleum USTs. Petroleum product releases to groundwater are documented
Garage Underground Tanks	SWMU/UST	Fuel USTs used from 1944 to 1978. Converted to waste oil storage in 1978; removed in 1989. Petroleum and waste oil leaks represent probable releases to groundwater

^aRegulatory status before the 1992 Federal Facility Agreement: TSD Unit—RCRA-regulated, land-based treatment, storage, or disposal unit; SWMU—RCRA-regulated solid waste management unit; and UST—petroleum underground storage tank.

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Table 7.4. History of CERCLA operable units and waste management units included in the 1994 Comprehensive Groundwater Monitoring Program; Bear Creek Hydrogeologic Regime

Site	Historical regulatory classification ^a	Historical data
S-3 Site	TSD unit	Four unlined surface impoundments constructed in 1951. Received liquid nitric acid/uranium-bearing wastes via the Nitric Acid Pipeline until 1984. Closed and capped under RCRA in 1988. Infiltration was the primary release mechanism to groundwater
Oil Landfarm	TSD unit	Operated from 1973 to 1982. Received waste oils and coolants tainted with metals and PCBs. Closed and capped under RCRA in 1989. Infiltration was the primary release mechanism to groundwater
Boneyard	SWMU	Unlined shallow trenches used to dispose of construction debris and to burn magnesium chips and wood
Burnyard	SWMU	Used from 1943 to 1968. Wastes, metal shavings, solvents, oils, and laboratory chemicals were burned in two unlined trenches
Hazardous Chemical Disposal Area	SWMU	Built over the burnyard. Handled compressed gas cylinders and reactive chemicals. Residues placed in a small, unlined pit
Sanitary Landfill I	SWMU	Used from 1968 to 1982. TDEC-permitted, nonhazardous industrial landfill. May be a source of certain contaminants to groundwater. Closed and capped under TDEC requirements in 1983
Bear Creek Burial Grounds Waste-Management Area	Burial Grounds A and C and Walk-in Pits—TSD units	A and C received waste oils, coolants, beryllium and uranium, various metallic wastes, and asbestos into unlined trenches and standpipes. Walk-in Pits received chemical wastes, shock-sensitive reagents, and uranium saw fines. Activities ceased in 1981. Final closure certified for A (1989), C (1990), and the Walk-in Pits (1994). Infiltration is the primary release mechanism to groundwater
Bear Creek Burial Grounds Waste-Management Area (continued)	Burial Grounds B, D, E, J, and Oil Retention Pond Nos. 1 and 2—SWMUs	Burial Grounds B, D, E, and J, unlined trenches, received depleted uranium metal and oxides and minor amounts of debris and inorganic salts. Ponds 1 and 2, built in 1971 and 1972, respectively, captured waste oils seeping into two Bear Creek tributaries. The ponds were closed and capped under RCRA in 1989. Certification of closure and capping of Burial Grounds B and part of C was granted 2/95
Rust Spoil Area	SWMU	Used from 1975 to 1983 for disposal of construction debris, but may have included materials bearing solvents, asbestos, mercury, and uranium. Closed under RCRA in 1984. Site is a source of VOCs to shallow groundwater according to CERCLA RI
Spoil Area I	SWMU	Used from 1980 to about 1987 for disposal of construction debris and other stable, nonrad wastes. Permitted under TDEC solid waste management regulations in 1986; closure began shortly thereafter. Soil contamination is of primary concern
SY-200 Yard	SWMU	Used from 1950s to 1986 for equipment and materials storage. No documented waste disposal at the site occurred. Leaks, spills, and soil contamination are concerns
Above-Grade LLW Storage Facility	NA	Constructed in 1993. Consists of six used to store inert, low-level radioactive debris and solid wastes packaged in steel containers

^aRegulatory status before the 1992 Federal Facilities Agreement: TSD Unit—RCRA regulated, land-based treatment, storage, or disposal unit; SWMU—RCRA-regulated solid waste management unit.

Table 7.5 History of CERCLA operable units and waste management units included in the 1994 Comprehensive Groundwater Monitoring Program; Chestnut Ridge Hydrogeologic Regime

Site	Historical regulatory classification ^a	Historical data
Chestnut Ridge Sediment Disposal Basin	TSD unit	Operated from 1973 to 1989. Received soil and sediment from New Hope Pond and mercury-contaminated soils from the Y-12 Plant. Site was closed under RCRA in 1989. Not a documented source of groundwater contamination
Kerr Hollow Quarry	TSD unit	Operated from 1940s to 1988. Used for the disposal of reactive materials, compressed gas cylinders, and various debris. RCRA closure (waste removal) was conducted between 1990 and 1993. Certification of closure with some wastes remaining in place was approved by TDEC 2/95
Chestnut Ridge Security Pits	TSD unit	Operated from 1973 to 1988. Series of trenches for disposal of classified materials, liquid wastes, thorium, uranium, heavy metals, and various debris. Closed under RCRA in 1989. Infiltration is the primary release mechanism to groundwater
East Chestnut Ridge Waste Pile	TSD unit	A lined, RCRA-permitted hazardous waste storage facility for contaminated soils from the Y-12 Plant
Ash Disposal Basin	SWMU	Used until 1967. Site received Y-12 Steam Plant coal ash slurries. Leaching of metals to groundwater are of concern
United Nuclear Corporation Site	SWMU	Received about 29,000 drums of cement-fixed sludges and soils, demolition materials, and low-level radioactive contaminated soils. Closed in 1992 under CERCLA and RCRA
Rogers Quarry	SWMU	Used from 1960s until 1993 for disposal of steam-plant coal ash and process debris. Metals contaminants are of primary concern
Chestnut Ridge Burrow Area Waste Pile	Not regulated	Contains soils from off-site locations in Oak Ridge bearing low levels of mercury and other metals
Centralized Sanitary Landfill II	TDEC-permitted Class II industrial SWDF	Central sanitary landfill for the ORR. Detection monitoring under TDEC-SWM regulations has been ongoing since 1986
Industrial Landfill IV	TDEC-permitted Class II industrial SWDF	Permitted to receive only, nonhazardous industrial solid wastes. Detection monitoring under TDEC-SWM regulations has been ongoing since 1988
Industrial Landfill V	TDEC-permitted Class II industrial SWDF	New facility completed 4/94. Baseline groundwater monitoring began 5/93 and was completed 1/95. Currently under TDEC-SWM detection monitoring
Construction/Demolition Landfill VI	TDEC-permitted Class IV construction/demolition SWDF	New facility completed 12/93. Baseline groundwater quality monitoring began 5/93 and was completed 12/93. Waste disposal began 4/94. Currently under permit-required detection monitoring per TDEC
Construction/Demolition Landfill VII	TDEC-permitted Class IV construction/demolition SWDF	New facility, construction completed in 12/94. TDEC granted approval to operate 1/95. Baseline groundwater quality monitoring began in 5/93 and was completed in 1/95. Currently under permit-required detection monitoring per TDEC

^aRegulatory classification before the 1992 Federal Facilities Agreement: TSD Unit—RCRA regulated, land-based treatment, storage, or disposal facility; SWDF—solid waste disposal facility (landfill); SWMU—RCRA-regulated solid waste management unit.

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Table 7.6. Annual average summed VOC concentrations in groundwater at the Chestnut Ridge Security Pits

Well number	Summed average VOCs ($\mu\text{g/L}$)						Percentage decrease
	1989	1990	1991	1992	1993	1994	
GW-173	17.0	13.5	11.8	11.7	<i>a</i>	<i>a</i>	31
GW-174	47.8	48.5	43.7	34.0	<i>a</i>	<i>a</i>	29
GW-175	31.8	38.5	31.0	29.5	17.0	25.3	20
GW-176	285.3	233.5	170.5	139.7	<i>a</i>	<i>a</i>	51
GW-177	66.7	18.8	26.3	25.5	33.0	28.3	58
GW-178	43.4	40.0	34.0	29.0	<i>a</i>	<i>a</i>	32
GW-179	838.0	455.0	328.3	262.3	<i>a</i>	<i>a</i>	69
GW-180	145.8	99.5	74.2	52.3	<i>a</i>	<i>a</i>	64
GW-322	696.0	730.3	633.0	538.3	<i>a</i>	<i>a</i>	23
GW-607	<i>a</i>	16.9	<i>b</i>	<i>b</i>	<i>b</i>	<i>a</i>	100
GW-608	<i>a</i>	14.8	15.5	4.5	4.0	4.5	70
GW-609	<i>a</i>	78.0	67.5	35.5	28.4	54.5	49
GW-610	<i>a</i>	1.0	0.5	<i>b</i>	<i>b</i>	0.3	70
GW-611	<i>a</i>	16.0	9.0	13.5	10.5	12.3	23
GW-612	<i>a</i>	505.8	451.3	358.3	<i>a</i>	<i>a</i>	29

^aNot sampled.

^bNot detected.

Table 7.7. Summary of the groundwater surveillance program at ORNL, 1994

WAG	Regulatory status	Upgradient/ downgradient wells		Parameters monitored ^a	Frequency and last date sampled
<i>Bethel Valley</i>					
1	CERCLA and DOE Orders 5400.1 and 5400.5	3	24	Standard	Rotation June 1994
3	DOE Orders 5400.1 and 5400.5	3	12	Standard	Rotation September 1994
17	DOE Orders 5400.1 and 5400.5	4	4	Standard	Rotation July 1994
<i>Melton Valley</i>					
2	CERCLA and DOE Orders 5400.1 and 5400.5	12	8	Standard	Rotation May 1994
4	CERCLA and DOE Orders 5400.1 and 5400.5	4	11	Standard	Rotation January 1994
5	CERCLA and DOE Orders 5400.1 and 5400.5	2	20	Standard	Rotation October 1994
6	RCRA/CERCLA and DOE Orders 5400.1 and 5400.5	7	17	Volatile organics gross alpha, gross beta, ³ H, ¹³⁷ Cs, ⁶⁰ Co total rad Sr + standard field measurements	8 wells quarterly; 16 wells semiannually
7	CERCLA and DOE Orders 5400.1 and 5400.5	2	14	Standard	Rotation November 1994
8 and 9	DOE Orders 5400.1 and 5400.5	2	9	Standard	Rotation December 1994
<i>White Wing Scrapyard</i>					
11	DOE Orders 5400.1 and 5400.5	6	5	Standard	Rotation March, July 1994

^aStandard: volatile and semivolatile organics, total organic carbon, total organic halides, metals, anions, total phenolics, total suspended solids, alkalinity, gross alpha and beta, ³H, ¹³⁷Cs, ⁶⁰Co, and total radioactive strontium. Standard field measurements: pH, conductivity, turbidity, oxidation/reduction potential, temperature, and dissolved oxygen.

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Table 7.8. Summary of the plant perimeter surveillance program at ORNL, 1994^a

Exit pathway	WAG	Number of wells	Surface water locations
White Oak Creek/Melton Valley	6 & 2 ^b	10	White Oak Creek at White Oak Dam
West Bethel Valley	3	3	Raccoon Creek
East Bethel Valley	17	4	Bearden Creek
White Wing Scrapyard	11	3	Bear Creek

^aAll locations are monitored for volatile organics, tritium, total radioactive strontium, gross alpha and beta, ⁶⁰Co, and ¹³⁷Cs.

^bFour wells are part of the ORNL WAG 6 perimeter network, and four wells are part of the ORNL WAG 2 perimeter network. Two other wells were not sampled in 1994, pending a decision regarding installation of dedicated pumps in them.

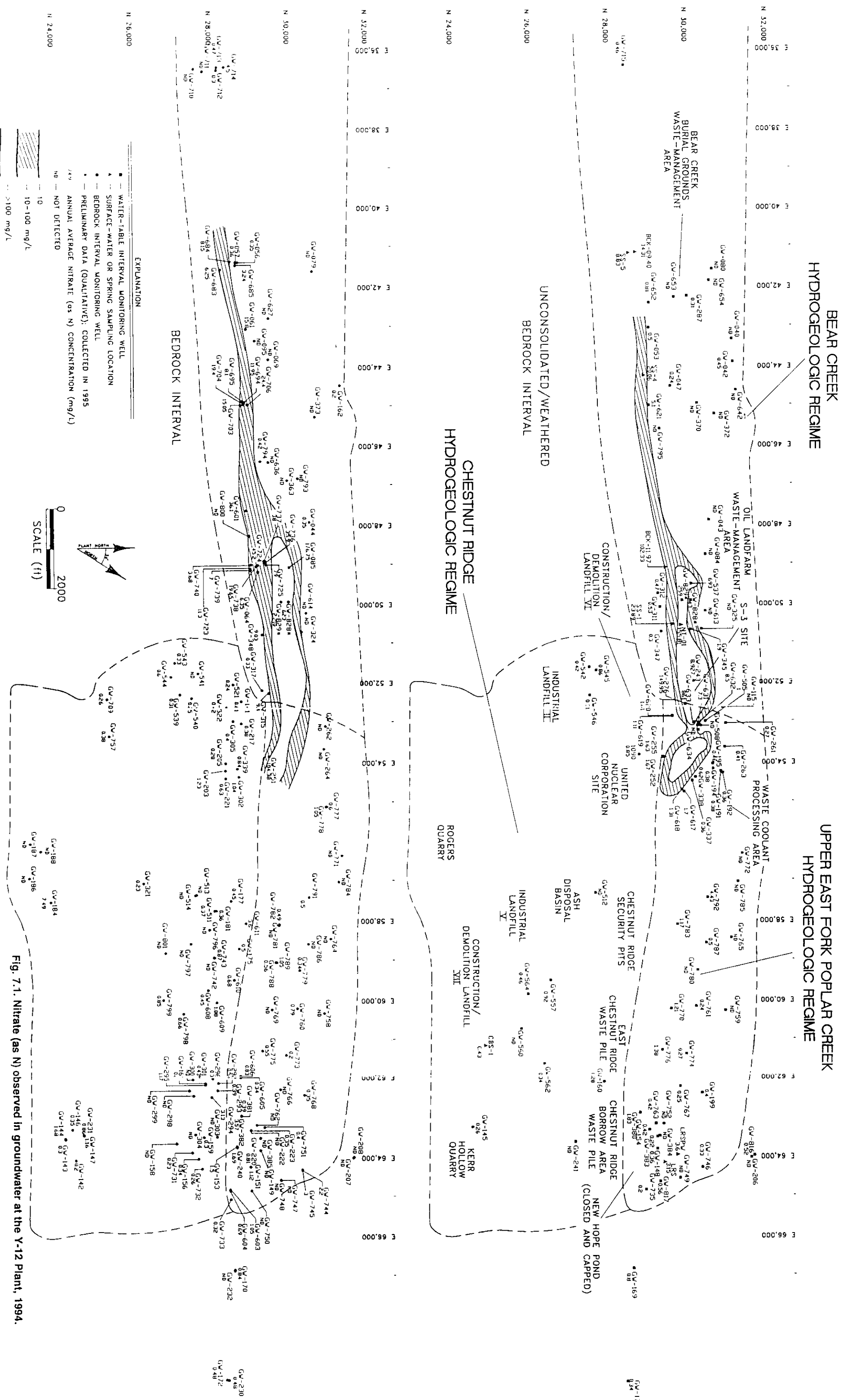


Fig. 7.1. Nitrate (as N) observed in groundwater at the Y-12 Plant, 1994.

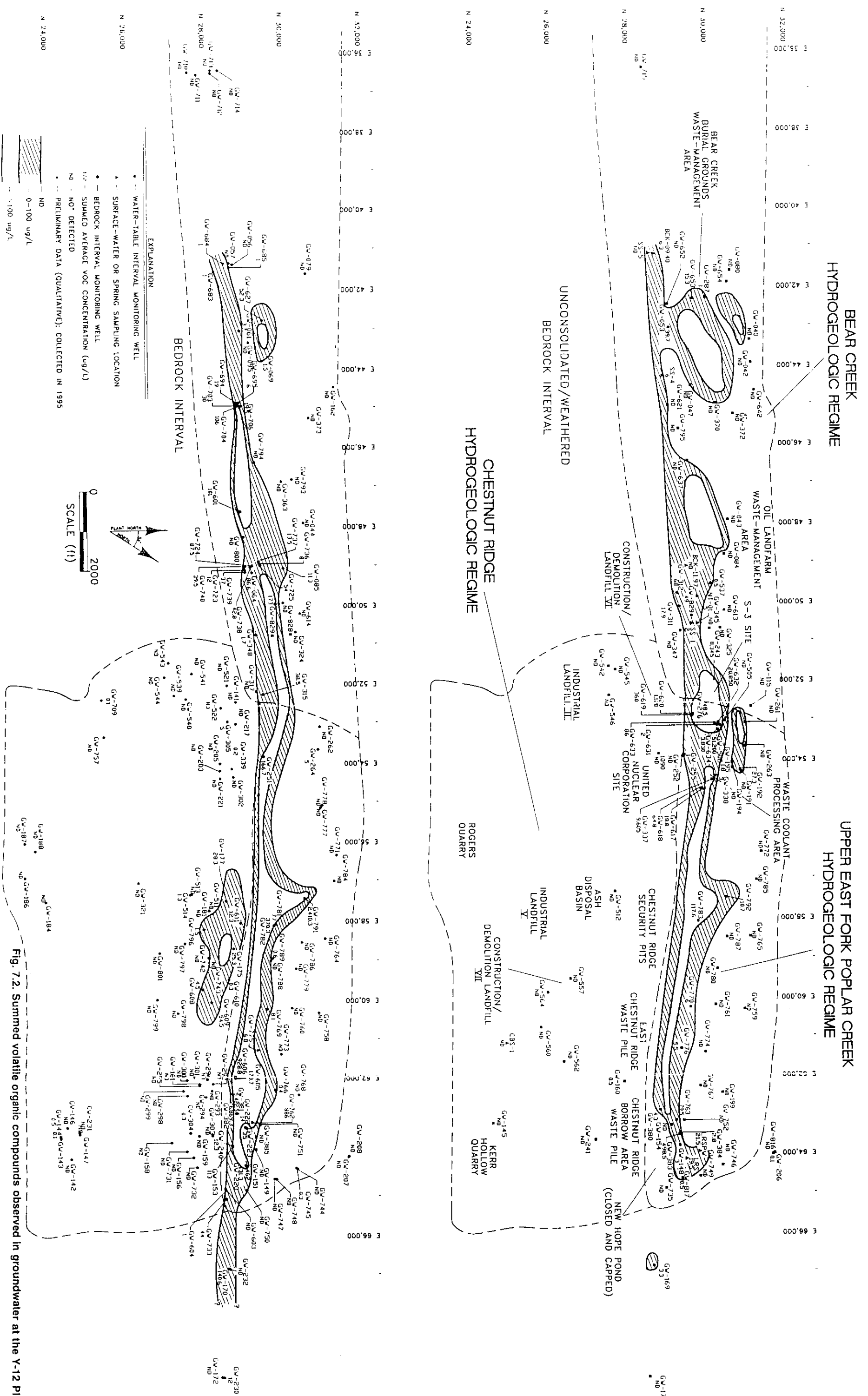
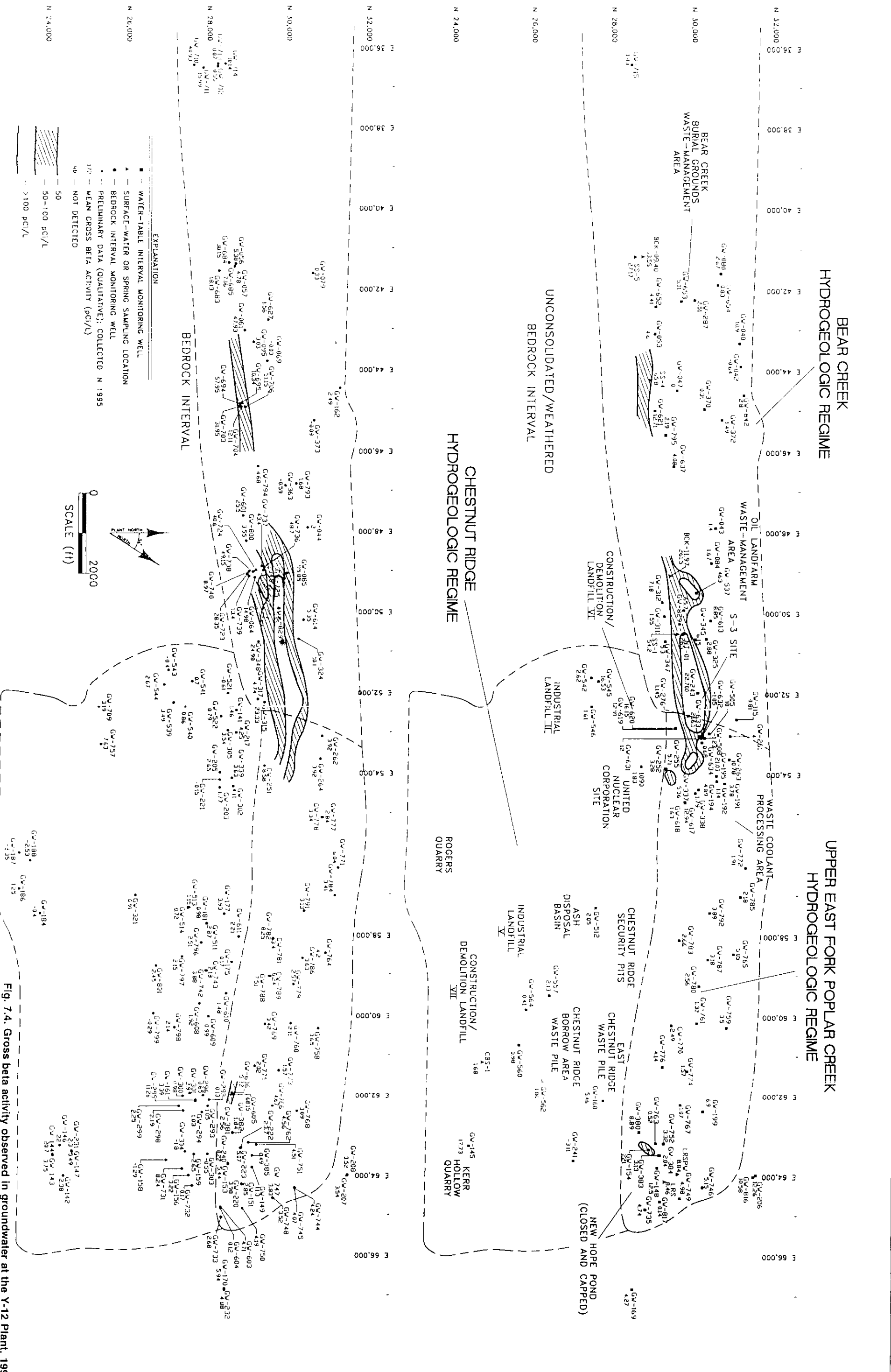


Fig. 7.2. Summed volatile organic compounds observed in groundwater at the Y-12 Plant, 1994.



**BEAR CREEK
HYDROGEOLOGIC REGIME**

**UPPER EAST FORK POPLAR CREEK
HYDROGEOLOGIC REGIME**

**CHESTNUT RIDGE
HYDROGEOLOGIC REGIME**

**UNCONSOLIDATED/WEATHERED
BEDROCK INTERVAL**

BEDROCK INTERVAL

- EXPLANATION**
- WATER-TABLE INTERVAL MONITORING WELL
 - ▲ SURFACE-WATER OR SPRING SAMPLING LOCATION
 - BEDROCK INTERVAL MONITORING WELL
 - PRELIMINARY DATA (QUALITATIVE): COLLECTED IN 1995
 - 1/2" - MEAN CROSS BETA ACTIVITY (pCi/L)
 - ND - NOT DETECTED

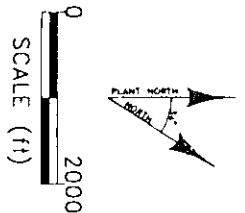


Fig. 7.4. Gross beta activity observed in groundwater at the Y-12 Plant, 1994.

Groundwater Reference Standards Footnotes

- a = Concentration limits listed in 40 CFR 264.94 incorporated by reference at the Rules of the Tennessee Department of Environment and Conservation (TDEC) 1200-1-11.06(6)(a), effective February 13, 1994.
- b = TDEC 1200-1-7, Appendix I, effective February 21, 1994.
- c = National Primary Drinking Water Regulation MCLs—enforceable health-based maximum concentration levels for public water supply systems (40 CFR 141); TDEC 1200-5-1.06, effective July 16, 1994.
- d = National Secondary Drinking Water SMCLs—nonenforceable taste, odor, or appearance guidelines (40 CFR 143); TDEC 1200-5-1-.12, effective July 16, 1994.
- e = Four percent of Derived Concentration Guide (DCG) values—calculation based on comparison with the DOE drinking water systems criterion of 4 mrem/year [DOE Order 5400.5 *Radiation Protection of the Public and the Environment*, effective July 7, 1993, Chapter III (2)].
- f = The DCG values for internal exposure—based on a committed effective dose equivalent of 100 mrem/year [DOE Order 5400.5 Chapter III (2)].
- g = TDEC 1200-4-3, effective August 30, 1991.
- h = Water hardness dependent criteria (50 mg/L as CaCO₃).
- i = Number in parenthesis is an “action level” which, if measured in the 90th percentile at the water tap, triggers initiation of corrosion control studies and treatment requirements.
TT = Treatment Technology
- j = Applies to fibers longer than 10 microns.
- k = The MCL is based on the presence or absence (P/A) of total coliforms in a sample; if no more than 50% of the 40 or greater water samples collected per month are positive, the system is in compliance with the MCL.
- l = The State of Tennessee sets a MCL of 1 TU (TDEC 1200-5-1-11).
- m = TDEC 1200-1-15-.06(e), Underground Storage Tank Program.
- n = Gross alpha particle activity includes radium-226, but excludes radon and uranium.

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- o = If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or any organ shall not exceed 4 mrem/year; if the activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive constituents present.
- p = These values are not MCLs, but concentrations that result in the effective dose equivalent of 4 mrem/year, the MCL for gross beta activity.
- q = MCL applies to combined radium-226 and radium-228 concentrations.
- r = Proposed MCL, 56 FR 33050, July 18, 1991; final rule expected April 1995.
- s = Number is approximately equal to uranium MCL of 20 µg/L.
- t = Total trihalomethanes (THM) includes the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform).
- u = According to Mr. Glen Pugh, TDEC Office of Solid Waste, in Rule 1200-1-7 this standard was incorrectly promulgated, and instead should have replicated the Federal MCL of 400 µg/L (personal communication to A. M. Vance, January 31, 1995).
- v = Criteria is based on a pH of 7.8.
- w = Final ruling 57 FR 22178, May 27, 1992, effective date postponed indefinitely.

Laboratory Qualifier Footnotes

Default Lab Number

Default laboratory	Laboratory description
01 and 02	FIELD MMTS (Sample Custodian and Reporting Laboratory)
07	AAS (Atomic Absorption Spectroscopy)
13	HG (Mercury)
12	WET (WET Chemistry Laboratory)
12	TOX (WET Chemistry Laboratory)
03	VOA (Organic Mass Spectroscopy Laboratory)
03	BNA (
08	ICP (Inductively Coupled Plasma Laboratory)
09	RAD CHEM (Radiochemistry Laboratory)

Qualifiers

Qualifier symbol	Default laboratory	Qualifier description
*	01	Duplicate analysis outside control limits.
*	02	Duplicate analysis outside control limits.
*	03	Duplicate analysis outside control limits.
*	04	Duplicate analysis outside control limits.
*	05	Duplicate analysis outside control limits.
*	07	Duplicate analysis outside control limits.
*	08	Duplicate analysis outside control limits.
*	09	Duplicate analysis outside control limits.
*	10	Duplicate analysis outside control limits.
*	12	Duplicate analysis outside control limits.
*	13	Duplicate analysis outside control limits.
*	14	Duplicate analysis outside control limits.
+	01	Correlation coefficient for MSA <0.995.
+	02	Correlation coefficient for MSA <0.995.
+	05	Correlation coefficient for MSA <0.995.
+	07	Correlation coefficient for MSA <0.995.
+	08	Correlation coefficient for MSA <0.995.
+	09	Duplicate control limits do not apply, duplicate and sample are near the MDA.
+	10	Correlation coefficient for MSA <0.995.
+	12	Correlation coefficient for MSA <0.995.
+	13	Correlation coefficient for MSA <0.995.
+	14	Correlation coefficient for MSA <0.995.
+	32	This sample was POSITIVE for asbestos fibers.

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-	32	This sample was NEGATIVE for asbestos fibers.
I	03	Can not be separated from Diphenylamine.
2	03	Cannot be separated from 3-Methylphenol.
A	03	TIC is a suspected aldol-condensation product.
A	09	Possible detector contamination.
B	03	Analyte found in blank as well as sample.
B	04	Analyte found in blank as well as sample.
B	07	Reported value was less than the CRDL but greater than or equal to IDL.
B	09	Blank analysis outside of control limits.
B	13	Reported value was less than the CRDL but greater than or equal to IDL.
B	25	Analyte found in blank as well as sample.
C	03	Identification has been confirmed by GC/MS.
C	04	Identification has been confirmed by GC/MS.
C	09	Control analysis outside of control limits.
D	03	Compounds identified in an analysis at a secondary dilution factor.
D	07	Sample contained matrix interferences which caused an adjustment in the normal reporting limit.
D	09	Spike control limits do not apply, sample activity exceeds the activity of the spike.
E	03	Concentrations exceed calibration range of the GC/MS instrument.
E	04	Concentrations exceed calibration range of the GC instrument.
E	07	Estimated value, interferences.
E	08	Estimated value, interferences.
E	09	Result of analysis is less than the MDA, confidence level is less than 95%.
E	10	Estimated value, interferences.
E	12	Estimated value, interferences.
E	13	Estimated value, interferences.
E	14	Estimated value, interferences.
E	25	Indicates an estimated value. Used in cases where a target analyte is detected at a level greater than the upper quantification limit of instrument calibration.
F	09	Result less than background.
G	09	Gamma photopeak near MDA, resulting in a poor curve fit.
H	09	Daughter of Uranium Isotopes. Reported for comparison purposes only.
H	25	Peak height (instead of peak area) was used to calculate the isotopic or confirmation/quantitation ion ratio and to quantitate the analyte. Peak must meet all other identification criteria.
I	09	Insufficient amount of sample to meet customer's MDA requirements.
I	19	The sample has been analyzed by ICP-MS and was found to have an insufficient amount of Uranium to allow for an accurate isotopic determination.

J	03	Indicates an estimated value.
J	04	Indicates an estimated value.
J	09	Chemical tracer recovery is outside of control limits.
J	25	Indicates an estimated value.
L	01	Sample received by ACD with expired holding time.
L	02	Sample received by ACD with expired holding time.
L	03	Sample received by ACD with expired holding time.
L	04	Sample received by ACD with expired holding time.
L	05	Sample received by ACD with expired holding time.
L	06	Sample received by ACD with expired holding time.
L	07	Sample received by ACD with expired holding time.
L	08	Sample received by ACD with expired holding time.
L	09	Sample received by ACD with expired holding time.
L	10	Sample received by ACD with expired holding time.
L	11	Sample received by ACD with expired holding time.
L	12	Sample received by ACD with expired holding time.
L	13	Sample received by ACD with expired holding time.
L	14	Sample received by ACD with expired holding time.
L	19	Sample received by ACD with expired holding time.
L	21	Sample received by ACD with expired holding time.
L	22	Sample received by ACD with expired holding time.
L	25	Sample received by ACD with expired holding time.
M	07	Duplicate injection precision not met.
M	08	Laboratory Control Sample recovery not within limits.
M	09	Duplicate injection precision not met.
M	10	Duplicate injection precision not met.
M	12	Duplicate injection precision not met.
M	13	Duplicate injection precision not met.
M	14	Duplicate injection precision not met.
N	03	Presumptive evidence of a compound.
N	04	Confirmed by second column, quantitative results differed by >50% between columns.

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N	07	Spiked sample recovery not within limits.
N	08	Spiked sample recovery not within limits.
N	10	Spiked sample recovery not within limits.
N	12	Spiked sample recovery not within limits.
N	13	Spiked sample recovery not within limits.
N	14	Spiked sample recovery not within limits.
N	25	Spiked sample recovery not within control limits.
P	08	This sample was found to have a pH above 2.
P	19	This sample was found to have a pH above 2.
R	01	Result was Revised after Approved.
R	02	Result was Revised after Approved.
R	03	Result was Revised after Approved.
R	04	Result was Revised after Approved.
R	05	Result was Revised after Approved.
R	07	Result was Revised after Approved.
R	08	Result was Revised after Approved.
R	09	Result was Revised after Approved.
R	10	Result was Revised after Approved.
R	12	Result was Revised after Approved.
R	13	Result was Revised after Approved.
R	14	Result was revised after Approval.
R	32	Result was Revised after Approved.
S	07	Value determined by Method of Standard Additions.
U	01	Compound was analyzed for but not detected.
U	02	Compound was analyzed for but not detected.
U	03	Compound was analyzed for but not detected.
U	04	Compound was analyzed for but not detected.
U	05	Compound was analyzed for but not detected.
U	07	Compound was analyzed for but not detected.
U	08	Compound was analyzed for but not detected.
U	09	Compound was analyzed for but not detected.
U	10	(INSUFF U) The sample has been analyzed by TIMS and was found to have an insufficient amount of Uranium to allow for an accurate isotopic determination.
U	12	Compound was analyzed for but not detected.
U	13	Compound was analyzed for but not detected.
U	14	Compound was analyzed for but not detected.
U	19	Compound was analyzed for but not detected.
U	25	Compound was analyzed for but not detected.
W	07	Post digestion spike for furnace AA out of control limits.
Y	03	Undistinguishable isomer components.
a	09	Acceptable duplicate difference for non-aqueous matrices is $\pm 35\%$.
b	03	Method blank failed surrogate recovery acceptance limits.
b	04	Method blank failed Surrogate Recovery acceptance limits.
c	01	Possible contamination.
c	02	Possible contamination.

c	03	Possible contamination.
c	04	Possible contamination.
c	05	Possible contamination.
c	06	Possible contamination.
c	07	Possible contamination.
c	08	Possible contamination.
c	09	Possible contamination.
c	10	Possible contamination.
c	11	Possible contamination.
c	12	Possible contamination.
c	13	Possible contamination.
c	14	Possible contamination.
c	25	Possible contamination.
c	32	Possible contamination.
d	08	Dilution required for accurate determination of all analytes; reporting limits raised accordingly.
d	09	Acceptable duplicate difference for non-aqueous matrices is $\pm 35\%$.
d	25	Dilution required for accurate determination of all analytes; reporting limits raised accordingly.
d	26	Dilution required for accurate determination of all analytes; reporting limits raised accordingly.
e	09	Results are considered estimated.
f	09	Tentatively Identified Isotope (TII)
g	25	Isotope ratio criteria are not met using either peak height or peak area.
h	01	Procedure Performed past regulatory holding time.
h	02	Procedure Performed past regulatory holding time.
h	03	Procedure Performed past regulatory holding time.
h	04	Procedure Performed past regulatory holding time.
h	05	Procedure Performed past regulatory holding time.
h	06	Procedure Performed past regulatory holding time.
h	07	Procedure Performed past regulatory holding time.
h	08	Procedure Performed past regulatory holding time.
h	09	Procedure Performed past regulatory holding time.
h	10	Procedure Performed past regulatory holding time.
h	11	Procedure Performed past regulatory holding time.
h	12	Procedure Performed past regulatory holding time.
h	13	Procedure Performed past regulatory holding time.
h	14	Procedure performed past regulatory holding time.
h	25	Procedure performed past regulatory holding time.
i	03	Internal standard areas failed acceptance criteria.
i	09	Tentatively Identified Isotope (TII)
i	25	Isotope ratio criteria are not met using either peak height or peak area.
j	10	(LOW U) Not enough Uranium in the sample to warrant isotopic analysis.
k	12	Matrix spiked component.
k	14	Spike recovery not within limits.
m	03	Analytical method/requested method discrepancy.
n	01	Analyte not analyzed.

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n	02	Analyte not analyzed.
n	03	Analyte not analyzed.
n	04	Analyte not analyzed.
n	05	Analyte not analyzed.
n	07	Analyte not analyzed.
n	08	Analyte not analyzed.
n	09	Analyte not analyzed.
n	10	(LOW U) Not enough Uranium in the sample to warrant isotopic analysis.
n	12	Analyte not analyzed.
n	13	Analyte not analyzed.
n	14	Analyte not analyzed.
n	32	Analyte not analyzed.
p	01	Sample known to be unpreserved.
p	02	Sample known to be unpreserved.
p	03	Sample known to be unpreserved.
p	04	Sample known to be unpreserved.
p	05	Sample known to be unpreserved.
p	06	Sample known to be unpreserved.
p	07	Sample known to be unpreserved.
p	08	Sample known to be unpreserved.
p	09	Sample known to be unpreserved.
p	10	Sample known to be unpreserved.
p	11	Sample known to be unpreserved.
p	12	Sample known to be unpreserved.
p	13	Sample known to be unpreserved.
p	14	Sample known to be unpreserved.
p	19	Sample known to be unpreserved.
p	25	Sample known to be unpreserved.
q	04	Sample fell between subsequent standards, one or both of which did not meet applicable QC acceptance criteria.
r	03	Surrogate standards failed recovery criteria.
r	04	Surrogate Standards failed recovery criteria.
s	01	Spike recovery not within limits.
s	02	Spike recovery not within limits.
s	03	Matrix spiked component.
s	04	Spike recovery not within limits.
s	05	Spike recovery not within limits.
s	07	Spike recovery not within limits.
s	08	Spike recovery not within limits.
s	09	Spike recovery not within limits.
s	10	Spike recovery not within limits.
s	12	Matrix spiked component.
s	13	Spike recovery not within limits.
s	25	Signal-to-noise ratio of the confirmation ion does not meet 2.5 S/N requirement, but peak was determined to be positive in the judgement of the GC/MS analyst.
t	09	Acceptable spike recovery limits for non-aqueous matrices are 50% to 150%.

Annual Site Environmental Data

u	03	Insufficient Sample
u	04	Insufficient Sample
u	07	Insufficient Sample
u	08	Insufficient Sample
u	09	Insufficient Sample
u	12	Insufficient Sample
u	13	Insufficient Sample
u	14	Insufficient sample.
u	25	Insufficient Uranium.
v	25	Signal-to-noise ratio of the confirmation ion does not meet 2.5 S/N requirement, but peak was determined to be positive in the judgement of the GC/MS analyst.
z	08	Not a recommended analyte by the preparation procedure used.

Table 7.9. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=BC Location Description=Above Grade Low-Level Storage Facility

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		12	12	12	1	5.166667	250.000	0
Fluoride (mg/L)		12	3	0.2	0.1	0.133333	2.000	0
Nitrate nitrogen (mg/L)		12	4	0.59	0.2	0.4225	10.000	0
Sulfate (mg/L)		12	12	25	4	16.94167	250.000	0
Aluminum, ICAP (mg/L)		12	10	1.7	0.035	0.3567	0.2	6
Aluminum, ICAP (mg/L)	Filtered	12	6	0.38	0.027	0.116667	0.2	1
Barium, ICAP (mg/L)		12	12	0.15	0.056	0.108083	1.000	0
Barium, ICAP (mg/L)	Filtered	12	12	0.15	0.054	0.102833	1.000	0
Boron, ICAP (mg/L)		12	12	0.1 c	0.007	0.037333	NR	NA
Boron, ICAP (mg/L)	Filtered	12	12	0.072 c	0.01	0.038333	NR	NA
Calcium, ICAP (mg/L)		12	12	97	52	76.58333	NR	NA
Calcium, ICAP (mg/L)	Filtered	12	12	99	52	76.66667	NR	NA
Chromium, ICAP (mg/L)		12	1	0.012	0.012	0.012	0.050	0
Copper, ICAP (mg/L)		12	6	0.011	0.0051	0.0069	1.000	0
Copper, ICAP (mg/L)	Filtered	12	6	0.021	0.0042	0.0081	1.000	0
Iron, ICAP (mg/L)		12	12	1.8	0.0094	0.307367	0.300	3
Iron, ICAP (mg/L)	Filtered	12	9	0.074	0.005	0.020544	0.300	0
Magnesium, ICAP (mg/L)		12	12	9.8	3.4	5.666667	NR	NA
Magnesium, ICAP (mg/L)	Filtered	12	12	9.6	3.4	5.583333	NR	NA
Manganese, ICAP (mg/L)		12	12	0.14	0.011	0.058333	0.050	6
Manganese, ICAP (mg/L)	Filtered	12	12	0.086	0.0017	0.035267	0.050	4

Table 7.9 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Molybdenum, ICAP (mg/L)	Filtered	12	1	0.011	0.011	0.011	NR	NA
Nickel, ICAP (mg/L)		12	1	0.011	0.011	0.011	0.100	0
Nickel, ICAP (mg/L)	Filtered	12	2	0.013	0.011	0.012	0.100	0
Potassium, ICAP (mg/L)		12	12	2.9	0.65	1.484167	NR	NA
Potassium, ICAP (mg/L)	Filtered	12	12	2.7	0.63	1.3875	NR	NA
Selenium, ICAP (mg/L)		12	1	0.05	0.05	0.05	0.010	1
Silver, ICAP (mg/L)		12	1	0.0065	0.0065	0.0065	0.010	0
Sodium, ICAP (mg/L)		12	12	4	1.9	3.066667	NR	NA
Sodium, ICAP (mg/L)	Filtered	12	12	3.9	1.9	3.083333	NR	NA
Strontium, ICAP (mg/L)		12	12	0.19	0.091	0.136667	NR	NA
Strontium, ICAP (mg/L)	Filtered	12	12	0.19	0.091	0.1365	NR	NA
Uranium (mg/L)		12	5	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	12	4	0.001	0.001	0.001	0.020	0
Zinc, ICAP (mg/L)		12	12	0.17	0.0056	0.029608	5.000	0
Zinc, ICAP (mg/L)	Filtered	12	9	0.43	0.0046 c	0.070644	5.000	0
Conductivity, field measurement (µmhos/cm)		12	NA	495	270	382.0833	NR	NA
Dissolved oxygen, field measurement (ppm)		12	NA	12.1	0.9	3.941667	NR	NA
pH, field measurement (pH units)		12	NA	7.7	7	7.308333	6.5-8.5	0
Redox, field measurement (MV)		12	NA	206	117	157.8333	NR	NA

Table 7.9 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft-TOC)		12	12	-4.95	-20	-10.4317	NR	NA
Water temperature, field measurement (°C)		12	NA	18.4	13.7	15.39167	NR	NA
Alkalinity-HCO ₃ (mg/L)		12	12	239	150	194	NR	NA
Conductivity (µmhos/cm)		12	12	505	286	396.9167	NR	NA
Dissolved solids (mg/L)		12	12	332	172	245.1667	500.000	0
pH (pH units)		12	12	7.7	7.4	7.558333	NR	NA
Total suspended solids (mg/L)		12	8	32	2	10.375	NR	NA
Turbidity (NTU)		12	12	24	0.4	7.066667	1.0 I	10
¹³⁷ Cs (pCi/L)		1	1	5.13	5.13	5.13	120.000	0
^{231,232} Th (pCi/L)		2	2	1010 H	136 I	573	400.000	1
²³⁴ U (pCi/L)		12	12	1.33	-0.705	0.189525	20.000	0
²³⁵ U (pCi/L)		12	12	77.6 E	-41.7 F	8.700615	24.000	2
²³⁸ U (pCi/L)		12	12	0.716	-0.0963	0.191225	24.000	0
⁴⁰ K (pCi/L)		1	1	0.471	0.471	0.471	NR	NA
⁹⁹ Tc (pCi/L)		1	1	373 C	373 C	373	4000.000	0
Gross alpha (pCi/L)		12	12	1.97	-0.683	0.418653	15 n	0
Gross beta (pCi/L)		12	12	7.25	-1.92	2.850167	4 o	4
Strontium (pCi/L)		1	1	10.8	10.8	10.8	8 p	1
Methylene chloride (µg/L)		12	1	1 JB	1 JB	1	5.000	0

Table 7.10. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=BC Location Description=Bear Creek Burial Grounds WMA

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		76	70	45	1	8.112857	250.000	0
Fluoride (mg/L)		76	51	6.3	0.1	0.807843	2.000	4
Nitrate nitrogen (mg/L)		76	11	23	0.2	6.046364	10.000	3
Sulfate (mg/L)		76	75	40	1.1	15.01867	250.000	0
Aluminum, ICAP (mg/L)		76	59	21	0.026	2.159119	0.2	37
Aluminum, ICAP (mg/L)	Filtered	76	24	0.42	0.02	0.057667	0.2	1
Barium, ICAP (mg/L)		76	76	0.41	0.026	0.134882	1.000	0
Barium, ICAP (mg/L)	Filtered	76	76	0.45	0.0075	0.111546	1.000	0
Beryllium, ICAP (mg/L)		76	12	0.0028	0.00031	0.000773	0.004	0
Beryllium, ICAP (mg/L)	Filtered	76	1	0.00037	0.00037	0.00037	0.004	0
Boron, ICAP (mg/L)		76	76	1	0.0085	0.132297	NR	NA
Boron, ICAP (mg/L)	Filtered	76	76	1.1	0.0057	0.138496	NR	NA
Cadmium, AAS (mg/L)		32	6	0.033	0.0028	0.009983	0.005	2
Cadmium, AAS (mg/L)	Filtered	32	6	0.026	0.0023	0.009067	0.005	2
Cadmium, ICAP (mg/L)		76	6	0.03	0.0034	0.0105	0.005	3
Cadmium, ICAP (mg/L)	Filtered	76	7	0.028	0.0033	0.010943	0.005	4
Calcium, ICAP (mg/L)		76	76	130	0.84	28.41592	NR	NA
Calcium, ICAP (mg/L)	Filtered	76	76	130	0.85	28.68829	NR	NA
Chromium, AAS (mg/L)		32	8	0.095	0.014	0.04475	0.050	2
Chromium, ICAP (mg/L)		76	8	0.075	0.012	0.028375	0.050	1
Chromium, ICAP (mg/L)	Filtered	76	1	0.014	0.014	0.014	0.050	0

Table 7.10 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Cobalt, ICAP (mg/L)		76	7	0.021	0.0059	0.010643	NR	NA
Copper, ICAP (mg/L)		76	28	0.043	0.0042	0.011039	1.000	0
Copper, ICAP (mg/L)	Filtered	76	17	0.065	0.0042	0.011435	1.000	0
Iron, ICAP (mg/L)		76	73	43	0.0082	3.145556	0.300	49
Iron, ICAP (mg/L)	Filtered	76	57	6.7	0.0063	0.430805	0.300	10
Lead, AAS (mg/L)		32	12	0.018	0.0042	0.009458	0.015 i	1
Magnesium, ICAP (mg/L)		76	76	18	0.18	5.665132	NR	NA
Magnesium, ICAP (mg/L)	Filtered	76	76	17	0.1	5.308289	NR	NA
Manganese, ICAP (mg/L)		76	73	5	0.0015	0.364973	0.050	38
Manganese, ICAP (mg/L)	Filtered	76	64	2.9	0.0011	0.24042	0.050	29
Mercury, CVAA (mg/L)		32	1	0.00024	0.00024	0.00024	0.002	0
Molybdenum, ICAP (mg/L)		76	1	0.014	0.014	0.014	NR	NA
Molybdenum, ICAP (mg/L)	Filtered	76	1	0.012	0.012	0.012	NR	NA
Nickel, ICAP (mg/L)		76	18	0.051	0.011	0.021278	0.100	0
Nickel, ICAP (mg/L)	Filtered	76	12	0.03	0.01	0.016583	0.100	0
Potassium, ICAP (mg/L)		76	75	6.7	0.65	2.240267	NR	NA
Potassium, ICAP (mg/L)	Filtered	76	71	5.1	0.71	1.880141	NR	NA
Selenium, ICAP (mg/L)		76	1	0.06	0.06	0.06	0.010	1
Silver, ICAP (mg/L)		76	1	0.011	0.011	0.011	0.010	1
Sodium, ICAP (mg/L)		76	76	350	1.1	39.61184	NR	NA
Sodium, ICAP (mg/L)	Filtered	76	76	330	1.2 c	39.24211	NR	NA

Table 7.10 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Strontium, ICAP (mg/L)		76	76	0.94	0.015	0.180395	NR	NA
Strontium, ICAP (mg/L)	Filtered	76	76	1.1	0.012	0.178158	NR	NA
Uranium (mg/L)		76	19	0.088	0.001	0.010263	0.020	3
Uranium (mg/L)	Filtered	76	17	0.079	0.001	0.011471	0.020	3
Vanadium, ICAP (mg/L)		76	12	0.03	0.005	0.011925	NR	NA
Zinc, ICAP (mg/L)		76	71	1.1	0.0024	0.037718	5.000	0
Zinc, ICAP (mg/L)	Filtered	76	62	0.43	0.0023 c	0.018884	5.000	0
Conductivity, field measurement (µmhos/cm)		76	NA	1196	33	334.1974	NR	NA
Dissolved oxygen, field measurement (ppm)		76	NA	12.9	0.15	4.111447	NR	NA
pH, field measurement (pH units)		76	NA	9.4	5.1	7.313158	6.5-8.5	38
Redox, field measurement (MV)		76	NA	301	4.3	133.5435	NR	NA
Static water level (ft-TOC)		76	76	-2	-27	-15.4401	NR	NA
Water temperature, field measurement (°C)		76	NA	19.8	10.3	15.01447	NR	NA
Alkalinity-CO ₃ (mg/L)		76	16	78	6	35.875	NR	NA
Alkalinity-HCO ₃ (mg/L)		76	76	493	12	137.8947	NR	NA
Conductivity (µmhos/cm)		76	75	1220	32	334.7333	NR	NA
Dissolved solids (mg/L)		76	76	750	18	225.6842	500.000	4

Table 7.10 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH (pH units)		76	76	9.2	5.7	7.552632	NR	NA
Total suspended solids (mg/L)		76	59	614	1	58.86441	NR	NA
Turbidity (NTU)		76	76	520	0.5	51.04868	1.01	63
¹²⁹ I, X-10 lab (Bq/L)		32	32	0.4	-0.2	0.065938	NR	NA
¹³¹ I, X-10 lab (Bq/L)		17	17	0.05	-0.05	-0.00276	NR	NA
²³¹ U/ ²³² Th (pCi/L)		1	1	620 i	620 i	620	400,000	1
²³⁴ U (pCi/L)		36	36	33.2	-0.679	1.172861	20,000	1
²³⁵ U (pCi/L)		36	36	117 i	-59 F	12.26531	24,000	8
²³⁷ Np (pCi/L)		32	32	2.1	-0.675	0.158063	1.200	1
²³⁸ Pu (pCi/L)		32	32	0.373	-0.896	-0.19972	1.600	0
²³⁹ U (pCi/L)		36	36	16.4	-0.452	0.767028	24,000	0
²³⁹ Pu (pCi/L)		32	32	0.585	-0.431	-0.04503	1.200	0
²⁴¹ Am (pCi/L)		32	32	10.4	-28.3	-0.41353	1.20	9
⁴⁰ K (pCi/L)		4	4	717 i	388	527.25	NR	NA
⁹⁹ Tc (pCi/L)		37	37	362	-28.6	52.66054	4000,000	0
Gross alpha (pCi/L)		76	76	37.1	-3.14	1.867506	15 n	2
Gross beta (pCi/L)		76	76	71.7	-4.44	4.742655	4 o	16
Radium, X-10 lab (Bq/L)		30	30	0.11	-0.02	0.041033	0.15	0
Strontium (pCi/L)		37	37	65.7 J	-47.9	3.032595	8 p	15
Tritium, X-10 lab (Bq/L)		34	34	23	-31	-1.63824	20000 p	0

Table 7.10 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	A _v	Reference value	No. of measurements
1,1,1-Trichloroethane (µg/L)		76	1	0.7 J	0.7 J	0.7	200.000	0
1,1-Dichloroethane (µg/L)		76	9	8 J	2 J	5.111111	NR	NA
1,2-Dichloroethene (µg/L)		76	8	20	6 J	13.25	70	0
2-Butanone (µg/L)		76	3	16	8 J	11	NR	NA
Acetone (µg/L)		76	3	16	6 J	9.333333	NR	NA
Methylene chloride (µg/L)		76	3	2 JB	1 JB	1.333333	5.000	0
Tetrachloroethene (µg/L)		76	13	44	0.7 J	13.28462	5.000	4
Trichloroethene (µg/L)		76	11	7 J	0.6 J	3.209091	5.000	2
Vinyl chloride (µg/L)		76	7	11	2 J	5.857143	2.000	4

Table 7.11. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=BC Location Description=Exit Pathway

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		68	68	1934	1	91.43971	250.000	4
Fluoride (mg/L)		68	55	1.8	0.1	0.398182	2.000	0
Nitrate nitrogen (mg/L)		68	60	228	0.2	22.59267	10.000	28
Sulfate (mg/L)		68	67	2086	4	143.9343	250.000	4
Aluminum, ICAP (mg/L)		68	49	1.6	0.021	0.290857	0.2	23
Aluminum, ICAP (mg/L)	Filtered	68	32	0.69	0.02	0.134875	0.2	8
Arsenic, ICAP (mg/L)		68	3	0.57	0.055	0.248333	0.050	3
Barium, ICAP (mg/L)		68	66	1.1	0.009	0.11953	1.000	1
Barium, ICAP (mg/L)	Filtered	68	66	0.91	0.0078	0.114639	1.000	0
Beryllium, ICAP (mg/L)		68	2	0.0006	0.00049	0.000545	0.004	0
Beryllium, ICAP (mg/L)	Filtered	68	1	0.00045	0.00045	0.00045	0.004	0
Boron, ICAP (mg/L)		68	68	1.3	0.0073	0.103034	NR	NA
Boron, ICAP (mg/L)	Filtered	68	68	1.4	0.0075	0.111537	NR	NA
Cadmium, AAS (mg/L)		16	1	0.0026	0.0026	0.0026	0.005	0
Cadmium, ICAP (mg/L)		68	3	0.032	0.0038	0.015933	0.005	2
Cadmium, ICAP (mg/L)	Filtered	68	3	0.026	0.0055	0.0145	0.005	3
Calcium, ICAP (mg/L)		68	68	560	4.2	114.4294	NR	NA
Calcium, ICAP (mg/L)	Filtered	68	68	580	4.1	116.1632	NR	NA
Chromium, AAS (mg/L)		16	3	0.077	0.036	0.055667	0.050	2
Chromium, ICAP (mg/L)		68	6	0.071	0.02	0.042167	0.050	2
Chromium, ICAP (mg/L)	Filtered	68	1	0.021	0.021	0.021	0.050	0

Table 7.11 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Cobalt, ICAP (mg/L)		68	1	0.013	0.013	0.013	NR	NA
Cobalt, ICAP (mg/L)	Filtered	68	1	0.01	0.01	0.01	NR	NA
Copper, ICAP (mg/L)		68	6	0.008	0.0042	0.005533	1.000	0
Copper, ICAP (mg/L)	Filtered	68	13	0.023	0.0047	0.008331	1.000	0
Iron, ICAP (mg/L)		68	64	8.7	0.014	1.331672	0.300	42
Iron, ICAP (mg/L)	Filtered	68	49	7.6	0.0057	0.735796	0.300	17
Lead, AAS (mg/L)		16	1	0.014	0.014	0.014	0.015 i	0
Magnesium, ICAP (mg/L)		68	68	220	1.2	32.24853	NR	NA
Magnesium, ICAP (mg/L)	Filtered	68	68	230	1.1	32.84118	NR	NA
Manganese, ICAP (mg/L)		68	68	5.9	0.0023	0.264999	0.050	33
Manganese, ICAP (mg/L)	Filtered	68	62	4.8	0.0011	0.257956	0.050	23
Nickel, ICAP (mg/L)		68	8	0.23	0.018	0.081875	0.100	3
Nickel, ICAP (mg/L)	Filtered	68	7	0.1	0.01	0.050714	0.100	0
Potassium, ICAP (mg/L)		68	65	24	0.7	3.66	NR	NA
Potassium, ICAP (mg/L)	Filtered	68	65	28	0.77	3.781846	NR	NA
Silver, ICAP (mg/L)		68	1	0.0068	0.0068	0.0068	0.010	0
Silver, ICAP (mg/L)	Filtered	68	1	0.0077	0.0077	0.0077	0.010	0
Sodium, ICAP (mg/L)		68	68	1300	1.4	58.475	NR	NA
Sodium, ICAP (mg/L)	Filtered	68	68	1300	1.5	59.24118	NR	NA
Strontium, ICAP (mg/L)		68	68	13	0.017	0.918485	NR	NA
Strontium, ICAP (mg/L)	Filtered	68	68	14	0.017	0.955485	NR	NA

Table 7.11 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Uranium (mg/L)		66	51	0.324	0.0005	0.039452	0.020	20
Uranium (mg/L)	Filtered	68	50	0.288	0.00074	0.038739	0.020	20
Zinc, ICAP (mg/L)		68	46	0.02	0.0024	0.007778	5.000	0
Zinc, ICAP (mg/L)	Filtered	68	31	0.021	0.0021 c	0.006813	5.000	0
Conductivity, field measurement (µmhos/cm)		68	NA	7380	30	889.3824	NR	NA
Dissolved oxygen, field measurement (ppm)		68	NA	11.6	0.2	4.910147	NR	NA
pH, field measurement (pH units)		68	NA	8.4	6.4	7.405882	6.5-8.5	1
Redox, field measurement (MV)		50	NA	247	3	140.3297	NR	NA
Static water level (ft-TOC)		50	50	-4.25	-86.35	-32.255	NR	NA
Water temperature field measurement (°C)		68	NA	20.5	2.9	13.42941	NR	NA
Alkalinity-HCO ₃ (mg/L)		68	68	342	11	207.3088	NR	NA
Conductivity (µmhos/cm)		68	68	8340	45	1001.691	NR	NA
Dissolved solids (mg/L)		68	68	6126	40	690.1471	500.000	23
pH (pH units)		68	68	8.2	7	7.626471	NR	NA
Total suspended solids (mg/L)		68	59	114	1	10.10169	NR	NA
Turbidity (NTU)		68	68	46	0.2	9.714706	1.01	62
¹³⁷ I, X-10 lab (Bq/L)		12	12	0.1	-0.01	0.038333	NR	NA
¹³¹ I, X-10 lab (Bq/L)		6	6	0.06	-0.05	0.005167	NR	NA

Table 7.11 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
^{232}Th (pCi/L)		5	5	1000	548 EH	729.8	400,000	5
^{234}U (pCi/L)		12	12	1.33	0	0.431167	20,000	0
^{235}U (pCi/L)		12	12	52.4 E	-67 F	3.335167	24,000	3
^{237}Np (pCi/L)		12	12	0.741	-0.18	0.078	1,200	0
^{238}Pu (pCi/L)		12	12	0.213	-0.204	0.000833	1,600	0
^{238}U (pCi/L)		12	12	0.982	0	0.225167	24,000	0
^{239}Pu (pCi/L)		12	12	0.213	-0.204	0.003833	1,200	0
^{241}Am (pCi/L)		12	12	13.1 J	-6.88	0.8355	1,20	5
^{99}Tc (pCi/L)		30	30	786	24.9	174,5467	4000,000	0
Gross alpha (pCi/L)		68	68	67.4	-69.6	8,623347	15 n	15
Gross beta (pCi/L)		68	68	405	-80.9	35,43675	4 o	54
Radium, X-10 lab (Bq/L)		12	12	0.26	0.008	0.093583	0.15	4
Strontium (pCi/L)		30	30	374	-31.8 N	16,7169	8 p	5
Tritium, X-10 lab (Bq/L)		30	30	26	-24	2,333333	20000 p	0
1,1,1-Trichloroethane ($\mu\text{g/L}$)		68	3	2 J	0.7 J	1,566667	200,000	0
1,1-Dichloroethane ($\mu\text{g/L}$)		68	1	1 J	1 J	1	NR	NA
1,1-Dichloroethene ($\mu\text{g/L}$)		68	4	8 J	1 J	4	7,000	1
1,2-Dichloroethene ($\mu\text{g/L}$)		68	31	13	1 J	3,580645	70	0
2-Butanone ($\mu\text{g/L}$)		68	2	10 J	6 J	8	NR	NA
Acetone ($\mu\text{g/L}$)		68	2	9 JB	5 JB	7	NR	NA

Table 7.11 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Benzene (µg/L)		68	1	1 J	1 J	1	5,000 m	0
Carbon tetrachloride (µg/L)		68	4	2 J	1 J	1.5	5,000	0
Chloroform (µg/L)		68	3	2 J	1 J	1.333333	100,000 t	0
Methylene chloride (µg/L)		68	4	2 JB	1 JB	1.5	5,000	0
Tetrachloroethene (µg/L)		68	11	6 J	0.8 J	2.254545	5,000	1
Trichloroethene (µg/L)		68	32	100	0.6 J	25.4875	5,000	21

Table 7.12. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=BC Location Description=Oil Landfarm WMA

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		37	31	101	1	8.970968	250.000	0
Fluoride (mg/L)		37	12	0.3	0.1	0.141667	2.000	0
Nitrate nitrogen (mg/L)		37	14	1127	0.35	252.9179	10.000	9
Sulfate (mg/L)		37	35	55	2.5	10.92571	250.000	0
Aluminum, ICAP (mg/L)		37	29	4	0.024	0.997103	0.2	21
Aluminum, ICAP (mg/L)	Filtered	37	19	0.45	0.02	0.077526	0.2	1
Arsenic, ICAP (mg/L)		37	1	0.053	0.053	0.053	0.050	1
Barium, ICAP (mg/L)		37	37	3	0.022	0.440514	1.000	4
Barium, ICAP (mg/L)	Filtered	37	37	2.6	0.013	0.414405	1.000	4
Beryllium, ICAP (mg/L)		37	4	0.00044	0.00036	0.000405	0.004	0
Boron, ICAP (mg/L)		37	34	0.33	0.0084	0.066776	NR	NA
Boron, ICAP (mg/L)	Filtered	37	34	0.33	0.0094	0.073041	NR	NA
Cadmium, AAS (mg/L)		15	2	0.0034	0.0024	0.0029	0.005	0
Cadmium, AAS (mg/L)	Filtered	15	1	0.0023	0.0023	0.0023	0.005	0
Cadmium, ICAP (mg/L)		37	3	0.0042	0.0035	0.0038	0.005	0
Cadmium, ICAP (mg/L)	Filtered	37	1	0.0044	0.0044	0.0044	0.005	0
Calcium, ICAP (mg/L)		37	37	1300	1.6	194.3919	NR	NA
Calcium, ICAP (mg/L)	Filtered	37	37	1100	1.2	185.6324	NR	NA
Chromium, AAS (mg/L)		15	1	0.011	0.011	0.011	0.050	0
Copper, ICAP (mg/L)		37	14	0.015	0.004	0.007514	1.000	0
Copper, ICAP (mg/L)	Filtered	37	11	0.011	0.0041	0.007155	1.000	0

Table 7.12 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Iron, ICAP (mg/L)		37	34	4.7	0.014	0.882588	0.300	22
Iron, ICAP (mg/L)	Filtered	37	22	0.39	0.0057	0.048795	0.300	1
Lead, AAS (mg/L)		15	4	0.017	0.0078	0.010325	0.015 i	1
Magnesium, ICAP (mg/L)		37	37	85	0.7	16.63811	NR	NA
Magnesium, ICAP (mg/L)	Filtered	37	37	74	0.39	16.20541	NR	NA
Manganese, ICAP (mg/L)		37	37	0.3	0.0018	0.042468	0.050	8
Manganese, ICAP (mg/L)	Filtered	37	28	0.053	0.0011	0.011346	0.050	1
Nickel, ICAP (mg/L)		37	2	0.011	0.01	0.0105	0.100	0
Nickel, ICAP (mg/L)	Filtered	37	1	0.01	0.01	0.01	0.100	0
Potassium, ICAP (mg/L)		37	34	3.6	0.78	2.048824	NR	NA
Potassium, ICAP (mg/L)	Filtered	37	36	4.5	0.64	1.857222	NR	NA
Silver, ICAP (mg/L)		37	1	0.0078	0.0078	0.0078	0.010	0
Silver, ICAP (mg/L)	Filtered	37	1	0.0061	0.0061	0.0061	0.010	0
Sodium, ICAP (mg/L)		37	37	120	0.71	20.12189	NR	NA
Sodium, ICAP (mg/L)	Filtered	37	37	110	0.73	19.71135	NR	NA
Strontium, ICAP (mg/L)		37	37	3.4	0.023	0.501486	NR	NA
Strontium, ICAP (mg/L)	Filtered	37	37	3	0.024	0.493378	NR	NA
Uranium (mg/L)		37	13	0.004	0.00062	0.001229	0.020	0
Uranium (mg/L)	Filtered	37	12	0.002	0.00075	0.001179	0.020	0
Vanadium, ICAP (mg/L)		37	3	0.01	0.0052	0.006967	NR	NA
Zinc, ICAP (mg/L)		37	34	0.047	0.0025	0.013938	5.000	0

Table 7.12 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	A _v	Reference value	No. of measurements
Zinc, ICAP (mg/L)	Filtered	37	31	0.082	0.0021	0.011684	5.000	0
Conductivity, field measurement (µmhos/cm)		37	NA	5810	82	1035.919	NR	NA
Dissolved oxygen, field measurement (ppm)		37	NA	18.5	0.8	3.618919	NR	NA
pH, field measurement (pH units)		37	NA	9.2	5.6	7.244324	6.5-8.5	5
Redox, field measurement (MV)		37	NA	234	13.6	156.2529	NR	NA
Static water level (ft-TOC)		37	37	-4.73	-66	-17.487	NR	NA
Water temperature, field measurement (°C)		37	NA	18	9.3	14.8027	NR	NA
Alkalinity-CO ₃ (mg/L)		37	4	38	16	30	NR	NA
Alkalinity-HCO ₃ (mg/L)		37	37	302	40	181.8919	NR	NA
Conductivity (µmhos/cm)		37	37	6380	95	1121.081	NR	NA
Dissolved solids (mg/L)		37	37	5364	86	854.4324	500.000	9
pH (pH units)		37	37	9.2	6.3	7.575676	NR	NA
Total suspended solids (mg/L)		37	33	78	1	20.87879	NR	NA
Turbidity (NTU)		37	37	130	1.3	17.61081	1.01	37
¹²⁹ I, X-10 lab (Bq/L)		12	12	0.1	0.01	0.0575	NR	NA
¹³¹ I, X-10 lab (Bq/L)		8	8	0.24	-0.06	0.046125	NR	NA
¹³³ I, X-10 lab (Bq/L)		3	3	0.013	-0.006	0.003	NR	NA
¹³⁵ I, X-10 lab (Bq/L)		3	3	0.18	-0.25	-0.01333	NR	NA

Table 7.12 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
²³⁴ U (pCi/L)		19	19	2.33	-1.64	0.298211	20,000	0
²³⁵ U (pCi/L)		19	19	75.6 E	-37.5 F	14.34863	24,000	6
²³⁷ Np (pCi/L)		11	11	0.832	-0.367	0.097818	1.200	0
²³⁸ Pu (pCi/L)		11	11	0.364	-0.896	-0.16136	1.600	0
²³⁸ U (pCi/L)		19	19	0.582	-0.703	0.047316	24,000	0
²³⁹ Pu (pCi/L)		11	11	0.358	-1	-0.16482	1.200	0
²⁴⁰ Am (pCi/L)		11	11	0.952	-1.14	-0.17955	1.20	0
⁴⁰ K (pCi/L)		1	1	106 i	106 i	106	NR	NA
⁹⁹ Tc (pCi/L)		19	19	1460	-6.81	321.7737	4000,000	0
Gross alpha (pCi/L)		37	37	32.6	-8.52	1.548077	15 n	1
Gross beta (pCi/L)		37	37	713	-2.7	64.03233	4 o	18
Radium, X-10 lab (Bq/L)		12	12	0.14	0.006	0.045167	0.15	0
Strontium (pCi/L)		19	19	51	-38.2	-1.82037	8 p	6
Tritium, X-10 lab (Bq/L)		20	20	25	-20	2	20000 p	0
1,1,1-Trichloroethane (µg/L)		37	2	0.8 J	0.7 J	0.75	200,000	0
1,2-Dichloroethene (µg/L)		37	4	7 J	5 J	6	70	0
Bromodichloromethane (µg/L)		37	2	3 J	2 J	2.5	100,000 t	0
Carbon tetrachloride (µg/L)		37	4	2 J	1 J	1.75	5,000	0
Chloroform (µg/L)		37	7	25	0.9 J	6.842857	100,000 t	0
Methylene chloride (µg/L)		37	2	1 JB	1 JB	1	5,000	0
Tetrachloroethene (µg/L)		37	3	2 J	1 J	1.333333	5,000	0
Trichloroethene (µg/L)		37	5	98	64	81	5,000	5

Table 7.13. Constituents in groundwater at the Y-12 Plant site for 1994
Regime=BC Location Description=Rust Spoil Area

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	6	3	1	2.283333	250.000	0
Fluoride (mg/L)		8	4	0.2	0.1	0.175	2.000	0
Nitrate nitrogen (mg/L)		8	8	0.74	0.4	0.49625	10.000	0
Sulfate (mg/L)		8	8	5.2	3	4.1375	250.000	0
Aluminum, ICAP (mg/L)		8	8	3.9	0.022	1.69475	0.2	4
Aluminum, ICAP (mg/L)	Filtered	8	5	3.3	0.04	2.448	0.2	4
Barium, ICAP (mg/L)		8	8	0.043	0.013	0.02125	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.028	0.011	0.020125	1.000	0
Boron, ICAP (mg/L)		8	8	0.068 c	0.0076	0.0267	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.072	0.018 c	0.030125	NR	NA
Calcium, ICAP (mg/L)		8	8	180	69	100.125	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	120	74	92.25	NR	NA
Chromium, ICAP (mg/L)		8	2	0.021	0.011	0.016	0.050	0
Chromium, ICAP (mg/L)	Filtered	8	3	0.013	0.01	0.011667	0.050	0
Copper, ICAP (mg/L)		8	3	0.02	0.0052	0.010867	1.000	0
Copper, ICAP (mg/L)	Filtered	8	4	0.015	0.0052	0.0081	1.000	0
Iron, ICAP (mg/L)		8	8	0.35	0.0077	0.095213	0.300	1
Iron, ICAP (mg/L)	Filtered	8	5	0.19	0.0092	0.04964	0.300	0
Magnesium, ICAP (mg/L)		8	8	5.2	0.016	2.4425	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	5.6	0.014	2.473625	NR	NA
Manganese, ICAP (mg/L)		8	7	0.011	0.0011	0.003857	0.050	0
Manganese, ICAP (mg/L)	Filtered	8	3	0.0069	0.0011	0.003533	0.050	0

Table 7.13 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Potassium, ICAP (mg/L)		8	8	10	1.1	5.2375	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	9.8	0.86	5.195	NR	NA
Silver, ICAP (mg/L)		8	1	0.01	0.01	0.01	0.010	0
Sodium, ICAP (mg/L)		8	8	8.5	1.6	4.8	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	9.6	1.7	4.8625	NR	NA
Strontium, ICAP (mg/L)		8	8	0.43	0.059	0.197125	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.36	0.063	0.184125	NR	NA
Uranium (mg/L)		8	2	0.003	0.001	0.002	0.020	0
Uranium (mg/L)	Filtered	8	1	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		8	3	0.014	0.009	0.010767	NR	NA
Vanadium, ICAP (mg/L)	Filtered	8	4	0.014	0.006	0.00985	NR	NA
Zinc, ICAP (mg/L)		8	8	0.053	0.0061	0.019238	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.065	0.0036	0.018657	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	1430	379	785.375	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	13.8	1.6	5.6625	NR	NA
pH, field measurement (pH units)		8	NA	12	7.2	9.575	6.5-8.5	4
Redox, field measurement (MV)		8	NA	171	2	108.8	NR	NA
Static water level (ft-TOC)		8	8	-31.72	-39.05	-35.7625	NR	NA
Water temperature, field measurement (°C)		8	NA	19.2	12.5	15.375	NR	NA

Table 7.13 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Alkalinity-CO ₃ (mg/L)		8	4	60	50	53.5	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	4	219	209	214.25	NR	NA
Conductivity (µmhos/cm)		8	8	1464	383	856.25	NR	NA
Dissolved solids (mg/L)		8	8	380	194	286.75	500.000	0
pH (pH units)		8	8	11.8	7.4	9.65	NR	NA
Total suspended solids (mg/L)		8	7	14	1	4	NR	NA
Turbidity (NTU)		8	8	4.1	0.7	2.075	1.01	6
Gross alpha (pCi/L)		8	8	3.81	0.357	1.32275	15 n	0
Gross beta (pCi/L)		8	8	7.42	0.071	4.366375	4 o	4
1,2-Dichloroethene (µg/L)		8	1	1 J	1 J	1	70	0
Carbon tetrachloride (µg/L)		8	3	1 J	0.7 J	0.9	5.000	0
Chloroform (µg/L)		8	8	2 J	0.8 J	1.1	100.000 t	0
Trichloroethene (µg/L)		8	8	80	10	41.375	5.000	8

Table 7.14. Constituents in groundwater at the Y-12 Plant site for 1994
Regime=BC Location Description=S-3 Site

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		20	17	520	1	49.77647	250.000	1
Fluoride (mg/L)		20	9	6.2	0.1	0.833333	2.000	1
Nitrate nitrogen (mg/L)		20	10	8927	0.2	926.549	10.000	3
Sulfate (mg/L)		20	19	480	1.7	34.56842	250.000	1
Aluminum, ICAP (mg/L)		20	16	580	0.023	38.60913	0.2	9
Aluminum, ICAP (mg/L)	Filtered	20	8	570	0.028	75.1555	0.2	3
Arsenic, ICAP (mg/L)		20	1	0.14	0.14	0.14	0.050	1
Arsenic, ICAP (mg/L)	Filtered	20	2	0.16	0.12	0.14	0.050	2
Barium, ICAP (mg/L)		20	20	18	0.011	1.0488	1.000	1
Barium, ICAP (mg/L)	Filtered	20	20	3.4	0.0074	0.31087	1.000	1
Beryllium, ICAP (mg/L)		20	4	0.059	0.0022	0.020775	0.004	3
Beryllium, ICAP (mg/L)	Filtered	20	3	0.06	0.0096	0.027533	0.004	3
Boron, ICAP (mg/L)		20	20	0.8	0.011	0.0652	NR	NA
Boron, ICAP (mg/L)	Filtered	20	20	0.88	0.0065	0.067525	NR	NA
Cadmium, AAS (mg/L)		15	3	2.4	0.06	0.844667	0.005	3
Cadmium, AAS (mg/L)	Filtered	15	3	2.4	0.059	0.839667	0.005	3
Cadmium, ICAP (mg/L)		20	3	2.4	0.058	0.841667	0.005	3
Cadmium, ICAP (mg/L)	Filtered	20	3	2.3	0.052	0.804	0.005	3
Calcium, ICAP (mg/L)		20	20	6100	2.4	372.24	NR	NA
Calcium, ICAP (mg/L)	Filtered	20	20	6300	2.4	365.185	NR	NA
Chromium, AAS (mg/L)		15	3	0.3	0.015	0.110333	0.050	1
Chromium, AAS (mg/L)	Filtered	15	2	0.3	0.012	0.156	0.050	1

Table 7.14 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chromium, ICAP (mg/L)		20	1	0.016	0.016	0.016	0.050	0
Cobalt, ICAP (mg/L)		20	3	1.2	0.21	0.54	NR	NA
Cobalt, ICAP (mg/L)	Filtered	20	3	1.2	0.21	0.54	NR	NA
Copper, ICAP (mg/L)		20	5	0.76	0.0071	0.17242	1.000	0
Copper, ICAP (mg/L)	Filtered	20	3	0.93	0.034	0.333667	1.000	0
Iron, ICAP (mg/L)		20	18	4.2	0.0084	0.429356	0.300	6
Iron, ICAP (mg/L)	Filtered	20	9	3	0.009	0.434444	0.300	2
Lead, AAS (mg/L)		15	2	0.016	0.013	0.0145	0.015 i	1
Lead, AAS (mg/L)	Filtered	15	1	0.014	0.014	0.014	0.015 i	0
Magnesium, ICAP (mg/L)		20	20	690	1.1	44.025	NR	NA
Magnesium, ICAP (mg/L)	Filtered	20	20	680	1	43.13	NR	NA
Manganese, ICAP (mg/L)		20	16	210	0.0011	14.44996	0.050	6
Manganese, ICAP (mg/L)	Filtered	20	15	210	0.0011	15.32072	0.050	5
Mercury, CVAA (mg/L)		15	1	0.11	0.11	0.11	0.002	1
Mercury, CVAA (mg/L)	Filtered	15	1	0.088	0.088	0.088	0.002	1
Nickel, ICAP (mg/L)		20	4	13	0.012	3.568	0.100	3
Nickel, ICAP (mg/L)	Filtered	20	3	18	0.58	6.393333	0.100	3
Potassium, ICAP (mg/L)		20	18	71	0.76	7.245556	NR	NA
Potassium, ICAP (mg/L)	Filtered	20	18	110	0.64	9.022778	NR	NA
Silver, ICAP (mg/L)		20	1	0.03	0.03	0.03	0.010	1
Sodium, ICAP (mg/L)		20	20	740	0.69	47.8925	NR	NA
Sodium, ICAP (mg/L)	Filtered	20	20	730	0.77	46.7505	NR	NA

Table 7.14 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Strontium, ICAP (mg/L)		20	20	12	0.0085	0.746375	NR	NA
Strontium, ICAP (mg/L)	Filtered	20	20	12	0.0089	0.727695	NR	NA
Uranium (mg/L)		20	11	30	0.001	2.974455	0.020	3
Uranium (mg/L)	Filtered	20	11	30	0.001	2.990909	0.020	3
Vanadium, ICAP (mg/L)		20	1	0.01	0.01	0.01	NR	NA
Zinc, ICAP (mg/L)		20	16	2.3	0.0023	0.1852	5.000	0
Zinc, ICAP (mg/L)	Filtered	20	13	2.3	0.0022	0.224231	5.000	0
Conductivity, field measurement (μ mhos/cm)		20	NA	34400	38	2206.75	NR	NA
Dissolved oxygen, field measurement (ppm)		20	NA	13.2	0.6	4.8585	NR	NA
pH, field measurement (pH units)		20	NA	8	4	6.705	6.5-8.5	5
Redox, field measurement (MV)		20	NA	415	46	186.6667	NR	NA
Static water level (ft-TOC)		20	20	-3.13	-24.4	-13.4945	NR	NA
Water temperature, field measurement ($^{\circ}$ C)		20	NA	22.5	12	15.185	NR	NA
Alkalinity-HCO ₃ (mg/L)		20	17	245	5	143.2353	NR	NA
Conductivity (μ mhos/cm)		20	20	36800	35	2265.45	NR	NA
Dissolved solids (mg/L)		20	20	36172	38	2084.9	500.000	3
pH (pH units)		20	20	8.2	3.9	6.905	NR	NA
Total suspended solids (mg/L)		20	14	90	1	12.21429	NR	NA
Turbidity (NTU)		20	20	70	0.3	11.325	1.01	16

Table 7.14 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
¹²⁹ I, X-10 lab (Bq/L)		11	11	0.1	0.01	0.067273	NR	NA
¹³¹ I, X-10 lab (Bq/L)		7	7	0.22	-0.12	0.020429	NR	NA
¹³⁷ Cs (pCi/L)		1	1	31.4 E	31.4 E	31.4	120,000	0
^{231,234} Th (pCi/L)		1	1	946	946	946	400,000	1
²³⁴ U (pCi/L)		11	11	4210	0	419.6263	20,000	3
²³⁵ U (pCi/L)		11	11	86.2	-45 F	23.44809	24,000	5
²³⁷ Np (pCi/L)		11	11	374	-0.379	42.53782	1,200	3
²³⁸ Pu (pCi/L)		11	11	0.392	-10.2	-0.91082	1,600	0
²³⁸ U (pCi/L)		11	11	7810	0	792.4882	24,000	3
²³⁹ Pu (pCi/L)		11	11	0.216	-30.6	-5.81791	1,200	0
²⁴¹ Am (pCi/L)		11	11	31.5	-3.45 J	4.212545	1.20	5
⁹⁹ Tc (pCi/L)		12	12	54700	11.3	4856.117	4000,000	1
Gross alpha (pCi/L)		20	20	3530 *	-0.00588	219.8436	15 n	3
Gross beta (pCi/L)		20	20	22700	-0.584	1258.013	4 o	15
Radium, X-10 lab (Bq/L)		11	11	1.3	-0.004	0.162545	0.15	2
Strontium (pCi/L)		12	12	103	-24.1	16.42667	8 p	7
Tritium, X-10 lab (Bq/L)		12	12	140	-13	15.25	20000 p	0
1,2-Dichloroethene (µg/L)		20	1	75 J	75 J	75	70	1
Chloroform (µg/L)		20	2	1 J	1 J	1	100,000 t	0
Methylene chloride (µg/L)		20	1	370	370	370	5,000	1
Tetrachloroethene (µg/L)		20	4	7900	0.9 J	1998.975	5,000	3
Trichloroethene (µg/L)		20	1	6 J	6 J	6	5,000	1

Table 7.15. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=BC Location Description=Spoil Area 1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	8.5	1	4.1625	250.000	0
Fluoride (mg/L)		8	2	0.2	0.1	0.15	2.000	0
Nitrate nitrogen (mg/L)		8	7	14	0.2	5.514286	10.000	2
Sulfate (mg/L)		8	8	33	4	15.7125	250.000	0
Aluminum, ICAP (mg/L)		8	1	0.024	0.024	0.024	0.2	0
Aluminum, ICAP (mg/L)	Filtered	8	2	0.039	0.025	0.032	0.2	0
Arsenic, ICAP (mg/L)		8	2	0.093	0.069	0.081	0.050	2
Barium, ICAP (mg/L)		8	8	0.048	0.018	0.031	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.2	0.018	0.05	1.000	0
Boron, ICAP (mg/L)		8	8	0.049	0.0059	0.026863	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.048	0.0048	0.023762	NR	NA
Calcium, ICAP (mg/L)		8	8	98	40	67.625	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	94	41	66	NR	NA
Copper, ICAP (mg/L)		8	2	0.0065	0.0041	0.0053	1.000	0
Copper, ICAP (mg/L)	Filtered	8	1	0.0041	0.0041	0.0041	1.000	0
Iron, ICAP (mg/L)		8	6	0.023	0.0055	0.012933	0.300	0
Iron, ICAP (mg/L)	Filtered	8	2	0.13	0.041	0.0855	0.300	0
Magnesium, ICAP (mg/L)		8	8	23	9.8	16.475	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	23	8.9	15.925	NR	NA
Manganese, ICAP (mg/L)		8	3	0.0033	0.0015	0.0021	0.050	0
Manganese, ICAP (mg/L)	Filtered	8	2	0.092	0.0026	0.0473	0.050	1

Table 7.15 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Potassium, ICAP (mg/L)		8	8	3.5	0.72	1.84	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	3.4	0.91	1.66875	NR	NA
Silver, ICAP (mg/L)	Filtered	8	1	0.0071	0.0071	0.0071	0.010	0
Sodium, ICAP (mg/L)		8	8	11	1.9	5.625	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	10	1.8	5.15	NR	NA
Strontium, ICAP (mg/L)		8	8	0.16	0.03	0.087875	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.24	0.029	0.09525	NR	NA
Uranium (mg/L)		8	3	0.002	0.001	0.001333	0.020	0
Uranium (mg/L)	Filtered	8	4	0.002	0.001	0.00125	0.020	0
Zinc, ICAP (mg/L)		8	8	0.02	0.0025	0.008888	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	5	0.027	0.0024 c	0.01216	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	720	381	490.875	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	14.7	2.2	6.675	NR	NA
pH, field measurement (pH units)		8	NA	7.8	6.3	7.325	6.5-8.5	1
Redox, field measurement (MV)		8	NA	181	94	140.3875	NR	NA
Static water level (ft-TOC)		8	8	-48.05	-76.65	-64.475	NR	NA
Water temperature, field measurement (°C)		8	NA	17.4	11.3	15.575	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	246	205	224	NR	NA

Table 7.15 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Δv	Reference value	No. of measurements
Conductivity ($\mu\text{mhos/cm}$)		8	8	603	387	481.75	NR	NA
Dissolved solids (mg/L)		8	8	372	216	280.5	500,000	0
pH (pH units)		8	8	8.1	7.2	7.65	NR	NA
Total suspended solids (mg/L)		8	2	2	2	2	NR	NA
Turbidity (NTU)		8	8	4	0.1	1.425	1.0 l	5
^{99}Tc (pCi/L)		4	4	194 *	101	131.5	4000,000	0
Gross alpha (pCi/L)		8	8	2.89	-0.00644	1.24032	15 n	0
Gross beta (pCi/L)		8	8	30.6	3.79	14.035	4 o	6
Strontium (pCi/L)		4	4	28.1	-0.671	11.73635	8 p	2
Tritium, X-10 lab (Bq/L)		4	4	19	-22	-0.5	20000 p	0
1,2-Dichloroethene ($\mu\text{g/L}$)		8	4	14	8 J	11.25	70	0
Bromodichloromethane ($\mu\text{g/L}$)		8	1	1 J	1 J	1	100,000 t	0
Chloroform ($\mu\text{g/L}$)		8	4	6	2 J	3.25	100,000 t	0
Methylene chloride ($\mu\text{g/L}$)		8	1	1 J	1 J	1	5,000	0
Tetrachloroethene ($\mu\text{g/L}$)		8	4	23	11	15.25	5,000	4
Trichloroethene ($\mu\text{g/L}$)		8	4	11	6 J	8.5	5,000	4

Table 7.16. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Ash Disposal Basin

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference values	No. of measurements
Chloride (mg/L)		12	10	2	1	1.2	250.000	0
Fluoride (mg/L)		12	1	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		12	3	0.26	0.2	0.226667	10.000	0
Sulfate (mg/L)		12	12	8.8	2	5.108333	250.000	0
Aluminum, ICAP (mg/L)		12	6	1.1	0.021	0.390167	0.2	2
Aluminum, ICAP (mg/L)	Filtered	12	2	0.09	0.027	0.0585	0.2	0
Barium, ICAP (mg/L)		12	12	0.058	0.0052	0.024117	1.000	0
Barium, ICAP (mg/L)	Filtered	12	12	0.056	0.0048	0.022817	1.000	0
Beryllium, ICAP (mg/L)		12	2	0.00044	0.00032	0.00038	0.004	0
Boron, ICAP (mg/L)		12	12	0.11 c	0.015	0.04025	NR	NA
Boron, ICAP (mg/L)	Filtered	12	12	0.055 c	0.014	0.027583	NR	NA
Calcium, ICAP (mg/L)		12	12	41	26	34.25	NR	NA
Calcium, ICAP (mg/L)	Filtered	12	12	40	24	33.41667	NR	NA
Chromium, ICAP (mg/L)	Filtered	12	1	0.022	0.022	0.022	0.050	0
Copper, ICAP (mg/L)	Filtered	12	3	0.0063	0.0041	0.0052	1.000	0
Iron, ICAP (mg/L)		12	11	1.5	0.011	0.432182	0.300	4
Iron, ICAP (mg/L)	Filtered	12	4	0.22	0.0059	0.06485	0.300	0
Magnesium, ICAP (mg/L)		12	12	23	15	19.58333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	12	12	23	14	19.16667	NR	NA
Manganese, ICAP (mg/L)		12	12	0.038	0.0022	0.010917	0.050	0
Manganese, ICAP (mg/L)	Filtered	12	8	0.0094	0.0023	0.005188	0.050	0

Table 7.16 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference values	No. of measurements
Nickel, ICAP (mg/L)		12	1	0.032	0.032	0.032	0.100	0
Nickel, ICAP (mg/L)	Filtered	12	1	0.081	0.081	0.081	0.100	0
Potassium, ICAP (mg/L)		12	11	5.1	0.71	2.08	NR	NA
Potassium, ICAP (mg/L)	Filtered	12	11	4.8	0.72	2.05	NR	NA
Sodium, ICAP (mg/L)		12	12	2.2	0.45 c	0.949167	NR	NA
Sodium, ICAP (mg/L)	Filtered	12	12	2.1	0.41 c	0.921667	NR	NA
Strontium, ICAP (mg/L)		12	12	0.024	0.018	0.021	NR	NA
Strontium, ICAP (mg/L)	Filtered	12	12	0.023	0.017	0.020583	NR	NA
Uranium (mg/L)		12	2	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	12	2	0.001	0.001	0.001	0.020	0
Zinc, ICAP (mg/L)		12	7	0.027 c	0.0049	0.012186	5.000	0
Zinc, ICAP (mg/L)	Filtered	12	6	0.033	0.0035	0.010017	5.000	0
Conductivity, field measurement (µmhos/cm)		14	NA	371	213	283.3571	NR	NA
Dissolved oxygen, field measurement (ppm)		14	NA	10.1	3.6	6.064286	NR	NA
pH, field measurement (pH units)		14	NA	8.2	7.2	7.742857	6.5-8.5	0
Redox, field measurement (MV)		14	NA	198	82	151.7857	NR	NA
Static water level (ft-TOC)		13	13	-4.85	-28	-18.7708	NR	NA
Water temperature, field measurement (°C)		14	NA	16.4	12.2	14.48571	NR	NA

Table 7.16 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference values	No. of measurements
Alkalinity-HCO ₃ (mg/L)		12	12	183	124	159.3333	NR	NA
Conductivity (µmhos/cm)		12	12	346	227	298.0833	NR	NA
Dissolved solids (mg/L)		12	12	200	112	164	500.000	0
pH (pH units)		12	12	8.2	7.3	7.783333	NR	NA
Total organic carbon (mg/L)		12	5	42	1.7	10.32	NR	NA
Total suspended solids (mg/L)		12	6	19	1	7.5	NR	NA
Turbidity (NTU)		12	12	28	0.5	6.583333	1.01	10
Gross alpha (pCi/L)		12	12	4.66	-1.07	1.222917	15 n	0
Gross beta (pCi/L)		12	12	4.66	-2.95	1.205908	4 o	1
1,1,1-Trichloroethane (µg/L)		12	3	2 J	1 J	1.333333	200.000	0
Methylene chloride (µg/L)		12	3	1 JB	1 JB	1	5.000	0
Vinyl acetate (µg/L)		12	1	5 JB	5 JB	5	NR	NA

Table 7.17. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Chestnut Ridge Security Pits

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		40	38	3.5	1.3	2.157895	250.000	0
Fluoride (mg/L)		40	1	0.2	0.2	0.2	2.000	0
Nitrate nitrogen (mg/L)		40	28	4	0.2	1.081071	10.000	0
Sulfate (mg/L)		40	35	17	1	4.2	250.000	0
Aluminum, ICAP (mg/L)		40	19	0.89	0.022	0.091158	0.2	1
Aluminum, ICAP (mg/L)	Filtered	40	13	0.051	0.024	0.034154	0.2	0
Arsenic, ICAP (mg/L)		40	1	0.065	0.065	0.065	0.050	1
Arsenic, ICAP (mg/L)	Filtered	40	1	0.062	0.062	0.062	0.050	1
Barium, ICAP (mg/L)		40	40	0.16	0.0064	0.0371	1.000	0
Barium, ICAP (mg/L)	Filtered	40	40	0.16	0.0054	0.035495	1.000	0
Beryllium, ICAP (mg/L)		40	4	0.00064	0.00031	0.00042	0.004	0
Boron, ICAP (mg/L)		40	38	0.16	0.0041 c	0.039816	NR	NA
Boron, ICAP (mg/L)	Filtered	40	36	0.13	0.0041 c	0.031425	NR	NA
Calcium, ICAP (mg/L)		40	40	59	26	39.575	NR	NA
Calcium, ICAP (mg/L)	Filtered	40	40	59	26	38.825	NR	NA
Chromium, AAS (mg/L)		40	1	0.013	0.013	0.013	0.050	0
Chromium, ICAP (mg/L)		40	8	0.017	0.01	0.013125	0.050	0
Chromium, ICAP (mg/L)	Filtered	40	1	0.023	0.023	0.023	0.050	0
Copper, ICAP (mg/L)		40	15	0.04	0.0044	0.01062	1.000	0
Copper, ICAP (mg/L)	Filtered	40	14	0.012	0.0044	0.007571	1.000	0
Iron, ICAP (mg/L)		40	39	6.6	0.0052	0.630108	0.300	12
Iron, ICAP (mg/L)	Filtered	40	18	1.3	0.0064	0.129667	0.300	1

Table 7.17 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Lead, AAS (mg/L)		40	1	0.0044	0.0044	0.0044	0.015 i	0
Magnesium, ICAP (mg/L)		40	40	34	15	23.675	NR	NA
Magnesium, ICAP (mg/L)	Filtered	40	40	35	16	23.45	NR	NA
Manganese, ICAP (mg/L)		40	32	0.13	0.001	0.019309	0.050	3
Manganese, ICAP (mg/L)	Filtered	40	27	0.1	0.0011	0.015163	0.050	3
Nickel, ICAP (mg/L)		40	1	0.011	0.011	0.011	0.100	0
Potassium, ICAP (mg/L)		40	36	6.7	0.63	1.658056	NR	NA
Potassium, ICAP (mg/L)	Filtered	40	37	11	0.8	1.790811	NR	NA
Sodium, ICAP (mg/L)		40	40	2.3	0.5 c	1.01	NR	NA
Sodium, ICAP (mg/L)	Filtered	40	40	3.6	0.53	1.03	NR	NA
Strontium, ICAP (mg/L)		40	40	0.038	0.013	0.018425	NR	NA
Strontium, ICAP (mg/L)	Filtered	40	40	0.039	0.012	0.018475	NR	NA
Uranium (mg/L)		40	11	0.003	0.001	0.001273	0.020	0
Uranium (mg/L)	Filtered	40	11	0.003	0.001	0.001636	0.020	0
Zinc, ICAP (mg/L)		40	30	0.54	0.002	0.031413	5.000	0
Zinc, ICAP (mg/L)	Filtered	40	23	0.33	0.0027	0.033683	5.000	0
Conductivity, field measurement (µmhos/cm)		40	NA	512	248	355.25	NR	NA
Dissolved oxygen, field measurement (ppm)		40	NA	12.3	0.3	7.0175	NR	NA
pH, field measurement (pH units)		40	NA	8.3	6.7	7.6375	6.5-8.5	0
Redox, field measurement (MV)		40	NA	258	55	161.0769	NR	NA

Table 7.17 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft-TOC)		40	40	-60	-171.6	-111.794	NR	NA
Water temperature, field measurement (°C)		40	NA	21.9	12	15.295	NR	NA
Alkalinity-HCO ₃ (mg/L)		40	40	274	120	188.575	NR	NA
Conductivity (µmhos/cm)		40	40	513	259	356.675	NR	NA
Dissolved solids (mg/L)		40	40	290	136	200.85	500.000	0
pH (pH units)		40	40	8.2	7.5	7.83	NR	NA
Total suspended solids (mg/L)		40	20	43	1	8.6	NR	NA
Turbidity (NTU)		40	40	17	0.3	3.79	1.01	32
Gross alpha (pCi/L)		40	40	9.09	-0.598	1.611854	15 n	0
Gross beta (pCi/L)		40	40	7.73	-3.31	2.060438	4 o	6
1,1,1-Trichloroethane (µg/L)		40	19	25	1 J	7.210526	200.000	0
1,1-Dichloroethane (µg/L)		40	10	21	1 J	5.8	NR	NA
1,1-Dichloroethene (µg/L)		40	4	4 J	1 J	2.5	7.000	0
1,2-Dichloroethene (µg/L)		40	4	33	12	21.5	70	0
2-Butanone (µg/L)		40	1	10 JB	10 JB	10	NR	NA
Acetone (µg/L)		40	2	11 B	9 JB	10	NR	NA
Tetrachloroethene (µg/L)		40	13	39	1 J	15.30769	5.000	8
Toluene (µg/L)		40	3	1 JB	1 JB	1	1000.00	0
Trichloroethene (µg/L)		40	4	3 J	2 J	2.5	5.000	0

Table 7.18. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Chestnut Ridge Sediment Disposal Basin

Variable	Filtered status	No. samples	No. detected	Max	Min	Δv	Reference value	No. of measurements
Chloride (mg/L)		32	24	3	1	1.558333	250.000	0
Fluoride (mg/L)		32	6	1	0.1	0.666667	2.000	0
Nitrate nitrogen (mg/L)		32	7	0.5	0.23	0.308571	10.000	0
Sulfate (mg/L)		32	31	210	1	31.15484	250.000	0
Aluminum, ICAP (mg/L)		32	23	3.6	0.032	0.717391	0.2	11
Aluminum, ICAP (mg/L)	Filtered	32	12	0.29	0.021	0.059417	0.2	1
Barium, ICAP (mg/L)		32	32	0.08	0.0035	0.023084	1.000	0
Barium, ICAP (mg/L)	Filtered	32	32	0.056	0.0018	0.020184	1.000	0
Beryllium, ICAP (mg/L)		32	8	0.00068	0.00031	0.000455	0.004	0
Boron, ICAP (mg/L)		32	31	0.079	0.0041	0.030939	NR	NA
Boron, ICAP (mg/L)	Filtered	32	32	0.068	0.0044	0.027738	NR	NA
Calcium, ICAP (mg/L)		32	32	76	12	42.8125	NR	NA
Calcium, ICAP (mg/L)	Filtered	32	32	79	8.3	41.38438	NR	NA
Copper, ICAP (mg/L)		32	13	0.01	0.0041	0.005931	1.000	0
Copper, ICAP (mg/L)	Filtered	32	10	0.007	0.0043	0.00562	1.000	0
Iron, ICAP (mg/L)		32	32	3.8	0.03	0.788563	0.300	20
Iron, ICAP (mg/L)	Filtered	32	19	1.1	0.0052	0.210784	0.300	5
Lead, AAS (mg/L)		32	3	0.019	0.0061	0.0127	0.015 i	1
Lead, AAS (mg/L)	Filtered	32	1	0.0042	0.0042	0.0042	0.015 i	0
Magnesium, ICAP (mg/L)		32	32	44	14	25.8125	NR	NA
Magnesium, ICAP (mg/L)	Filtered	32	32	44	13	25.09375	NR	NA

Table 7.18 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		32	32	0.14	0.0014	0.020728	0.050	2
Manganese, ICAP (mg/L)	Filtered	32	14	0.026	0.0014	0.009129	0.050	0
Molybdenum, ICAP (mg/L)	Filtered	32	1	0.011	0.011	0.011	NR	NA
Potassium, ICAP (mg/L)		32	32	28	0.79	5.340313	NR	NA
Potassium, ICAP (mg/L)	Filtered	32	32	28	0.81	5.263125	NR	NA
Selenium, ICAP (mg/L)	Filtered	32	1	0.052	0.052	0.052	0.010	1
Silver, ICAP (mg/L)		32	1	0.0064	0.0064	0.0064	0.010	0
Silver, ICAP (mg/L)	Filtered	32	1	0.012	0.012	0.012	0.010	1
Sodium, ICAP (mg/L)		32	32	9.4	0.57	2.685625	NR	NA
Sodium, ICAP (mg/L)	Filtered	32	32	9.1	0.59	2.754063	NR	NA
Strontium, ICAP (mg/L)		32	32	3.2	0.012	0.4005	NR	NA
Strontium, ICAP (mg/L)	Filtered	32	32	3.4	0.0066	0.396581	NR	NA
Uranium (mg/L)		32	14	0.007	0.001	0.002429	0.020	0
Uranium (mg/L)	Filtered	32	14	0.005	0.001	0.001714	0.020	0
Vanadium, ICAP (mg/L)		32	2	0.0091	0.0083	0.0087	NR	NA
Zinc, ICAP (mg/L)		32	21	0.072	0.0022	0.014271	5.000	0
Zinc, ICAP (mg/L)	Filtered	32	11	0.027	0.0022	0.007609	5.000	0
Conductivity, field measurement (µmhos/cm)		34	NA	699	212	383.8529	NR	NA
Dissolved oxygen, field measurement (ppm)		34	NA	11.8	0.2	5.408824	NR	NA

Table 7.18 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	A _v	Reference value	No. of measurements
pH, field measurement (pH units)		34	NA	9.4	7	7.885294	6.5-8.5	6
Redox, field measurement (MV)		34	NA	223	27	157.4786	NR	NA
Static water level (ft-TOC)		36	36	-23.1	-157.9	-100.369	NR	NA
Water temperature, field measurement (°C)		34	NA	17.3	10	14.74706	NR	NA
Alkalinity-CO ₃ (mg/L)		32	6	42	2	14.33333	NR	NA
Alkalinity-HCO ₃ (mg/L)		32	32	370	99	186	NR	NA
Conductivity (µmhos/cm)		32	32	689	234	391.875	NR	NA
Conductivity, Rep. 2 (µmhos/cm)		32	32	688	234	391.375	NR	NA
Conductivity, Rep. 3 (µmhos/cm)		32	32	688	233	391.375	NR	NA
Conductivity, Rep. 4 (µmhos/cm)		32	32	688	232	393.0938	NR	NA
Dissolved solids (mg/L)		32	32	460	124	237.0625	500.000	0
pH (pH units)		32	32	9.5	7.4	8.00625	NR	NA
pH, Rep. 2 (pH units)		32	32	9.4	7.4	8.028125	NR	NA
pH, Rep. 3 (pH units)		32	32	9.5	7.4	8.028125	NR	NA
pH, Rep. 4 (pH units)		32	32	9.4	7.4	8.021875	NR	NA
Total organic carbon (mg/L)		32	15	6	1	1.986667	NR	NA
Total organic carbon, Rep. 2 (mg/L)		32	22	7	1	2.263636	NR	NA
Total organic carbon, Rep. 3 (mg/L)		32	23	28	1	3.695652	NR	NA

Table 7.18 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Total organic carbon, Rep. 4 (mg/L)		32	20	15	1	2.515	NR	NA
Total organic halide (µg/L)		32	1	10.295	10.295	10.295	NR	NA
Total organic halide, Rep. 3 (µg/L)		32	3	19.96	17.49	19.03	NR	NA
Total organic halide, Rep. 4 (µg/L)		32	2	12.59	11.32	11.955	NR	NA
Total suspended solids (mg/L)		32	29	421	1	39.96552	NR	NA
Turbidity (NTU)		32	32	250	1.6	22.9875	1.01	32
Gross alpha (pCi/L)		32	32	9.55	0.149	2.517594	15 n	0
Gross beta (pCi/L)		32	32	21	-19	0.278187	4 o	13
Di- <i>n</i> -butylphthalate (µg/L)		32	11	18 JB	1 J	6.454545	NR	NA
Methylene chloride (µg/L)		32	1	1 J	1 J	1	5.000	0
Toluene (µg/L)		32	1	4 JB	4 JB	4	1000.00	0
Trichloroethene (µg/L)		32	1	0.8 JB	0.8 JB	0.8	5.000	0

Table 7.19. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Construction/Debris Landfill VI

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		21	20	13	1	3.34	250	0
Nitrate nitrogen (mg/L)		21	14	0.9	0.25	0.515	10.000	0
Sulfate (mg/L)		21	21	25	2	8.352381	250.000	0
Aluminum, ICAP (mg/L)		21	17	30	0.032 M	2.464882	0.2	8
Aluminum, ICAP (mg/L)	Filtered	21	10	0.17	0.03	0.0648	0.2	0
Arsenic, ICAP (mg/L)		21	1	0.092	0.092	0.092	0.050	1
Barium, ICAP (mg/L)		21	21	0.16	0.0037	0.019014	2.000	0
Barium, ICAP (mg/L)	Filtered	21	21	0.017	0.0035	0.009533	2.000	0
Beryllium, ICAP (mg/L)		21	2	0.0033	0.00084	0.00207	0.004	0
Beryllium, ICAP (mg/L)	Filtered	21	1	0.0003	0.0003	0.0003	0.004	0
Boron, ICAP (mg/L)		21	21	0.062	0.0079	0.029043	NR	NA
Boron, ICAP (mg/L)	Filtered	21	21	0.089	0.0064	0.030948	NR	NA
Cadmium, ICAP (mg/L)		21	1	0.0071	0.0071	0.0071	0.005	1
Calcium, ICAP (mg/L)		21	21	140	10	46	NR	NA
Calcium, ICAP (mg/L)	Filtered	21	21	50	6.8	34.94286	NR	NA
Chromium, AAS (mg/L)		21	8	0.13	0.01	0.04225	0.050	2
Chromium, AAS (mg/L)	Filtered	21	3	0.027	0.011	0.017333	0.050	0
Chromium, ICAP (mg/L)		21	7	0.067	0.012	0.030429	0.050	1
Chromium, ICAP (mg/L)	Filtered	21	1	0.015	0.015	0.015	0.050	0
Cobalt, ICAP (mg/L)		21	2	0.026	0.0075	0.01675	NR	NA
Copper, ICAP (mg/L)		21	9	0.12	0.0043	0.024411	1.000	0

Table 7.19 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Δv	Reference value	No. of measurements
Copper, ICAP (mg/L)	Filtered	21	5	0.0084	0.0041	0.00534	1.000	0
Iron, ICAP (mg/L)		21	20	45	0.015	3.0531	0.3	5
Iron, ICAP (mg/L)	Filtered	21	10	0.33	0.0058	0.04405	0.3	1
Lead, AAS (mg/L)		21	3	0.25	0.0043	0.092433	0.050	1
Lead, ICAP (mg/L)		21	2	0.25	0.05	0.15	0.050	1
Magnesium, ICAP (mg/L)		21	21	85	3.1	24.48095	NR	NA
Magnesium, ICAP (mg/L)	Filtered	21	21	30	2.2	19.77143	NR	NA
Manganese, ICAP (mg/L)		21	18	1	0.0011	0.096894	0.050	2
Manganese, ICAP (mg/L)	Filtered	21	10	0.0041	0.0011	0.0019	0.050	0
Mercury, CVAA (mg/L)		21	2	0.0005	0.00044	0.00047	0.002	0
Molybdenum, ICAP (mg/L)		21	5	0.081	0.013	0.0376	NR	NA
Molybdenum, ICAP (mg/L)	Filtered	21	4	0.059	0.025	0.03825	NR	NA
Nickel, ICAP (mg/L)		21	2	0.065	0.055	0.06	0.100	0
Nickel, ICAP (mg/L)	Filtered	21	1	0.015	0.015	0.015	0.100	0
Potassium, ICAP (mg/L)		21	21	31	0.68	5.011429	NR	NA
Potassium, ICAP (mg/L)	Filtered	21	21	23	0.72	4.016667	NR	NA
Sodium, ICAP (mg/L)		21	21	9.4	0.49	2.847143	NR	NA
Sodium, ICAP (mg/L)	Filtered	21	21	7.9	0.52	2.59619	NR	NA
Strontium, ICAP (mg/L)		21	21	0.14	0.019	0.036524	NR	NA
Strontium, ICAP (mg/L)	Filtered	21	21	0.049	0.019	0.027048	NR	NA
Uranium (mg/L)		21	6	0.003	0.001	0.002167	0.020	0

Table 7.19 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Uranium (mg/L)	Filtered	21	8	0.005	0.001	0.002	0.020	0
Vanadium, ICAP (mg/L)		21	3	0.091	0.014	0.044333	NR	NA
Vanadium, ICAP (mg/L)	Filtered	21	2	0.0069	0.0069	0.0069	NR	NA
Zinc, ICAP (mg/L)		21	21	0.2	0.0051 c	0.047771	5.000	0
Zinc, ICAP (mg/L)	Filtered	21	14	0.13	0.002 c	0.029371	5.000	0
Conductivity, field measurement (µmhos/cm)		22	NA	432	196	315.0909	NR	NA
Conductivity, field measurement (µmhos/cm)	Filtered	1	NA	202	202	202	NR	NA
Dissolved oxygen, field measurement (ppm)		22	NA	9.6	1.1	5.763636	NR	NA
Dissolved oxygen, field measurement (ppm)	Filtered	1	NA	7.6	7.6	7.6	NR	NA
pH, field measurement (pH units)		22	NA	10.9	6.8	8.109091	6.5-8.5	4
pH, field measurement (pH units)	Filtered	1	NA	10.9	10.9	10.9	6.5-8.5	1
Redox, field measurement (MV)		22	NA	218	76	148.8182	NR	NA
Redox, field measurement (MV)	Filtered	1	NA	155	155	155	NR	NA
Static water level (ft-TOC)		21	21	-56.92	-82.25	-66.2129	NR	NA
Water temperature, field measurement (°C)		22	NA	17.1	13.1	14.91818	NR	NA
Water temperature, field measurement (°C)	Filtered	1	NA	13.9	13.9	13.9	NR	NA

Table 7.19 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Alkalinity-CO ₃ (mg/L)		21	3	50	28	38.66667	NR	NA
Alkalinity-HCO ₃ (mg/L)		21	19	231	36	173.7895	NR	NA
Ammonia nitrogen (mg/L)		21	2	0.5	0.2	0.35	NR	NA
Chemical oxygen demand (mg/L)		21	5	9	6	6.8	NR	NA
Conductivity (µmhos/cm)		21	21	428	180	324.4762	NR	NA
Dissolved solids (mg/L)		21	21	252	118	184.2857	500.000	0
pH (pH units)		21	21	10.5	7	8.085714	NR	NA
Total organic carbon (mg/L)		21	15	4	1	2.02	NR	NA
Total suspended solids (mg/L)		21	15	1574	2	198.6	NR	NA
Turbidity (NTU)		21	21	750	0.1	52.07619	1.01	16
¹³⁷ Cs (pCi/L)		21	21	20.7 E	-17.7 F	4.514	120.00	0
^{231,234} Th (pCi/L)		21	21	306 HE	-440 HF	20.28095	400.000	0
²³⁴ U (pCi/L)		21	21	0.927	0	0.434905	20.000	0
²³⁵ U (pCi/L)		21	21	84.2 E	-22.6 F	1.818857	24.000	1
²³⁸ U (pCi/L)		21	21	1.57	0	0.266743	24.000	0
⁴⁰ K (pCi/L)		3	3	517 i	58.3	307.7667	NR	NA
Gross alpha (pCi/L)		21	21	1.82	-0.873	0.56411	15 n	0
Gross beta (pCi/L)		21	21	23.3	-3.33	3.512048	4 o	6
Protactinium (pCi/L)		21	21	5560 HE	-3850 HG	1051.238	NR	NA
Methylene chloride (µg/L)		21	2	1 JB	1 JB	1	5.000	0

Table 7.20. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Construction/Debris Landfill VII

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		16	15	2.2	1	1.406667	250	0
Nitrate nitrogen (mg/L)		16	12	0.8	0.3	0.485833	10.000	0
Sulfate (mg/L)		16	15	8.2	1	4.28	250.000	0
Aluminum, ICAP (mg/L)		16	10	0.73 c	0.029	0.2248	0.2	3
Aluminum, ICAP (mg/L)	Filtered	16	5	0.052	0.022 c	0.0358	0.2	0
Barium, ICAP (mg/L)		16	16	0.25	0.0097	0.06445	2.000	0
Barium, ICAP (mg/L)	Filtered	16	16	0.26	0.0089	0.064919	2.000	0
Boron, ICAP (mg/L)		16	16	0.27 c	0.007 c	0.040569	NR	NA
Boron, ICAP (mg/L)	Filtered	16	16	0.61 c	0.012 c	0.076188	NR	NA
Calcium, ICAP (mg/L)		16	16	50	26	34.6875	NR	NA
Calcium, ICAP (mg/L)	Filtered	16	16	48	27	34.625	NR	NA
Chromium, ICAP (mg/L)		16	1	0.013	0.013	0.013	0.050	0
Copper, ICAP (mg/L)		16	5	0.0099	0.0042	0.0058	1.000	0
Copper, ICAP (mg/L)	Filtered	16	5	0.016	0.0042	0.00782	1.000	0
Iron, ICAP (mg/L)		16	16	0.69	0.0063	0.135956	0.3	3
Iron, ICAP (mg/L)	Filtered	16	6	0.15	0.0063	0.04405	0.3	0
Magnesium, ICAP (mg/L)		16	16	27	12	17.1875	NR	NA
Magnesium, ICAP (mg/L)	Filtered	16	16	26	12	17.0625	NR	NA
Manganese, ICAP (mg/L)		16	9	0.019	0.0014	0.006922	0.050	0
Manganese, ICAP (mg/L)	Filtered	16	3	0.0016	0.0013	0.0015	0.050	0
Potassium, ICAP (mg/L)		16	15	1.5	0.7	1.183333	NR	NA

Table 7.20 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Potassium, ICAP (mg/L)	Filtered	16	14	1.6	0.63	1.223571	NR	NA
Sodium, ICAP (mg/L)		16	16	0.89 c	0.47 c	0.6375	NR	NA
Sodium, ICAP (mg/L)	Filtered	16	16	1.4 c	0.43 c	0.67875	NR	NA
Strontium, ICAP (mg/L)		16	16	0.026	0.016	0.020063	NR	NA
Strontium, ICAP (mg/L)	Filtered	16	16	0.026	0.015	0.019875	NR	NA
Uranium (mg/L)		16	3	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	16	3	0.003	0.001	0.001667	0.020	0
Zinc, ICAP (mg/L)		16	13	0.04	0.0032	0.015808	5.000	0
Zinc, ICAP (mg/L)	Filtered	16	9	0.056	0.0035	0.015544	5.000	0
Conductivity, field measurement (µmhos/cm)		16	NA	371	235	273.625	NR	NA
Dissolved oxygen, field measurement (ppm)		16	NA	9.4	5.6	7.5125	NR	NA
pH, field measurement (pH units)		16	NA	8.1	6.6	7.6	6.5-8.5	0
Redox, field measurement (MV)		16	NA	260	109	181.8625	NR	NA
Static water level (ft-TOC)		16	16	0	-77.85	-22.285	NR	NA
Water temperature, field measurement (°C)		16	NA	16.3	14	15.30625	NR	NA
Alkalinity-HCO ₃ (mg/L)		16	16	184	126	148.1875	NR	NA
Ammonia nitrogen (mg/L)		16	1	0.2	0.2	0.2	NR	NA
Conductivity (µmhos/cm)		16	16	348	237	279.5	NR	NA

Table 7.20 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Dissolved solids (mg/L)		16	16	186	130	152.75	500.000	0
pH (pH units)		16	16	8	7.3	7.75	NR	NA
Total petroleum hydrocarbons (mg/L)		16	5	0.011	0.002	0.008	0.10 m	0
Total organic carbon (mg/L)		16	6	13	1	3.6	NR	NA
Total suspended solids (mg/L)		16	7	14	1	4.571429	NR	NA
Turbidity (NTU)		16	16	15	0.5	3.66875	1.01	11
¹³⁷ Cs (pCi/L)		16	16	44.7 E	-10.2 F	8.254	120.00	0
^{231,232} Th (pCi/L)		16	16	638 H	-537 HF	-8.99625	400.000	1
²³⁴ U (pCi/L)		16	16	0.694	-0.946	0.054688	20.000	0
²³⁵ U (pCi/L)		16	16	71.4 E	-31.7 F	9.750375	24.000	7
²³⁸ U (pCi/L)		16	16	0.539	-0.716	-0.1255	24.000	0
⁴⁰ K (pCi/L)		3	3	614	517	552.6667	NR	NA
Gross alpha (pCi/L)		16	16	3.76	-0.822	0.908244	15 n	0
Gross beta (pCi/L)		16	16	6.47	-1.53	1.350475	4 o	2
Protactinium (pCi/L)		16	16	8530 HE	-3410 HF	1867.5	NR	NA
2-Butanone (µg/L)		16	1	13 B	13 B	13	NR	NA
Acetone (µg/L)		16	1	4 JB	4 JB	4	NR	NA
Methylene chloride (µg/L)		16	3	2 JB	1 JB	1.333333	5.000	0
Trichloroethene (µg/L)		16	3	1 JB	0.8 JB	0.933333	5.000	0

Table 7.21. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=East Creek Borrow Area Waste Pile

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		14	14	48	1	7.292857	250.000	0
Nitrate nitrogen (mg/L)		14	6	1.5	0.2	0.61	10.000	0
Sulfate (mg/L)		14	14	15	1	6.1	250.000	0
Aluminum, ICAP (mg/L)		14	11	11	0.026	2.237545	0.2	6
Aluminum, ICAP (mg/L)	Filtered	14	6	0.15	0.021	0.053167	0.2	0
Arsenic, ICAP (mg/L)		14	1	0.056	0.056	0.056	0.050	1
Arsenic, ICAP (mg/L)	Filtered	14	2	0.073	0.063	0.068	0.050	2
Barium, ICAP (mg/L)		14	14	0.031	0.0088	0.017821	1.000	0
Barium, ICAP (mg/L)	Filtered	14	14	0.063	0.0089	0.017293	1.000	0
Beryllium, ICAP (mg/L)		14	3	0.0011	0.00031	0.000803	0.004	0
Beryllium, ICAP (mg/L)	Filtered	14	1	0.00041	0.00041	0.00041	0.004	0
Boron, ICAP (mg/L)		14	14	0.091	0.02 c	0.048286	NR	NA
Boron, ICAP (mg/L)	Filtered	14	14	0.06	0.0049 c	0.030636	NR	NA
Calcium, ICAP (mg/L)		14	14	56	21	38.64286	NR	NA
Calcium, ICAP (mg/L)	Filtered	14	14	53	21	37.28571	NR	NA
Chromium, AAS (mg/L)		14	5	0.32	0.016	0.1266	0.050	2
Chromium, AAS (mg/L)	Filtered	14	2	0.034	0.013	0.0235	0.050	0
Chromium, ICAP (mg/L)		14	2	0.34	0.18	0.26	0.050	2
Chromium, ICAP (mg/L)	Filtered	14	2	0.014	0.013	0.0135	0.050	0
Cobalt, ICAP (mg/L)	Filtered	14	1	0.011	0.011	0.011	NR	NA
Copper, ICAP (mg/L)		14	6	0.014	0.0051	0.008717	1.000	0

Table 7.21 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Copper, ICAP (mg/L)	Filtered	14	2	0.0099	0.0056	0.00775	1.000	0
Iron, ICAP (mg/L)		14	13	9.9	0.026	1.990077	0.300	7
Iron, ICAP (mg/L)	Filtered	14	12	0.37	0.0058	0.04905	0.300	1
Lead, AAS (mg/L)		14	5	0.026	0.0064	0.01462	0.015 i	3
Lead, AAS (mg/L)	Filtered	14	1	0.0055	0.0055	0.0055	0.015 i	0
Magnesium, ICAP (mg/L)		14	14	32	13	23.07143	NR	NA
Magnesium, ICAP (mg/L)	Filtered	14	14	32	13	22	NR	NA
Manganese, ICAP (mg/L)		14	10	0.25	0.0026	0.07182	0.050	5
Manganese, ICAP (mg/L)	Filtered	14	8	0.32	0.0012	0.050188	0.050	1
Mercury, CVAA (mg/L)		14	1	0.00021	0.00021	0.00021	0.002	0
Molybdenum, ICAP (mg/L)	Filtered	14	1	0.01	0.01	0.01	NR	NA
Nickel, ICAP (mg/L)		14	3	0.17	0.019	0.087667	0.100	1
Nickel, ICAP (mg/L)	Filtered	14	1	0.2	0.2	0.2	0.100	1
Potassium, ICAP (mg/L)		14	12	3.8	0.67	1.3525	NR	NA
Potassium, ICAP (mg/L)	Filtered	14	11	3.9	0.66	1.138182	NR	NA
Sodium, ICAP (mg/L)		14	14	6.2	0.46 c	1.907143	NR	NA
Sodium, ICAP (mg/L)	Filtered	14	14	6.6	0.5	1.98	NR	NA
Strontium, ICAP (mg/L)		14	14	0.07	0.013	0.026286	NR	NA
Strontium, ICAP (mg/L)	Filtered	14	14	0.08	0.013	0.025929	NR	NA
Uranium (mg/L)		14	6	0.003	0.001	0.0015	0.020	0
Uranium (mg/L)	Filtered	14	4	0.002	0.001	0.0015	0.020	0

Table 7.21 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Vanadium, ICAP (mg/L)		14	4	0.023	0.0071	0.014425	NR	NA
Zinc, ICAP (mg/L)		14	14	0.077	0.0024 c	0.025671	5.000	0
Zinc, ICAP (mg/L)	Filtered	14	11	0.15	0.0023	0.022518	5.000	0
Conductivity, field measurement (µmhos/cm)		14	NA	450	202	335.3571	NR	NA
Dissolved oxygen, field measurement (ppm)		14	NA	9.1	2.5	6.357143	NR	NA
pH, field measurement (pH units)		14	NA	8.2	7.1	7.685714	6.5-8.5	0
Redox, field measurement (MV)		14	NA	286	80	172.7857	NR	NA
Static water level (ft-TOC)		14	14	-89.8	-160.6	-121.765	NR	NA
Water temperature, field measurement (°C)		14	NA	17.4	12	14.79286	NR	NA
Alkalinity-HCO ₃ (mg/L)		14	14	224	105	168.2143	NR	NA
Chemical oxygen demand (mg/L)		14	2	6	6	6	NR	NA
Conductivity (µmhos/cm)		14	14	476	205	336	NR	NA
Dissolved solids (mg/L)		14	14	354	112	198	500.000	0
pH (pH units)		14	14	8.2	7.6	7.907143	NR	NA
Total organic carbon (mg/L)		13	7	7	1	3.071429	NR	NA
Total suspended solids (mg/L)		14	9	238	1	50.22222	NR	NA
Turbidity (NTU)		14	14	260	1	44.87857	1.01	13

Table 7.21 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
^{234}U (pCi/L)		7	7	1.21	0.333	0.828429	20.000	0
^{235}U (pCi/L)		7	7	22.2 E	-65.1 F	-4.88857	24.000	0
^{238}U (pCi/L)		7	7	1.21	0	0.365714	24.000	0
^{99}Tc (pCi/L)		7	7	302	91.5 *	180.3571	4000.000	0
Gross alpha (pCi/L)		14	14	6.62	-0.147	2.097929	15 n	0
Gross beta (pCi/L)		14	14	14.5	0	4.06	4 o	4
Strontium (pCi/L)		7	7	55.3	8.68	30.41143	8 p	7
Methylene chloride ($\mu\text{g/L}$)		14	1	1 J	1 J	1	5.000	0
Trichlorofluoromethane ($\mu\text{g/L}$)		14	1	44	44	44	NR	NA

Table 7.22. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=East Chestnut Ridge Waste Pile

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		12	12	12	2.2	8.175	250.000	0
Nitrate nitrogen (mg/L)		12	12	3.7	0.3	1.091667	10.000	0
Sulfate (mg/L)		12	12	5	1	2.683333	250.000	0
Aluminum, ICAP (mg/L)		12	8	0.51	0.024	0.102125	0.2	1
Aluminum, ICAP (mg/L)	Filtered	12	9	0.1	0.022	0.043778	0.2	0
Barium, ICAP (mg/L)		12	12	0.19	0.0097	0.079392	1.000	0
Barium, ICAP (mg/L)	Filtered	12	12	0.19	0.0099	0.078567	1.000	0
Boron, ICAP (mg/L)		12	12	0.11 c	0.011 c	0.036417	NR	NA
Boron, ICAP (mg/L)	Filtered	12	12	0.046 c	0.0083 c	0.026275	NR	NA
Calcium, ICAP (mg/L)		12	12	59	43	48.91667	NR	NA
Calcium, ICAP (mg/L)	Filtered	12	12	54	43	48.41667	NR	NA
Copper, ICAP (mg/L)		12	7	0.0068	0.0041 c	0.004986	1.000	0
Copper, ICAP (mg/L)	Filtered	12	6	0.021 c	0.0041	0.00875	1.000	0
Iron, ICAP (mg/L)		12	11	2.1	0.01	0.464364	0.300	3
Iron, ICAP (mg/L)	Filtered	12	5	0.033	0.0061	0.01834	0.300	0
Magnesium, ICAP (mg/L)		12	12	35	26	29.33333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	12	12	32	26	29.16667	NR	NA
Manganese, ICAP (mg/L)		12	7	0.024	0.001	0.009214	0.050	0
Manganese, ICAP (mg/L)	Filtered	12	6	0.018	0.0011	0.007717	0.050	0
Potassium, ICAP (mg/L)		12	11	1.6	0.66	1.108182	NR	NA
Potassium, ICAP (mg/L)	Filtered	12	12	1.8	0.74	1.14	NR	NA

Table 7.22 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Silver, ICAP (mg/L)		12	2	0.013	0.0062	0.0096	0.010	1
Sodium, ICAP (mg/L)		12	12	5.4	1.3	3.516667	NR	NA
Sodium, ICAP (mg/L)	Filtered	12	12	5	1.3	3.5	NR	NA
Strontium, ICAP (mg/L)		12	12	0.022	0.015	0.018	NR	NA
Strontium, ICAP (mg/L)	Filtered	12	12	0.023	0.015	0.01775	NR	NA
Uranium (mg/L)		12	2	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	12	1	0.002	0.002	0.002	0.020	0
Zinc, ICAP (mg/L)		12	9	0.023 c	0.0035 c	0.009211	5.000	0
Zinc, ICAP (mg/L)	Filtered	12	7	0.015 c	0.0034 c	0.006957	5.000	0
Conductivity, field measurement (µmhos/cm)		12	NA	474	369	427.9167	NR	NA
Dissolved oxygen, field measurement (ppm)		12	NA	10.6	3.2	7.116667	NR	NA
pH, field measurement (pH units)		12	NA	7.9	5.9	7.383333	6.5-8.5	1
Redox, field measurement (MV)		12	NA	206	84	164.75	NR	NA
Static water level (ft-TOC)		12	12	-92.47	-119.51	-109.103	NR	NA
Water temperature, field measurement (°C)		12	NA	16.6	12.2	14.34167	NR	NA
Alkalinity-HCO ₃ (mg/L)		12	12	254	218	235.5833	NR	NA
Conductivity (µmhos/cm)		12	12	512	396	459.0833	NR	NA

Table 7.22 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Dissolved solids (mg/L)		12	12	290	220	251.1667	500.000	0
pH (pH units)		12	12	8	7.5	7.758333	NR	NA
Total suspended solids (mg/L)		12	7	6	1	2.857143	NR	NA
Turbidity (NTU)		12	12	14	0.3	3.383333	1.01	8
Gross alpha (pCi/L)		12	12	2.37	-1.24	0.45915	15 n	0
Gross beta (pCi/L)		12	12	8.9	-3.66	0.715417	4 o	4
Methylene chloride ($\mu\text{g/L}$)		12	1	1 JB	1 JB	1	5.000	0

Table 7.23. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Industrial Landfill II

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		12	12	34	1	8.95	250	0
Fluoride (mg/L)		12	5	2	0.2	1.46	4.000	0
Nitrate nitrogen (mg/L)		12	6	0.38	0.25	0.315	10.000	0
Sulfate (mg/L)		12	12	14	1.2	8.5	250.000	0
Aluminum, ICAP (mg/L)		12	12	4.6	0.033	0.603667	0.2	5
Aluminum, ICAP (mg/L)	Filtered	12	2	0.058	0.024	0.041	0.2	0
Barium, ICAP (mg/L)		12	12	0.47	0.0092	0.1966	2.000	0
Barium, ICAP (mg/L)	Filtered	12	12	0.29	0.0087	0.16705	2.000	0
Beryllium, ICAP (mg/L)		12	5	0.00061	0.00036	0.000442	0.004	0
Beryllium, ICAP (mg/L)	Filtered	12	3	0.00048	0.0003	0.000373	0.004	0
Boron, ICAP (mg/L)		12	10	0.087	0.014	0.0465	NR	NA
Boron, ICAP (mg/L)	Filtered	12	12	0.081	0.0047	0.033575	NR	NA
Cadmium, ICAP (mg/L)		12	1	0.0042	0.0042	0.0042	0.005	0
Calcium, ICAP (mg/L)		12	12	92	25	39.75	NR	NA
Calcium, ICAP (mg/L)	Filtered	12	12	38	30	35.08333	NR	NA
Chromium, AAS (mg/L)		12	8	1.8	0.031	0.291125	0.050	5
Chromium, AAS (mg/L)	Filtered	12	4	0.2	0.025	0.10425	0.050	2
Chromium, ICAP (mg/L)		12	8	1.9	0.02	0.29675	0.050	5
Chromium, ICAP (mg/L)	Filtered	12	4	0.15	0.016	0.08325	0.050	2
Cobalt, ICAP (mg/L)		12	1	0.013	0.013	0.013	NR	NA
Copper, ICAP (mg/L)		12	4	0.099 c	0.013 c	0.03725	1.000	0

Table 7.23 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Copper, ICAP (mg/L)	Filtered	12	3	0.0096 c	0.0078 c	0.008567	1.000	0
Iron, ICAP (mg/L)		12	12	29	0.061	3.04925	0.3	9
Lead, AAS (mg/L)		12	1	0.042	0.042	0.042	0.050	0
Magnesium, ICAP (mg/L)		12	12	30	17	21.5	NR	NA
Magnesium, ICAP (mg/L)	Filtered	12	12	22	16	20.16667	NR	NA
Manganese, ICAP (mg/L)		12	11	0.37	0.0016	0.042191	0.050	1
Manganese, ICAP (mg/L)	Filtered	12	5	0.0032	0.0011	0.00176	0.050	0
Molybdenum, ICAP (mg/L)		12	1	0.018	0.018	0.018	NR	NA
Nickel, ICAP (mg/L)		12	4	0.65	0.088	0.2415	0.100	2
Nickel, ICAP (mg/L)	Filtered	12	4	0.14	0.045	0.06975	0.100	1
Potassium, ICAP (mg/L)		12	12	3.3	0.71	1.3875	NR	NA
Potassium, ICAP (mg/L)	Filtered	12	12	3.7	0.63	1.461667	NR	NA
Silver, ICAP (mg/L)		12	3	0.011	0.0065	0.008033	0.010	1
Silver, ICAP (mg/L)	Filtered	12	2	0.0076	0.0066	0.0071	0.010	0
Sodium, ICAP (mg/L)		12	12	6.6	0.53	2.199167	NR	NA
Sodium, ICAP (mg/L)	Filtered	12	12	4	0.55 c	2.048333	NR	NA
Strontium, ICAP (mg/L)		12	12	0.81	0.02	0.265583	NR	NA
Strontium, ICAP (mg/L)	Filtered	12	12	0.78	0.02	0.2615	NR	NA
Uranium (mg/L)		12	6	0.004	0.002	0.003167	0.020	0
Uranium (mg/L)	Filtered	12	6	0.008	0.001	0.004	0.020	0
Vanadium, ICAP (mg/L)		12	1	0.014	0.014	0.014	NR	NA

Table 7.23 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Zinc, ICAP (mg/L)		12	12	0.31	0.0026	0.04145	5.000	0
Zinc, ICAP (mg/L)	Filtered	12	8	0.025 c	0.0024 c	0.006813	5.000	0
Conductivity, field measurement (µmhos/cm)		12	NA	452	260	328.5	NR	NA
Dissolved oxygen, field measurement (ppm)		12	NA	11.7	3.4	7.466667	NR	NA
pH, field measurement (pH units)		12	NA	9.1	7.9	8.175	6.5-8.5	1
Redox, field measurement (MV)		12	NA	202	123	153.75	NR	NA
Static water level (ft-TOC)		12	12	-27.88	-119.5	-75.9208	NR	NA
Water temperature, field measurement (°C)		12	NA	18.8	10.2	14.475	NR	NA
Alkalinity-HCO ₃ (mg/L)		12	12	177	133	155.25	NR	NA
Ammonia nitrogen (mg/L)		4	1	0.7	0.7	0.7	NR	NA
Conductivity (µmhos/cm)		12	12	356	283	326	NR	NA
Dissolved solids (mg/L)		12	12	292	146	194.6667	500.000	0
pH (pH units)		12	12	8.3	7.6	8.083333	NR	NA
Total organic carbon (mg/L)		12	4	6	1.2	2.7	NR	NA
Total suspended solids (mg/L)		12	11	500	2	56.63636	NR	NA
Turbidity (NTU)		12	12	200	1.1	21.94167	1.01	12

Table 7.23 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Δv	Reference value	No. of measurements
¹³⁷ Cs (pCi/L)		4	4	19.5 E	-4.85 F	7.3775	120.00	0
^{231,232} Th (pCi/L)		4	4	135 HE	-128 HF	30.8875	400,000	0
²³⁴ U (pCi/L)		4	4	0.969	0	0.43175	20,000	0
²³⁵ U (pCi/L)		4	4	37.6 i	1.71 E	19.605	24,000	2
²³⁸ U (pCi/L)		4	4	0.636	0.18	0.365	24,000	0
Gross alpha (pCi/L)		12	12	6.76	-0.61	2.999167	15 n	0
Gross beta (pCi/L)		12	12	10.2	-1.2	4.768583	4 o	8
Protactinium (pCi/L)		4	4	7030 HE	-1660 HF	2478.75	NR	NA
Methylene chloride (µg/L)		12	1	1 JB	1 JB	1	5,000	0
Toluene (µg/L)		12	1	0.3 J	0.3 J	0.3	1000,00	0
Trichloroethene (µg/L)		12	2	1 JB	1 JB	1	5,000	0

Table 7.24. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Industrial Landfill IV

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		20	20	2.2	1.2	1.68	250	0
Fluoride (mg/L)		20	2	0.1	0.1	0.1	4.000	0
Nitrate nitrogen (mg/L)		20	17	0.75	0.2	0.428824	10.000	0
Sulfate (mg/L)		20	16	9.9	2	5.73125	250.000	0
Aluminum, ICAP (mg/L)		20	19	1.1	0.025	0.296263	0.2	7
Aluminum, ICAP (mg/L)	Filtered	20	5	0.037	0.023	0.0284	0.2	0
Arsenic, ICAP (mg/L)		20	1	0.05	0.05	0.05	0.050	0
Barium, ICAP (mg/L)		20	20	0.029	0.0074	0.014655	2.000	0
Barium, ICAP (mg/L)	Filtered	20	20	0.029	0.0069	0.013785	2.000	0
Beryllium, ICAP (mg/L)		20	4	0.00067	0.00036	0.000483	0.004	0
Boron, ICAP (mg/L)		20	20	0.22	0.0086	0.063525	NR	NA
Boron, ICAP (mg/L)	Filtered	20	20	0.22	0.0058	0.06028	NR	NA
Calcium, ICAP (mg/L)		20	20	48	27	33.2	NR	NA
Calcium, ICAP (mg/L)	Filtered	20	20	48	26	31.65	NR	NA
Chromium, AAS (mg/L)		20	1	0.018	0.018	0.018	0.050	0
Copper, ICAP (mg/L)		20	5	0.17 c	0.004 c	0.04236	1.000	0
Copper, ICAP (mg/L)	Filtered	20	5	0.011 c	0.004 c	0.00586	1.000	0
Iron, ICAP (mg/L)		20	18	1.2	0.044	0.344167	0.3	7
Iron, ICAP (mg/L)	Filtered	20	7	0.11	0.0072	0.034529	0.3	0
Lead, AAS (mg/L)		20	2	0.01	0.006	0.008	0.050	0
Magnesium, ICAP (mg/L)		20	20	31	16	20.65	NR	NA

Table 7.24 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)	Filtered	20	20	31	16	19.7	NR	NA
Manganese, ICAP (mg/L)		20	19	0.028	0.0016	0.010142	0.050	0
Manganese, ICAP (mg/L)	Filtered	20	9	0.0035	0.0011	0.001656	0.050	0
Nickel, ICAP (mg/L)		20	1	0.011	0.011	0.011	0.100	0
Potassium, ICAP (mg/L)		20	18	5	0.62	1.646667	NR	NA
Potassium, ICAP (mg/L)	Filtered	20	18	5.2	0.6	1.658889	NR	NA
Sodium, ICAP (mg/L)		20	20	5.5	0.55	1.623	NR	NA
Sodium, ICAP (mg/L)	Filtered	20	20	5.3	0.52	1.6485	NR	NA
Strontium, ICAP (mg/L)		20	20	0.043	0.01	0.0147	NR	NA
Strontium, ICAP (mg/L)	Filtered	20	20	0.018	0.0097	0.01273	NR	NA
Uranium (mg/L)		20	4	0.004	0.001	0.00225	0.020	0
Uranium (mg/L)	Filtered	20	3	0.002	0.001	0.001333	0.020	0
Vanadium, ICAP (mg/L)		20	1	0.0062	0.0062	0.0062	NR	NA
Zinc, ICAP (mg/L)		20	20	0.052 c	0.0049 c	0.0181	5.000	0
Zinc, ICAP (mg/L)	Filtered	20	14	0.022	0.0022	0.006921	5.000	0
Conductivity, field measurement (µmhos/cm)		20	NA	444	249	304.4	NR	NA
Dissolved oxygen, field measurement (ppm)		20	NA	10.3	6.3	8.355	NR	NA
pH, field measurement (pH units)		20	NA	8.5	6.9	7.885	6.5-8.5	0
Redox, field measurement (MV)		20	NA	210	122	158.5	NR	NA

Table 7.24 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft-TOC)		20	20	-80.16	-125.7	-99.1275	NR	NA
Water temperature, field measurement (°C)		20	NA	19	12	15.015	NR	NA
Alkalinity-CO ₃ (mg/L)		20	1	2	2	2	NR	NA
Alkalinity-HCO ₃ (mg/L)		20	20	241	131	162.3	NR	NA
Chemical oxygen demand (mg/L)		20	3	42	5	18	NR	NA
Conductivity (µmhos/cm)		20	20	433	251	303.9	NR	NA
Dissolved solids (mg/L)		20	20	270	118	184.7	500.000	0
pH (pH units)		20	20	8.5	7.3	7.89	NR	NA
Total organic carbon (mg/L)		20	9	2	1	1.366667	NR	NA
Total suspended solids (mg/L)		20	17	31	2	10.05882	NR	NA
Turbidity (NTU)		20	20	26	1	10.7	1.01	19
¹²⁹ I, X-10 lab (Bq/L)		4	4	0.1	0.01	0.055	NR	NA
¹³¹ I, X-10 lab (Bq/L)		2	2	-0.02	-0.02	-0.02	NR	NA
¹³² I, X-10 lab (Bq/L)		1	1	0.01	0.01	0.01	NR	NA
¹³⁴ I, X-10 lab (Bq/L)		1	1	0.7	0.7	0.7	NR	NA
¹³⁷ Cs (pCi/L)		2	2	18.2 E	16.8 F	0.7	120.00	0
^{231,232} Th (pCi/L)		2	2	1480 H	72 HE	776	400.000	1
²³⁴ U (pCi/L)		4	4	0.968	-0.149	0.3205	20.000	0
²³⁵ U (pCi/L)		4	4	101	-4.36 F	56.435	24.000	3
²³⁷ Np (pCi/L)		4	4	0.523	0	0.13075	1.2	0

Table 7.24 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
^{238}Pu (pCi/L)		4	4	0	-0.633	-0.21225	1.600	0
^{238}U (pCi/L)		4	4	0.117	-0.194	-0.01925	24.000	0
^{239}Pu (pCi/L)		4	4	0.211	0	0.05275	1.200	0
^{241}Am (pCi/L)		4	4	8.13	0	2.34675	1.20	1
^{40}K (pCi/L)		22	16	20	475 i	1047.5	NR	NA
^{99}Tc (pCi/L)		4	4	148	38.2	90.975	4000.000	0
Gross alpha (pCi/L)		20	20	12.4	-2	1.2261	15 n	0
Gross beta (pCi/L)		20	20	12.2	-2.85	1.88485	4 o	3
Protactinium (pCi/L)		2	2	-1200 HF	-5190 HF	-3195	NR	NA
Radium, X-10 lab (Bq/L)		4	4	0.072	0.008	0.044	0.15	0
Strontium (pCi/L)		4	4	37.8	-45.7	-2.83825	8 p	1
Tritium, X-10 lab (Bq/L)		4	4	100	3	30	20000 p	0
1,1,1-Trichloroethane ($\mu\text{g/L}$)		20	4	6 J	4 J	5	200.000	0
Methylene chloride ($\mu\text{g/L}$)		20	2	1 JB	1 JB	1	5.000	0
Trichloroethene ($\mu\text{g/L}$)		20	5	2 JB	1 JB	1.4	5.000	0

Table 7.25. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Industrial Landfill V

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		22	21	2.7	1	1.457143	250	0
Fluoride (mg/L)		22	3	0.3	0.1	0.166667	4.000	0
Nitrate nitrogen (mg/L)		22	10	0.98	0.42	0.793	10.000	0
Sulfate (mg/L)		22	19	12	1	4.547368	250.000	0
Aluminum, ICAP (mg/L)		22	19	9.2	0.028	0.591105	0.2	4
Aluminum, ICAP (mg/L)	Filtered	22	10	0.45	0.021	0.0771	0.2	1
Arsenic, ICAP (mg/L)		22	1	0.063	0.063	0.063	0.050	1
Arsenic, ICAP (mg/L)	Filtered	22	1	0.054	0.054	0.054	0.050	1
Barium, ICAP (mg/L)		22	22	0.15	0.0017	0.016768	2.000	0
Barium, ICAP (mg/L)	Filtered	22	22	0.18	0.0023	0.0166	2.000	0
Boron, ICAP (mg/L)		22	22	0.094	0.0076 c	0.0317	NR	NA
Boron, ICAP (mg/L)	Filtered	22	22	0.076	0.0067 c	0.031759	NR	NA
Calcium, ICAP (mg/L)		22	22	98	15	33.68182	NR	NA
Calcium, ICAP (mg/L)	Filtered	22	22	44	15	31	NR	NA
Chromium, AAS (mg/L)		22	1	0.021	0.021	0.021	0.050	0
Chromium, ICAP (mg/L)		22	2	0.013	0.013	0.013	0.050	0
Chromium, ICAP (mg/L)	Filtered	22	1	0.011	0.011	0.011	0.050	0
Copper, ICAP (mg/L)		22	9	0.03	0.0042	0.008356	1.000	0
Copper, ICAP (mg/L)	Filtered	22	6	0.0064	0.0041	0.0051	1.000	0
Iron, ICAP (mg/L)		22	21	8.2	0.0072	0.484229	0.3	2
Iron, ICAP (mg/L)	Filtered	22	8	0.36	0.0052	0.0702	0.3	1

Table 7.25 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Lead, AAS (mg/L)		22	1	0.019	0.019	0.019	0.050	0
Magnesium, ICAP (mg/L)		22	22	29	5.4	17.79091	NR	NA
Magnesium, ICAP (mg/L)	Filtered	22	22	23	5.3	17.33182	NR	NA
Manganese, ICAP (mg/L)		22	14	0.3	0.0014	0.024764	0.050	1
Manganese, ICAP (mg/L)	Filtered	22	7	0.13	0.0011	0.020243	0.050	1
Potassium, ICAP (mg/L)		22	22	4.1	0.78	1.570909	NR	NA
Potassium, ICAP (mg/L)	Filtered	22	22	2.9	0.79	1.459545	NR	NA
Selenium, ICAP (mg/L)		22	1	0.053	0.053	0.053	0.050	1
Sodium, ICAP (mg/L)		22	22	2.5	0.41 c	0.914091	NR	NA
Sodium, ICAP (mg/L)	Filtered	22	22	2.7	0.45 c	0.953636	NR	NA
Strontium, ICAP (mg/L)		22	22	0.099	0.014	0.023409	NR	NA
Strontium, ICAP (mg/L)	Filtered	22	22	0.12	0.014	0.022136	NR	NA
Uranium (mg/L)		22	5	0.002	0.001	0.0012	0.020	0
Uranium (mg/L)	Filtered	22	8	0.005	0.001	0.002	0.020	0
Vanadium, ICAP (mg/L)		22	1	0.014	0.014	0.014	NR	NA
Zinc, ICAP (mg/L)		22	14	0.13	0.0029	0.018886	5.000	0
Zinc, ICAP (mg/L)	Filtered	22	12	0.02	0.0026	0.008358	5.000	0
Conductivity, field measurement (µmhos/cm)		22	NA	332	90	251.8636	NR	NA
Dissolved oxygen, field measurement (ppm)		22	NA	12.7	6.6	8.372727	NR	NA

Table 7.25 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		22	NA	8.8	6.5	7.895455	6.5-8.5	2
Redox, field measurement (MV)		20	NA	259	62	162.335	NR	NA
Static water level (ft-TOC)		20	20	0	-116.66	-66.883	NR	NA
Water temperature, field measurement (°C)		22	NA	18.4	9.8	14.90909	NR	NA
Alkalinity-CO ₃ (mg/L)		22	3	10	6	8	NR	NA
Alkalinity-HCO ₃ (mg/L)		22	22	171	49	138.2273	NR	NA
Chemical oxygen demand (mg/L)		22	1	5	5	5	NR	NA
Conductivity (µmhos/cm)		22	22	320	117	263.2727	NR	NA
Cyanide (mg/L)		22	1	0.1	0.1	0.1	0.200	0
Dissolved solids (mg/L)		22	22	204	74	147.8182	500.000	0
pH (pH units)		22	22	8.7	7.1	8	NR	NA
Total organic carbon (mg/L)		22	12	4	1	1.725	NR	NA
Total suspended solids (mg/L)		22	16	116	1	9.875	NR	NA
Turbidity (NTU)		22	22	85	1	6.7	1.01	21
¹³⁷ Cs (pCi/L)		22	22	14.6 E	-9.6 F	1.153091	120.00	0
²³¹⁻²³⁴ Th (pCi/L)		22	22	277 HE	-525 HG	-61.0364	400.000	0
²³⁴ U (pCi/L)		22	22	0.999 J	-0.845	0.156818	20.000	0
²³⁵ U (pCi/L)		22	22	50.9 E	-64.1 F	1.219045	24.000	3

Table 7.25 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
^{238}U (pCi/L)		22	22	0.761	-0.617	-0.01891	24,000	0
^{40}K (pCi/L)		6	6	1040	277 i	507.3333	NR	NA
Gross alpha (pCi/L)		22	22	3.06	-0.937	0.645318	15 n	0
Gross beta (pCi/L)		22	22	6.66	-2.47	1.778591	4 o	3
Protactinium (pCi/L)		22	22	6750 Hi	-3380 HF	1795.273	NR	NA
1,1,1-Trichloroethane ($\mu\text{g/L}$)		22	4	2 J	1 J	1.5	200,000	0
2-Butanone ($\mu\text{g/L}$)		22	2	10 B	9 JB	9.5	NR	NA
Acetone ($\mu\text{g/L}$)		22	1	6 JB	6 JB	6	NR	NA
Methylene chloride ($\mu\text{g/L}$)		22	4	2 JB	1 JB	1.25	5,000	0
Toluene ($\mu\text{g/L}$)		22	1	0.6 JB	0.6 JB	0.6	1000.00	0
Trichloroethene ($\mu\text{g/L}$)		22	1	1 JB	1 JB	1	5,000	0
Trichlorofluoromethane ($\mu\text{g/L}$)		21	1	2	2	2	NR	NA

Table 7.26. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Kerr Hollow Quarry

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		28	28	13.6	1.3	5.117857	250.000	0
Fluoride (mg/L)		28	24	3.2	0.1	1.575	2.000	12
Nitrate nitrogen (mg/L)		28	20	2.2	0.2	0.858	10.000	0
Sulfate (mg/L)		28	28	70	2.7	22.47857	250.000	0
Aluminum, ICAP (mg/L)		28	15	1.2	0.02	0.272733	0.2	3
Aluminum, ICAP (mg/L)	Filtered	28	8	0.071	0.02	0.044375	0.2	0
Arsenic, ICAP (mg/L)		28	2	0.069	0.063	0.066	0.050	2
Arsenic, ICAP (mg/L)	Filtered	28	2	0.061	0.054	0.0575	0.050	2
Barium, ICAP (mg/L)		28	28	0.43	0.031	0.121321	1.000	0
Barium, ICAP (mg/L)	Filtered	28	28	0.42	0.031	0.114893	1.000	0
Boron, ICAP (mg/L)		28	28	1.1	0.0092 c	0.265829	NR	NA
Boron, ICAP (mg/L)	Filtered	28	28	0.91	0.012 c	0.265	NR	NA
Calcium, ICAP (mg/L)		28	28	81	21	40.75	NR	NA
Calcium, ICAP (mg/L)	Filtered	28	28	46	21	36.92857	NR	NA
Chromium, AAS (mg/L)	Filtered	28	1	0.052	0.052	0.052	0.050	1
Chromium, ICAP (mg/L)	Filtered	28	1	0.037	0.037	0.037	0.050	0
Copper, ICAP (mg/L)		28	5	0.029	0.0048	0.01092	1.000	0
Copper, ICAP (mg/L)	Filtered	28	3	0.0076	0.0052	0.006333	1.000	0
Iron, ICAP (mg/L)		28	26	14	0.01	1.422692	0.300	15
Iron, ICAP (mg/L)	Filtered	28	16	1.3	0.0083	0.343206	0.300	6
Lead, AAS (mg/L)		28	2	0.0053	0.0049	0.0051	0.015 i	0

Table 7.26 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Lead, AAS (mg/L)	Filtered	28	1	0.0052	0.0052	0.0052	0.015 i	0
Magnesium, ICAP (mg/L)		28	28	56	9.7	26.525	NR	NA
Magnesium, ICAP (mg/L)	Filtered	28	28	35	9.7	24.56071	NR	NA
Manganese, ICAP (mg/L)		28	23	0.15	0.0021	0.039683	0.050	7
Manganese, ICAP (mg/L)	Filtered	28	20	0.07	0.0016	0.02427	0.050	4
Molybdenum, ICAP (mg/L)		28	4	0.014	0.012	0.013	NR	NA
Molybdenum, ICAP (mg/L)	Filtered	28	5	0.019	0.01	0.0142	NR	NA
Potassium, ICAP (mg/L)		28	28	18	0.74	8.494286	NR	NA
Potassium, ICAP (mg/L)	Filtered	28	28	18	1	8.632143	NR	NA
Selenium, ICAP (mg/L)		28	1	0.054	0.054	0.054	0.010	1
Sodium, ICAP (mg/L)		28	28	25	0.88	6.937857	NR	NA
Sodium, ICAP (mg/L)	Filtered	28	28	26	0.94	7.234643	NR	NA
Strontium, ICAP (mg/L)		28	28	7.9	0.019	2.691107	NR	NA
Strontium, ICAP (mg/L)	Filtered	28	28	7.7	0.019	2.658143	NR	NA
Uranium (mg/L)		28	19	0.024	0.001	0.005368	0.020	1
Uranium (mg/L)	Filtered	28	18	0.028	0.001	0.005667	0.020	1
Zinc, ICAP (mg/L)		28	21	0.032	0.0027 c	0.009776	5.000	0
Zinc, ICAP (mg/L)	Filtered	28	17	0.019	0.002	0.006588	5.000	0
Conductivity, field measurement (µmhos/cm)		28	NA	581	191	405.0714	NR	NA
Dissolved oxygen, field measurement (ppm)		28	NA	12.2	1.9	6.2	NR	NA

Table 7.26 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		28	NA	8.4	7	7.767857	6.5-8.5	0
Redox, field measurement (MV)		28	NA	246	13	152.375	NR	NA
Static water level (ft-TOC)		28	28	-2.15	-138.2	-60.3739	NR	NA
Water temperature, field measurement (°C)		28	NA	17.8	11.7	15.11786	NR	NA
Alkalinity-HCO ₃ (mg/L)		28	28	238	96	185.8214	NR	NA
Conductivity (µmhos/cm)		28	28	554	179	409.1786	NR	NA
Conductivity, Rep. 2 (µmhos/cm)		28	28	554	179	408.5	NR	NA
Conductivity, Rep. 3 (µmhos/cm)		28	28	555	180	409.0357	NR	NA
Conductivity, Rep. 4 (µmhos/cm)		28	28	557	180	409.8214	NR	NA
Dissolved solids (mg/L)		28	28	338	90	233.3571	500.000	0
pH (pH units)		28	28	8.3	7.4	7.892857	NR	NA
pH, Rep. 2 (pH units)		28	28	8.3	7.4	7.896429	NR	NA
pH, Rep. 3 (pH units)		28	28	8.3	7.4	7.896429	NR	NA
pH, Rep. 4 (pH units)		28	28	8.3	7.4	7.896429	NR	NA
Total organic carbon (mg/L)		28	17	6	1	2.258824	NR	NA
Total organic carbon, Rep. 2 (mg/L)		28	17	7	1	2.329412	NR	NA
Total organic carbon, Rep. 3 (mg/L)		28	17	4	1	1.958824	NR	NA
Total organic carbon, Rep. 4 (mg/L)		28	15	8	1	2.42	NR	NA

Table 7.26 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Total organic halide, Rep. 3 (µg/L)		28	1	10.4	10.4	10.4	NR	NA
Total suspended solids (mg/L)		28	20	293	1	23.75	NR	NA
Turbidity (NTU)		28	28	39	0.1	10.47857	1.0 l	22
Gross alpha (pCi/L)		28	28	15.5	-0.998	4.739286	15 n	1
Gross beta (pCi/L)		28	28	33.4 *	-6.79	10.62057	4 o	20
2-Butanone (µg/L)		28	1	13 B	13 B	13	NR	NA
Acetone (µg/L)		28	1	6 JB	6 JB	6	NR	NA
Carbon tetrachloride (µg/L)		28	1	2 J	2 J	2	5.000	0
Chloroform (µg/L)		28	1	0.5 J	0.5 J	0.5	100.000 t	0
Methylene chloride (µg/L)		28	3	1 JB	1 JB	1	5.000	0

Table 7.27. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=Rogers Quarry

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		4	4	128	1.8	37.65	250.000	0
Fluoride (mg/L)		4	3	0.9	0.15	0.583333	2.000	0
Nitrate nitrogen (mg/L)		4	1	7.49	7.49	7.49	10.000	0
Sulfate (mg/L)		4	4	66	20.4	35.125	250.000	0
Aluminum, ICAP (mg/L)		4	2	1.2	0.036	0.618	0.2	1
Barium, ICAP (mg/L)		4	4	0.27	0.019	0.111	1.000	0
Barium, ICAP (mg/L)	Filtered	4	4	0.27	0.018	0.109	1.000	0
Beryllium, ICAP (mg/L)		4	1	0.00071	0.00071	0.00071	0.004	0
Boron, ICAP (mg/L)		4	4	0.57	0.049 c	0.22475	NR	NA
Boron, ICAP (mg/L)	Filtered	4	4	0.58	0.028 c	0.2195	NR	NA
Calcium, ICAP (mg/L)		4	4	110	33	65	NR	NA
Calcium, ICAP (mg/L)	Filtered	4	4	100	35	62.25	NR	NA
Copper, ICAP (mg/L)		4	1	0.008	0.008	0.008	1.000	0
Copper, ICAP (mg/L)	Filtered	4	2	0.01	0.0042	0.0071	1.000	0
Iron, ICAP (mg/L)		4	4	1.1	0.045	0.48025	0.300	2
Iron, ICAP (mg/L)	Filtered	4	2	0.72	0.11	0.415	0.300	1
Lead, AAS (mg/L)		4	1	0.0043	0.0043	0.0043	0.015 i	0
Magnesium, ICAP (mg/L)		4	4	31	6.6	20.65	NR	NA
Magnesium, ICAP (mg/L)	Filtered	4	4	31	6.4	20.85	NR	NA
Manganese, ICAP (mg/L)		4	4	0.15	0.0021	0.07385	0.050	2
Manganese, ICAP (mg/L)	Filtered	4	3	0.15	0.0044	0.0658	0.050	1

Table 7.27 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Potassium, ICAP (mg/L)		4	4	3.1	1.4	2.25	NR	NA
Potassium, ICAP (mg/L)	Filtered	4	4	2.8	1.3	2.025	NR	NA
Silver, ICAP (mg/L)		4	1	0.0087	0.0087	0.0087	0.010	0
Sodium, ICAP (mg/L)		4	4	120	1.5	45.875	NR	NA
Sodium, ICAP (mg/L)	Filtered	4	4	120	1.6	45.65	NR	NA
Strontium, ICAP (mg/L)		4	4	1.9	0.14	1.1625	NR	NA
Strontium, ICAP (mg/L)	Filtered	4	4	1.9	0.15	1.17	NR	NA
Zinc, ICAP (mg/L)		4	3	0.013	0.0066	0.008767	5.000	0
Zinc, ICAP (mg/L)	Filtered	4	3	0.0077	0.0039	0.005633	5.000	0
Conductivity, field measurement (μ mhos/cm)		4	NA	850	361	611.5	NR	NA
Dissolved oxygen, field measurement (ppm)		4	NA	10.2	2	7.25	NR	NA
pH, field measurement (pH units)		4	NA	7.9	7.1	7.525	6.5-8.5	0
Redox, field measurement (MV)		4	NA	140	66	103	NR	NA
Static water level (ft-TOC)		4	4	-13.6	-109.19	-39.5875	NR	NA
Water temperature, field measurement ($^{\circ}$ C)		4	NA	14.9	12.1	13.325	NR	NA
Alkalinity- HCO_3 (mg/L)		4	4	412	155	267	NR	NA
Conductivity (μ mhos/cm)		4	4	968	420	687.5	NR	NA
Dissolved solids (mg/L)		4	4	564	250	400.5	500.000	2

Table 7.27 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH (pH units)		4	4	8.3	7.5	7.925	NR	NA
Total suspended solids (mg/L)		4	2	24	2	13	NR	NA
Turbidity (NTU)		4	4	30	1.5	16	1.0 I	4
Gross alpha (pCi/L)		4	4	-0.374	-2.69	-1.11825	15 n	0
Gross beta (pCi/L)		4	4	1.25	-2.53	-1.0075	4 o	0
2-Chlorophenol (µg/L)		4	1	2 J	2 J	2	NR	NA
Bis(2-ethylhexyl)phthalate (µg/L)		4	2	2 BJ	1 J	1.5	6.000	0
Di-n-butylphthalate (µg/L)		4	1	15 B	15 B	15	NR	NA
Methylene chloride (µg/L)		4	3	1 JB	1 JB	1	5.000	0

Table 7.28. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=CR Location Description=United Nuclear Corporation Site

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		24	24	39	1	11.84583	250.000	0
Nitrate nitrogen (mg/L)		24	23	1.7	0.24	0.833043	10.000	0
Sulfate (mg/L)		24	21	11	1	4.62381	250.000	0
Aluminum, ICAP (mg/L)		24	9	0.84	0.027	0.161667	0.2	1
Aluminum, ICAP (mg/L)	Filtered	24	3	0.038 c	0.03	0.035	0.2	0
Barium, ICAP (mg/L)		24	24	0.028	0.007	0.016321	1.000	0
Barium, ICAP (mg/L)	Filtered	24	24	0.028	0.0064	0.016088	1.000	0
Beryllium, ICAP (mg/L)		24	1	0.0003	0.0003	0.0003	0.004	0
Boron, ICAP (mg/L)		24	24	0.1	0.0068 c	0.028475	NR	NA
Boron, ICAP (mg/L)	Filtered	24	24	0.067	0.0071 c	0.025821	NR	NA
Calcium, ICAP (mg/L)		24	24	58	20	42.29167	NR	NA
Calcium, ICAP (mg/L)	Filtered	24	24	57	18	41.875	NR	NA
Chromium, AAS (mg/L)		24	7	0.12	0.022	0.054286	0.050	2
Chromium, ICAP (mg/L)		24	7	0.092	0.023	0.047714	0.050	2
Copper, ICAP (mg/L)		24	11	0.015 c	0.004	0.005882	1.000	0
Copper, ICAP (mg/L)	Filtered	24	8	0.016 c	0.004	0.006263	1.000	0
Iron, ICAP (mg/L)		24	22	1.7	0.011	0.318909	0.300	5
Iron, ICAP (mg/L)	Filtered	24	7	0.23	0.0056	0.0489	0.300	0
Magnesium, ICAP (mg/L)		24	24	34	16	25.375	NR	NA
Magnesium, ICAP (mg/L)	Filtered	24	24	34	16	25.20833	NR	NA
Manganese, ICAP (mg/L)		24	19	0.028	0.001	0.007158	0.050	0

Table 7.28 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)	Filtered	24	10	0.0047	0.0012	0.00243	0.050	0
Nickel, ICAP (mg/L)		24	10	0.13	0.02 c	0.0644	0.100	1
Nickel, ICAP (mg/L)	Filtered	24	8	0.11	0.048	0.065375	0.100	1
Potassium, ICAP (mg/L)		24	23	19	0.75	1.939565	NR	NA
Potassium, ICAP (mg/L)	Filtered	24	24	19	0.7	1.840833	NR	NA
Sodium, ICAP (mg/L)		24	24	13	0.54	5.164167	NR	NA
Sodium, ICAP (mg/L)	Filtered	24	24	12	0.47 c	5.2	NR	NA
Strontium, ICAP (mg/L)		24	24	0.025	0.0095	0.016388	NR	NA
Strontium, ICAP (mg/L)	Filtered	24	24	0.025	0.0076	0.016204	NR	NA
Uranium (mg/L)		24	8	0.002	0.001	0.001125	0.020	0
Uranium (mg/L)	Filtered	24	9	0.002	0.001	0.001111	0.020	0
Zinc, ICAP (mg/L)		24	14	0.0097	0.0024	0.004707	5.000	0
Zinc, ICAP (mg/L)	Filtered	24	5	0.02	0.0023	0.00692	5.000	0
Conductivity, field measurement (µmhos/cm)		24	NA	570	243	401.25	NR	NA
Dissolved oxygen, field measurement (ppm)		24	NA	7.4	0.9	4.3	NR	NA
pH, field measurement (pH units)		24	NA	8.8	7.1	7.6	6.5-8.5	1
Redox, field measurement (MV)		24	NA	220	68	151.9167	NR	NA
Static water level (ft-TOC)		24	24	-27.52	-105.86	-72.1825	NR	NA
Water temperature, field measurement (°C)		24	NA	17.7	12.2	15.05417	NR	NA

Table 7.28 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Δv	Reference value	No. of measurements
Alkalinity-CO ₃ (mg/L)		24	1	4	4	4	NR	NA
Alkalinity-HCO ₃ (mg/L)		24	24	264	128	198.5	NR	NA
Conductivity (μ mhos/cm)		24	24	568	260	407.0417	NR	NA
Dissolved solids (mg/L)		24	24	342	148	230	500.000	0
pH (pH units)		24	24	8.5	7.4	7.779167	NR	NA
Total suspended solids (mg/L)		24	11	9	2	4	NR	NA
Turbidity (NTU)		24	24	13	0.4	3.45	1.01	17
¹⁰⁶ Ru (pCi/L)		2	2	258 i	184 i	221	NR	NA
¹³⁷ Cs (pCi/L)		18	18	41.7 E	-120 F	-0.48433	120.000	0
^{231,235} Th (pCi/L)		18	18	1640 H	-152 HF	59.72	400.000	1
²³⁴ U (pCi/L)		24	24	2.18 J	-0.982	0.38625	20.000	0
²³⁵ U (pCi/L)		24	24	26.9 E	-28.1 F	-3.09458	24.000	1
²³⁸ U (pCi/L)		24	24	0.816	-0.818	0.025042	24.000	0
⁴⁰ K (pCi/L)		3	3	9410	301 i	3458.667	NR	NA
Gross alpha (pCi/L)		24	24	7.91	-0.502	1.745958	.15 n	0
Gross beta (pCi/L)		24	24	19.6	-4.94	2.304583	4 o	5
Protactinium (pCi/L)		18	18	32000 H	-7870 HF	2725.061	NR	NA
Radium, X-10 lab (Bq/L)		24	24	0.15	-0.006	0.056	0.15	0
Chloroform (μ g/L)		24	1	0.7 J	0.7 J	0.7	100.000 t	0
Methylene chloride (μ g/L)		24	2	1 JB	0.9 JB	0.95	5.000	0

Table 7.29. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Beta 4 Security Pits

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		16	16	15	3.7	7.26875	250.000	0
Fluoride (mg/L)		16	9	0.4	0.1	0.188889	2.000	0
Nitrate nitrogen (mg/L)		16	7	0.69	0.27	0.424286	10.000	0
Sulfate (mg/L)		16	16	16.3	2	10.61875	250.000	0
Aluminum, ICAP (mg/L)		16	16	14	0.025	2.938438	0.2	14
Aluminum, ICAP (mg/L)	Filtered	16	5	0.1	0.024	0.064	0.2	0
Arsenic, ICAP (mg/L)		16	1	0.17	0.17	0.17	0.050	1
Barium, ICAP (mg/L)		16	16	0.52	0.17	0.32125	1.000	0
Barium, ICAP (mg/L)	Filtered	16	16	0.38	0.15	0.25	1.000	0
Beryllium, ICAP (mg/L)		16	1	0.00049	0.00049	0.00049	0.004	0
Boron, ICAP (mg/L)		16	16	0.13 c	0.018	0.044188	NR	NA
Boron, ICAP (mg/L)	Filtered	16	16	0.081	0.0084	0.038213	NR	NA
Cadmium, ICAP (mg/L)		16	1	0.0038	0.0038	0.0038	0.005	0
Calcium, ICAP (mg/L)		16	16	120	67	90.8125	NR	NA
Calcium, ICAP (mg/L)	Filtered	16	16	130	66	87.75	NR	NA
Chromium, AAS (mg/L)		16	4	0.11	0.013	0.04025	0.050	1
Chromium, ICAP (mg/L)		16	1	0.024	0.024	0.024	0.050	0
Cobalt, ICAP (mg/L)		16	3	0.011	0.0061	0.007833	NR	NA
Cobalt, ICAP (mg/L)	Filtered	16	1	0.0059	0.0059	0.0059	NR	NA
Copper, ICAP (mg/L)		16	9	0.032	0.0055	0.012033	1.000	0
Copper, ICAP (mg/L)	Filtered	16	2	0.0077	0.0066	0.00715	1.000	0
Iron, ICAP (mg/L)		16	16	16	0.26	4.7725	0.300	15

Table 7.29 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Iron, ICAP (mg/L)	Filtered	16	8	3.4	0.0078	0.911225	0.300	3
Lead, AAS (mg/L)		16	1	0.011	0.011	0.011	0.015	0
Magnesium, ICAP (mg/L)		16	16	16	6.8	10.40625	NR	NA
Magnesium, ICAP (mg/L)	Filtered	16	16	18	6	9.6	NR	NA
Manganese, ICAP (mg/L)		16	16	4.1	0.015	1.180313	0.050	15
Manganese, ICAP (mg/L)	Filtered	16	16	2.5	0.0072	0.592888	0.050	8
Molybdenum, ICAP (mg/L)		16	1	0.011	0.011	0.011	NR	NA
Nickel, ICAP (mg/L)		16	2	0.021	0.01	0.0155	0.100	0
Potassium, ICAP (mg/L)		16	16	6	0.92	2.4075	NR	NA
Potassium, ICAP (mg/L)	Filtered	16	16	3.1	0.73	1.493125	NR	NA
Sodium, ICAP (mg/L)		16	16	12	6.1	7.6875	NR	NA
Sodium, ICAP (mg/L)	Filtered	16	16	9.7	5.9	7.40625	NR	NA
Strontium, ICAP (mg/L)		16	16	0.69	0.14	0.28125	NR	NA
Strontium, ICAP (mg/L)	Filtered	16	16	0.74	0.14	0.29	NR	NA
Uranium (mg/L)		16	7	0.008	0.001	0.002143	0.020	0
Uranium (mg/L)	Filtered	16	7	0.011	0.001	0.003429	0.020	0
Vanadium, ICAP (mg/L)		16	6	0.017	0.005	0.009017	NR	NA
Zinc, ICAP (mg/L)		16	16	0.039	0.01	0.022313	5.000	0
Zinc, ICAP (mg/L)	Filtered	16	15	0.027	0.0034	0.010767	5.000	0
Conductivity, field measurement (µmhos/cm)		16	NA	783	346	477.8125	NR	NA
Dissolved oxygen, field measurement (ppm)		16	NA	11.3	1	3.64375	NR	NA

Table 7.29 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		16	NA	8	6.3	6.9375	6.5-8.5	1
Redox, field measurement (MV)		16	NA	246	11	150.1429	NR	NA
Static water level (ft-TOC)		16	16	-4.34	-7.5	-5.83125	NR	NA
Water temperature, field measurement (°C)		16	NA	20	6.8	14.5	NR	NA
Alkalinity-HCO ₃ (mg/L)		16	16	397	86	243.6875	NR	NA
Conductivity (µmhos/cm)		16	16	718	371	516.75	NR	NA
Dissolved solids (mg/L)		16	16	436	264	334	500.000	0
pH (pH units)		16	16	7.7	6.8	7.23125	NR	NA
Total suspended solids (mg/L)		16	16	384	8	103.5625	NR	NA
Turbidity (NTU)		16	16	180	6.7	56.10625	1.01	16
Gross alpha (pCi/L)		16	16	10.5	-0.837	1.594276	15 n	0
Gross beta (pCi/L)		16	16	38	-1.3	7.70675	40	7
1,1,1-Trichloroethane (µg/L)		16	3	1 JB	0.9 JB	0.933333	200.000	0
1,1-Dichloroethane (µg/L)		16	4	2 J	1 J	1.5	NR	NA
1,2-Dichloroethane (µg/L)		16	4	23	15	18.5	70	0
2-Butanone (µg/L)		16	1	14	14	14	NR	NA
Acetone (µg/L)		16	3	37 B	7 J	18.66667	NR	NA
Methylene chloride (µg/L)		16	4	12 B	12 B	12	5.000	4
Tetrachloroethene (µg/L)		16	2	4 J	3 J	3.5	5.000	0
Trichloroethene (µg/L)		16	5	4 J	0.7 JB	2.14	5.000	0

Table 7.30. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Exit Pathway

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		54	54	45	1	11.88333	250.000	0
Fluoride (mg/L)		54	36	0.9	0.1	0.256944	2.000	0
Nitrate nitrogen (mg/L)		54	32	3.8	0.2	1.203125	10.000	0
Sulfate (mg/L)		54	54	104	1.5	31.04444	250.000	0
Aluminum, ICAP (mg/L)		54	37	68	0.021	3.242568	0.2	15
Aluminum, ICAP (mg/L)	Filtered	54	24	0.25	0.021	0.061167	0.2	2
Arsenic, ICAP (mg/L)		54	1	0.057	0.057	0.057	0.050	1
Arsenic, ICAP (mg/L)	Filtered	54	2	0.072	0.066	0.069	0.050	2
Barium, ICAP (mg/L)		54	54	0.94	0.023	0.166333	1.000	0
Barium, ICAP (mg/L)	Filtered	54	54	0.91	0.022	0.150574	1.000	0
Beryllium, ICAP (mg/L)		54	6	0.0039	0.00032	0.001568	0.004	0
Boron, ICAP (mg/L)		54	54	0.49	0.0093	0.110783	NR	NA
Boron, ICAP (mg/L)	Filtered	54	53	0.4	0.013	0.113453	NR	NA
Cadmium, AAS (mg/L)		54	5	0.022	0.005	0.0176	0.005	4
Cadmium, AAS (mg/L)	Filtered	54	4	0.015	0.011	0.01225	0.005	4
Cadmium, ICAP (mg/L)		54	4	0.022	0.016	0.01975	0.005	4
Cadmium, ICAP (mg/L)	Filtered	54	4	0.016	0.0089	0.011975	0.005	4
Calcium, ICAP (mg/L)		54	54	130	18	67.75926	NR	NA
Calcium, ICAP (mg/L)	Filtered	54	54	140	19	65.90741	NR	NA
Chromium, AAS (mg/L)		54	8	0.31	0.016	0.1035	0.050	3
Chromium, ICAP (mg/L)		54	9	0.25	0.012	0.078444	0.050	3
Cobalt, ICAP (mg/L)		54	4	0.066	0.005	0.030825	NR	NA

Table 7.30 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Copper, ICAP (mg/L)		54	21	0.14	0.004	0.01671	1.000	0
Copper, ICAP (mg/L)	Filtered	54	13	0.04	0.0043	0.009908	1.000	0
Iron, ICAP (mg/L)		54	52	170	0.0073	7.724121	0.300	31
Iron, ICAP (mg/L)	Filtered	54	47	22	0.0053	1.939855	0.300	11
Lead, AAS (mg/L)		54	5	0.095	0.006	0.03486	0.015 i	3
Lead, ICAP (mg/L)		54	1	0.085	0.085	0.085	0.015 i	1
Magnesium, ICAP (mg/L)		54	54	52	4.6	19.22593	NR	NA
Magnesium, ICAP (mg/L)	Filtered	54	54	43	4.9	18.06296	NR	NA
Manganese, ICAP (mg/L)		54	53	5.1	0.0021	0.636291	0.050	30
Manganese, ICAP (mg/L)	Filtered	54	50	4.2	0.0017	0.5158	0.050	26
Mercury, CVAA (mg/L)		54	1	0.00035	0.00035	0.00035	0.002	0
Nickel, ICAP (mg/L)		54	8	1.1	0.011	0.2045	0.100	3
Nickel, ICAP (mg/L)	Filtered	54	5	0.93	0.01	0.2622	0.100	2
Potassium, ICAP (mg/L)		54	54	14	0.85	3.869444	NR	NA
Potassium, ICAP (mg/L)	Filtered	54	54	7.4	0.68	3.467037	NR	NA
Selenium, ICAP (mg/L)		54	1	0.094	0.094	0.094	0.010	1
Selenium, ICAP (mg/L)	Filtered	54	1	0.051	0.051	0.051	0.010	1
Silver, ICAP (mg/L)		54	1	0.0063	0.0063	0.0063	0.010	0
Silver, ICAP (mg/L)	Filtered	54	2	0.011	0.0068	0.0089	0.010	1
Sodium, ICAP (mg/L)		54	54	24	1.4	8.327778	NR	NA
Sodium, ICAP (mg/L)	Filtered	54	54	23	1.5	8.207407	NR	NA

Table 7.30 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Strontium, ICAP (mg/L)		54	54	1.5	0.031	0.326907	NR	NA
Strontium, ICAP (mg/L)	Filtered	54	54	1.4	0.031	0.319907	NR	NA
Uranium (mg/L)		54	15	0.246	0.001	0.061667	0.020	4
Uranium (mg/L)	Filtered	54	17	0.226	0.001	0.054529	0.020	4
Vanadium, ICAP (mg/L)		54	6	0.13	0.0059	0.036817	NR	NA
Zinc, ICAP (mg/L)		54	49	2.4	0.0024	0.140582	5.000	0
Zinc, ICAP (mg/L)	Filtered	54	43	2	0.0022 c	0.118205	5.000	0
Conductivity, field measurement (µmhos/cm)		54	NA	639	173	482.8519	NR	NA
Dissolved oxygen, field measurement (ppm)		54	NA	8.3	0.05	2.39463	NR	NA
pH, field measurement (pH units)		54	NA	8.5	5.4	7.17037	6.5-8.5	5
Redox, field measurement (MV)		50	NA	321	7.6	96.86286	NR	NA
Static water level (ft-TOC)		50	50	0	-59.6	-21.8564	NR	NA
Water temperature, field measurement (°C)		54	NA	25.2	12.3	16.28333	NR	NA
Alkalinity-HCO ₃ (mg/L)		54	54	295	36	217.3704	NR	NA
Conductivity (µmhos/cm)		54	54	671	173	495.6667	NR	NA
Dissolved solids (mg/L)		54	54	482	106	313.1481	500.000	0
pH (pH units)		54	54	8.2	6	7.368519	NR	NA
Total suspended solids (mg/L)		54	35	12355	1	414.4	NR	NA

Table 7.30 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Turbidity (NTU)		54	54	3500	0.2	89.42963	1.01	42
Gross alpha (pCi/L)		54	54	128	-1.56	10.54871	15 n	5
Gross beta (pCi/L)		54	54	110	-5	10.19506	4 o	27
1,1-Dichloroethane (µg/L)		56	3	2 J	0.9 J	1.633333	NR	NA
1,2-Dichloroethene (µg/L)		56	14	34	1 J	15.21429	70	0
2-Butanone (µg/L)		56	3	13	9 JB	11	NR	NA
Acetone (µg/L)		56	3	11 JB	6 JB	8.333333	NR	NA
Carbon tetrachloride (µg/L)		56	18	1300 D	10 J	276.9444	5.000	18
Chloroform (µg/L)		56	21	290	1 J	61.57143	100.000 t	4
Di-n-butylphthalate (µg/L)		2	2	8 JB	8 JB	8	NR	NA
Methylene chloride (µg/L)		56	4	62 B	10 B	35.5	5.000	4
Tetrachloroethene (µg/L)		56	23	36	1 J	10.04348	5.000	13
Toluene (µg/L)		56	2	4 JB	0.4 J	2.466667	1000.00	0
Trichloroethene (µg/L)		56	14	29	1 J	8.5	5.000	8
Vinyl chloride (µg/L)		56	1	5 J	5 J	5	2.000	1

Table 7.31. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Fire Training Facility

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	3.2	1.8	2.35	250.000	0
Fluoride (mg/L)		8	3	0.2	0.1	0.133333	2.000	0
Nitrate nitrogen (mg/L)		8	8	2	0.79	1.35625	10.000	0
Sulfate (mg/L)		8	8	6.6	2.8	4.575	250.000	0
Aluminum, ICAP (mg/L)		8	8	1.7	0.32	1.0125	0.2	8
Aluminum, ICAP (mg/L)	Filtered	8	7	1.3	0.025	0.670429	0.2	5
Arsenic, ICAP (mg/L)		8	1	0.067	0.067	0.067	0.050	1
Arsenic, ICAP (mg/L)	Filtered	8	2	0.14	0.11	0.125	0.050	2
Barium, ICAP (mg/L)		8	8	0.066	0.01	0.032	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.075	0.01	0.026625	1.000	0
Boron, ICAP (mg/L)		8	8	0.075 c	0.031 c	0.059	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.18	0.026 c	0.074875	NR	NA
Calcium, ICAP (mg/L)		8	8	170	42	73.5	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	220	35	68.125	NR	NA
Copper, ICAP (mg/L)		8	2	0.012	0.0043	0.00815	1.000	0
Copper, ICAP (mg/L)	Filtered	8	2	0.0045	0.0042	0.00435	1.000	0
Iron, ICAP (mg/L)		8	8	0.55	0.02	0.125625	0.300	1
Iron, ICAP (mg/L)	Filtered	8	4	0.02	0.0062	0.010625	0.300	0
Magnesium, ICAP (mg/L)		8	8	9.6	0.77	3.60875	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	8.8	0.021	2.653875	NR	NA
Manganese, ICAP (mg/L)		8	6	0.0062	0.0017	0.003417	0.050	0

Table 7.31 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)	Filtered	8	3	0.0015	0.0011	0.001267	0.050	0
Molybdenum, ICAP (mg/L)		8	1	0.01	0.01	0.01	NR	NA
Potassium, ICAP (mg/L)		8	8	29	5.8	16.15	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	34	6.2	17.4	NR	NA
Sodium, ICAP (mg/L)		8	8	5.4	2.4	3.2375	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	6	2.5	3.425	NR	NA
Strontium, ICAP (mg/L)		8	8	0.67	0.15	0.27	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.81	0.14	0.27125	NR	NA
Uranium (mg/L)		8	1	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	8	2	0.002	0.001	0.0015	0.020	0
Vanadium, ICAP (mg/L)		8	3	0.0056	0.0052	0.005467	NR	NA
Vanadium, ICAP (mg/L)	Filtered	8	2	0.0062	0.006	0.0061	NR	NA
Zinc, ICAP (mg/L)		8	6	0.0042	0.0021	0.003433	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	2	0.007	0.004	0.0055	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	1915	233	512.875	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	5.7	1.7	3.25	NR	NA
pH, field measurement (pH units)		8	NA	11.9	8	10.225	6.5-8.5	7
Redox, field measurement (MV)		8	NA	123	10	60.2	NR	NA
Static water level (ft-TOC)		8	8	-21.44	-26.8	-23.8675	NR	NA

Table 7.31 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		8	NA	19	14.7	16.3625	NR	NA
Alkalinity-CO ₃ (mg/L)		8	7	22	4	10	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	6	126	55	89.66667	NR	NA
Conductivity (µmhos/cm)		8	8	970	135	364	NR	NA
Dissolved solids (mg/L)		8	8	292	86	149.25	500.000	0
pH (pH units)		8	8	11.7	8.2	9.85	NR	NA
Total suspended solids (mg/L)		8	8	138	43	92.375	NR	NA
Turbidity (NTU)		8	8	74	15	42.75	1.0 I	8
Gross alpha (pCi/L)		8	8	1.9	0.324	0.813125	15 n	0
Gross beta (pCi/L)		8	8	26	6.24	14.53	4 o	8
1,2-Dichloroethene (µg/L)		8	8	470 E	25	272.5	70	6
2-Butanone (µg/L)		8	2	89 JB	16 JB	52.5	NR	NA
Acetone (µg/L)		8	1	57 JB	57 JB	57	NR	NA
Methylene chloride (µg/L)		8	2	52 B	11 B	31.5	5.000	2
Tetrachloroethene (µg/L)		8	8	750 E	49	358.125	5.000	8
Trichloroethene (µg/L)		8	8	190	13	109.375	5.000	8

Table 7.32. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location A1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	6.2	1.1	3.85	250.000	0
Fluoride (mg/L)		6	6	0.3	0.1	0.2	2.000	0
Nitrate nitrogen (mg/L)		6	1	0.27	0.27	0.27	10.000	0
Sulfate (mg/L)		6	6	37	8.7	23.58333	250.000	0
Aluminum, ICAP (mg/L)		6	6	1.1	0.08	0.5125	0.2	3
Aluminum, ICAP (mg/L)	Filtered	6	4	0.047	0.026	0.0335	0.2	0
Barium, ICAP (mg/L)		6	6	0.32	0.081	0.2005	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.29	0.076	0.181333	1.000	0
Beryllium, ICAP (mg/L)		6	1	0.00031	0.00031	0.00031	0.004	0
Boron, ICAP (mg/L)		6	6	0.051	0.021	0.033333	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	0.09	0.019	0.055667	NR	NA
Cadmium, AAS (mg/L)		6	2	0.0034	0.0023	0.00285	0.005	0
Cadmium, AAS (mg/L)	Filtered	6	1	0.0037	0.0037	0.0037	0.005	0
Cadmium, ICAP (mg/L)		6	1	0.0035	0.0035	0.0035	0.005	0
Cadmium, ICAP (mg/L)	Filtered	6	1	0.0034	0.0034	0.0034	0.005	0
Calcium, ICAP (mg/L)		6	6	67	49	59	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	68	48	56.5	NR	NA
Copper, ICAP (mg/L)		6	3	0.046	0.0093	0.0221	1.000	0
Copper, ICAP (mg/L)	Filtered	6	1	0.008	0.008	0.008	1.000	0
Iron, ICAP (mg/L)		6	6	1.5	0.088	0.567833	0.300	3
Iron, ICAP (mg/L)	Filtered	6	2	0.024	0.018	0.021	0.300	0

Table 7.32 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)		6	6	13	6.4	9.883333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	13	6.2	9.733333	NR	NA
Manganese, ICAP (mg/L)		6	6	0.15	0.022	0.0765	0.050	3
Manganese, ICAP (mg/L)	Filtered	6	6	0.12	0.02	0.056833	0.050	3
Potassium, ICAP (mg/L)		6	6	2.2	1.8	1.933333	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	2.1	1.7	1.883333	NR	NA
Sodium, ICAP (mg/L)		6	6	15	9.5	12.08333	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	14	9.6	11.93333	NR	NA
Strontium, ICAP (mg/L)		6	6	0.17	0.095	0.1285	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.17	0.092	0.129667	NR	NA
Uranium (mg/L)		6	2	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	6	3	0.002	0.001	0.001333	0.020	0
Zinc, ICAP (mg/L)		6	6	0.052	0.0032	0.021067	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	5	0.033	0.0087	0.01794	5.000	0
Conductivity, field measurement (μ mhos/cm)		6	NA	436	346	386.3333	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	6.7	1.4	3.3	NR	NA
pH, field measurement (pH units)		6	NA	8.1	6.9	7.5	6.5-8.5	0
Redox, field measurement (MV)		6	NA	224	171	197	NR	NA

Table 7.32 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft-TOC)		6	6	-17.55	-19.29	-18.4533	NR	NA
Water temperature, field measurement (°C)		6	NA	21.6	17.7	19.51667	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	201	150	171.6667	NR	NA
Conductivity (µmhos/cm)		6	6	390	373	381	NR	NA
Dissolved solids (mg/L)		6	6	306	230	262	500.000	0
pH (pH units)		6	6	8.4	7.1	7.65	NR	NA
Total suspended solids (mg/L)		6	6	122	1	25.5	NR	NA
Turbidity (NTU)		6	6	250	1.5	43.8	1.01	6
Gross alpha (pCi/L)		6	6	4.51	-0.353	1.45536	15 n	0
Gross beta (pCi/L)		6	6	9.74	0.546	3.959167	4 o	3
2-Butanone (µg/L)		6	2	15 B	13 B	14	NR	NA
Acetone (µg/L)		6	2	6 JB	5 JB	5.5	NR	NA
Methylene chloride (µg/L)		6	1	1 JB	1 JB	1	5.000	0

Table 7.33. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location A2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	44	20	30.5	250.000	0
Fluoride (mg/L)		6	3	0.2	0.1	0.166667	2.000	0
Nitrate nitrogen (mg/L)		6	3	0.51	0.3	0.406667	10.000	0
Sulfate (mg/L)		6	6	110	16	60.5	250.000	0
Aluminum, ICAP (mg/L)		6	6	19	0.049	3.4215	0.2	2
Aluminum, ICAP (mg/L)	Filtered	6	3	0.058	0.024	0.039333	0.2	0
Arsenic, ICAP (mg/L)	Filtered	6	1	0.092	0.092	0.092	0.050	1
Barium, ICAP (mg/L)		6	6	0.89	0.039	0.219833	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.14	0.038	0.082833	1.000	0
Boron, ICAP (mg/L)		6	5	0.074	0.024	0.0418	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	0.071	0.016	0.048	NR	NA
Cadmium, AAS (mg/L)		6	1	0.002	0.002	0.002	0.005	0
Cadmium, AAS (mg/L)	Filtered	6	1	0.0045	0.0045	0.0045	0.005	0
Cadmium, ICAP (mg/L)	Filtered	6	1	0.0054	0.0054	0.0054	0.005	1
Calcium, ICAP (mg/L)		6	6	150	63	104.1667	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	160	61	101.3333	NR	NA
Chromium, AAS (mg/L)		6	3	56	0.012	18.67767	0.050	1
Chromium, ICAP (mg/L)		6	2	49	0.015	24.5075	0.050	1
Cobalt, ICAP (mg/L)		6	1	0.17	0.17	0.17	NR	NA
Cobalt, ICAP (mg/L)	Filtered	6	1	0.0053	0.0053	0.0053	NR	NA
Copper, ICAP (mg/L)		6	3	1.1	0.004	0.371333	1.000	1

Table 7.33 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Copper, ICAP (mg/L)	Filtered	6	3	0.01	0.0043	0.007	1.000	0
Iron, ICAP (mg/L)		6	6	290	0.14	48.75833	0.300	4
Iron, ICAP (mg/L)	Filtered	6	6	0.25	0.012	0.104333	0.300	0
Lead, AAS (mg/L)		6	1	0.1	0.1	0.1	0.015 i	1
Magnesium, ICAP (mg/L)		6	6	39	16	28	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	42	14	27.16667	NR	NA
Manganese, ICAP (mg/L)		6	6	1.5	0.018	0.282167	0.050	2
Manganese, ICAP (mg/L)	Filtered	6	6	0.065	0.011	0.035667	0.050	1
Molybdenum, ICAP (mg/L)		6	2	0.31	0.011	0.1605	NR	NA
Nickel, ICAP (mg/L)		6	3	7.8	0.23	2.793333	0.100	3
Nickel, ICAP (mg/L)	Filtered	6	3	0.45	0.24	0.356667	0.100	3
Potassium, ICAP (mg/L)		6	6	6.8	1.7	3.583333	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	3.8	1.6	2.666667	NR	NA
Sodium, ICAP (mg/L)		6	6	31	20	25.33333	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	32	20	25.66667	NR	NA
Strontium, ICAP (mg/L)		6	6	0.35	0.15	0.255	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.38	0.14	0.245	NR	NA
Uranium (mg/L)		6	2	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	6	4	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		6	1	0.23	0.23	0.23	NR	NA
Zinc, ICAP (mg/L)		6	6	0.15	0.0041	0.043	5.000	0

Table 7.33 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Zinc, ICAP (mg/L)	Filtered	6	5	0.026	0.0026	0.0149	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	992	440	738.1667	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	5.7	1.6	4.2	NR	NA
pH, field measurement (pH units)		6	NA	7.6	6.7	7.083333	6.5-8.5	0
Redox, field measurement (MV)		6	NA	243	66	162.3333	NR	NA
Static water level (ft-TOC)		6	6	-26.15	-32	-29.2583	NR	NA
Water temperature, field measurement (°C)		6	NA	23.9	15.9	19.31667	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	407	179	294.8333	NR	NA
Conductivity (µmhos/cm)		6	6	996	490	715.5	NR	NA
Dissolved solids (mg/L)		6	6	658	320	480.6667	500.000	3
pH (pH units)		6	6	7.9	7.2	7.6	NR	NA
Total suspended solids (mg/L)		6	6	1430	2	260.5	NR	NA
Turbidity (NTU)		6	6	1600	2.1	275.5167	1.01	6
Gross alpha (pCi/L)		6	6	14.1	-1.08	3.5445	15 n	0
Gross beta (pCi/L)		6	6	26.5	0.623	7.352167	4 o	3
Acetone (µg/L)		6	1	15	15	15	NR	NA

Table 7.34. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location B2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	13	1.6	5.566667	250.000	0
Fluoride (mg/L)		6	5	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		6	3	1.1	0.6	0.9	10.000	0
Sulfate (mg/L)		6	6	26	6.5	15.75	250.000	0
Aluminum, ICAP (mg/L)		6	6	4.1	0.035	1.400833	0.2	4
Aluminum, ICAP (mg/L)	Filtered	6	5	0.03	0.021	0.0258	0.2	0
Barium, ICAP (mg/L)		6	6	0.23	0.091	0.165167	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.22	0.006	0.113667	1.000	0
Boron, ICAP (mg/L)		6	6	0.086	0.025	0.046167	NR	NA
Boron, ICAP (mg/L)	Filtered	6	5	0.041	0.02	0.0312	NR	NA
Calcium, ICAP (mg/L)		6	6	72	56	63.833333	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	68	2.1	52.683333	NR	NA
Chromium, AAS (mg/L)		6	3	0.16	0.067	0.119	0.050	3
Chromium, ICAP (mg/L)		6	3	0.13	0.05	0.1	0.050	2
Copper, ICAP (mg/L)		6	4	0.018	0.0046	0.0095	1.000	0
Copper, ICAP (mg/L)	Filtered	6	1	0.0061	0.0061	0.0061	1.000	0
Iron, ICAP (mg/L)		6	6	6.4	0.21	2.408333	0.300	5
Iron, ICAP (mg/L)	Filtered	6	4	0.11	0.028	0.05975	0.300	0
Lead, AAS (mg/L)		6	2	0.0064	0.005	0.0057	0.015 i	0
Magnesium, ICAP (mg/L)		6	6	11	7.2	8.783333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	10	0.22	7.336667	NR	NA

Table 7.34 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		6	6	0.29	0.057	0.1275	0.050	6
Manganese, ICAP (mg/L)	Filtered	6	6	0.067	0.0015	0.022767	0.050	2
Nickel, ICAP (mg/L)		6	1	0.018	0.018	0.018	0.100	0
Nickel, ICAP (mg/L)	Filtered	6	1	0.015	0.015	0.015	0.100	0
Potassium, ICAP (mg/L)		6	6	2.7	1.4	2.133333	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	5	2.1	1.4	1.64	NR	NA
Sodium, ICAP (mg/L)		6	6	13	9.6	11.26667	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	13	0.27	9.761667	NR	NA
Strontium, ICAP (mg/L)		6	6	0.21	0.1	0.148333	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.21	0.006	0.120833	NR	NA
Uranium (mg/L)	Filtered	6	1	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		6	1	0.0056	0.0056	0.0056	NR	NA
Zinc, ICAP (mg/L)		6	6	0.036	0.0075	0.019067	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	6	0.025	0.0038	0.012433	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	414	323	381	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	8.5	1.7	3.8	NR	NA
pH, field measurement (pH units)		6	NA	7.6	6.7	7.116667	6.5-8.5	0
Redox, field measurement (MV)		6	NA	136	24	85.42	NR	NA
Static water level (ft-TOC)		6	6	-7.4	-10	-8.63667	NR	NA

Table 7.34 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		6	NA	24.9	16.4	18.88333	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	205	155	183.5	NR	NA
Conductivity (µmhos/cm)		6	6	404	388	396.5	NR	NA
Dissolved solids (mg/L)		6	6	298	244	271	500.000	0
pH (pH units)		6	6	8	7.2	7.55	NR	NA
Total suspended solids (mg/L)		6	5	91	6	39.2	NR	NA
Turbidity (NTU)		6	6	90	2.8	30.08333	1.01	6
Gross alpha (pCi/L)		6	6	4.43	-1.23	1.459833	15 n	0
Gross beta (pCi/L)		6	6	6.39	0.625	3.089167	40	2

Table 7.35. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime= EF Location Description=GW Monitoring Plan Grid Location C1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	75	5.6	25.5875	250.000	0
Fluoride (mg/L)		8	3	0.2	0.1	0.166667	2.000	0
Sulfate (mg/L)		8	8	17	7.5	12.1625	250.000	0
Aluminum, ICAP (mg/L)		8	6	0.28	0.026	0.088167	0.2	1
Aluminum, ICAP (mg/L)	Filtered	8	2	0.03	0.024	0.027	0.2	0
Barium, ICAP (mg/L)		8	8	0.17	0.074	0.123125	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.17	0.076	0.123625	1.000	0
Beryllium, ICAP (mg/L)		8	2	0.0011	0.0003	0.0007	0.004	0
Beryllium, ICAP (mg/L)	Filtered	8	1	0.00037	0.00037	0.00037	0.004	0
Boron, ICAP (mg/L)		8	8	0.1	0.016 c	0.0485	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.13	0.012	0.0555	NR	NA
Cadmium, ICAP (mg/L)		8	2	0.0038	0.0031	0.00345	0.005	0
Cadmium, ICAP (mg/L)	Filtered	8	2	0.0031	0.003	0.00305	0.005	0
Calcium, ICAP (mg/L)		8	8	74	11	43.125	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	73	11	42.375	NR	NA
Cobalt, ICAP (mg/L)		8	4	0.062	0.049	0.0535	NR	NA
Cobalt, ICAP (mg/L)	Filtered	8	4	0.066	0.047	0.0565	NR	NA
Copper, ICAP (mg/L)		8	1	0.0095	0.0095	0.0095	1.000	0
Copper, ICAP (mg/L)	Filtered	8	3	0.0048	0.0042	0.0045	1.000	0
Iron, ICAP (mg/L)		8	8	43	0.13	18.0825	0.300	5
Iron, ICAP (mg/L)	Filtered	8	7	41	0.069 c	20.61157	0.300	4

Table 7.35 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)		8	8	7.8	5.1	6.9125	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	7.7	5	6.7375	NR	NA
Manganese, ICAP (mg/L)		8	8	15	0.19	6.4825	0.050	8
Manganese, ICAP (mg/L)	Filtered	8	8	15	0.2	6.7325	0.050	8
Mercury, CVAA (mg/L)		8	1	0.00051	0.00051	0.00051	0.002	0
Nickel, ICAP (mg/L)		8	1	0.016	0.016	0.016	0.100	0
Nickel, ICAP (mg/L)	Filtered	8	2	0.016	0.01	0.013	0.100	0
Potassium, ICAP (mg/L)		8	8	1.8	0.82	1.3025	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	2	0.99	1.39875	NR	NA
Selenium, ICAP (mg/L)		8	1	0.051	0.051	0.051	0.010	1
Sodium, ICAP (mg/L)		8	8	25	5.3	14.725	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	26	5	14.7125	NR	NA
Strontium, ICAP (mg/L)		8	8	0.17	0.037	0.100875	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.16	0.037	0.099375	NR	NA
Uranium (mg/L)		8	1	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	8	1	0.006	0.006	0.006	0.020	0
Zinc, ICAP (mg/L)		8	8	0.043	0.0043	0.019125	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.027	0.003	0.014043	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	409	328	374.375	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	3.5	0.4	1.5	NR	NA

Table 7.35 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		8	NA	7.4	5.9	6.7	6.5-8.5	4
Redox, field measurement (MV)		8	NA	116.6	5	46.65	NR	NA
Static water level (ft-TOC)		8	8	-8.85	-13.5	-10.8688	NR	NA
Water temperature, field measurement (°C)		8	NA	20.2	15.2	17	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	207	102	157.875	NR	NA
Conductivity (µmhos/cm)		8	8	437	340	398.25	NR	NA
Dissolved solids (mg/L)		8	8	294	208	252.5	500.000	0
pH (pH units)		8	8	7.9	6.4	7.0375	NR	NA
Total suspended solids (mg/L)		8	5	6	1	3.8	NR	NA
Turbidity (NTU)		8	8	11	1.5	4.4625	1.01	8
Gross alpha (pCi/L)		8	8	7.22	-0.513	1.553305	15 n	0
Gross beta (pCi/L)		8	8	15.9 *	-0.256	3.97125	4 o	2
2-Butanone (µg/L)		8	2	12 B	12 B	12	NR	NA
Acetone (µg/L)		8	1	8 JB	8 JB	8	NR	NA
Toluene (µg/L)		8	2	1 JB	1 JB	1	1000.00	0

Table 7.36. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location D1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	27	19	22.66667	250,000	0
Fluoride (mg/L)		6	1	0.1	0.1	0.1	2,000	0
Sulfate (mg/L)		6	3	16	12	13.33333	250,000	0
Aluminum, ICAP (mg/L)		6	4	3.6	0.091	1.36525	0.2	3
Aluminum, ICAP (mg/L)	Filtered	6	1	0.026	0.026	0.026	0.2	0
Barium, ICAP (mg/L)		6	6	0.25	0.035	0.14	1,000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.24	0.032	0.134	1,000	0
Boron, ICAP (mg/L)		6	6	0.039	0.0043	0.021767	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	0.11	0.02	0.051	NR	NA
Cadmium, AAS (mg/L)		6	1	0.0048	0.0048	0.0048	0.005	0
Cadmium, AAS (mg/L)	Filtered	6	1	0.0022	0.0022	0.0022	0.005	0
Cadmium, ICAP (mg/L)		6	1	0.0054	0.0054	0.0054	0.005	1
Cadmium, ICAP (mg/L)	Filtered	6	1	0.0031	0.0031	0.0031	0.005	0
Calcium, ICAP (mg/L)		6	6	86	1.9	42.66667	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	83	1.9	42.15	NR	NA
Chromium, AAS (mg/L)		6	1	0.01	0.01	0.01	0.050	0
Cobalt, ICAP (mg/L)		6	3	0.012	0.0078	0.010267	NR	NA
Cobalt, ICAP (mg/L)	Filtered	6	3	0.013	0.0089	0.010967	NR	NA
Copper, ICAP (mg/L)		6	1	0.0043	0.0043	0.0043	1,000	0
Copper, ICAP (mg/L)	Filtered	6	1	0.0045	0.0045	0.0045	1,000	0
Iron, ICAP (mg/L)		6	6	30	0.44	14.47333	0.300	6

Table 7.36 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Iron, ICAP (mg/L)	Filtered	6	6	29	0.065	13.51417	0.300	5
Magnesium, ICAP (mg/L)		6	6	9.1	1.5	5.3	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	8.9	1.4	5.083333	NR	NA
Manganese, ICAP (mg/L)		6	6	1.4	0.24	0.801667	0.050	6
Manganese, ICAP (mg/L)	Filtered	6	6	1.4	0.22	0.803333	0.050	6
Nickel, ICAP (mg/L)		6	1	0.015	0.015	0.015	0.100	0
Nickel, ICAP (mg/L)	Filtered	6	2	0.016	0.011	0.0135	0.100	0
Potassium, ICAP (mg/L)		6	5	3	1.7	2.42	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	3.1	1.4	2.166667	NR	NA
Sodium, ICAP (mg/L)		6	6	10	7.3	8.7	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	11	7.2	8.866667	NR	NA
Strontium, ICAP (mg/L)		6	6	0.46	0.011	0.222667	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.44	0.011	0.210667	NR	NA
Uranium (mg/L)		6	1	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)	Filtered	6	1	0.0053	0.0053	0.0053	NR	NA
Zinc, ICAP (mg/L)		6	6	0.038	0.004	0.0182	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	6	0.049	0.0024	0.01875	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	530	170	353.5	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	3.8	0.8	1.8	NR	NA

Table 7.36 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		6	NA	7.2	5.8	6.45	6.5-8.5	3
Redox, field measurement (MV)		6	NA	20	4	9.666667	NR	NA
Static water level (ft-TOC)		6	6	-11.95	-13.45	-12.5333	NR	NA
Water temperature, field measurement (°C)		6	NA	22	15.6	18.78333	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	219	47	133.3333	NR	NA
Conductivity (µmhos/cm)		6	6	518	158	330	NR	NA
Dissolved solids (mg/L)		6	6	382	92	237.3333	500.000	0
pH (pH units)		6	6	7.7	6.2	6.916667	NR	NA
Total suspended solids (mg/L)		6	6	98	1	30.66667	NR	NA
Turbidity (NTU)		6	6	70	1.1	27.6	1.01	6
Gross alpha (pCi/L)		6	6	1.93	-0.738	0.541593	15 n	0
Gross beta (pCi/L)		6	6	4.97	1.25	2.795	4 o	2

Table 7.37. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location D2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	7.5	2	4.583333	250.000	0
Fluoride (mg/L)		6	3	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		6	4	5.1	0.5	3.45	10.000	0
Sulfate (mg/L)		6	6	27	11	19.5	250.000	0
Aluminum, ICAP (mg/L)		6	5	1.3	0.022	0.2924	0.2	1
Aluminum, ICAP (mg/L)	Filtered	6	2	0.038	0.025	0.0315	0.2	0
Barium, ICAP (mg/L)		6	6	0.29	0.075	0.180167	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.29	0.07	0.181167	1.000	0
Beryllium, ICAP (mg/L)		6	1	0.00035	0.00035	0.00035	0.004	0
Boron, ICAP (mg/L)		6	6	0.041	0.016	0.029833	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	0.05	0.019	0.031167	NR	NA
Cadmium, AAS (mg/L)	Filtered	6	1	0.0028	0.0028	0.0028	0.005	0
Calcium, ICAP (mg/L)		6	6	71	23	47.83333	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	70	28	48.5	NR	NA
Copper, ICAP (mg/L)		6	1	0.0052	0.0052	0.0052	1.000	0
Copper, ICAP (mg/L)	Filtered	6	2	0.021	0.0055	0.01325	1.000	0
Iron, ICAP (mg/L)		6	6	1.6	0.12	0.4	0.300	1
Iron, ICAP (mg/L)	Filtered	6	4	0.16	0.0085	0.093125	0.300	0
Magnesium, ICAP (mg/L)		6	6	15	2.8	8.65	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	14	3	8.516667	NR	NA
Manganese, ICAP (mg/L)		6	6	0.12	0.019	0.037333	0.050	1

Table 7.37 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)	Filtered	6	6	0.02	0.0053	0.015383	0.050	0
Potassium, ICAP (mg/L)		6	6	2.7	1.2	2	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	3	0.8	1.966667	NR	NA
Sodium, ICAP (mg/L)		6	6	10	7.6	8.216667	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	8.9	7.7	8.133333	NR	NA
Strontium, ICAP (mg/L)		6	6	0.39	0.052	0.218167	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.39	0.055	0.22	NR	NA
Uranium (mg/L)		6	1	0.008	0.008	0.008	0.020	0
Uranium (mg/L)	Filtered	6	2	0.002	0.001	0.0015	0.020	0
Zinc, ICAP (mg/L)		6	6	0.082	0.0062	0.025967	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	6	0.09	0.0027	0.028817	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	676	219	396.5	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	8.3	1.2	3.5	NR	NA
pH, field measurement (pH units)		6	NA	7.3	5.9	6.6	6.5-8.5	3
Redox, field measurement (MV)		6	NA	214	112	162.5	NR	NA
Static water level (ft-TOC)		6	6	-23.2	-25.2	-24.2	NR	NA
Water temperature, field measurement (°C)		6	NA	27.2	15.6	22.61667	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	236	36	141.3333	NR	NA

Table 7.37 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Conductivity (µmhos/cm)		6	6	462	202	333.6667	NR	NA
Dissolved solids (mg/L)		6	6	312	174	242.6667	500.000	0
pH (pH units)		6	6	7.7	6.4	7.066667	NR	NA
Total suspended solids (mg/L)		6	5	10	1	5	NR	NA
Turbidity (NTU)		6	6	18	0.1	5.8	1.01	5
Gross alpha (pCi/L)		6	6	2.28	0.331	1.1535	15 n	0
Gross beta (pCi/L)		6	6	4.89	2.29	3.511667	4 o	3
1,1,2,2-Tetrachloroethane (µg/L)		7	1	3500	3500	3500	NR	NA
Tetrachloroethene (µg/L)		7	6	3300	8 J	708.6667	5.000	6
Trichloroethene (µg/L)		7	2	11	11	11	5.000	2

Table 7.38. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location E1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	10	3	6.7	250,000	0
Fluoride (mg/L)		8	4	0.2	0.1	0.175	2,000	0
Sulfate (mg/L)		8	8	15	8	11.25	250,000	0
Aluminum, ICAP (mg/L)		8	7	7.7	0.052	1.925286	0.2	4
Aluminum, ICAP (mg/L)	Filtered	8	2	0.029	0.021	0.025	0.2	0
Barium, ICAP (mg/L)		8	8	0.32	0.16	0.25	1,000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.32	0.15	0.2325	1,000	0
Beryllium, ICAP (mg/L)		8	2	0.0015	0.00044	0.00097	0.004	0
Boron, ICAP (mg/L)		8	8	0.14	0.017	0.060125	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.12 c	0.014	0.066625	NR	NA
Calcium, ICAP (mg/L)		8	8	100	45	72.25	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	100	45	71.875	NR	NA
Chromium, AAS (mg/L)		8	2	0.027	0.015	0.021	0.050	0
Chromium, ICAP (mg/L)		8	2	0.016	0.012	0.014	0.050	0
Cobalt, ICAP (mg/L)		8	1	0.0068	0.0068	0.0068	NR	NA
Copper, ICAP (mg/L)		8	4	0.009	0.0045	0.006675	1,000	0
Copper, ICAP (mg/L)	Filtered	8	2	0.0065	0.0045	0.0055	1,000	0
Iron, ICAP (mg/L)		8	8	8.7	0.088	2.32975	0.300	6
Iron, ICAP (mg/L)	Filtered	8	6	0.11	0.0094	0.054567	0.300	0
Lead, AAS (mg/L)		8	2	0.014	0.0071	0.01055	0.015 i	0
Magnesium, ICAP (mg/L)		8	8	11	5.9	8.4625	NR	NA

Table 7.38 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)	Filtered	8	8	11	5.8	8.1	NR	NA
Manganese, ICAP (mg/L)		8	8	0.57	0.053	0.262375	0.050	8
Manganese, ICAP (mg/L)	Filtered	8	8	0.3	0.068	0.1635	0.050	8
Mercury, CVAA (mg/L)		8	1	0.0032	0.0032	0.0032	0.002	1
Molybdenum, ICAP (mg/L)		8	1	0.011	0.011	0.011	NR	NA
Nickel, ICAP (mg/L)		8	1	0.013	0.013	0.013	0.100	0
Potassium, ICAP (mg/L)		8	8	3.9	0.9	2.2125	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	2.8	0.81	1.65875	NR	NA
Silver, ICAP (mg/L)	Filtered	8	1	0.0074	0.0074	0.0074	0.010	0
Sodium, ICAP (mg/L)		8	8	28	8.6	18.3	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	28	8.6	18.1375	NR	NA
Strontium, ICAP (mg/L)		8	8	0.47	0.14	0.29875	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.47	0.14	0.29875	NR	NA
Uranium (mg/L)	Filtered	8	2	0.002	0.002	0.002	0.020	0
Vanadium, ICAP (mg/L)		8	2	0.0095	0.0082	0.00885	NR	NA
Zinc, ICAP (mg/L)		8	7	0.061	0.0031	0.020857	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	6	0.63	0.005 c	0.11935	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	551	341	436	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	8.4	0.9	2.5	NR	NA

Table 7.38 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		8	NA	7.6	6.9	7.3125	6.5-8.5	0
Redox, field measurement (MV)		8	NA	182	10	94.33333	NR	NA
Static water level (ft-TOC)		8	8	-19.64	-20.9	-20.4287	NR	NA
Water temperature, field measurement (°C)		8	NA	19.3	12.7	16.875	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	288	160	231.875	NR	NA
Conductivity (µmhos/cm)		8	8	583	322	458	NR	NA
Dissolved solids (mg/L)		8	8	370	228	299.5	500.000	0
pH (pH units)		8	8	8.2	7.3	7.6375	NR	NA
Total suspended solids (mg/L)		8	7	19	62	64	NR	NA
Turbidity (NTU)		8	8	200	1.5	44.675	1.01	8
Gross alpha (pCi/L)		8	8	8.35	-0.188	2.367679	15 n	0
Gross beta (pCi/L)		8	8	9.71	1.8	4.62	4.0	2
2-Butanone (µg/L)		8	1	13 B	13 B	13	NR	NA
Acetone (µg/L)		8	1	7 JB	7 JB	7	NR	NA
Methylene chloride (µg/L)		8	1	12 B	12 B	12	5.000	1
Toluene (µg/L)		8	1	1 JB	1 JB	1	1000.00	0

Table 7.39. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location E2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	13	2.7	7.233333	250.000	0
Nitrate nitrogen (mg/L)		6	3	0.62	0.39	0.5	10.000	0
Sulfate (mg/L)		6	5	13	5.6	8.84	250.000	0
Aluminum, ICAP (mg/L)		6	4	5.5	0.04	1.975	0.2	3
Aluminum, ICAP (mg/L)	Filtered	6	1	0.16	0.16	0.16	0.2	0
Barium, ICAP (mg/L)		6	6	0.4	0.035	0.244167	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.39	0.035	0.2135	1.000	0
Beryllium, ICAP (mg/L)		6	1	0.0003	0.0003	0.0003	0.004	0
Boron, ICAP (mg/L)		6	6	0.027	0.0086	0.0181	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	0.05	0.0041	0.02015	NR	NA
Cadmium, AAS (mg/L)	Filtered	6	1	0.0028	0.0028	0.0028	0.005	0
Calcium, ICAP (mg/L)		6	6	72	1.4	36.7	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	71	1.9	35.75	NR	NA
Chromium, AAS (mg/L)		6	2	0.15	0.012	0.081	0.050	1
Chromium, ICAP (mg/L)		6	2	0.091	0.013	0.052	0.050	1
Cobalt, ICAP (mg/L)		6	1	0.019	0.019	0.019	NR	NA
Copper, ICAP (mg/L)		6	5	0.042	0.0061	0.01516	1.000	0
Copper, ICAP (mg/L)	Filtered	6	4	0.0081	0.0046	0.006575	1.000	0
Iron, ICAP (mg/L)		6	6	7.7	0.092	2.007	0.300	3
Iron, ICAP (mg/L)	Filtered	6	3	0.19	0.045	0.101333	0.300	0
Lead, AAS (mg/L)		6	1	0.01	0.01	0.01	0.015 i	0

Table 7.39 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)		6	6	14	0.99	7.465	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	13	1.1	6.9	NR	NA
Manganese, ICAP (mg/L)		6	6	0.77	0.016	0.170167	0.050	2
Manganese, ICAP (mg/L)	Filtered	6	6	0.036	0.0097	0.02295	0.050	0
Nickel, ICAP (mg/L)		6	2	0.046	0.019	0.0325	0.100	0
Nickel, ICAP (mg/L)	Filtered	6	1	0.013	0.013	0.013	0.100	0
Potassium, ICAP (mg/L)		6	6	2.2	1	1.666667	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	5	2.2	1.2	1.76	NR	NA
Silver, ICAP (mg/L)		6	1	0.0066	0.0066	0.0066	0.010	0
Sodium, ICAP (mg/L)		6	6	10	2.9	6.3	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	9.4	3.2	6.45	NR	NA
Strontium, ICAP (mg/L)		6	6	0.21	0.0084	0.1034	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.19	0.01	0.104167	NR	NA
Vanadium, ICAP (mg/L)		6	2	0.014	0.0095	0.01175	NR	NA
Zinc, ICAP (mg/L)		6	5	0.53	0.0025	0.12426	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	6	0.35	0.002	0.068667	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	518	38	261.5	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	8.7	1.8	5.016667	NR	NA
pH, field measurement (pH units)		6	NA	7.4	5.4	6.383333	6.5-8.5	3

Table 7.39 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Redox, field measurement (MV)		6	NA	284	12	155.75	NR	NA
Static water level (ft-TOC)		6	6	-10.45	-17.4	-13.7833	NR	NA
Water temperature, field measurement (°C)		6	NA	20.1	14.2	17.5	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	225	10	117.3333	NR	NA
Conductivity (µmhos/cm)		6	6	465	36	247.8333	NR	NA
Dissolved solids (mg/L)		6	6	330	48	186.6667	500.000	0
pH (pH units)		6	6	7.8	6	7.016667	NR	NA
Total suspended solids (mg/L)		6	5	140	2	32.2	NR	NA
Turbidity (NTU)		6	6	120	0.6	26.33333	1.01	5
Gross alpha (pCi/L)		6	6	3.27	-0.184	1.151833	15 n	0
Gross beta (pCi/L)		6	6	7.94	0.155	3.4025	4 a	2
Methylene chloride (µg/L)		6	1	0.7 JB	0.7 JB	0.7	5.000	0

Table 7.40. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location E3

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		9	9	22	7.1	16.2	250.000	0
Fluoride (mg/L)		9	1	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		9	5	1.3	0.47	0.896	10.000	0
Sulfate (mg/L)		9	9	23	8.4	16.26667	250.000	0
Aluminum, ICAP (mg/L)		9	8	2	0.043	0.542125	0.2	5
Aluminum, ICAP (mg/L)	Filtered	9	4	0.085	0.023	0.04425	0.2	0
Barium, ICAP (mg/L)		9	9	0.71	0.12	0.438889	1.000	0
Barium, ICAP (mg/L)	Filtered	9	9	0.69	0.14	0.394444	1.000	0
Boron, ICAP (mg/L)		9	9	0.46	0.058	0.211222	NR	NA
Boron, ICAP (mg/L)	Filtered	9	9	0.52	0.068	0.246444	NR	NA
Calcium, ICAP (mg/L)		9	9	95	16	66.33333	NR	NA
Calcium, ICAP (mg/L)	Filtered	9	9	100	12	64.22222	NR	NA
Chromium, AAS (mg/L)		9	3	0.87	0.011	0.301333	0.050	1
Chromium, ICAP (mg/L)		9	3	0.88	0.012	0.303667	0.050	1
Cobalt, ICAP (mg/L)		9	1	0.0057	0.0057	0.0057	NR	NA
Copper, ICAP (mg/L)		9	4	0.024	0.0051	0.01405	1.000	0
Iron, ICAP (mg/L)		9	9	5.9	0.04	1.123778	0.300	4
Iron, ICAP (mg/L)	Filtered	9	8	0.27	0.012	0.053125	0.300	0
Lead, AAS (mg/L)		9	1	0.0078	0.0078	0.0078	0.015	0
Magnesium, ICAP (mg/L)		9	9	16	4.9	9.6	NR	NA
Magnesium, ICAP (mg/L)	Filtered	9	9	15	4.3	9.244444	NR	NA

Table 7.40 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Δv	Reference value	No. of measurements
Manganese, ICAP (mg/L)		9	9	0.1	0.0064	0.046489	0.050	3
Manganese, ICAP (mg/L)	Filtered	9	9	0.084	0.0049	0.027211	0.050	2
Nickel, ICAP (mg/L)		9	5	0.28	0.011	0.1208	0.100	2
Nickel, ICAP (mg/L)	Filtered	9	4	0.26	0.013	0.11875	0.100	2
Potassium, ICAP (mg/L)		9	9	6.4	1.6	4.588889	NR	NA
Potassium, ICAP (mg/L)	Filtered	9	9	6	1.6	4.344444	NR	NA
Sodium, ICAP (mg/L)		9	9	75	10	31.55556	NR	NA
Sodium, ICAP (mg/L)	Filtered	9	9	79	9.7	33.63333	NR	NA
Strontium, ICAP (mg/L)		9	9	1.1	0.2	0.684444	NR	NA
Strontium, ICAP (mg/L)	Filtered	9	9	0.96	0.21	0.627778	NR	NA
Uranium (mg/L)		9	3	0.002	0.001	0.001333	0.020	0
Uranium (mg/L)	Filtered	9	3	0.002	0.001	0.001333	0.020	0
Vanadium, ICAP (mg/L)		9	1	0.0062	0.0062	0.0062	NR	NA
Zinc, ICAP (mg/L)		9	8	0.048	0.0046	0.01895	5.000	0
Zinc, ICAP (mg/L)	Filtered	9	8	0.062	0.0029	0.0194	5.000	0
Conductivity, field measurement (μ mhos/cm)		9	NA	673	436	549.3333	NR	NA
Dissolved oxygen, field measurement (ppm)		9	NA	5.8	0.6	2.766667	NR	NA
pH, field measurement (pH units)		9	NA	8.2	7	7.5	6.5-8.5	0
Redox, field measurement (MV)		9	NA	164	33	102.1111	NR	NA

Table 7.40 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft-TOC)		9	9	-8.22	-10.8	-9.53222	NR	NA
Water temperature, field measurement (°C)		9	NA	23.6	16	19.2	NR	NA
Alkalinity-CO ₃ (mg/L)		9	1	2	2	2	NR	NA
Alkalinity-HCO ₃ (mg/L)		9	9	261	198	229.4444	NR	NA
Conductivity (µmhos/cm)		9	9	581	394	496.6667	NR	NA
Dissolved solids (mg/L)		9	9	350	266	314.4444	500.000	0
pH (pH units)		9	9	8.3	7.4	7.711111	NR	NA
Total suspended solids (mg/L)		9	8	82	2	19	NR	NA
Turbidity (NTU)		9	9	50	1.2	15.18889	1.01	9
Gross alpha (pCi/L)		9	9	29.9	0.214	10.15633	15 n	3
Gross beta (pCi/L)		9	9	9.31	1.22	4.77	4 o	5
1,1,1-Trichloroethane (µg/L)		9	8	25	2 J	10.375	200.000	0
1,1-Dichloroethane (µg/L)		9	9	160	2 J	50.66667	NR	NA
1,1-Dichloroethene (µg/L)		9	8	44	4 J	17.5	7.000	6
1,2-Dichloroethene (µg/L)		9	7	30	1 J	17.28571	70	0
Carbon tetrachloride (µg/L)		9	6	18	1 J	7.5	5.000	2
Chloroform (µg/L)		9	5	5 J	0.8 J	2.56	100.000 t	0
Tetrachloroethene (µg/L)		9	9	210	3 J	73.88889	5.000	8
Trichloroethene (µg/L)		9	8	49	3 J	21.25	5.000	6
Vinyl chloride (µg/L)		9	2	1 J	1 J	1	2.000	0

Table 7.41. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location F2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	136	2.7	56.01667	250.000	0
Fluoride (mg/L)		6	4	0.6	0.1	0.45	2.000	0
Nitrate nitrogen (mg/L)		6	1	0.34	0.34	0.34	10.000	0
Sulfate (mg/L)		6	6	16	8.6	12.93333	250.000	0
Aluminum, ICAP (mg/L)		6	6	7.4	0.033	1.389667	0.2	3
Aluminum, ICAP (mg/L)	Filtered	6	1	0.036	0.036	0.036	0.2	0
Barium, ICAP (mg/L)		6	6	0.77	0.18	0.4	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.53	0.17	0.351667	1.000	0
Beryllium, ICAP (mg/L)		6	1	0.0015	0.0015	0.0015	0.004	0
Boron, ICAP (mg/L)		6	6	0.22	0.037	0.122333	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	0.19	0.044	0.117	NR	NA
Cadmium, ICAP (mg/L)		6	1	0.0041	0.0041	0.0041	0.005	0
Calcium, ICAP (mg/L)		6	6	130	5.6	64.63333	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	130	5.4	64.51667	NR	NA
Chromium, AAS (mg/L)		6	1	1.1	1.1	1.1	0.050	1
Chromium, ICAP (mg/L)		6	1	0.8	0.8	0.8	0.050	1
Cobalt, ICAP (mg/L)		6	1	0.013	0.013	0.013	NR	NA
Copper, ICAP (mg/L)		6	2	0.12	0.0069	0.06345	1.000	0
Copper, ICAP (mg/L)	Filtered	6	1	0.0043	0.0043	0.0043	1.000	0
Iron, ICAP (mg/L)		6	6	13	0.1	2.558333	0.300	3
Iron, ICAP (mg/L)	Filtered	6	4	0.71	0.0053	0.451325	0.300	3

Table 7.41 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Lead, AAS (mg/L)		6	1	0.0056	0.0056	0.0056	0.015 i	0
Magnesium, ICAP (mg/L)		6	6	20	2.1	10.06667	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	18	2.1	9.55	NR	NA
Manganese, ICAP (mg/L)		6	6	1.1	0.0036	0.460633	0.050	3
Manganese, ICAP (mg/L)	Filtered	6	5	1.4	0.0029	0.69522	0.050	3
Nickel, ICAP (mg/L)		6	2	0.53	0.011	0.2705	0.100	1
Nickel, ICAP (mg/L)	Filtered	6	1	0.033	0.033	0.033	0.100	0
Potassium, ICAP (mg/L)		6	6	4.4	2.4	3.116667	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	3.1	2.3	2.733333	NR	NA
Sodium, ICAP (mg/L)		6	6	89	16	51.33333	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	88	16	51.33333	NR	NA
Strontium, ICAP (mg/L)		6	6	0.7	0.33	0.493333	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.61	0.33	0.471667	NR	NA
Vanadium, ICAP (mg/L)		6	1	0.014	0.014	0.014	NR	NA
Zinc, ICAP (mg/L)		6	5	0.18	0.0036	0.04578	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	5	0.062	0.003	0.03024	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	881	382	641	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	3.5	1.5	2.383333	NR	NA
pH, field measurement (pH units)		6	NA	8.8	6.8	7.8	6.5-8.5	2

Table 7.41 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Redox, field measurement (MV)		6	NA	142	9	78.4	NR	NA
Static water level (ft-TOC)		6	6	-9.85	-12.1	-11	NR	NA
Water temperature, field measurement (°C)		6	NA	20.4	14.6	17.66667	NR	NA
Alkalinity-CO ₃ (mg/L)		6	3	24	4	12.66667	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	275	174	227	NR	NA
Conductivity (µmhos/cm)		6	6	831	370	598.5	NR	NA
Dissolved solids (mg/L)		6	6	542	230	382.3333	500.000	2
pH (pH units)		6	6	8.9	7.2	8.016667	NR	NA
Total suspended solids (mg/L)		6	5	174	1	36.8	NR	NA
Turbidity (NTU)		6	6	6.4	2.2	4.916667	1.01	6
Gross alpha (pCi/L)		6	6	2.18	-0.984	0.513825	15 n	0
Gross beta (pCi/L)		6	6	4.32	0.779	2.563167	4 o	1

Table 7.42. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description-GW Monitoring Plan Grid Location F3

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	6	8.2	5.7	6.583333	250.000	0
Fluoride (mg/L)		6	4	1.5	0.1	1.075	2.000	0
Nitrate nitrogen (mg/L)		6	5	1.3	0.42	0.85	10.000	0
Sulfate (mg/L)		6	6	29	18	22.83333	250.000	0
Aluminum, ICAP (mg/L)		6	6	6.4	0.41	3.218333	0.2	6
Aluminum, ICAP (mg/L)	Filtered	6	3	0.072	0.024	0.040333	0.2	0
Barium, ICAP (mg/L)		6	6	0.33	0.12	0.233333	1.000	0
Barium, ICAP (mg/L)	Filtered	6	6	0.31	0.081	0.1945	1.000	0
Beryllium, ICAP (mg/L)		6	3	0.00035	0.0003	0.00033	0.004	0
Boron, ICAP (mg/L)		6	6	1.5	0.075	0.695833	NR	NA
Boron, ICAP (mg/L)	Filtered	6	6	1.3	0.068	0.659833	NR	NA
Cadmium, AAS (mg/L)		6	1	0.0023	0.0023	0.0023	0.005	0
Calcium, ICAP (mg/L)		6	6	77	12	44	NR	NA
Calcium, ICAP (mg/L)	Filtered	6	6	65	8.2	36.76667	NR	NA
Chromium, AAS (mg/L)		6	2	0.023	0.015	0.019	0.050	0
Chromium, ICAP (mg/L)		6	1	0.014	0.014	0.014	0.050	0
Cobalt, ICAP (mg/L)		6	1	0.0052	0.0052	0.0052	NR	NA
Copper, ICAP (mg/L)		6	6	0.025	0.0061	0.0136	1.000	0
Copper, ICAP (mg/L)	Filtered	6	2	0.0086	0.0051	0.00685	1.000	0
Iron, ICAP (mg/L)		6	6	7.5	0.33	3.321667	0.300	6
Iron, ICAP (mg/L)	Filtered	6	1	0.063	0.063	0.063	0.300	0

Table 7.42 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Lead, AAS (mg/L)		6	1	0.004	0.004	0.004	0.015 i	0
Magnesium, ICAP (mg/L)		6	6	10	3.3	6.85	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	9.3	2.4	5.816667	NR	NA
Manganese, ICAP (mg/L)		6	6	0.21	0.019	0.113167	0.050	5
Manganese, ICAP (mg/L)	Filtered	6	6	0.011	0.0023	0.0081	0.050	0
Molybdenum, ICAP (mg/L)		6	2	0.013	0.012	0.0125	NR	NA
Molybdenum, ICAP (mg/L)	Filtered	6	1	0.013	0.013	0.013	NR	NA
Nickel, ICAP (mg/L)		6	2	0.013	0.012	0.0125	0.100	0
Nickel, ICAP (mg/L)	Filtered	6	1	0.013	0.013	0.013	0.100	0
Potassium, ICAP (mg/L)		6	6	7.8	3.1	5.433333	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	5.6	2.6	4.283333	NR	NA
Sodium, ICAP (mg/L)		6	6	130	5.7	64.966667	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	120	5.8	63.01667	NR	NA
Strontium, ICAP (mg/L)		6	6	0.55	0.22	0.378333	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	0.51	0.24	0.348333	NR	NA
Uranium (mg/L)		6	2	0.003	0.001	0.002	0.020	0
Uranium (mg/L)	Filtered	6	2	0.002	0.001	0.0015	0.020	0
Vanadium, ICAP (mg/L)		6	3	0.0092	0.0056	0.007133	NR	NA
Zinc, ICAP (mg/L)		6	6	0.029	0.0046	0.016267	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	1	0.03	0.03	0.03	5.000	0
Conductivity, field measurement (μ mhos/cm)		6	NA	574	373	467.8333	NR	NA

Table 7.42 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Dissolved oxygen, field measurement (ppm)		6	NA	5	0.9	2.916667	NR	NA
pH, field measurement (pH units)		6	NA	8.5	7.3	7.833333	6.5-8.5	0
Redox, field measurement (MV)		6	NA	156	116	141.8	NR	NA
Static water level (ft-TOC)		6	6	0	-3.75	-2.00833	NR	NA
Water temperature, field measurement (°C)		6	NA	22	16.1	19.36667	NR	NA
Alkalinity-CO ₃ (mg/L)		6	2	6	2	4	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	272	174	217.3333	NR	NA
Conductivity (µmhos/cm)		6	6	608	386	476.5	NR	NA
Dissolved solids (mg/L)		6	6	434	252	344	500.000	0
pH (pH units)		6	6	8.5	7.7	8.083333	NR	NA
Total suspended solids (mg/L)		6	6	160	12	88.83333	NR	NA
Turbidity (NTU)		6	6	135	1	90.66667	1.01	5
Gross alpha (pCi/L)		6	6	4.28	1.32 *	2.83	15 n	0
Gross beta (pCi/L)		6	6	9.18	4.23	6.875	4 o	6
Chloroform (µg/L)		6	1	0.7 J	0.7 J	0.7	100.000 t	0
Trichloroethene (µg/L)		6	1	1 J	1 J	1	5.000	0

Table 7.43. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location G1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	25	16	19.95	250.000	0
Fluoride (mg/L)		8	7	0.2	0.1	0.128571	2.000	0
Sulfate (mg/L)		8	8	27	17.9	20.1125	250.000	0
Aluminum, ICAP (mg/L)		8	6	4.2	0.039	1.046833	0.2	4
Aluminum, ICAP (mg/L)	Filtered	8	1	0.024	0.024	0.024	0.2	0
Barium, ICAP (mg/L)		8	8	0.22	0.11	0.1375	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.13	0.11	0.11875	1.000	0
Boron, ICAP (mg/L)		8	8	0.12	0.03	0.059875	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.12	0.024	0.05625	NR	NA
Calcium, ICAP (mg/L)		8	8	76	66	70.625	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	72	65	68	NR	NA
Chromium, AAS (mg/L)		8	1	0.074	0.074	0.074	0.050	1
Chromium, ICAP (mg/L)		8	1	0.018	0.018	0.018	0.050	0
Cobalt, ICAP (mg/L)		8	1	0.0076	0.0076	0.0076	NR	NA
Copper, ICAP (mg/L)		8	3	0.028	0.0045	0.0125	1.000	0
Copper, ICAP (mg/L)	Filtered	8	1	0.004	0.004	0.004	1.000	0
Iron, ICAP (mg/L)		8	8	8.2	0.21	1.775	0.300	7
Iron, ICAP (mg/L)	Filtered	8	7	0.27	0.038	0.158	0.300	0
Lead, AAS (mg/L)		8	1	0.008	0.008	0.008	0.015 i	0
Magnesium, ICAP (mg/L)		8	8	15	8.6	10.3125	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	10	8.6	9.45	NR	NA

Table 7.43 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		8	8	1.2	0.19	0.43875	0.050	8
Manganese, ICAP (mg/L)	Filtered	8	8	0.58	0.16	0.265	0.050	8
Nickel, ICAP (mg/L)		8	3	0.087	0.013	0.04	0.100	0
Nickel, ICAP (mg/L)	Filtered	8	2	0.032	0.011	0.0215	0.100	0
Potassium, ICAP (mg/L)		8	8	3.2	1.8	2.6125	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	2.8	1.9	2.3375	NR	NA
Selenium, ICAP (mg/L)		8	1	0.053	0.053	0.053	0.010	1
Sodium, ICAP (mg/L)		8	8	14	11	12.875	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	15	12	13	NR	NA
Strontium, ICAP (mg/L)		8	8	0.49	0.2	0.34875	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.53	0.2	0.34625	NR	NA
Uranium (mg/L)		8	1	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	8	1	0.001	0.001	0.001	0.020	0
Zinc, ICAP (mg/L)		8	5	0.11	0.0072	0.03548	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	4	0.0096	0.004 c	0.0073	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	483	405	449.25	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	9.3	0.4	2	NR	NA
pH, field measurement (pH units)		8	NA	7.7	6.8	7.2875	6.5-8.5	0
Redox, field measurement (MV)		8	NA	117	30	69.2	NR	NA

Table 7.43 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft-TOC)		8	8	-15.39	-22.5	-18.4375	NR	NA
Water temperature, field measurement (°C)		8	NA	17.5	13.4	16.325	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	202	193	196.5	NR	NA
Conductivity (µmhos/cm)		8	8	484	448	469.75	NR	NA
Dissolved solids (mg/L)		8	8	336	280	303.5	500.000	0
pH (pH units)		8	8	7.9	7.6	7.675	NR	NA
Total suspended solids (mg/L)		8	8	232	1	40.75	NR	NA
Turbidity (NTU)		8	8	200	0.4	43.625	1.01	7
Gross alpha (pCi/L)		8	8	4.87	-0.746	1.4945	15 n	0
Gross beta (pCi/L)		8	8	7.67	0.0772	3.5559	4 o	3
2-Butanone (µg/L)		8	1	12	12	12	NR	NA
Methylene chloride (µg/L)		8	2	11 B	11 B	11	5.000	2

Table 7.44. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location G2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	139	2.9	66.45	250,000	0
Fluoride (mg/L)		8	5	0.2	0.1	0.14	2,000	0
Nitrate nitrogen (mg/L)		8	5	1.1	0.24	0.682	10,000	0
Sulfate (mg/L)		8	8	29	9.7	17.9125	250,000	0
Aluminum, ICAP (mg/L)		8	8	1.9	0.041	0.59025	0.2	4
Aluminum, ICAP (mg/L)	Filtered	8	2	0.032	0.028	0.03	0.2	0
Barium, ICAP (mg/L)		8	8	0.49	0.07	0.266375	1,000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.5	0.055	0.2555	1,000	0
Boron, ICAP (mg/L)		8	8	0.049	0.013	0.025375	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.054 c	0.014	0.02775	NR	NA
Calcium, ICAP (mg/L)		8	8	120	27	71.5	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	120	25	71	NR	NA
Chromium, AAS (mg/L)		8	6	0.88	0.052	0.311	0.050	6
Chromium, ICAP (mg/L)		8	7	0.69	0.029	0.239714	0.050	5
Cobalt, ICAP (mg/L)		8	1	0.0058	0.0058	0.0058	NR	NA
Copper, ICAP (mg/L)		8	4	0.011	0.005	0.00715	1,000	0
Copper, ICAP (mg/L)	Filtered	8	3	0.0048	0.0041	0.004433	1,000	0
Iron, ICAP (mg/L)		8	8	4.7	0.31	1.80125	0.300	8
Iron, ICAP (mg/L)	Filtered	8	4	0.07	0.009	0.03325	0.300	0
Magnesium, ICAP (mg/L)		8	8	16	2.5	8.325	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	16	2.5	8.1875	NR	NA

Table 7.44 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		8	8	0.28	0.024	0.106125	0.050	5
Manganese, ICAP (mg/L)	Filtered	8	8	0.063	0.0035	0.028788	0.050	2
Nickel, ICAP (mg/L)		8	8	0.17	0.012	0.082375	0.100	3
Nickel, ICAP (mg/L)	Filtered	8	7	0.15	0.02	0.068571	0.100	1
Potassium, ICAP (mg/L)		8	8	2.4	0.72	1.4225	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	7	2	0.62	1.35	NR	NA
Sodium, ICAP (mg/L)		8	8	12	5.3	8.65	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	12	5.3	8.4625	NR	NA
Strontium, ICAP (mg/L)		8	8	0.3	0.043	0.156625	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.3	0.041	0.15475	NR	NA
Uranium (mg/L)		8	1	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	8	1	0.001	0.001	0.001	0.020	0
Zinc, ICAP (mg/L)		8	8	0.04 c	0.0021	0.018825	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	5	0.02 c	0.0023	0.00988	5.000	0
Conductivity, field measurement (μ mhos/cm)		8	NA	835	165	459.5	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	9.7	0.5	4.475	NR	NA
pH, field measurement (pH units)		8	NA	7.9	6.1	7.125	6.5-8.5	1
Redox, field measurement (MV)		8	NA	216	122	172.875	NR	NA
Static water level (ft-TOC)		8	8	-9.54	-12.3	-11.0688	NR	NA

Table 7.44 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		8	NA	21.1	13.3	17.8125	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	168	76	121.25	NR	NA
Conductivity (µmhos/cm)		8	8	855	179	479.75	NR	NA
Dissolved solids (mg/L)		8	8	774	110	348.5	500.000	3
pH (pH units)		8	8	7.9	7.1	7.525	NR	NA
Total suspended solids (mg/L)		8	8	91	3	29	NR	NA
Turbidity (NTU)		8	8	110	2.7	22.8	1.01	8
Gross alpha (pCi/L)		8	8	0.837	-0.779	0.286125	15 n	0
Gross beta (pCi/L)		8	8	2.73	-0.806	1.71425	4 o	0
Methylene chloride (µg/L)		8	1	12 B	12 B	12	5.000	1

Table 7.45. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location G3

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	23	4	11.7875	250.000	0
Fluoride (mg/L)		8	4	0.2	0.2	0.2	2.000	0
Nitrate nitrogen (mg/L)		8	4	2.7	0.6	1.21	10.000	0
Sulfate (mg/L)		8	8	25	16.6	20.8	250.000	0
Aluminum, ICAP (mg/L)		8	4	0.91	0.034	0.4835	0.2	2
Aluminum, ICAP (mg/L)	Filtered	8	3	0.083	0.029	0.048333	0.2	0
Arsenic, ICAP (mg/L)		8	1	0.11	0.11	0.11	0.050	1
Arsenic, ICAP (mg/L)	Filtered	8	1	0.093	0.093	0.093	0.050	1
Barium, ICAP (mg/L)		8	8	0.49	0.048	0.25925	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.51	0.048	0.261625	1.000	0
Beryllium, ICAP (mg/L)	Filtered	8	1	0.0012	0.0012	0.0012	0.004	0
Boron, ICAP (mg/L)		8	8	0.11	0.03	0.051	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.077	0.029	0.055125	NR	NA
Calcium, ICAP (mg/L)		8	8	76	47	63.875	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	78	46	65.125	NR	NA
Copper, ICAP (mg/L)		8	2	0.0079	0.0062	0.00705	1.000	0
Copper, ICAP (mg/L)	Filtered	8	1	0.0073	0.0073	0.0073	1.000	0
Iron, ICAP (mg/L)		8	8	1	0.025	0.365625	0.300	2
Iron, ICAP (mg/L)	Filtered	8	4	0.15	0.069	0.12225	0.300	0
Magnesium, ICAP (mg/L)		8	8	11	3.5	7.15	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	12	3.7	7.45	NR	NA

Table 7.45 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		8	8	0.051	0.0018	0.0221	0.050	1
Manganese, ICAP (mg/L)	Filtered	8	6	0.017	0.0026	0.01165	0.050	0
Nickel, ICAP (mg/L)		8	1	0.014	0.014	0.014	0.100	0
Nickel, ICAP (mg/L)	Filtered	8	1	0.017	0.017	0.017	0.100	0
Potassium, ICAP (mg/L)		8	8	3.3	1.8	2.6875	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	3.2	2.2	2.7875	NR	NA
Sodium, ICAP (mg/L)		8	8	7.2	4.6	5.8	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	7.2	4.6	5.925	NR	NA
Strontium, ICAP (mg/L)		8	8	0.48	0.062	0.252625	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.5	0.062	0.258	NR	NA
Uranium (mg/L)		8	2	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	8	2	0.001	0.001	0.001	0.020	0
Zinc, ICAP (mg/L)		8	7	0.071	0.005	0.019757	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	8	0.033	0.0033	0.011712	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	466	258	384.875	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	9.1	0.6	3.6375	NR	NA
pH, field measurement (pH units)		8	NA	7.4	7	7.2125	6.5-8.5	0
Redox, field measurement (MV)		8	NA	199	21	133.5	NR	NA
Static water level (ft-TOC)		8	8	-10.6	-15.2	-12.5938	NR	NA

Table 7.45 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		8	NA	21.2	16	18.4875	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	208	120	169	NR	NA
Conductivity (µmhos/cm)		8	8	486	300	395.5	NR	NA
Dissolved solids (mg/L)		8	8	292	182	241.25	500.000	0
pH (pH units)		8	8	7.8	7.3	7.55	NR	NA
Total suspended solids (mg/L)		8	6	20	1	5.666667	NR	NA
Turbidity (NTU)		8	8	55	0.6	8.5375	1.01	7
Gross alpha (pCi/L)		8	8	3.2	-0.545	0.899801	15 n	0
Gross beta (pCi/L)		8	8	5.38	0.717	2.954625	4 o	2
Carbon tetrachloride (µg/L)		8	5	7 J	2 J	4.6	5.000	1
Chloroform (µg/L)		8	5	8	0.7 J	4.54	100.000 t	0
Tetrachloroethene (µg/L)		8	3	3 J	3 J	3	5.000	0
Trichloroethene (µg/L)		8	2	1 J	0.8 J	0.9	5.000	0

Table 7.46. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location H2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	11	3	5.3875	250.000	0
Fluoride (mg/L)		8	4	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		8	2	0.27	0.2	0.235	10.000	0
Sulfate (mg/L)		8	8	12	5	9.4375	250.000	0
Aluminum, ICAP (mg/L)		8	6	2.7	0.023	0.5445	0.2	2
Aluminum, ICAP (mg/L)	Filtered	8	3	0.073	0.025	0.056333	0.2	0
Arsenic, ICAP (mg/L)	Filtered	8	2	0.063	0.051	0.057	0.050	2
Barium, ICAP (mg/L)		8	8	0.5	0.35	0.42125	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.46	0.34	0.40625	1.000	0
Boron, ICAP (mg/L)		8	8	0.078	0.022	0.0435	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.077	0.015	0.03675	NR	NA
Calcium, ICAP (mg/L)		8	8	74	55	63.875	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	73	54	63.25	NR	NA
Copper, ICAP (mg/L)		8	2	0.008	0.0065	0.00725	1.000	0
Iron, ICAP (mg/L)		8	8	3.2	0.027	0.498875	0.300	1
Iron, ICAP (mg/L)	Filtered	8	6	0.1	0.0079	0.03915	0.300	0
Magnesium, ICAP (mg/L)		8	8	7.6	5.9	6.6875	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	7.2	5.9	6.5625	NR	NA
Manganese, ICAP (mg/L)		8	8	0.25	0.023	0.058375	0.050	1
Manganese, ICAP (mg/L)	Filtered	8	8	0.038	0.0079	0.02488	0.050	0

Table 7.46 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Potassium, ICAP (mg/L)		8	8	2.8	1.1	1.8875	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	2.5	1.1	1.6875	NR	NA
Selenium, ICAP (mg/L)	Filtered	8	2	0.063	0.059	0.061	0.010	2
Sodium, ICAP (mg/L)		8	8	5.5	4.1	4.675	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	5.1	4.1	4.5625	NR	NA
Strontium, ICAP (mg/L)		8	8	0.17	0.11	0.13375	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.16	0.11	0.13125	NR	NA
Uranium (mg/L)	Filtered	8	1	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		8	1	0.006	0.006	0.006	NR	NA
Zinc, ICAP (mg/L)		8	6	0.016	0.0029	0.009267	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.015	0.0026	0.005786	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	423	284	347.75	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	6.8	0.6	1.875	NR	NA
pH, field measurement (pH units)		8	NA	7.6	6.5	7.05	6.5-8.5	0
Redox, field measurement (MV)		8	NA	207	80	122.4429	NR	NA
Static water level (ft-TOC)		8	8	-5.75	-17.05	-12.8	NR	NA

Table 7.46 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		8	NA	22.7	13.8	16.8875	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	201	162	183.25	NR	NA
Conductivity (µmhos/cm)		8	8	402	325	360.875	NR	NA
Dissolved solids (mg/L)		8	8	262	204	234.75	500.000	0
pH (pH units)		8	8	8.1	7.4	7.6875	NR	NA
Total suspended solids (mg/L)		8	5	5	22	19.2	NR	NA
Turbidity (NTU)		8	8	240	0.5	35.2875	1.01	5
Gross alpha (pCi/L)		8	8	2.24	-0.909	0.358	15 n	0
Gross beta (pCi/L)		8	8	4.5	-0.0832	1.57085	4.0	1

Table 7.47. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location H3

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	44	8.8	29.225	250.000	0
Nitrate nitrogen (mg/L)		8	8	1.8	0.47	0.96375	10.000	0
Sulfate (mg/L)		8	8	44	28	35.375	250.000	0
Aluminum, ICAP (mg/L)		8	6	2.6	0.039	0.5965	0.2	2
Aluminum, ICAP (mg/L)	Filtered	8	3	0.044	0.026	0.037	0.2	0
Arsenic, ICAP (mg/L)		8	2	0.052	0.052	0.052	0.050	2
Barium, ICAP (mg/L)		8	8	0.18	0.082	0.130125	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.18	0.072	0.124125	1.000	0
Boron, ICAP (mg/L)		8	8	0.14	0.029	0.055375	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.074	0.023	0.038375	NR	NA
Calcium, ICAP (mg/L)		8	8	100	79	87.5	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	99	78	88	NR	NA
Chromium, AAS (mg/L)		8	5	2.6	0.026	1.0844	0.050	4
Chromium, AAS (mg/L)	Filtered	8	1	0.07	0.07	0.07	0.050	1
Chromium, ICAP (mg/L)		8	5	2.3	0.029	0.9678	0.050	4
Chromium, ICAP (mg/L)	Filtered	8	1	0.078	0.078	0.078	0.050	1
Cobalt, ICAP (mg/L)		8	3	0.03	0.013	0.023667	NR	NA
Cobalt, ICAP (mg/L)	Filtered	8	3	0.014	0.0055	0.010167	NR	NA
Copper, ICAP (mg/L)		8	5	0.016	0.0041	0.00982	1.000	0
Copper, ICAP (mg/L)	Filtered	8	1	0.0059	0.0059	0.0059	1.000	0
Iron, ICAP (mg/L)		8	8	25	0.0071	7.035888	0.300	4
Iron, ICAP (mg/L)	Filtered	8	5	1.7	0.0077	0.63674	0.300	2

Table 7.47 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)		8	8	6.9	4.9	5.8625	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	6.8	4.7	5.925	NR	NA
Manganese, ICAP (mg/L)		8	7	0.3	0.001	0.1133	0.050	4
Manganese, ICAP (mg/L)	Filtered	8	7	0.17	0.0016	0.049786	0.050	3
Molybdenum, ICAP (mg/L)		8	3	0.03	0.012	0.019333	NR	NA
Nickel, ICAP (mg/L)		8	5	1.5	0.021	0.7222	0.100	4
Nickel, ICAP (mg/L)	Filtered	8	4	1	0.072	0.6705	0.100	3
Potassium, ICAP (mg/L)		8	8	6.1	2.3	3.5875	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	4	2.2	3.0875	NR	NA
Selenium, ICAP (mg/L)		8	1	0.066	0.066	0.066	0.010	1
Sodium, ICAP (mg/L)		8	8	14	4	8.5125	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	14	4.2	8.775	NR	NA
Strontium, ICAP (mg/L)		8	8	0.23	0.15	0.1825	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.23	0.14	0.18375	NR	NA
Uranium (mg/L)		8	3	0.002	0.001	0.001333	0.020	0
Uranium (mg/L)	Filtered	8	3	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		8	3	0.0079	0.0063	0.0073	NR	NA
Zinc, ICAP (mg/L)		8	8	0.034	0.0027	0.011775	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.034	0.0026	0.0097	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	565	421	489.625	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	4.3	0.7	2.4125	NR	NA

Table 7.47 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		8	NA	8.3	6.9	7.2875	6.5-8.5	0
Redox, field measurement (MV)		8	NA	168	3	119.375	NR	NA
Static water level (ft-TOC)		8	8	-11.32	-17.11	-14.9013	NR	NA
Water temperature, field measurement (°C)		8	NA	22.3	16.3	18.6875	NR	NA
Alkalinity-CO ₃ (mg/L)		8	1	1	1	1	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	198	164	179.125	NR	NA
Conductivity (µmhos/cm)		8	8	579	451	513.375	NR	NA
Dissolved solids (mg/L)		8	8	380	290	333.5	500.000	0
pH (pH units)		8	8	7.9	7.4	7.6625	NR	NA
Total suspended solids (mg/L)		8	6	63	2	30.5	NR	NA
Turbidity (NTU)		8	8	150	0.4	30.1	1.01	5
Gross alpha (pCi/L)		8	8	4.81	-0.378	0.84525	15 n	0
Gross beta (pCi/L)		8	8	8.33	-0.165	3.077	4 o	2
2-Butanone (µg/L)		8	2	11 B	7 JB	9	NR	NA
Acetone (µg/L)		8	3	17	6 JB	12.66667	NR	NA
Chloroform (µg/L)		8	1	1 J	1 J	1	100.000 t	0
Methylene chloride (µg/L)		8	3	3 J	1 JB	2	5.000	0
Tetrachloroethene (µg/L)		8	3	2 J	2 J	2	5.000	0
Trichloroethene (µg/L)		8	7	4 J	2 J	3.142857	5.000	0

Table 7.48. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location 11

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	12	3	5.6125	250.000	0
Fluoride (mg/L)		8	8	0.4	0.1	0.2875	2.000	0
Nitrate nitrogen (mg/L)		8	5	0.5	0.3	0.38	10.000	0
Sulfate (mg/L)		8	8	29	13	21.5	250.000	0
Aluminum, ICAP (mg/L)		8	8	87	0.083	11.79038	0.2	5
Aluminum, ICAP (mg/L)	Filtered	8	4	0.061	0.04	0.05425	0.2	0
Arsenic, ICAP (mg/L)		8	1	0.051	0.051	0.051	0.050	1
Barium, ICAP (mg/L)		8	8	1.4	0.13	0.38125	1.000	1
Barium, ICAP (mg/L)	Filtered	8	8	0.32	0.094	0.2105	1.000	0
Beryllium, ICAP (mg/L)		8	1	0.0043	0.0043	0.0043	0.004	1
Boron, ICAP (mg/L)		8	8	0.22	0.058	0.131375	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.17	0.05	0.104	NR	NA
Cadmium, AAS (mg/L)		8	1	0.003	0.003	0.003	0.005	0
Cadmium, AAS (mg/L)	Filtered	8	1	0.0035	0.0035	0.0035	0.005	0
Cadmium, ICAP (mg/L)		8	1	0.0038	0.0038	0.0038	0.005	0
Cadmium, ICAP (mg/L)	Filtered	8	1	0.0031	0.0031	0.0031	0.005	0
Calcium, ICAP (mg/L)		8	8	68	37	49.375	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	58	35	46.375	NR	NA
Chromium, AAS (mg/L)		8	1	0.18	0.18	0.18	0.050	1
Chromium, ICAP (mg/L)		8	1	0.11	0.11	0.11	0.050	1
Cobalt, ICAP (mg/L)		8	2	0.092	0.0058	0.0489	NR	NA
Copper, ICAP (mg/L)		8	4	0.092	0.0055	0.027525	1.000	0

Table 7.48 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Copper, ICAP (mg/L)	Filtered	8	3	0.015	0.0055	0.0092	1.000	0
Iron, ICAP (mg/L)		8	8	210	0.18	27.78125	0.300	5
Iron, ICAP (mg/L)	Filtered	8	6	0.47	0.0069	0.15765	0.300	1
Lead, AAS (mg/L)		8	2	0.22	0.004	0.112	0.015 i	1
Lead, ICAP (mg/L)		8	1	0.19	0.19	0.19	0.015 i	1
Magnesium, ICAP (mg/L)		8	8	32	6.8	12.6	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	14	6.5	9.925	NR	NA
Manganese, ICAP (mg/L)		8	8	20	0.0067	2.982175	0.050	4
Manganese, ICAP (mg/L)	Filtered	8	8	2	0.002	0.606588	0.050	4
Nickel, ICAP (mg/L)		8	1	0.1	0.1	0.1	0.100	0
Nickel, ICAP (mg/L)	Filtered	8	1	0.013	0.013	0.013	0.100	0
Potassium, ICAP (mg/L)		8	8	17	2.5	4.7375	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	3.1	2.2	2.775	NR	NA
Selenium, ICAP (mg/L)		8	1	0.055	0.055	0.055	0.010	1
Selenium, ICAP (mg/L)	Filtered	8	1	0.074	0.074	0.074	0.010	1
Sodium, ICAP (mg/L)		8	8	78	6.9	41	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	73	7.3	39.5125	NR	NA
Strontium, ICAP (mg/L)		8	8	0.8	0.12	0.45125	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.75	0.12	0.43125	NR	NA
Uranium (mg/L)		8	4	0.004	0.001	0.00175	0.020	0
Uranium (mg/L)	Filtered	8	4	0.002	0.001	0.0015	0.020	0
Vanadium, ICAP (mg/L)		8	2	0.13	0.0051	0.06755	NR	NA

Table 7.48 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Zinc, ICAP (mg/L)		8	8	0.28	0.0025	0.060938	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	8	0.086	0.0021	0.026913	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	548	287	442.5	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	11	2.5	6.0125	NR	NA
pH, field measurement (pH units)		8	NA	8.1	6	7.2375	6.5-8.5	1
Redox, field measurement (MV)		8	NA	209	108	159.125	NR	NA
Static water level (ft-TOC)		8	8	-15.67	-18.97	-17.5625	NR	NA
Water temperature, field measurement (°C)		8	NA	19.2	12.7	15.2625	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	300	12	188.5	NR	NA
Conductivity (µmhos/cm)		8	8	535	371	451	NR	NA
Dissolved solids (mg/L)		8	8	328	226	293.75	500.000	0
pH (pH units)		8	8	8.3	6.5	7.3875	NR	NA
Total suspended solids (mg/L)		8	8	300	2	98.25	NR	NA
Turbidity (NTU)		8	8	72	1.7	24.775	1.01	8
Gross alpha (pCi/L)		8	8	2.88	0.179	1.361625	15 n	0
Gross beta (pCi/L)		8	8	10.4	0.931	4.993875	4 o	4
2-Butanone (µg/L)		8	2	11 B	10 B	10.5	NR	NA
Acetone (µg/L)		8	1	5 BJ	5 BJ	5	NR	NA
Methylene chloride (µg/L)		8	3	2 JB	1 JB	1.666667	5.000	0

Table 7.49. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location 12

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	13	3.3	5.225	250.000	0
Fluoride (mg/L)		8	2	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		8	2	0.36	0.14	0.25	10.000	0
Sulfate (mg/L)		8	8	13	2	8.15	250.000	0
Aluminum, ICAP (mg/L)		8	8	1.4	0.051	0.353125	0.2	3
Aluminum, ICAP (mg/L)	Filtered	8	5	0.84	0.026	0.1924	0.2	1
Barium, ICAP (mg/L)		8	8	0.37	0.052	0.174625	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.29	0.044	0.159625	1.000	0
Beryllium, ICAP (mg/L)		8	1	0.00043	0.00043	0.00043	0.004	0
Boron, ICAP (mg/L)		8	8	0.09 c	0.019	0.048875	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.061	0.015	0.042	NR	NA
Cadmium, AAS (mg/L)		8	1	0.0026	0.0026	0.0026	0.005	0
Cadmium, ICAP (mg/L)		8	1	0.0032	0.0032	0.0032	0.005	0
Calcium, ICAP (mg/L)		8	8	53	2.5	22.625	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	43	2.4	19.4	NR	NA
Copper, ICAP (mg/L)		8	3	0.0095	0.004	0.006267	1.000	0
Copper, ICAP (mg/L)	Filtered	8	1	0.0063	0.0063	0.0063	1.000	0
Iron, ICAP (mg/L)		8	8	2.2	0.0081	0.476888	0.300	2
Iron, ICAP (mg/L)	Filtered	8	3	0.013	0.005	0.0092	0.300	0
Magnesium, ICAP (mg/L)		8	8	9.2	1	4.225	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	8	0.89	4.11125	NR	NA

Table 7.49 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		8	8	0.09	0.002	0.041563	0.050	3
Manganese, ICAP (mg/L)	Filtered	8	7	0.059	0.0015	0.026157	0.050	1
Nickel, ICAP (mg/L)		8	1	0.011	0.011	0.011	0.100	0
Potassium, ICAP (mg/L)		8	8	4.8	0.67	2.435	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	7	4	0.72	2.432857	NR	NA
Sodium, ICAP (mg/L)		8	8	14	2.6	8.0125	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	14	2.7	7.9	NR	NA
Strontium, ICAP (mg/L)		8	8	0.79	0.012	0.293625	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.66	0.011	0.273375	NR	NA
Uranium (mg/L)		8	1	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	8	3	0.006	0.002	0.003667	0.020	0
Vanadium, ICAP (mg/L)		8	1	0.0054	0.0054	0.0054	NR	NA
Zinc, ICAP (mg/L)		8	8	0.08	0.0029	0.032475	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	8	0.073	0.0031	0.0258	5.000	0
Conductivity, field measurement (µmhos/cm)		10	NA	306	43	153	NR	NA
Dissolved oxygen, field measurement (ppm)		10	NA	45	1.6	8.993	NR	NA
pH, field measurement (pH units)		10	NA	9.6	4.9	7.14	6.5-8.5	7
Redox, field measurement (MV)		10	NA	345	21	165.8	NR	NA
Static water level (ft-TOC)		10	10	-9.95	-13.54	-12.064	NR	NA

Table 7.49 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		10	NA	21.3	15.1	19.27	NR	NA
Alkalinity-CO ₃ (mg/L)		8	4	20	2	11	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	150	9	67.75	NR	NA
Conductivity (µmhos/cm)		8	7	325	41	180.4286	NR	NA
Dissolved solids (mg/L)		8	8	194	32	116.75	500.000	0
pH (pH units)		8	8	9	5.3	7.0875	NR	NA
Total petroleum hydrocarbons (mg/L)		8	3	0.007	0.003	0.005	0.10 m	0
Total suspended solids (mg/L)		8	7	117	1	26.28571	NR	NA
Turbidity (NTU)		8	8	33	0.7	8.45	1.01	7
Gross alpha (pCi/L)		8	8	2.2	-0.587	0.641084	15 n	0
Gross beta (pCi/L)		8	8	6.96	-0.357	2.867039	4 o	2
Toluene (µg/L)		8	1	1 J	1 J	1	1000.00	0
Xylenes (µg/L)		8	1	0.7 J	0.7 J	0.7	10000.0	0

Table 7.50. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location J3

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	53	11	28	250.000	0
Fluoride (mg/L)		8	2	0.66	0.04	0.35	2.000	0
Nitrate nitrogen (mg/L)		8	1	0.4	0.4	0.4	10.000	0
Sulfate (mg/L)		8	8	21	3.8	8.5	250.000	0
Aluminum, ICAP (mg/L)		8	6	0.31	0.022	0.085833	0.2	1
Aluminum, ICAP (mg/L)	Filtered	8	1	0.03	0.03	0.03	0.2	0
Arsenic, ICAP (mg/L)		8	1	0.053	0.053	0.053	0.050	1
Barium, ICAP (mg/L)		8	8	0.58	0.12	0.345	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.58	0.12	0.345	1.000	0
Beryllium, ICAP (mg/L)		8	1	0.0024	0.0024	0.0024	0.004	0
Beryllium, ICAP (mg/L)	Filtered	8	2	0.0012	0.00044	0.00082	0.004	0
Boron, ICAP (mg/L)		8	8	0.14 c	0.028	0.05875	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.12	0.011	0.06125	NR	NA
Calcium, ICAP (mg/L)		8	8	61	27	43.25	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	62	27	43.5	NR	NA
Cobalt, ICAP (mg/L)		8	2	0.0055	0.0051	0.0053	NR	NA
Cobalt, ICAP (mg/L)	Filtered	8	2	0.0074	0.0054	0.0064	NR	NA
Copper, ICAP (mg/L)		8	2	0.0047	0.0042	0.00445	1.000	0
Copper, ICAP (mg/L)	Filtered	8	3	0.039	0.0052	0.0244	1.000	0
Iron, ICAP (mg/L)		8	8	0.5	0.17	0.25875	0.300	1
Iron, ICAP (mg/L)	Filtered	8	8	0.25	0.14	0.19375	0.300	0

Table 7.50 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)		8	8	11	3.3	6.8	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	11	3.4	6.8125	NR	NA
Manganese, ICAP (mg/L)		8	8	1.8	0.012	0.83175	0.050	4
Manganese, ICAP (mg/L)	Filtered	8	8	1.8	0.011	0.844	0.050	4
Nickel, ICAP (mg/L)		8	3	0.023	0.015	0.02	0.100	0
Nickel, ICAP (mg/L)	Filtered	8	4	0.024	0.013	0.01775	0.100	0
Potassium, ICAP (mg/L)		8	8	3.4	1.7	2.5	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	3.2	1.5	2.5	NR	NA
Sodium, ICAP (mg/L)		8	8	9.9	8.5	9.025	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	9.8	8.4	9.0375	NR	NA
Strontium, ICAP (mg/L)		8	8	0.47	0.073	0.26675	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.47	0.074	0.26575	NR	NA
Uranium (mg/L)	Filtered	8	2	0.001	0.001	0.001	0.020	0
Zinc, ICAP (mg/L)		8	7	0.023	0.0055	0.013571	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.029	0.0024	0.010586	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	404	234	326.875	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	2	0.4	0.8625	NR	NA
pH, field measurement (pH units)		8	NA	7.7	5.2	6.3625	6.5-8.5	4
Redox, field measurement (MV)		8	NA	146	40	101.5	NR	NA

Table 7.50 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Static water level (ft.-TOC)		8	8	-4.06	-5.5	-4.63625	NR	NA
Water temperature, field measurement (°C)		8	NA	19.5	13	17.05	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	188	40	115.5	NR	NA
Conductivity (µmhos/cm)		8	8	395	229	314.875	NR	NA
Dissolved solids (mg/L)		8	8	268	128	190.5	500.000	0
pH (pH units)		8	8	7.9	5.6	6.725	NR	NA
Total suspended solids (mg/L)		8	4	2	1	1.25	NR	NA
Turbidity (NTU)		8	8	3.9	0.1	1.1625	1.01	4
Gross alpha (pCi/L)		8	8	3.99	-0.83	0.994033	15 n	0
Gross beta (pCi/L)		8	8	8.06 *	2.39	3.915	4 o	2
2-Butanone (µg/L)		8	2	9 BJ	9 BJ	9	NR	NA
Acetone (µg/L)		8	2	7 BJ	5 BJ	6	NR	NA
Methylene chloride (µg/L)		8	2	2 BJ	2 BJ	2	5.000	0

Table 7.51. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location K1

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		12	12	19	4.2	10.55833	250.000	0
Fluoride (mg/L)		12	8	0.2	0.1	0.1125	2.000	0
Nitrate nitrogen (mg/L)		12	6	3	0.2	1.086667	10.000	0
Sulfate (mg/L)		12	12	29	21	25.16667	250.000	0
Aluminum, ICAP (mg/L)		12	12	4.9	0.025	0.554333	0.2	3
Aluminum, ICAP (mg/L)	Filtered	12	8	0.12	0.023	0.045375	0.2	0
Arsenic, ICAP (mg/L)	Filtered	12	1	0.067	0.067	0.067	0.050	1
Barium, ICAP (mg/L)		12	12	0.19	0.099	0.156583	1.000	0
Barium, ICAP (mg/L)		12	12	0.19	0.1	0.155833	1.000	0
Beryllium, ICAP (mg/L)		12	2	0.00044	0.0003	0.00037	0.004	0
Boron, ICAP (mg/L)		12	12	0.15	0.024	0.08125	NR	NA
Boron, ICAP (mg/L)	Filtered	12	12	0.12	0.017	0.078167	NR	NA
Calcium, ICAP (mg/L)		12	12	69	7.5	44.29167	NR	NA
Calcium, ICAP (mg/L)	Filtered	12	12	69	8.2	44.85	NR	NA
Chromium, AAS (mg/L)		12	3	0.3	0.038	0.134667	0.050	2
Chromium, ICAP (mg/L)		12	3	0.33	0.046	0.145	0.050	2
Cobalt, ICAP (mg/L)		12	1	0.0076	0.0076	0.0076	NR	NA
Copper, ICAP (mg/L)		12	6	0.012	0.0043	0.0076	1.000	0
Copper, ICAP (mg/L)	Filtered	12	5	0.0065	0.0043	0.00562	1.000	0
Iron, ICAP (mg/L)		12	12	9.2	0.048	1.095833	0.300	5
Iron, ICAP (mg/L)	Filtered	12	10	0.27	0.0072	0.13862	0.300	0

Table 7.51 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)		12	12	11	3.4	8.325	NR	NA
Magnesium, ICAP (mg/L)	Filtered	12	12	11	3.8	8.325	NR	NA
Manganese, ICAP (mg/L)		12	12	0.59	0.024	0.205667	0.050	10
Manganese, ICAP (mg/L)	Filtered	12	12	0.52	0.024	0.162917	0.050	10
Nickel, ICAP (mg/L)		12	4	0.19	0.016	0.10475	0.100	2
Nickel, ICAP (mg/L)	Filtered	12	4	0.13	0.019	0.07425	0.100	1
Potassium, ICAP (mg/L)		12	12	3.5	1.1	2.775	NR	NA
Potassium, ICAP (mg/L)	Filtered	12	12	3.8	1.3	2.725	NR	NA
Silver, ICAP (mg/L)		12	1	0.0089	0.0089	0.0089	0.010	0
Sodium, ICAP (mg/L)		12	12	30	6.9	19.575	NR	NA
Sodium, ICAP (mg/L)	Filtered	12	12	30	7	19.86667	NR	NA
Strontium, ICAP (mg/L)		12	12	1.1	0.037	0.595667	NR	NA
Strontium, ICAP (mg/L)	Filtered	12	12	1.1	0.04	0.601667	NR	NA
Uranium (mg/L)		12	3	0.004	0.002	0.002667	0.020	0
Uranium (mg/L)	Filtered	12	6	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		12	1	0.017	0.017	0.017	NR	NA
Zinc, ICAP (mg/L)		12	10	0.1	0.0029	0.01925	5.000	0
Zinc, ICAP (mg/L)	Filtered	12	10	0.027	0.0026	0.01158	5.000	0
Conductivity, field measurement (µmhos/cm)		12	NA	514	137	358.4167	NR	NA
Dissolved oxygen, field measurement (ppm)		12	NA	5.4	0.5	2.858333	NR	NA

Table 7.51 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
pH, field measurement (pH units)		12	NA	7.6	5.1	6.675	6.5-8.5	4
Redox, field measurement (MV)		12	NA	245.1	41	131.3	NR	NA
Static water level (ft-TOC)		12	12	-3.37	-10	-6.79083	NR	NA
Water temperature, field measurement (°C)		12	NA	20.3	13.1	16.75	NR	NA
Alkalinity-HCO ₃ (mg/L)		12	12	211	35	146.9167	NR	NA
Conductivity (µmhos/cm)		12	12	460	118	346.8333	NR	NA
Dissolved solids (mg/L)		12	12	296	90	217.3333	500.000	0
pH (pH units)		12	12	7.7	5.6	7.058333	NR	NA
Total suspended solids (mg/L)		12	4	71	3	25.25	NR	NA
Turbidity (NTU)		12	12	60	0.3	8.575	1.01	10
Gross alpha (pCi/L)		12	12	5.21	-0.386	1.115494	15 n	0
Gross beta (pCi/L)		12	12	13.4	1.11	4.484167	4 o	5
Ethylbenzene (µg/L)		12	1	1 J	1 J	1	700.000	0

Table 7.52. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location K2

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		12	12	29	2	13.76667	250.000	0
Fluoride (mg/L)		12	7	0.2	0.1	0.157143	2.000	0
Sulfate (mg/L)		12	12	44	18	33.33333	250.000	0
Aluminum, ICAP (mg/L)		12	12	2.8	0.021	0.5955	0.2	5
Aluminum, ICAP (mg/L)	Filtered	12	9	0.048	0.024	0.030889	0.2	0
Barium, ICAP (mg/L)		12	12	0.25	0.12	0.164167	1.000	0
Barium, ICAP (mg/L)	Filtered	12	12	0.23	0.12	0.151667	1.000	0
Boron, ICAP (mg/L)		12	12	0.12	0.016	0.064	NR	NA
Boron, ICAP (mg/L)	Filtered	12	12	0.17	0.016	0.066667	NR	NA
Calcium, ICAP (mg/L)		12	12	130	41	79.5	NR	NA
Calcium, ICAP (mg/L)	Filtered	12	12	130	41	80.08333	NR	NA
Chromium, AAS (mg/L)		12	1	0.019	0.019	0.019	0.050	0
Copper, ICAP (mg/L)		12	3	0.0099	0.0066	0.008367	1.000	0
Copper, ICAP (mg/L)	Filtered	12	3	0.0064	0.0041	0.0053	1.000	0
Iron, ICAP (mg/L)		12	12	4.1	0.083	1.058083	0.300	8
Iron, ICAP (mg/L)	Filtered	12	9	0.78	0.017	0.345	0.300	4
Magnesium, ICAP (mg/L)		12	12	11	7.2	9.558333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	12	12	11	7	9.375	NR	NA
Manganese, ICAP (mg/L)		12	12	2.9	0.013	0.584667	0.050	7
Manganese, ICAP (mg/L)	Filtered	12	12	2	0.0012	0.552617	0.050	5

Table 7.52 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Potassium, ICAP (mg/L)		12	12	2.8	0.87	1.814167	NR	NA
Potassium, ICAP (mg/L)	Filtered	12	11	3.2	1	1.936364	NR	NA
Sodium, ICAP (mg/L)		12	12	42	6.5	18.35833	NR	NA
Sodium, ICAP (mg/L)	Filtered	12	12	42	6.5	18.38333	NR	NA
Strontium, ICAP (mg/L)		12	12	0.67	0.17	0.353333	NR	NA
Strontium, ICAP (mg/L)	Filtered	12	12	0.68	0.17	0.353333	NR	NA
Uranium (mg/L)		12	4	0.008	0.001	0.00375	0.020	0
Uranium (mg/L)	Filtered	12	5	0.005	0.001	0.002	0.020	0
Vanadium, ICAP (mg/L)		12	1	0.0087	0.0087	0.0087	NR	NA
Zinc, ICAP (mg/L)		12	10	0.031	0.0021	0.01114	5.000	0
Zinc, ICAP (mg/L)	Filtered	12	7	0.039	0.0024	0.0122	5.000	0
Conductivity, field measurement (μ mhos/cm)		12	NA	673	396	487.25	NR	NA
Dissolved oxygen, field measurement (ppm)		12	NA	6.2	0.5	2.533333	NR	NA
pH, field measurement (pH units)		12	NA	7.9	6.1	7.216667	6.5-8.5	1
Redox, field measurement (MV)		12	NA	139	58	106.7	NR	NA
Static water level (ft-TOC)		12	12	-2.61	-7.65	-5.8225	NR	NA
Water temperature, field measurement ($^{\circ}$ C)		12	NA	20.3	9.5	16.64167	NR	NA

Table 7.52 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Alkalinity-HCO ₃ (mg/L)		12	12	271	170	219.5	NR	NA
Conductivity (µmhos/cm)		12	12	665	410	509.75	NR	NA
Dissolved solids (mg/L)		12	12	408	246	322.6667	500.000	0
pH (pH units)		12	12	8	7	7.583333	NR	NA
Total suspended solids (mg/L)		12	8	149	2	45.125	NR	NA
Turbidity (NTU)		12	12	160	1	21.38333	1.01	11
Gross alpha (pCi/L)		12	12	6.98	-0.381	1.804264	15 n	0
Gross beta (pCi/L)		12	12	7.23	1.4	4.106667	4 o	5
2-Butanone (µg/L)		12	1	13 B	13 B	13	NR	NA
Methylene chloride (µg/L)		12	1	2 JB	2 JB	2	5.000	0

Table 7.53. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=GW Monitoring Plan Grid Location K3

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		2	2	5.6	4.6	5.1	250.000	0
Nitrate nitrogen (mg/L)		2	1	0.56	0.56	0.56	10.000	0
Sulfate (mg/L)		2	2	22	17	19.5	250.000	0
Aluminum, ICAP (mg/L)		2	2	2	1	1.5	0.2	2
Barium, ICAP (mg/L)		2	2	0.35	0.34	0.345	1.000	0
Barium, ICAP (mg/L)	Filtered	2	2	0.35	0.31	0.33	1.000	0
Boron, ICAP (mg/L)		2	2	0.042	0.014	0.028	NR	NA
Boron, ICAP (mg/L)	Filtered	2	2	0.055	0.044	0.0495	NR	NA
Calcium, ICAP (mg/L)		2	2	76	69	72.5	NR	NA
Calcium, ICAP (mg/L)	Filtered	2	2	74	67	70.5	NR	NA
Copper, ICAP (mg/L)		2	1	0.045	0.045	0.045	1.000	0
Iron, ICAP (mg/L)		2	2	2.2	1.3	1.75	0.300	2
Iron, ICAP (mg/L)	Filtered	2	2	0.12	0.013	0.0665	0.300	0
Magnesium, ICAP (mg/L)		2	2	8.8	7.9	8.35	NR	NA
Magnesium, ICAP (mg/L)	Filtered	2	2	8.4	7.4	7.9	NR	NA
Manganese, ICAP (mg/L)		2	2	0.29	0.24	0.265	0.050	2
Manganese, ICAP (mg/L)	Filtered	2	2	0.14	0.054	0.097	0.050	2
Potassium, ICAP (mg/L)		2	2	5.5	2.7	4.1	NR	NA
Potassium, ICAP (mg/L)	Filtered	2	2	5.2	2	3.6	NR	NA
Sodium, ICAP (mg/L)		2	2	10	5.1	7.55	NR	NA
Sodium, ICAP (mg/L)	Filtered	2	2	10	5	7.5	NR	NA
Strontium, ICAP (mg/L)		2	2	0.22	0.2	0.21	NR	NA

Table 7.53 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Strontium, ICAP (mg/L)	Filtered	2	2	0.21	0.19	0.2	NR	NA
Zinc, ICAP (mg/L)		2	2	0.012	0.0094	0.0107	5.000	0
Zinc, ICAP (mg/L)	Filtered	2	2	0.0054	0.0035	0.00445	5.000	0
Conductivity, field measurement (µmhos/cm)		2	NA	445	429	437	NR	NA
Dissolved oxygen, field measurement (ppm)		2	NA	2.3	1	1.65	NR	NA
pH, field measurement (pH units)		2	NA	7.9	7.2	7.55	6.5-8.5	0
Redox, field measurement (MV)		2	NA	143	143	143	NR	NA
Static water level (ft-TOC)		2	2	-7.38	-8	-7.69	NR	NA
Water temperature, field measurement (°C)		2	NA	19.5	15.6	17.55	NR	NA
Alkalinity-HCO ₃ (mg/L)		2	1	215	215	215	NR	NA
Conductivity (µmhos/cm)		2	2	441	419	430	NR	NA
Dissolved solids (mg/L)		2	2	338	230	284	500.000	0
pH (pH units)		2	2	7.9	7.4	7.65	NR	NA
Total suspended solids (mg/L)		2	2	54	35	44.5	NR	NA
Turbidity (NTU)		2	2	36	20	28	1.01	2
Gross alpha (pCi/L)		2	2	0.177	-0.991	-0.407	15 n	0
Gross beta (pCi/L)		2	2	8.74	-8.45	0.145	4 o	1
2-Butanone (µg/L)		2	1	12	12	12	NR	NA
Methylene chloride (µg/L)		2	1	1 J	1 J	1	5.000	0

Table 7.54. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Grid J Primary

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	44	1	31.5	250.000	0
Fluoride (mg/L)		8	7	0.3	0.1	0.157143	2.000	0
Nitrate nitrogen (mg/L)		8	1	0.42	0.42	0.42	10.000	0
Sulfate (mg/L)		8	8	18	1	10	250.000	0
Aluminum, ICAP (mg/L)		8	7	0.82	0.18	0.471429	0.2	6
Aluminum, ICAP (mg/L)	Filtered	8	5	0.038	0.022	0.0316	0.2	0
Barium, ICAP (mg/L)		8	8	0.61	0.069	0.343	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.61	0.07	0.342375	1.000	0
Beryllium, ICAP (mg/L)		8	1	0.00031	0.00031	0.00031	0.004	0
Boron, ICAP (mg/L)		8	7	0.21	0.03	0.092857	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.18	0.02	0.088875	NR	NA
Cadmium, ICAP (mg/L)		8	1	0.0043	0.0043	0.0043	0.005	0
Calcium, ICAP (mg/L)		8	8	120	80	99.125	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	120	81	98.375	NR	NA
Cobalt, ICAP (mg/L)	Filtered	8	1	0.0053	0.0053	0.0053	NR	NA
Copper, ICAP (mg/L)		8	2	0.0068	0.0044	0.0056	1.000	0
Copper, ICAP (mg/L)	Filtered	8	1	0.0074	0.0074	0.0074	1.000	0
Iron, ICAP (mg/L)		8	8	28	0.36	11.885	0.300	8
Iron, ICAP (mg/L)	Filtered	8	8	25	0.18	10.72	0.300	4
Magnesium, ICAP (mg/L)		8	8	26	13	19.625	NR	NA
Magnesium, ICAP (mg/L)	Filtered	8	8	26	13	19.625	NR	NA

Table 7.54 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		8	8	1.6	0.14	0.7525	0.050	8
Manganese, ICAP (mg/L)	Filtered	8	8	1.6	0.13	0.7475	0.050	8
Potassium, ICAP (mg/L)		8	8	4	1	2.4875	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	7	4	0.85	2.592857	NR	NA
Silver, ICAP (mg/L)		8	1	0.0069	0.0069	0.0069	0.010	0
Silver, ICAP (mg/L)	Filtered	8	1	0.0076	0.0076	0.0076	0.010	0
Sodium, ICAP (mg/L)		8	8	11	7.8	9.175	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	10	8.1	9.125	NR	NA
Strontium, ICAP (mg/L)		8	8	0.86	0.2	0.52875	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.89	0.2	0.5325	NR	NA
Zinc, ICAP (mg/L)		8	8	0.046	0.0067	0.021375	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.033	0.0028	0.015971	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	831	554	681.25	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	6.9	0.25	2.51625	NR	NA
pH, field measurement (pH units)		8	NA	7.3	6.4	6.9125	6.5-8.5	1
Redox, field measurement (MV)		8	NA	86	54	70	NR	NA
Static water level (ft-TOC)		8	8	-7.6	-13.9	-11.555	NR	NA
Water temperature, field measurement (°C)		8	NA	22.6	15	18.2	NR	NA

Table 7.54 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Alkalinity-HCO ₃ (mg/L)		8	8	319	275	289.875	NR	NA
Conductivity (µmhos/cm)		8	8	699	583	649.375	NR	NA
Dissolved solids (mg/L)		8	8	418	338	375.75	500.000	0
pH (pH units)		8	8	7.6	6.9	7.2875	NR	NA
Total suspended solids (mg/L)		8	8	48	4	21	NR	NA
Turbidity (NTU)		8	8	100	3.4	34.7375	1.01	8
Gross alpha (pCi/L)		8	8	1.53	-0.391	0.328089	15 n	0
Gross beta (pCi/L)		8	8	5.19	-0.0045	2.542688	4 o	2
1,1,1-Trichloroethane (µg/L)		9	1	3 J	3 J	3	200.000	0
1,1-Dichloroethene (µg/L)		9	3	15 JD	1 J	9.666667	7.000	2
1,2-Dichloroethene (µg/L)		9	7	82 J	43	62.71429	70	1
Methylene chloride (µg/L)		9	2	130 B	12 B	71	5.000	2
Tetrachloroethene (µg/L)		9	9	1400 D	6	494.5556	5.000	9
Trichloroethene (µg/L)		9	9	75 J	2 J	29	5.000	5
Vinyl chloride (µg/L)		9	4	29	16	24	2.000	4

Table 7.55. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=New Hope Pond

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		42	42	256	2	38.16429	250.000	1
Fluoride (mg/L)		42	30	2.4	0.1	0.47	2.000	4
Nitrate nitrogen (mg/L)		42	26	3.97	0.22	1.512308	10.000	0
Sulfate (mg/L)		42	42	72	3.9	19.05238	250.000	0
Aluminum, ICAP (mg/L)		42	33	14	0.02	0.93903	0.2	15
Aluminum, ICAP (mg/L)	Filtered	42	21	0.16	0.02	0.049857	0.2	0
Arsenic, ICAP (mg/L)	Filtered	42	2	0.082	0.065	0.0735	0.050	2
Barium, ICAP (mg/L)		42	42	0.62	0.028	0.2105	1.000	0
Barium, ICAP (mg/L)	Filtered	42	42	0.61	0.024	0.203262	1.000	0
Beryllium, ICAP (mg/L)		42	5	0.0023	0.00031	0.000828	0.004	0
Beryllium, ICAP (mg/L)	Filtered	42	2	0.00046	0.00032	0.00039	0.004	0
Boron, ICAP (mg/L)		42	42	0.99	0.02	0.180643	NR	NA
Boron, ICAP (mg/L)	Filtered	42	42	1.1	0.016	0.168833	NR	NA
Cadmium, AAS (mg/L)		42	1	0.0021	0.0021	0.0021	0.005	0
Cadmium, ICAP (mg/L)		42	2	0.0034	0.003	0.0032	0.005	0
Calcium, ICAP (mg/L)		42	42	150	1.1	65.27381	NR	NA
Calcium, ICAP (mg/L)	Filtered	42	42	140	1	64.52143	NR	NA
Chromium, AAS (mg/L)		42	6	9.7	0.011	2.533	0.050	4
Chromium, AAS (mg/L)	Filtered	42	2	0.035	0.027	0.031	0.050	0
Chromium, ICAP (mg/L)		42	5	9	0.015	2.683	0.050	4
Chromium, ICAP (mg/L)	Filtered	42	2	0.037	0.022	0.0295	0.050	0

Table 7.55 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Cobalt, ICAP (mg/L)		42	5	0.086	0.012	0.0288	NR	NA
Cobalt, ICAP (mg/L)	Filtered	42	2	0.04	0.02	0.03	NR	NA
Copper, ICAP (mg/L)		42	12	0.14	0.0041	0.025108	1.000	0
Copper, ICAP (mg/L)	Filtered	42	8	0.01	0.0041	0.006338	1.000	0
Iron, ICAP (mg/L)		42	42	54	0.0091	3.381264	0.300	30
Iron, ICAP (mg/L)	Filtered	42	33	9.6	0.0051	0.856879	0.300	16
Lead, AAS (mg/L)		42	7	0.056	0.004	0.016371	0.015 i	1
Lead, AAS (mg/L)	Filtered	42	1	0.0045	0.0045	0.0045	0.015 i	0
Lead, ICAP (mg/L)		42	2	0.064	0.051	0.0575	0.015 i	2
Magnesium, ICAP (mg/L)		42	42	29	0.26	16.95262	NR	NA
Magnesium, ICAP (mg/L)	Filtered	42	42	29	0.23	16.82929	NR	NA
Manganese, ICAP (mg/L)		42	40	4.1	0.0011	0.314565	0.050	23
Manganese, ICAP (mg/L)	Filtered	42	36	1.2	0.001	0.201517	0.050	18
Mercury, CVAA (mg/L)		42	2	0.019	0.00022	0.00961	0.002	1
Mercury, CVAA (mg/L)	Filtered	42	1	0.00026	0.00026	0.00026	0.002	0
Molybdenum, ICAP (mg/L)		42	2	0.071	0.018	0.0445	NR	NA
Nickel, ICAP (mg/L)		42	5	5.1	0.029	1.3498	0.100	4
Nickel, ICAP (mg/L)	Filtered	42	4	2.3	0.09	0.99	0.100	3
Potassium, ICAP (mg/L)		42	42	11	0.95	2.913095	NR	NA
Potassium, ICAP (mg/L)	Filtered	42	42	10	0.91	2.766905	NR	NA
Sodium, ICAP (mg/L)		42	42	200	3.4	38.18571	NR	NA

Table 7.55 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Sodium, ICAP (mg/L)	Filtered	42	42	200	3.8	37.96905	NR	NA
Strontium, ICAP (mg/L)		42	42	0.93	0.035	0.319952	NR	NA
Strontium, ICAP (mg/L)	Filtered	42	42	1	0.031	0.319167	NR	NA
Uranium (mg/L)		42	13	0.465	0.001	0.041154	0.020	2
Uranium (mg/L)	Filtered	42	13	0.528	0.001	0.046	0.020	2
Vanadium, ICAP (mg/L)		42	8	0.032	0.005	0.012838	NR	NA
Vanadium, ICAP (mg/L)	Filtered	42	2	0.0067	0.0051	0.0059	NR	NA
Zinc, ICAP (mg/L)		42	27	0.06	0.002	0.018011	5.000	0
Zinc, ICAP (mg/L)	Filtered	42	26	0.34	0.0028	0.032262	5.000	0
Conductivity, field measurement (μ mhos/cm)		42	NA	1137	389	584.1429	NR	NA
Dissolved oxygen, field measurement (ppm)		42	NA	10.4	0.3	2.975	NR	NA
pH, field measurement (pH units)		42	NA	9.3	6.6	7.478571	6.5-8.5	4
Redox, field measurement (MV)		42	NA	280	18.6	137.584	NR	NA
Static water level (ft-TOC)		42	42	-2.83	-23.3	-12.1338	NR	NA
Water temperature, field measurement ($^{\circ}$ C)		42	NA	21.3	12.2	16.85952	NR	NA
Alkalinity-CO ₃ (mg/L)		42	4	56	48	52.5	NR	NA
Alkalinity-HCO ₃ (mg/L)		42	42	337	132	234.8571	NR	NA
Conductivity (μ mhos/cm)		42	42	1170	386	598.381	NR	NA

Table 7.55 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Dissolved solids (mg/L)		42	42	646	242	368.9524	500.000	3
pH (pH units)		42	42	9.1	6.3	7.683333	NR	NA
Total suspended solids (mg/L)		42	31	385	1	28.90323	NR	NA
Turbidity (NTU)		42	42	480	0.4	32.80476	1.0	37
Gross alpha (pCi/L)		42	42	443	-1	12.37335	15 n	2
Gross beta (pCi/L)		42	42	221	-2.07	9.881214	4 o	16
1,1,1-Trichloroethane (µg/L)		49	1	1 J	1 J	1	200.000	0
1,1-Dichloroethene (µg/L)		49	2	2 J	1 J	1.5	7.000	0
1,2-Dichloroethene (µg/L)		49	13	100	1 J	37.38462	70	4
2-Butanone (µg/L)		49	6	16	10 JB	13.33333	NR	NA
Acetone (µg/L)		49	8	490 J	10 JB	70.75	NR	NA
Carbon tetrachloride (µg/L)		49	30	6800	1 J	1783	5.000	27
Chloroform (µg/L)		49	29	720	1 J	146.7586	100.000 t	9
Methylene chloride (µg/L)		49	7	13 B	1 J	9.714286	5.000	6
Tetrachloroethene (µg/L)		49	28	510 D	1 J	113.6786	5.000	24
Toluene (µg/L)		49	6	2 JB	1 JB	1.666667	1000.00	0
Trichloroethene (µg/L)		49	20	160 D	1 J	38.45	5.000	12
Vinyl chloride (µg/L)		49	1	2 J	2 J	2	2.000	0

Table 7.56. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Rust Garage Area

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		6	5	97	9	40.6	250.000	0
Fluoride (mg/L)		6	2	0.4	0.2	0.3	2.000	0
Nitrate nitrogen (mg/L)		6	4	861	1	219.45	10.000	1
Sulfate (mg/L)		6	3	25	2	15.66667	250.000	0
Aluminum, ICAP (mg/L)		6	5	14	0.035	4.705	0.2	4
Aluminum, ICAP (mg/L)	Filtered	6	3	0.55	0.082	0.277333	0.2	1
Barium, ICAP (mg/L)		6	6	5.3	0.068	1.069667	1.000	1
Barium, ICAP (mg/L)	Filtered	6	6	12	0.052	2.149667	1.000	1
Beryllium, ICAP (mg/L)		6	5	0.0023	0.00036	0.001092	0.004	0
Beryllium, ICAP (mg/L)	Filtered	6	2	0.0015	0.00099	0.001245	0.004	0
Boron, ICAP (mg/L)		6	5	0.089 c	0.04 c	0.0702	NR	N/A
Boron, ICAP (mg/L)	Filtered	6	5	0.21	0.035 c	0.0812	NR	N/A
Cadmium, AAS (mg/L)		6	1	0.0041	0.0041	0.0041	0.005	0
Calcium, ICAP (mg/L)		6	6	1300	2.7	231.4333	NR	N/A
Calcium, ICAP (mg/L)	Filtered	6	6	2700	2.3	462.45	NR	N/A
Chromium, AAS (mg/L)		6	2	0.63	0.04	0.335	0.050	1
Chromium, ICAP (mg/L)		6	2	0.51	0.022	0.266	0.050	1
Cobalt, ICAP (mg/L)		6	5	0.14	0.013	0.0676	NR	N/A
Cobalt, ICAP (mg/L)	Filtered	6	4	0.12	0.03	0.07525	NR	N/A
Copper, ICAP (mg/L)		6	3	0.032 c	0.0074 c	0.018133	1.000	0
Copper, ICAP (mg/L)	Filtered	6	3	0.009 c	0.0069 c	0.0079	1.000	0

Table 7.56 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Iron, ICAP (mg/L)		6	6	19	0.15	4.936667	0.300	5
Iron, ICAP (mg/L)	Filtered	6	2	2.3	1.6	1.95	0.300	2
Lead, AAS (mg/L)		6	2	0.018	0.014	0.016	0.015 i	1
Magnesium, ICAP (mg/L)		6	6	94	2.4	21.93333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	6	6	190	2.3	37.1	NR	NA
Manganese, ICAP (mg/L)		6	6	11	0.83	4.438333	0.050	6
Manganese, ICAP (mg/L)	Filtered	6	6	9.8	0.035	4.005833	0.050	5
Mercury, CVAA (mg/L)		6	1	0.00034	0.00034	0.00034	0.002	0
Molybdenum, ICAP (mg/L)		6	1	0.01	0.01	0.01	NR	NA
Nickel, ICAP (mg/L)		6	5	0.12	0.013	0.063	0.100	1
Nickel, ICAP (mg/L)	Filtered	6	4	0.19	0.025	0.074	0.100	1
Potassium, ICAP (mg/L)		6	6	8.1	1.1	3.483333	NR	NA
Potassium, ICAP (mg/L)	Filtered	6	6	9.6	0.99	2.865	NR	NA
Sodium, ICAP (mg/L)		6	6	44	3.8	18.3	NR	NA
Sodium, ICAP (mg/L)	Filtered	6	6	44	3.9	18.08333	NR	NA
Strontium, ICAP (mg/L)		6	6	3.1	0.014	0.571667	NR	NA
Strontium, ICAP (mg/L)	Filtered	6	6	6.6	0.013	1.148333	NR	NA
Uranium (mg/L)		6	2	0.028	0.011	0.0195	0.020	1
Uranium (mg/L)	Filtered	6	2	0.025	0.007	0.016	0.020	1
Vanadium, ICAP (mg/L)		6	2	0.03	0.0086	0.0193	NR	NA
Xylene (M&P), X-10 lab (µg/L)		6	4	6700	22	2530.5	NR	NA

Table 7.56 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Zinc, ICAP (mg/L)		6	6	0.18 c	0.034 c	0.084	5.000	0
Zinc, ICAP (mg/L)	Filtered	6	6	0.4	0.041 c	0.178833	5.000	0
Conductivity, field measurement (µmhos/cm)		6	NA	4800	80	1012	NR	NA
Dissolved oxygen, field measurement (ppm)		6	NA	8.5	0.9	3.931667	NR	NA
pH, field measurement (pH units)		6	NA	5.9	4.7	5.266667	6.5-8.5	6
Redox, field measurement (MV)		6	NA	257	55.7	154.2	NR	NA
Static water level (ft-TOC)		6	6	-4.7	-9.9	-7.11167	NR	NA
Water temperature, field measurement (°C)		6	NA	13.7	9.6	11.5	NR	NA
Alkalinity-HCO ₃ (mg/L)		6	6	126	10	48.16667	NR	NA
Conductivity (µmhos/cm)		6	6	5160	81	1069.5	NR	NA
Dissolved solids (mg/L)		6	6	4316	46	835.6667	500.000	1
pH (pH units)		6	6	6.1	4.9	5.516667	NR	NA
Total petroleum hydrocarbons (mg/L)		6	3	24.47	2.46	11.27333	0.10 in	3
Total suspended solids (mg/L)		6	6	259	5	66.83333	NR	NA
Turbidity (NTU)		6	6	200	3.6	40.28333	1.01	6
Gross alpha (pCi/L)		6	6	15.3	0.725	5.9785	15 n	1
Gross beta (pCi/L)		6	6	261	-1.23	46.67317	4 o	3

Table 7.56 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
1,1-Dichloroethene ($\mu\text{g/L}$)		6	1	1 J	1 J	1	7,000	0
Benzene ($\mu\text{g/L}$)		6	4	12000	6	4466.5	5,000 m	4
Benzene, X-10 lab ($\mu\text{g/L}$)		6	5	8000	2	2674.8	5,000 m	4
Bromoform ($\mu\text{g/L}$)		6	1	1 J	1 J	1	100,000 t	0
Chloroform ($\mu\text{g/L}$)		6	1	12	12	12	100,000 t	0
Ethylbenzene ($\mu\text{g/L}$)		6	3	2600	450 J	1240	700,000	1
Ethylbenzene, X-10 lab ($\mu\text{g/L}$)		6	4	2600	6	919	700,000	1
Methylene chloride ($\mu\text{g/L}$)		6	1	12 B	12 B	12	5,000	1
Tetrachloroethene ($\mu\text{g/L}$)		6	2	57	2 J	29.5	5,000	1
Toluene ($\mu\text{g/L}$)		6	4	25000	5	7476.25	1000.00	2
Toluene, X-10 lab ($\mu\text{g/L}$)		6	4	7800	50	2877.5	1000.00	2
Trichloroethene ($\mu\text{g/L}$)		6	1	4 J	4 J	4	5,000	0
Xylene (O), X-10 lab ($\mu\text{g/L}$)		6	4	4400	11	1640.25	10000.0	0
Xylenes ($\mu\text{g/L}$)		6	3	18000	2400	8133.333	10000.0	1

Table 7.57. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=S-2 Site

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		10	10	10.4	2	6.17	250.000	0
Fluoride (mg/L)		10	7	1.5	0.2	0.914286	2.000	0
Nitrate nitrogen (mg/L)		10	9	146.9	1.3	35.89333	10.000	3
Sulfate (mg/L)		10	10	18.1	5	10.97	250.000	0
Aluminum, ICAP (mg/L)		10	10	8.6	0.23	4.124	0.2	10
Aluminum, ICAP (mg/L)	Filtered	10	4	0.092	0.024	0.06775	0.2	0
Arsenic, ICAP (mg/L)		10	1	0.067	0.067	0.067	0.050	1
Arsenic, ICAP (mg/L)	Filtered	10	1	0.22	0.22	0.22	0.050	1
Barium, ICAP (mg/L)		10	10	0.15	0.013	0.0818	1.000	0
Barium, ICAP (mg/L)	Filtered	10	10	0.13	0.014	0.0638	1.000	0
Beryllium, ICAP (mg/L)		10	7	0.0024	0.00036	0.00119	0.004	0
Beryllium, ICAP (mg/L)	Filtered	10	2	0.00056	0.00044	0.0005	0.004	0
Boron, ICAP (mg/L)		10	10	0.1	0.012	0.0416	NR	NA
Boron, ICAP (mg/L)	Filtered	10	10	0.057	0.019	0.0285	NR	NA
Cadmium, AAS (mg/L)		10	5	0.16	0.0027	0.09694	0.005	4
Cadmium, AAS (mg/L)	Filtered	10	4	0.16	0.072	0.1195	0.005	4
Cadmium, ICAP (mg/L)		10	4	0.16	0.073	0.12325	0.005	4
Cadmium, ICAP (mg/L)	Filtered	10	4	0.16	0.07	0.1225	0.005	4
Calcium, ICAP (mg/L)		10	10	120	15	67.9	NR	NA
Calcium, ICAP (mg/L)	Filtered	10	10	120	35	69.1	NR	NA
Chromium, AAS (mg/L)		10	8	0.029	0.011	0.019375	0.050	0

Table 7.57 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chromium, ICAP (mg/L)		10	5	0.02	0.011	0.0154	0.050	0
Cobalt, ICAP (mg/L)		10	5	0.039	0.0096	0.02352	NR	NA
Cobalt, ICAP (mg/L)	Filtered	10	4	0.03	0.007	0.02075	NR	NA
Copper, ICAP (mg/L)		10	9	0.9	0.011	0.341889	1.000	0
Copper, ICAP (mg/L)	Filtered	10	7	0.47	0.0044	0.194	1.000	0
Iron, ICAP (mg/L)		10	10	14	0.2	5.377	0.300	9
Iron, ICAP (mg/L)	Filtered	10	4	0.0094	0.0055	0.00765	0.300	0
Lead, AAS (mg/L)		10	8	0.047	0.0049	0.020387	0.015 i	4
Magnesium, ICAP (mg/L)		10	10	32	8.1	22.01	NR	NA
Magnesium, ICAP (mg/L)	Filtered	10	10	29	14	22.6	NR	NA
Manganese, ICAP (mg/L)		10	10	5.1	0.016	1.7443	0.050	8
Manganese, ICAP (mg/L)	Filtered	10	7	4.9	0.0011	2.002671	0.050	4
Mercury, CVAA (mg/L)		10	2	0.00039	0.00028	0.000335	0.002	0
Nickel, ICAP (mg/L)		10	6	0.066	0.014	0.034333	0.100	0
Nickel, ICAP (mg/L)	Filtered	10	4	0.051	0.014	0.03275	0.100	0
Potassium, ICAP (mg/L)		10	10	5.2	1.1	2.98	NR	NA
Potassium, ICAP (mg/L)	Filtered	10	10	3.7	1.3	2.27	NR	NA
Selenium, ICAP (mg/L)	Filtered	10	2	0.052	0.051	0.0515	0.010	2
Sodium, ICAP (mg/L)		10	10	21	3.3	10.07	NR	NA
Sodium, ICAP (mg/L)	Filtered	10	10	21	3.3	10.68	NR	NA
Strontium, ICAP (mg/L)		10	10	0.24	0.014	0.0927	NR	NA

Table 7.57 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Strontium, ICAP (mg/L)	Filtered	10	10	0.23	0.018	0.0935	NR	NA
Uranium (mg/L)		10	6	0.015	0.001	0.006667	0.020	0
Uranium (mg/L)	Filtered	10	6	0.005	0.001	0.002833	0.020	0
Vanadium, ICAP (mg/L)		10	7	0.018	0.005	0.010843	NR	NA
Zinc, ICAP (mg/L)		10	10	0.12	0.018	0.0577	5.000	0
Zinc, ICAP (mg/L)	Filtered	10	8	0.11	0.0045	0.042775	5.000	0
Conductivity, field measurement (µmhos/cm)		10	NA	1038	198	580.8	NR	NA
Dissolved oxygen, field measurement (ppm)		10	NA	8.6	0.5	4.19	NR	NA
pH, field measurement (pH units)		10	NA	7.5	6	6.88	6.5-8.5	1
Redox, field measurement (MV)		10	NA	268	82	165.5	NR	NA
Static water level (ft-TOC)		10	10	-13.55	-42.4	-24.176	NR	NA
Water temperature, field measurement (°C)		10	NA	19.1	14.2	15.57	NR	NA
Alkalinity-CO ₃ (mg/L)		10	1	1	1	1	NR	NA
Alkalinity-HCO ₃ (mg/L)		10	10	240	110	185.4	NR	NA
Conductivity (µmhos/cm)		10	10	1060	294	607.2	NR	NA
Dissolved solids (mg/L)		10	10	704	178	402.8	500.000	3
pH (pH units)		10	10	8	6.7	7.26	NR	NA

Table 7.57 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Total suspended solids (mg/L)		10	10	288	8	111.7	NR	NA
Turbidity (NTU)		10	10	260	11	94.4	1.0 I	10
Gross alpha (pCi/L)		10	10	9.75	0.154	5.3084	15 n	0
Gross beta (pCi/L)		10	10	10.1	0.574	6.1281	4 o	8
1,2-Dichloroethene ($\mu\text{g/L}$)		11	2	5 J	5 J	5	70	0
Carbon tetrachloride ($\mu\text{g/L}$)		11	4	13	0.9 J	7.975	5.000	3
Chloroform ($\mu\text{g/L}$)		11	8	9 J	1 J	4.375	100.000 t	0
Methylene chloride ($\mu\text{g/L}$)		11	1	11 B	11 B	11	5.000	1
Tetrachloroethene ($\mu\text{g/L}$)		11	5	260	27	141.2	5.000	5
Trichloroethene ($\mu\text{g/L}$)		11	5	100	8	54.6	5.000	5

Table 7.58. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Union Valley

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		15	15	98	1.7	20.98667	250.000	0
Fluoride (mg/L)		15	7	2.3	0.1	0.985714	2.000	1
Nitrate nitrogen (mg/L)		15	9	0.96	0.34	0.692222	10.000	0
Sulfate (mg/L)		15	15	30	2.8	12.88	250.000	0
Aluminum, ICAP (mg/L)		15	6	4.5	0.027	1.247167	0.2	3
Aluminum, ICAP (mg/L)	Filtered	15	5	0.05	0.022	0.034	0.2	0
Barium, ICAP (mg/L)		15	15	0.37	0.012	0.144133	1.000	0
Barium, ICAP (mg/L)	Filtered	15	15	0.37	0.011	0.142733	1.000	0
Beryllium, ICAP (mg/L)		15	4	0.00073	0.00043	0.000545	0.004	0
Boron, ICAP (mg/L)		15	15	1.4	0.0047 c	0.329907	NR	NA
Boron, ICAP (mg/L)	Filtered	15	15	1.5	0.0094 c	0.334493	NR	NA
Calcium, ICAP (mg/L)		15	15	130	1.2	55.34667	NR	NA
Calcium, ICAP (mg/L)	Filtered	15	15	130	1.2	55.44667	NR	NA
Cobalt, ICAP (mg/L)		15	1	0.0053	0.0053	0.0053	NR	NA
Copper, ICAP (mg/L)		15	2	0.01	0.0048	0.0074	1.000	0
Copper, ICAP (mg/L)	Filtered	15	5	0.13	0.0057	0.03234	1.000	0
Iron, ICAP (mg/L)		15	15	9.7	0.039	1.837	0.300	8
Iron, ICAP (mg/L)	Filtered	15	10	6.9	0.0089	1.65099	0.300	4
Lead, AAS (mg/L)		15	2	0.013	0.0058	0.0094	0.015 i	0
Magnesium, ICAP (mg/L)		15	15	30	0.84	13.73333	NR	NA
Magnesium, ICAP (mg/L)	Filtered	15	15	30	0.81	13.926	NR	NA

Table 7.58 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Manganese, ICAP (mg/L)		15	14	12	0.0011	1.969286	0.050	7
Manganese, ICAP (mg/L)	Filtered	15	11	11	0.0012	2.316018	0.050	6
Mercury, CVAA (mg/L)		15	1	0.00022	0.00022	0.00022	0.002	0
Nickel, ICAP (mg/L)		15	4	0.024	0.012	0.01575	0.100	0
Nickel, ICAP (mg/L)	Filtered	15	1	0.012	0.012	0.012	0.100	0
Potassium, ICAP (mg/L)		15	15	7.1	2.1	3.473333	NR	NA
Potassium, ICAP (mg/L)	Filtered	15	15	6.9	2.1	3.36	NR	NA
Sodium, ICAP (mg/L)		15	15	230	1 c	53.80667	NR	NA
Sodium, ICAP (mg/L)	Filtered	15	15	220	1.2 c	52.04	NR	NA
Strontium, ICAP (mg/L)		15	15	0.73	0.048	0.305133	NR	NA
Strontium, ICAP (mg/L)	Filtered	15	15	0.73	0.048	0.306333	NR	NA
Uranium (mg/L)		15	2	0.001	0.001	0.001	0.020	0
Uranium (mg/L)	Filtered	15	2	0.001	0.001	0.001	0.020	0
Vanadium, ICAP (mg/L)		15	1	0.007	0.007	0.007	NR	NA
Zinc, ICAP (mg/L)		15	14	1.7	0.0049	0.30295	5.000	0
Zinc, ICAP (mg/L)	Filtered	15	13	2	0.002	0.328454	5.000	0
Conductivity, field measurement (µmhos/cm)		15	NA	990	227	592.4	NR	NA
Dissolved oxygen, field measurement (ppm)		15	NA	11.6	0.3	3.134667	NR	NA
pH, field measurement (pH units)		15	NA	9.2	5.9	7.366667	6.5-8.5	6

Table 7.58 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Redox, field measurement (MV)		15	NA	165	42	105.7	NR	NA
Static water level (ft-TOC)		15	15	-13.35	-33.4	-25.0053	NR	NA
Water temperature, field measurement (°C)		15	NA	17	11	14.82	NR	NA
Alkalinity-CO ₃ (mg/L)		15	3	80	80	80	NR	NA
Alkalinity-HCO ₃ (mg/L)		15	15	458	102	268.8	NR	NA
Conductivity (µmhos/cm)		15	15	953	219	593.5333	NR	NA
Dissolved solids (mg/L)		15	15	624	126	371.6	500.000	5
pH (pH units)		15	15	9.3	6.8	7.693333	NR	NA
Total suspended solids (mg/L)		15	7	2154	1	317.1429	NR	NA
Turbidity (NTU)		15	15	105	0.5	14.55333	1.01	11
¹²⁹ I, X-10 lab (Bq/L)		10	10	0.1	0.01	0.046	NR	NA
¹³¹ I, X-10 lab (Bq/L)		3	3	0.012	0.003	0.008333	NR	NA
²³¹⁻²³⁴ Th (pCi/L)		6	6	655 E	105	357.6667	400.000	2
²³⁴ U (pCi/L)		12	12	2.23	-0.227 J	0.394583	20.000	0
²³⁵ U (pCi/L)		12	12	54.9	-19.2 F	10.94945	24.000	2
²³⁷ Np (pCi/L)		12	12	0.358	-0.672	-0.21731	1.200	0
²³⁸ Pu (pCi/L)		12	12	0.294	-0.64	-0.10892	1.600	0
²³⁸ U (pCi/L)		12	12	0.655	0 J	0.22375	24.000	0
²³⁹ Pu (pCi/L)		12	12	0.153	0	0.040758	1.200	0
²⁴¹ Am (pCi/L)		12	12	1.74	-0.336	0.617917	1.20	4

Table 7.58 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
⁴⁰ K (pCi/L)		3	3	789	215 i	444	NR	NA
⁹⁹ Tc (pCi/L)		12	12	76.5	-1.02	26.56917	4000.000	0
Gross alpha (pCi/L)		15	15	3.81	-1.12	0.754667	15 n	0
Gross beta (pCi/L)		15	15	8.42	1.36	5.117333	4 o	9
Radium, X-10 lab (Bq/L)		9	9	0.065	0.001	0.028333	0.15	0
Strontium (pCi/L)		12	12	267	-36.3	28.3625	8 p	6
Tritium, X-10 lab (Bq/L)		9	9	18	-30	1.311111	20000 p	0
1,2-Dichloroethene (µg/L)		15	3	17	0.9 J	7.966667	70	0
1,4-Dichlorobenzene (µg/L)		12	1	17	17	17	75.000	0
Acetone (µg/L)		15	1	10 J	10 J	10	NR	NA
Bis(2-ethylhexyl)phthalate (µg/L)		12	1	3 J	3 J	3	6.000	0
Carbon tetrachloride (µg/L)		15	3	200	2 J	68.66667	5.000	1
Chloroform (µg/L)		15	3	95	12	58.66667	100.000 t	0
Di-n-butylphthalate (µg/L)		12	8	4 JB	2 JB	3	NR	NA
Methylene chloride (µg/L)		15	3	3 JB	1 JB	2.333333	5.000	0
Pentachlorophenol (µg/L)		12	1	2 J	2 J	2	1.000	1
Phenol (µg/L)		12	3	4 JB	3 JB	3.666667	NR	NA
Tetrachloroethene (µg/L)		15	6	11	1 J	5.5	5.000	3
Toluene (µg/L)		15	6	1 JB	1 JB	1	1000.00	0
Trichloroethene (µg/L)		15	6	3 J	0.8 J	2.133333	5.000	0

Table 7.59. Constituents in groundwater at the Y-12 Plant site for 1994
 Regime=EF Location Description=Waste Coolant Facilities

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Chloride (mg/L)		8	8	19	5.7	12.025	250.000	0
Fluoride (mg/L)		8	2	0.1	0.1	0.1	2.000	0
Nitrate nitrogen (mg/L)		8	5	0.93	0.36	0.57	10.000	0
Sulfate (mg/L)		8	8	17	5.4	11.0125	250.000	0
Aluminum, ICAP (mg/L)		8	8	3.1	0.094	0.953	0.2	6
Aluminum, ICAP (mg/L)	Filtered	8	4	0.13	0.039	0.07025	0.2	0
Arsenic, ICAP (mg/L)		8	1	0.08	0.08	0.08	0.050	1
Barium, ICAP (mg/L)		8	8	0.43	0.2	0.275	1.000	0
Barium, ICAP (mg/L)	Filtered	8	8	0.39	0.048	0.251	1.000	0
Beryllium, ICAP (mg/L)		8	1	0.00043	0.00043	0.00043	0.004	0
Boron, ICAP (mg/L)		8	8	0.061	0.014 c	0.03775	NR	NA
Boron, ICAP (mg/L)	Filtered	8	8	0.076	0.021 c	0.037375	NR	NA
Cadmium, AAS (mg/L)		8	2	0.003	0.0025	0.00275	0.005	0
Cadmium, AAS (mg/L)	Filtered	8	3	0.0029	0.0022	0.002633	0.005	0
Calcium, ICAP (mg/L)		8	8	97	82	89.125	NR	NA
Calcium, ICAP (mg/L)	Filtered	8	8	95	84	88.375	NR	NA
Copper, ICAP (mg/L)		8	5	0.012	0.0043	0.00796	1.000	0
Copper, ICAP (mg/L)	Filtered	8	6	0.0063	0.0043	0.00525	1.000	0
Iron, ICAP (mg/L)		8	8	3.3	0.16	1.2025	0.300	5
Iron, ICAP (mg/L)	Filtered	8	4	0.047	0.011	0.028	0.300	0
Magnesium, ICAP (mg/L)		8	8	11	8.5	9.5875	NR	NA

Table 7.59 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Magnesium, ICAP (mg/L)	Filtered	8	8	11	8.6	9.6	NR	NA
Manganese, ICAP (mg/L)		8	8	0.6	0.059	0.25075	0.050	8
Manganese, ICAP (mg/L)	Filtered	8	7	0.21	0.018	0.099286	0.050	6
Potassium, ICAP (mg/L)		8	8	3.1	1.7	2.5	NR	NA
Potassium, ICAP (mg/L)	Filtered	8	8	3	1.6	2.1625	NR	NA
Sodium, ICAP (mg/L)		8	8	6.4	4.2	5.15	NR	NA
Sodium, ICAP (mg/L)	Filtered	8	8	6.3	4.1	5.15	NR	NA
Strontium, ICAP (mg/L)		8	8	0.28	0.22	0.24625	NR	NA
Strontium, ICAP (mg/L)	Filtered	8	8	0.28	0.16	0.2325	NR	NA
Uranium (mg/L)		8	6	0.003	0.001	0.001833	0.020	0
Uranium (mg/L)	Filtered	8	6	0.002	0.001	0.001333	0.020	0
Zinc, ICAP (mg/L)		8	7	0.062	0.0053	0.023714	5.000	0
Zinc, ICAP (mg/L)	Filtered	8	7	0.1	0.0021	0.020071	5.000	0
Conductivity, field measurement (µmhos/cm)		8	NA	545	434	476.625	NR	NA
Dissolved oxygen, field measurement (ppm)		8	NA	7.3	0.9	3.2125	NR	NA
pH, field measurement (pH units)		8	NA	7.4	6.6	6.9125	6.5-8.5	0
Redox, field measurement (MV)		8	NA	293	126	212.5	NR	NA
Static water level (ft-TOC)		8	8	-8.25	-10.82	-9.61875	NR	NA

Table 7.59 (continued)

Variable	Filtered status	No. samples	No. detected	Max	Min	Av	Reference value	No. of measurements
Water temperature, field measurement (°C)		8	NA	20.5	9.1	16.1125	NR	NA
Alkalinity-HCO ₃ (mg/L)		8	8	253	236	243.125	NR	NA
Conductivity (µmhos/cm)		8	8	528	469	500.25	NR	NA
Dissolved solids (mg/L)		8	8	344	302	319.75	500.000	0
pH (pH units)		8	8	7.6	6.9	7.275	NR	NA
Total suspended solids (mg/L)		8	7	105	1	35.42857	NR	NA
Turbidity (NTU)		8	8	240	3	46.475	1.01	8
Gross alpha (pCi/L)		8	8	2.95	-2	0.783875	15 n	0
Gross beta (pCi/L)		8	8	7.18	0.623	3.574625	4 o	3
1,1,1-Trichloroethane (µg/L)		8	4	310 J	270	287.5	200.000	4
1,1-Dichloroethane (µg/L)		8	3	170 J	150 J	160	NR	NA
1,1-Dichloroethene (µg/L)		8	3	200 J	170 J	183.3333	7.000	3
1,2-Dichloroethene (µg/L)		8	4	7600	6700	7150	70	4
2-Butanone (µg/L)		8	1	13	13	13	NR	NA
Acetone (µg/L)		8	1	10 J	10 J	10	NR	NA
Methylene chloride (µg/L)		8	2	12 B	2 J	7	5.000	1
Tetrachloroethene (µg/L)		8	4	910 J	830	880	5.000	4
Trichloroethene (µg/L)		8	4	1000	920	960	5.000	4
Vinyl chloride (µg/L)		8	1	280 J	280 J	280	2.000	1

Table 7.60. Bear Creek Hydrogeologic Regime and area summary

Well	Sample number									
	<i>Above-Grade Low-Level Storage Facility</i>									
GW-793	940322-045	940322-046	940525-044	940525-045	940728-069	940728-070	941103-042	941103-043		
GW-794	940323-113	940323-114	940527-095	940527-096	940804-157	940804-158	941107-074	941107-075		
GW-795	940323-115	940323-116	940527-097	940527-098	940804-159	940804-160	941108-047	941108-048		
	<i>Bear Creek Burial Grounds Waste Management Area</i>									
GW-040	940309-001	940309-002	940517-078	940517-079	940823-017	940823-018	941110-010	941110-011		
GW-042	940311-050	940311-051	940517-076	940517-077	940824-004	940824-005	941123-055	941123-056		
GW-047	940324-030	940324-031	940531-052	940531-053	940809-040	940809-041	941108-049	941108-050		
GW-053	940311-007	940311-008	940624-028	940624-029	940916-039	940916-040	941212-143	941212-144		
GW-061	940321-135	940321-136	940624-026	940624-027	940916-041	940916-042	941212-141	941212-142		
GW-069	940311-064	940311-065	940608-105	940608-106	940909-130	940909-131	941206-168	941206-169		
GW-079	940310-009	940310-010	940607-116	940607-117	940913-019	940913-020	941207-022	941207-023		
GW-080	940310-011	940310-012	940607-118	940607-119	940909-128	940909-129	941206-166	941206-167		
GW-095	940310-105	940310-106	940628-049	940628-050	940913-021	940913-022	941206-065	941206-066		
GW-162	940309-003	940309-004	940518-064	940518-065	940823-013	940823-014	941108-005	941108-006		
GW-287	940310-015	940310-016	940609-321	940609-322	940913-120	940913-121	941207-112	941207-113		
GW-370	940310-142	940310-143	940524-114	940524-115	940825-107	940825-108	941110-008	941110-009		
GW-372	940310-004	940310-005	940519-062	940519-063	940824-007	940824-008	941109-033	941109-034		
GW-373	940310-144	940310-145	940524-058	940524-059	940824-141	940824-142	941109-038	941109-039		
GW-627	940315-001	940315-002	940623-147	940623-148	940916-043	940916-044	941212-069	941212-070		
GW-642	940310-002	940310-003	940519-060	940519-061	940824-009	940824-010	941108-008	941108-009		

Table 7.60 (continued)

Well	Sample number										
GW-652	940310-017	940310-018	940617-037	940617-038	940913-118	940913-119	941207-117	941207-118			
GW-653	940228-064	940228-065	940609-323	940609-324	940913-122	940913-123	941207-110	941207-111			
GW-654	940310-013	940310-014	940608-107	940608-108	940913-124	940913-125	941207-114	941207-115			
	<i>Exit-pathway monitoring</i>										
BCK-00.63	940214-088	940214-089	940906-094	940906-095							
BCK-04.55	940214-090	940214-091	940906-096	940906-097							
BCK-09.40	940214-094	940214-095	940906-100	940906-101							
BCK-11.97	940214-100	940214-101	940906-106	940906-107							
GW-056	940228-068	940228-069	940914-105	940914-106							
GW-057	940228-066	940228-067	940914-107	940914-108							
GW-621	940218-040	940218-041	941207-103	941207-104							
GW-683	940304-085	940304-086	940921-018	940921-019							
GW-684	940304-087	940304-088	940921-022	940921-023							
GW-685	940228-073	940228-074	940920-006	940920-007							
GW-694	940302-127	940302-128	941214-057	941214-058							
GW-695	940221-205	940221-206	941207-107	941207-108							
GW-703	940223-098	940223-099	941213-002	941213-003							
GW-704	940225-179	940225-180	941214-054	941214-055							
GW-706	940304-067	940304-068	941215-042	941215-043							
GW-710	940225-001	940225-002	940819-140	940819-141							
GW-711	940224-034	940224-035	940819-078	940819-079							
GW-712	940225-003	940225-004	940819-081	940819-082							
GW-713	940228-002	940228-003	940819-120	940819-121							

Table 7.60 (continued)

Well	Sample number	
GW-714	940225-176	940822-028
GW-715	940228-070	940822-031
GW-723	940318-026	941221-009
GW-724	940321-003	941219-024
GW-725	940321-001	941219-010
GW-736	940321-128	941219-078
GW-737	940321-130	941219-013
GW-738	940317-033	941219-051
GW-739	940317-035	941219-031
GW-740	940315-004	941219-049
NT-01	940214-104	940908-080
NT-13	940214-092	940906-099
SS-1	940214-102	940908-078
SS-4	940214-098	940906-105
SS-5	940214-096	940906-103
<i>Oil Landfarm Waste Management Area</i>		
GW-043	940208-107	940621-115
GW-044	940208-109	940621-119
GW-064	940210-058	940623-131
GW-084	940208-111	940621-117
GW-085	940214-032	940624-020
	940208-108	940621-116
	940208-110	940621-120
	940210-059	940623-132
	940208-112	940621-118
	940214-033	940624-021
	940901-110	941130-094
	940901-112	941130-096
	940901-177	941216-008
	940901-178	941130-093
	940907-106	941216-010
	940901-109	941130-095
	940901-111	941130-097
	940901-176	941216-009
	940901-179	941130-092
	940907-105	941216-011

Table 7.60 (continued)

Well	Sample number										
GW-363	940322-043	940322-044	940526-083	940526-084	940729-057	940729-058	941103-038	941103-039			
GW-537	940214-034	940214-035	940624-022	940624-023	940907-103	940907-104	941216-012	941216-013			
GW-601	940325-095	940325-096									
GW-637	940323-117	940323-118	940526-081	940526-082	940729-059	940729-060	941107-076	941107-077			
GW-800	940214-030	940214-031	940622-045	940622-046	940902-127	940902-128	941214-079	941214-080			
			<i>Rust Spoil Area</i>								
GW-311	940209-256	940209-257	940622-043	940622-044	940907-030	940907-031	941214-077	941214-078			
GW-312	940209-258	940209-259	940623-135	940623-136	940907-032	940907-033	941214-075	941214-076			
			<i>S-3 Site</i>								
GW-115	940217-129	940217-130	940816-047	940816-048							
GW-243	940331-002	940331-003									
GW-276	940331-004	940331-005	940822-025	940822-026							
GW-324	940215-107	940215-108									
GW-325	940215-109	940215-110									
GW-345	940218-043	940218-044									
GW-347	940217-005	940217-006	940617-051	940617-052	940830-067	940830-068	941205-059	941205-060			
GW-348	940217-001	940217-002	940620-082	940620-083	940830-069	940830-070	941206-048	941206-049			
GW-613	940215-015	940215-016	940816-045	940816-046							
GW-614	940215-017	940215-018	940816-093	940816-094							
			<i>Spoil Area I</i>								
GW-315	940217-125	940217-126	940620-080	940620-081	940830-065	940830-066	941206-044	941206-045			
GW-317	940217-127	940217-128	940617-049	940617-050	940830-015	940830-016	941205-057	941205-058			

Table 7.61. 1994 Chestnut Ridge Hydrogeologic Regime and area summary

Well	Sample number									
	<i>Ash Disposal Basin</i>									
GW-321	940112-009	940112-010	940414-009	940414-010	941019-012	941019-013	941019-016	941019-017	941021-104	941021-103
GW-512	940112-063	940112-064	940414-067	940414-068	941020-086	941020-087	941019-016	941019-017	941024-228	941021-103
GW-513	940112-011	940112-012	940414-005	940414-006	941019-016	941019-017	941019-016	941019-017	941024-228	941021-103
GW-514	940114-085	940114-086	940418-064	940418-065	941021-099	941021-100	941021-099	941021-100	941021-104	941021-103
	<i>Chestnut Ridge Security Pits</i>									
GW-175	940223-101	940223-102	940520-057	940520-058	940815-008	940815-009	940815-009	940815-009	941202-021	941202-022
GW-177	940228-082	940228-083	940630-014	940630-015	940815-010	940815-011	940815-011	940815-011	941201-032	941201-033
GW-181	940217-008	940217-009	940422-088	940422-089	940801-008	940801-009	940801-009	940801-009	941115-011	941115-012
GW-511	940217-122	940217-123	940425-077	940425-078	940801-006	940801-007	940801-007	940801-007	941115-014	941115-015
GW-608	940221-202	940221-203	940519-001	940519-002	940809-021	940809-022	940809-022	940809-022	941130-035	941130-036
GW-609	940224-065	940224-066	940524-123	940524-124	940815-016	940815-017	940815-017	940815-017	941202-023	941202-024
GW-610	940218-048	940218-049	940504-063	940504-064	940808-031	940808-032	940808-032	940808-032	941121-204	941121-205
GW-611	940222-059	940222-060	940519-057	940519-058	940815-014	940815-015	940815-015	940815-015	941201-030	941201-031
GW-742	940221-001	940221-002	940503-046	940503-047	940804-145	940804-150	940804-150	940804-150	941117-141	941117-142
GW-743	940218-050	940218-051	940503-115	940503-116	940808-033	940808-034	940808-034	940808-034	941117-137	941117-138
	<i>Chestnut Ridge Sediment Disposal Basin</i>									
GW-156	940214-001	940214-002	940408-018	940408-019	940711-003	940711-004	940711-004	940711-004	941020-186	941020-187
GW-158	940215-020	940215-021	940415-084	940415-085	940711-081	940711-082	940711-082	940711-082	941026-106	941026-107
GW-159	940210-114	940210-115	940405-004	940405-005	940405-086	940405-086	940405-086	940405-086	940711-016	940711-016
	941017-133									

Table 7.61 (continued)

Well	Sample number											
GW-241	940215-074 941024-033	940215-075	940413-039	940413-040	940712-163	940712-164	940725-059	941024-032				
GW-303	940215-010 941024-035	940215-011	940412-032	940412-033	940712-038	940712-039	940725-002	941024-034				
GW-304	940210-112 941019-021	940210-113 941019-022	940311-070	940405-006	940405-007	940405-087	940711-017	940711-018				
GW-731	940211-057	940211-058	940405-008	940405-009	940711-005	940711-006	941019-023	941019-024				
GW-732	940214-003	940214-004	940406-052	940406-053	940711-007	940711-008	941019-081	941019-082				
<i>Construction/Debris Landfill VI</i>												
GW-540	940322-055 941010-154	940322-056	940323-010	940414-070	940414-071	940414-072	941010-152	941010-153				
GW-541	940324-014 941011-139	940324-015	940324-021	940418-073	940418-074	940418-075	941011-137	941011-138				
GW-542	940324-085 941012-050	940324-086	940324-088	940419-083	940419-084	940419-085	941012-048	941012-049				
GW-543	940325-105 941013-085	940325-106	940325-107	940421-005	940421-006	940421-007	941013-079	941013-080				
GW-544	940325-108 941013-086	940325-109	940325-111	940421-115	940421-116	940421-118	941013-081	941013-082				
GW-545	940328-067 941018-084	940328-068 941021-076	940328-069	940419-086	940419-087	940419-089	941018-082	941018-083				
GW-546	940324-016 941011-134	940324-017	940324-020	940414-076	940414-077	940414-079	941011-132	941011-133				

Table 7.61 (continued)

Well	Sample number	
	<i>Construction/Debris Landfill VII</i>	
GW-560	940308-006 940713-035	940308-007 941010-019
	940308-015 941010-020	940419-096 941010-027
GW-562	940308-008 940713-111	940308-009 941010-021
	940308-016 941010-022	940419-102 941010-028
GW-564	940307-126 940714-107	940307-127 941010-023
	940308-003 941010-024	940420-061 941010-029
GW-798	940309-015 940720-017	940309-016 941011-020
	940309-020 941011-021	940422-093 941011-028
	<i>Chestnut Ridge Borrow Area Waste Pile</i>	
GW-160	940214-062	940214-063
GW-161	940211-086	940211-087
GW-295	940215-091	940215-092
GW-298	940215-007	940215-008
GW-299	940214-053	940214-054
GW-300	940214-057	940214-058
GW-301	940214-059	940214-060
	940721-014	940721-015
	940718-103	940718-104
	940718-101	940718-102
	940721-076	940721-077
	940721-072	940721-073
	940721-012	940721-013
	940721-010	940721-011
	<i>East Chestnut Ridge Waste Pile</i>	
GW-292	940114-062	940114-063
GW-293	940113-102	940113-103
GW-294	940112-071	940112-072
GW-296	940111-008	940111-009
	940412-090	940412-091
	940412-086	940412-087
	940408-065	940408-066
	940408-063	940408-064
	941017-023	941017-024
	941017-016	941017-017
	941017-018	941017-019
	941017-020	941017-021

Table 7.61 (continued)

Well	Sample number									
	<i>Industrial Landfill II</i>									
GW-539	940106-117	940106-118	940404-064	940404-065	940404-067	940713-189	940713-190	940713-191		
	941006-055	941006-056	941006-057							
GW-709	940106-119	940106-120	940405-098	940405-099	940405-100	940714-061	940714-062	940714-064		
	941010-003	941010-004	941010-005							
GW-757	940107-184	940107-185	940406-058	940406-059	940406-060	940718-008	940718-009	940718-010		
	941010-008	941010-009	941010-010							
	<i>Industrial Landfill IV</i>									
GW-141	940106-105	940106-106	940404-130	940404-131	940404-132	940706-081	940706-082	940706-083		
	941005-020	941005-021	941005-022							
GW-217	940105-052	940105-053	940404-136	940404-137	940404-139	940706-087	940706-088	940706-090		
	941004-011	941004-012	941004-015							
GW-305	940111-004	940111-005	940406-045	940406-046	940406-047	940708-007	940708-008	940708-009		
	941006-031	941006-032	941006-033							
GW-521	940106-111	940106-112	940405-092	940405-093	940405-095	940708-010	940708-011	940708-012		
	941005-017	941005-018	941005-019							
GW-522	940107-080	940107-081	940405-090	940405-091	940405-094	940708-004	940708-005	940708-006		
	941006-036	941006-037	941006-039							
	<i>Industrial Landfill V</i>									
CBS-1	940214-106	940214-107	940908-085	940908-086	940909-038					
GW-557	940308-010	940308-011	940308-017	940421-091	940421-092	940421-093	940718-003	940718-004		
	940718-005	941010-017	941010-018	941010-026						

Table 7.61 (continued)

Well	Sample number									
GW-796	940309-008	940309-009	940309-012	940425-082	940425-083	940425-084	940720-068	940720-069		
	940720-070	941011-154	941011-155	941011-158						
GW-797	940309-006	940309-007	940309-011	940425-085	940425-086	940425-088	940720-018	940720-019		
	940720-020	941011-018	941011-019	941011-027						
GW-799	940308-012	940308-013	940308-018	940421-088	940421-089	940421-090	940719-004	940719-005		
	940719-006	941011-022	941011-023	941011-029						
GW-801	940309-017	940309-018	940309-021	940428-027	940428-028	940428-030	940721-080	940721-081		
	940721-082	941011-151	941011-152	941011-153						
<i>Kerr Hollow Quarry</i>										
GW-142	940217-013	940217-014	940412-094	940412-095	940721-086	940721-087	941024-024	941024-025		
GW-143	940303-088	940303-089	940418-078	940418-079	940725-053	940725-054	941025-010	941025-011		
GW-144	940310-137	940310-138	940419-091	940419-092	940727-005	940727-034	941025-062	941025-063		
GW-145	940311-071	940311-072	940421-001	940421-002	940727-004	940727-033	941026-110	941026-111		
GW-146	940303-086	940303-087	940418-080	940418-081	940725-076	940725-077	941031-003	941031-004		
GW-147	940301-016	940301-017	940413-076	940413-077	940722-080	940722-081	941024-029	941024-030		
GW-231	940301-018	940301-019	940413-074	940413-075	940725-046	940725-047	941024-027	941024-028		
<i>Rogers Quarry</i>										
GW-184	940112-014	940112-015								
GW-186	940127-666	940127-667								
GW-187	940112-074	940112-075								
GW-188	940112-016	940112-017								

Table 7.61 (continued)

Well	Sample number											
	<i>United Nuclear Corporation Site</i>											
1090	940112-005	940112-006	940412-099	940412-100	940728-062	940728-065	941017-012	941017-013				
GW-203	940106-063	940106-090	940408-008	940408-009	940726-049	940726-050	941013-034	941013-035				
GW-205	940107-181	940107-182	940408-006	940408-007	940726-052	940726-053	941013-036	941013-037				
GW-221	940111-011	940111-012	940408-053	940408-054	940727-088	940727-089	941017-009	941017-010				
GW-302	940112-001	940112-002	940412-097	940412-098	940728-061	940728-064	941017-003	941017-004				
GW-339	940112-003	940112-004	940408-055	940408-056	940727-086	940727-087	941017-005	941017-006				

Table 7.62. 1994 East Fork Poplar Creek Hydrogeologic Regime and area summary

Well	Sample number									
	<i>Beta-4 Security Pits</i>									
GW-191	940204-083	940204-084	940503-051	940503-052	940822-105	940822-106	941129-148	941129-149		
GW-192	940207-002	940207-003	940504-152	940504-153	940822-041	940822-042	941205-002	941205-003		
GW-194	940204-085	940204-086	940503-049	940503-050	940822-101	940822-102	941201-047	941201-048		
GW-195	940207-004	940207-005	940504-154	940504-155	940822-099	940822-100	941201-045	941201-046		
	<i>Exit-pathway monitoring</i>									
GW-206	940131-009	940131-010	940615-074	940615-075	940928-074	940928-075	941128-138	941128-139		
GW-207	940128-102	940128-103	940525-002	940525-003	940914-007	940914-008	941205-048	941205-049		
GW-208	940131-011	940131-012	940527-067	940527-068	940916-090	940916-091	941205-025	941205-026		
GW-603	940131-128	940131-129	940527-084	940527-085	940920-081	940920-082	941205-052	941205-053		
GW-604	940201-067	940201-068	940531-089	940531-090	940920-079	940920-080	941205-054	941205-055		
GW-605	940202-083	940202-084	940603-102	940603-103	940926-068	940926-069	940928-072	941206-175		
	941206-176									
GW-606	940203-128	940203-129	940606-195	940606-196	940926-070	940926-071	940928-073	941207-119		
	941207-120									
GW-617	940207-006	940207-007	940505-039	940505-040	940822-043	940822-044	941205-004	941205-005		
GW-618	940208-006	940208-007	940505-041	940505-042	940822-045	940822-046	941205-037	941205-038		
GW-733	940131-002	940131-003	940602-298	940602-299	940926-065	940926-066	941206-177	941206-178		
GW-735	940202-085	940202-086	940531-087	940531-088	940920-077	940920-078	941206-039	941206-040		
GW-750	940131-006	940131-007	940601-017	940601-018	940802-042	940802-043	941101-003	941101-004		
GW-816	940921-056	940921-057	941128-140	941128-141						
LRS	940908-083	940908-084	941228-013	941228-014						
LRSWP	940908-081	940908-082	941228-011	941228-012						

Table 7.62 (continued)

Well	Sample number	
	<i>Fire Training Facility</i>	
GW-619	940208-002	941205-044
	940509-081	940822-196
	940509-082	940822-195
GW-620	940208-004	941205-041
	940509-083	940823-144
	940509-084	940823-143
	<i>Groundwater Monitoring Plan Grid Location A1</i>	
GW-261	940511-117	941028-038
	940815-081	941028-037
GW-262	940511-113	941028-036
	940815-084	941028-035
	940815-100	941028-036
	<i>Groundwater Monitoring Plan Grid Location A2</i>	
GW-263	940512-054	941031-073
	940815-085	941031-072
GW-264	940512-056	941031-013
	940815-087	941031-012
	940815-088	941031-013
	<i>Groundwater Monitoring Plan Grid Location B2</i>	
GW-777	940520-119	941031-075
	940815-122	941031-074
GW-778	940520-123	941031-077
	940815-124	941031-076
	940815-125	941031-076
	<i>Groundwater Monitoring Plan Grid Location C1</i>	
W-771	940202-092	941102-007
	940503-039	940825-014
	940503-040	940825-013
GW-772	940203-125	941102-014
	940202-093	940825-014
	940203-126	940825-008
	940503-043	940825-007
	940503-044	940825-008
	<i>Groundwater Monitoring Plan Grid Location D1</i>	
GW-784	940606-116	941129-005
	940901-171	941129-004
GW-785	940607-126	941129-007
	940907-012	941129-006
	940907-013	941129-006

Table 7.62 (continued)

Well	Sample number			
	<i>Groundwater Monitoring Plan Grid Location D2</i>			
GW-791	940607-122	940607-123	940610-076	940907-014
			940907-015	941202-016
GW-792	940607-124	940607-125	940908-001	940908-002
			941202-018	941202-019
	<i>Groundwater Monitoring Plan Grid Location E1</i>			
GW-764	940203-123	940203-124	940505-074	940505-075
			940825-011	940825-012
GW-765	940204-075	940204-076	940505-072	940505-073
			940825-009	940825-010
			941103-001	941103-002
			941102-012	941102-013
GW-786	940608-136	940608-137	940908-003	940908-004
			941129-008	941129-009
GW-787	940608-134	940608-135	940908-005	940908-006
			941130-044	941130-045
	<i>Groundwater Monitoring Plan Grid Location E2</i>			
GW-781	940615-083	940615-084	940909-116	940909-117
			941202-014	941202-015
GW-782	940616-096	940616-097	940912-080	940912-081
			941202-060	941202-061
GW-783	940616-098	940616-099	940912-082	940912-083
			941202-062	941202-063
	<i>Groundwater Monitoring Plan Grid Location E3</i>			
GW-779	940609-174	940609-175	940909-091	940909-092
			940909-111	941130-040
GW-780	940609-176	940609-177	940909-087	940909-088
			940909-112	941130-038
			941130-041	941130-039
	<i>Groundwater Monitoring Plan Grid Location F2</i>			
GW-788	940610-096	940610-097	940909-089	940909-090
			940909-113	941130-121
GW-789	940615-081	940615-082	940909-114	940909-115
			941130-119	941130-120

Table 7.62 (continued)

Well	Sample number									
	<i>Groundwater Monitoring Plan Grid Location G1</i>									
GW-758	940207-015	940207-016	940506-061	940506-062	940829-123	940829-124	941103-004	941103-005		
GW-759	940207-011	940207-012	940506-063	940506-064	940829-128	940829-129	941103-006	941103-007		
	<i>Groundwater Monitoring Plan Grid Location G2</i>									
GW-760	940209-049	940209-050	940509-076	940509-077	940830-075	940830-076	941122-067	941122-068		
GW-761	940207-013	940207-014	940509-078	940509-079	940830-077	940830-078	941103-058	941103-059		
	<i>Groundwater Monitoring Plan Grid Location G3</i>									
GW-769	940209-051	940209-052	940510-077	940510-078	940831-076	940831-077	941107-104	941107-105		
GW-770	940209-053	940209-054	940510-079	940510-080	940831-078	940831-079	941107-106	941107-107		
	<i>Groundwater Monitoring Plan Grid Location H2</i>									
GW-773	940128-112	940128-113	940427-001	940427-002	940810-123	940810-124	941102-059	941102-060		
GW-774	940128-110	940128-111	940427-003	940427-004	940810-125	940810-126	941102-062	941102-063		
	<i>Groundwater Monitoring Plan Grid Location H3</i>									
GW-775	940131-124	940131-125	940427-005	940427-006	940812-029	940812-030	941102-064	941102-065		
GW-776	940131-122	940131-123	940429-067	940429-068	940812-033	940812-034	941102-068	941102-069		
	<i>Groundwater Monitoring Plan Grid Location H1</i>									
GW-199	940114-089	940114-090	940422-100	940422-101	940809-018	940809-019	941027-031	941027-032		
GW-768	940127-001	940127-002	940422-098	940422-099	940810-067	940810-068	941031-084	941031-085		

Table 7.62 (continued)

Well	Sample number									
	<i>Groundwater Monitoring Plan Grid Location I2</i>									
GW-766	940128-009 941109-012	940128-010	940425-094	940425-095	940810-063	940810-064	941031-080	941031-081		
GW-767	940128-011 941109-013	940128-012	940425-092	940425-093	940810-065	940810-066	941031-082	941031-083		
	<i>Groundwater Monitoring Plan Grid Location J3</i>									
GW-751	940126-065	940126-066	940526-003	940526-004	940729-061	940729-062	941025-045	941025-046		
GW-752	940126-069	940126-070	940526-001	940526-002	940801-057	940801-058	941025-047	941025-048		
	<i>Groundwater Monitoring Plan Grid Location K1</i>									
GW-744	940128-002	940128-003	940526-075	940526-076	940801-044	940801-045	941026-044	941026-045		
GW-745	940128-004	940128-005	940526-077	940526-078	940801-046	940801-047	941026-048	941026-049		
GW-746	940128-006	940128-007	940527-100	940527-101	940801-048	940801-049	941027-090	941027-091		
	<i>Groundwater Monitoring Plan Grid Location K2</i>									
GW-747	940128-105	940128-106	940527-102	940527-103	940801-051	940801-052	941027-092	941027-093		
GW-748	940128-107	940128-108	940531-082	940531-083	940801-053	940801-054	941027-094	941027-095		
GW-749	940131-004	940131-005	940531-084	940531-085	940801-055	940801-056	941101-001	941101-002		
	<i>Groundwater Monitoring Plan Grid Location K3</i>									
GW-817	940921-058	940921-059	941128-142	941128-143						

Table 7.62 (continued)

Well	Sample number									
	<i>Grid J Primary</i>									
GW-762	940204-003 941110-002	940204-004	940505-065	940505-066	940922-011	940922-012	940928-060	941110-001		
GW-763	940204-001	940204-002	940505-067	940505-068	940922-013	940922-014	941110-006	941110-007		
	<i>New Hope Pond</i>									
GW-148	941115-008	941115-009								
GW-149	941115-004	941115-005								
GW-151	940207-075 941116-087	940207-076 941116-088	940210-013	940513-001	940513-002	940517-082	940922-114	940922-115		
GW-153	941115-006	941115-007								
GW-154	941116-006	941116-007								
GW-220	940207-073 940928-071	940207-074 941116-085	940210-012 941116-086	940513-003	940513-004	940517-083	940922-116	940922-117		
GW-222	941116-002	941116-003								
GW-223	941116-004	941116-005								
GW-240	940204-078	940204-079	940512-002	940512-003	940922-118	940922-119	941116-083	941116-084		
GW-380	940204-080	940204-081	940512-004	940512-005	940922-009	940922-010	941116-009	941116-010		
GW-381	940209-189 941121-214	940209-190	940517-085	940517-086	940927-060	940927-061	940928-080	941121-213		
GW-382	940208-104	940208-105	940517-003	940517-004	940927-013	940927-014	941118-037	941118-038		
GW-383	940207-071 941118-007	940207-072	940210-011	940513-086	940513-087	940922-122	940922-123	941118-006		
GW-384	940201-056	940201-057	940603-079	940603-080	940803-052	940803-053	941102-076	941102-077		
GW-385	940131-147	940131-148	940602-301	940602-302	940803-056	940803-057	941101-056	941101-057		

Table 7.62 (continued)

Well	Sample number	
	<i>Rust Garage Area</i>	
GW-505	940301-085	940301-086
GW-508	940302-107	940302-108
GW-631	940301-081	940301-082
GW-632	940302-109	940302-110
GW-633	940303-052	940303-053
GW-634	940301-083	940301-084
	<i>S-2 Site</i>	
GW-251	940208-008 941205-036	940208-009 940509-085 940509-086
GW-252	940513-072	940513-073 940815-116 940815-117
GW-255	940513-074	940513-075 940815-118 940815-119 941031-008 941031-010
	<i>Union Valley</i>	
GW-169	940131-205	940131-206 940812-047 940812-048
GW-170	940202-089	940202-090 940812-045 940812-046
GW-171	940927-106	940927-107 941116-014 941116-015
GW-172	940926-124	940926-125 941115-016 941115-017
GW-230	940928-100	940928-101 941116-018 941116-019
GW-232	940202-018	940202-019 940812-050 940812-051 941117-132 941117-133
	<i>Waste coolant facilities</i>	
GW-337	940208-050	940208-051 940510-069 940510-070
GW-338	940207-008	940207-009 940504-150 940504-151 940822-103 940822-104 941205-006 941205-007

**Table 7.63. Constituents in Waste Area Grouping (WAG) 1 groundwater
at ORNL, June 3–July 7, 1994**

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	8/20	0.83	<0.10	-0.20	<i>d</i>	[<i>d</i>]
Chloride	20/20	83	1.3	24	250	0[3]
Fluoride	11/20	5.0	<0.10	-0.67	4	1[2]
Nitrate	10/20	12	<0.10	-1.1	10	1[2]
Sulfate, as SO ₄	20/20	150	0.63	37	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
2,4,5-Trichlorophenol	1/18	U28	U10	-25	<i>d</i>	[<i>d</i>]
2,4,6-Trichlorophenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
2,4-Dichlorophenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
2,4-Dimethylphenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
2,4-Dinitrophenol	1/18	U28	U25	-27	<i>d</i>	[<i>d</i>]
2-Chlorophenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
2-Methylphenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
4-Chloro-3-methylphenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
4-Methylphenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
4-Nitrophenol	1/18	U28	U25	-27	<i>d</i>	[<i>d</i>]
Pentachlorophenol	1/18	U28	U25	-27	1	18[2]
Phenol	1/18	U11	U10	-11	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	20/20	1.1	0.36	0.68	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	20/20	13	7.3	11	<i>d</i>	[<i>d</i>]
Redox (mV)	20/20	370	33	220	<i>d</i>	[<i>d</i>]
Temperature (°C)	20/20	23	14	17	30.5	0[1]
Turbidity (JTU)	20/20	180	0	46	1	18[2]
pH (SU)	20/20	9.0	6.3	7.3	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	11/20	0.66	<0.050	-0.14	0.2	3[3]
Barium, total	20/20	0.21	0.012	0.091	2	0[2]
Boron, total	10/20	1.0	<0.080	-0.21	<i>d</i>	[<i>d</i>]
Cadmium, total	1/20	0.010	<0.0050	-0.0053	0.01	0[1]
Calcium, total	20/20	160	1.4	81	<i>d</i>	[<i>d</i>]
Chromium, total	2/20	0.058	<0.0040	-0.0073	0.05	1[1]
Copper, total	6/20	0.018	<0.0070	-0.0090	1.3	0[2]
Iron, total	15/20	9.3	<0.050	-1.5	0.3	10[3]
Lead, total	1/20	0.11	<0.020	-0.025	0.05	1[1]
Magnesium, total	20/20	30	0.49	16	<i>d</i>	[<i>d</i>]
Manganese, total	19/20	6.0	<0.0010	-0.97	0.05	8[3]

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Table 7.63 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Nickel, total	1/20	0.045	<0.010	~0.012	0.1	0[2]
Potassium, total	6/20	6.2	<2.0	~2.5	<i>d</i>	[<i>d</i>]
Silicon, total	20/20	8.2	3.3	5.2	<i>d</i>	[<i>d</i>]
Sodium, total	20/20	270	2.4	41	<i>d</i>	[<i>d</i>]
Vanadium, total	8/20	0.0046	<0.0020	~0.0023	<i>d</i>	[<i>d</i>]
Others, unfiltered						
Alkalinity (mg/L)	20/20	470	170	300	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	20/20	5.1	0.63	2.0	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	4/20	17	<5.0	~6.0	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	10/20	18	<5.0	~7.5	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
⁶⁰ Co	5/20	7.8*	-2.2	1.6*	200	0[4]
¹³⁷ Cs	2/20	6.5*	-8.1	0.90	120	0[4]
Gross alpha	7/20	380*	-0.46	20	15	1[2]
Gross beta	17/20	11,000*	0.81	570	50	3[2]
³ H	16/20	12,000*	-140	2,300*	20,000	0[2]
Total rad Sr	15/20	5,600*	-0.11	290	8	5[2]
Total uranium	1/1	350*	350*	350	20	1[4]
²³⁴ U	1/1	320*	320*	320	20	1[4]
²³⁵ U	1/1	2.7*	2.7*	2.7	24	0[4]
²³⁸ U	1/1	9.7*	9.7*	9.7	24	0[4]
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	1/20	7.3*	-2.7	1.5*	200	0[4]
¹³⁷ Cs	1/20	4.9*	-2.7	0.51	120	0[4]
Gross alpha	12/20	320*	-0.89	18	15	1[2]
Gross beta	15/20	12,000*	0.81	620	50	3[2]
³ H	14/20	14,000*	-27	2,400*	20,000	0[2]
Total rad Sr	14/20	5,700*	0.43	300	8	6[2]
Total uranium	1/1	320*	320*	320	20	1[4]
²³⁴ U	1/1	320*	320*	320	20	1[4]
²³⁵ U	1/1	2.6*	2.6*	2.6	24	0[4]
²³⁸ U	1/1	7.0*	7.0*	7.0	24	0[4]
Volatile organics, unfiltered (µg/L)						
1,2-Dichloroethene, total	1/20	5.7	U5.0	~5.0	70	0[2]
Chloroform	1/20	9.6	U5.0	~5.2	100	0[2]
Methylene chloride	1/20	U5.0	J1.2	~4.8	5	0[2]
Trichloroethene	1/20	U5.0	J2.6	~4.9	5	0[1]
Vinyl chloride	1/20	21	U10	~11	2	20[1]
<i>cis</i> -1,2-Dichloroethene	1/20	5.7	U5.0	~5.0	<i>d</i>	[<i>d</i>]

Table 7.63 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	3/3	14	1.1	6.0	250	0[3]
Fluoride	1/3	0.92	<0.10	~0.37	4	0[2]
Nitrate	3/3	6.7	0.37	4.2	10	0[2]
Sulfate, as SO ₄	3/3	33	19	27	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	3/3	0.63	0.47	0.54	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	3/3	15	13	14	<i>d</i>	[<i>d</i>]
Redox (mV)	3/3	510	89	360	<i>d</i>	[<i>d</i>]
Temperature (°C)	3/3	16	16	16	30.5	0[1]
Turbidity (JTU)	3/3	57	0	20	1	2[2]
pH (SU)	3/3	8.2	6.8	7.6	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	1/3	3.4	<0.050	~1.2	0.2	1[3]
Barium, total	3/3	0.21	0.067	0.12	2	0[2]
Boron, total	1/3	0.24	<0.080	~0.13	<i>d</i>	[<i>d</i>]
Calcium, total	3/3	120	38	86	<i>d</i>	[<i>d</i>]
Chromium, total	1/3	0.0053	<0.0040	~0.0044	0.05	0[1]
Iron, total	1/3	3.9	<0.050	~1.3	0.3	1[3]
Magnesium, total	3/3	30	8.3	17	<i>d</i>	[<i>d</i>]
Manganese, total	3/3	0.066	0.0030	0.026	0.05	1[3]
Nickel, total	1/3	0.040	<0.010	~0.020	0.1	0[2]
Silicon, total	3/3	8.1	4.5	6.7	<i>d</i>	[<i>d</i>]
Sodium, total	3/3	29	3.1	13	<i>d</i>	[<i>d</i>]
Vanadium, total	1/3	0.0079	<0.0020	~0.0040	<i>d</i>	[<i>d</i>]
Zinc, total	1/3	0.0064	<0.0050	~0.0055	5	0[3]
Others, unfiltered						
Alkalinity (mg/L)	3/3	350	230	280	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	3/3	1.9	0.99	1.4	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	1/3	17	<5.0	~9.0	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	1/3	52	<5.0	~21	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
Gross alpha	2/3	2.5*	1.4	2.1*	15	0[2]
Gross beta	3/3	19*	2.5*	8.0	50	0[2]
³ H	3/3	9,700*	780*	3,900	20,000	0[2]
Total rad Sr	1/3	1.6*	-0.65	0.72	8	0[2]

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Table 7.63 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	1/3	5.1*	-0.27	1.7	200	0[4]
¹³⁷ Cs	1/3	4.1*	-0.54	1.3	120	0[4]
Gross alpha	2/3	2.7*	0.84	1.8*	15	0[2]
Gross beta	2/3	5.9*	1.9	3.7*	50	0[2]
³ H	2/3	2,400*	570	1,500	20,000	0[2]
Volatile organics, unfiltered (µg/L)						
Chloroform	1/3	11	U5.0	~7.0	100	0[2]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^dNot applicable.

^eIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.64. Constituents in Waste Area Grouping (WAG) 2 groundwater at ORNL, April 7-15, 29-May 19, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
<i>Anions, unfiltered (mg/L)</i>						
Bromide	3/8	0.74	<0.10	-0.20	<i>d</i>	[<i>d</i>]
Chloride	8/8	30	0.46	10	250	0[3]
Fluoride	1/8	3.2	<0.10	-0.49	4	0[2]
Nitrate	3/8	6.5	<0.10	-1.4	10	0[2]
Phosphate	1/8	0.76	<0.50	-0.53	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	8/8	32	0.78	11	250	0[3]
<i>Base neutral/acid extractable organics, unfiltered (µg/L)</i>						
2,4,5-Trichlorophenol	1/8	U28	U25	-27	<i>d</i>	[<i>d</i>]
2,4,6-Trichlorophenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
2,4-Dichlorophenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
2,4-Dimethylphenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
2,4-Dinitrophenol	1/8	U28	U25	-27	<i>d</i>	[<i>d</i>]
2-Chlorophenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
2-Methylphenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
2-Nitrophenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
4,6-Dinitro-2-methylphenol	1/8	U28	U25	-27	<i>d</i>	[<i>d</i>]
4-Chloro-3-methylphenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
4-Methylphenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
4-Nitrophenol	1/8	U28	U25	-27	<i>d</i>	[<i>d</i>]
Pentachlorophenol	1/8	U28	U25	-27	1	8[2]
Phenol	1/8	U11	U10	-11	<i>d</i>	[<i>d</i>]
<i>Field measurements, unfiltered</i>						
Conductivity (mS/cm)	8/8	0.96	0.23	0.58	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	8/8	13	11	12	<i>d</i>	[<i>d</i>]
Redox (mV)	8/8	440	110	250	<i>d</i>	[<i>d</i>]
Temperature (°C)	8/8	17	12	15	30.5	0[1]
Turbidity (JTU)	8/8	280	0	43	1	7[2]
pH (SU)	8/8	9.4	6.7	7.6	(6.0, 9.0)	2[1]
<i>Metals, unfiltered (mg/L)</i>						
Aluminum, total	5/8	0.36	<0.050	-0.16	0.2	3[3]
Arsenic, total	2/8	0.042	<0.010	-0.014	0.05	0[1]
Barium, total	8/8	0.94	0.041	0.26	2	0[2]
Boron, total	2/8	1.1	<0.080	-0.23	<i>d</i>	[<i>d</i>]
Calcium, total	8/8	120	1.0	61	<i>d</i>	[<i>d</i>]
Chromium, total	1/8	0.39	<0.0040	-0.052	0.05	1[1]
Cobalt, total	1/8	0.0042	<0.0040	-0.0040	<i>d</i>	[<i>d</i>]
Iron, total	7/8	19	<0.050	-5.6	0.3	5[3]

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Table 7.64 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Magnesium, total	8/8	19	0.23	8.3	<i>d</i>	[<i>d</i>]
Manganese, total	8/8	0.97	0.0025	0.20	0.05	4[3]
Nickel, total	1/8	0.030	<0.010	~0.012	0.1	0[2]
Potassium, total	4/8	3.6	<2.0	~2.4	<i>d</i>	[<i>d</i>]
Silicon, total	8/8	9.2	3.5	6.6	<i>d</i>	[<i>d</i>]
Sodium, total	8/8	230	4.8	56	<i>d</i>	[<i>d</i>]
Vanadium, total	3/8	0.0046	<0.0020	~0.0026	<i>d</i>	[<i>d</i>]
Others, unfiltered						
Alkalinity (mg/L)	8/8	470	120	300	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	8/8	5.7	0.76	1.6	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	1/8	10	<5.0	~5.6	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	3/8	55	<5.0	~15	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^f						
⁶⁰ Co	1/8	8.6*	-1.4	1.8	200	0[4]
¹³⁷ Cs	2/8	6.2*	-3.0	1.3	120	0[4]
Gross beta	5/8	1,000*	1.6	130	50	1[2]
³ H	6/8	180,000*	300	50,000*	20,000	3[2]
Total rad Sr	3/8	350*	-0.027	45	8	1[2]
Radionuclides, unfiltered (pCi/L) ^f						
⁶⁰ Co	3/8	7.3*	-1.4	2.2*	200	0[4]
Gross alpha	2/8	2.0*	0.081	0.96*	15	0[2]
Gross beta	6/8	810*	1.6	100	50	1[2]
³ H	5/8	180,000*	-190	48,000*	20,000	3[2]
Total rad Sr	5/8	320*	0.35	43	8	1[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	1/8	U10	JB1.0	~8.9	<i>d</i>	[<i>d</i>]
Acetone	1/8	U10	JB1.4	~8.9	<i>d</i>	[<i>d</i>]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	2/12	0.14	<0.10	~0.11	<i>d</i>	[<i>d</i>]
Chloride	12/12	6.0	0.83	2.6	250	0[3]
Fluoride	4/12	1.1	<0.10	~0.32	4	0[2]
Nitrate	6/12	6.5	<0.050	~0.81	10	0[2]
Phosphate	1/12	<0.50	0.15	~0.47	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	12/12	87	5.7	36	250	0[3]

Table 7.64 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^a	Reference value	Number of values exceeding reference [ref] ^c
Base neutral/acid extractable organics, unfiltered (µg/L)						
2,4,5-Trichlorophenol	2/12	U28	U10	-24	<i>d</i>	[<i>d</i>]
2,4,6-Trichlorophenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
2,4-Dichlorophenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
2,4-Dimethylphenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
2,4-Dinitrophenol	2/12	U28	U25	-25	<i>d</i>	[<i>d</i>]
2-Chlorophenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
2-Methylphenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
2-Nitrophenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
4,6-Dinitro-2-methylphenol	2/12	U28	U25	-25	<i>d</i>	[<i>d</i>]
4-Chloro-3-methylphenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
4-Methylphenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
4-Nitrophenol	1/12	U28	U25	-25	<i>d</i>	[<i>d</i>]
Pentachlorophenol	2/12	U28	U25	-25	1	12[2]
Phenol	2/12	U11	U10	-10	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	12/12	0.69	0.26	0.50	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	12/12	14	10	12	<i>d</i>	[<i>d</i>]
Redox (mV)	12/12	470	150	340	<i>d</i>	[<i>d</i>]
Temperature (°C)	12/12	15	11	13	30.5	0[1]
Turbidity (JTU)	12/12	41	0	6.4	1	5[2]
pH (SU)	12/12	9.2	5.7	7.3	(6.0, 9.0)	2[1]
Metals, unfiltered (mg/L)						
Aluminum, total	6/12	0.26	<0.050	-0.11	0.2	3[3]
Barium, total	12/12	0.56	0.041	0.19	2	0[2]
Boron, total	7/12	0.87	<0.080	-0.20	<i>d</i>	[<i>d</i>]
Calcium, total	12/12	130	1.0	56	<i>d</i>	[<i>d</i>]
Chromium, total	1/12	0.0046	<0.0040	-0.0041	0.05	0[1]
Cobalt, total	2/12	0.025	<0.0040	-0.0059	<i>d</i>	[<i>d</i>]
Iron, total	10/12	4.6	<0.050	-0.54	0.3	3[3]
Magnesium, total	12/12	28	0.26	12	<i>d</i>	[<i>d</i>]
Manganese, total	12/12	8.5	0.0028	0.86	0.05	7[3]
Nickel, total	3/12	0.023	<0.010	-0.011	0.1	0[2]
Potassium, total	7/12	6.4	<2.0	-3.0	<i>d</i>	[<i>d</i>]
Silicon, total	12/12	9.1	3.1	6.9	<i>d</i>	[<i>d</i>]
Sodium, total	12/12	190	7.4	50	<i>d</i>	[<i>d</i>]
Zinc, total	1/12	0.013	<0.0050	-0.0057	5	0[3]

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Table 7.64 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Others, unfiltered						
Alkalinity (mg/L)	12/12	390	120	250	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	12/12	3.4	0.52	1.3	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	3/12	47	<5.0	~9.6	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	2/12	15	<5.0	~6.2	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
⁶⁰ Co	3/12	190*	-2.2	18	200	0[4]
¹³⁷ Cs	1/12	13*	-1.1	1.2	120	0[4]
Gross alpha	5/12	9.2*	-0.68	1.7*	15	0[2]
Gross beta	8/12	570*	2.2	54	50	1[2]
³ H	9/12	350,000*	270	33,000	20,000	2[2]
Total rad Sr	4/12	25*	-0.89	3.3	8	1[2]
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	5/12	200*	0.27	20	200	1[4]
¹³⁷ Cs	4/12	20*	-1.4	4.5*	120	0[4]
Gross alpha	5/12	12*	0.081	2.1*	15	0[2]
Gross beta	9/12	650*	1.1	59	50	1[2]
³ H	8/12	380,000*	27	35,000	20,000	2[2]
Total rad Sr	3/12	10*	-0.32	1.6*	8	1[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	1/12	U10	JB1.0	~9.3	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^eNot applicable.

*Individual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.65. Constituents in Waste Area Grouping (WAG) 3 groundwater at ORNL, September 20–October 7, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [rcf] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	7/10	0.22	<0.10	-0.16	<i>d</i>	[<i>d</i>]
Chloride	10/10	390	1.7	94	250	1[3]
Fluoride	2/10	0.65	<0.10	-0.19	4	0[2]
Nitrate	3/10	4.4	<0.10	-0.61	10	0[2]
Sulfate, as SO ₄	10/10	230	2.6	55	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	10/10	1.7	0.59	0.98	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	10/10	16	10	12	<i>d</i>	[<i>d</i>]
Redox (mV)	10/10	560	41	260	<i>d</i>	[<i>d</i>]
Temperature (°C)	10/10	16	14	15	30.5	0[1]
Turbidity (JTU)	10/10	420	0	94	1	8[2]
pH (SU)	10/10	7.3	5.8	6.7	(6.0, 9.0)	1[1]
Metals, unfiltered (mg/L)						
Aluminum, total	2/10	0.83	<0.050	-0.15	0.2	2[3]
Barium, total	10/10	0.63	0.067	0.20	2	0[2]
Boron, total	8/10	4.4	<0.080	-0.76	<i>d</i>	[<i>d</i>]
Calcium, total	10/10	200	41	120	<i>d</i>	[<i>d</i>]
Chromium, total	1/10	0.017	<0.0040	-0.0053	0.05	0[1]
Cobalt, total	1/10	0.0055	<0.0040	-0.0042	<i>d</i>	[<i>d</i>]
Iron, total	7/10	6.9	<0.050	-1.1	0.3	4[3]
Magnesium, total	10/10	55	12	28	<i>d</i>	[<i>d</i>]
Manganese, total	10/10	2.8	0.0053	0.45	0.05	5[3]
Mercury, total	3/10	0.00064	<0.000050	-0.00013	0.002	0[1]
Nickel, total	2/10	0.027	<0.010	-0.012	0.1	0[2]
Potassium, total	10/10	15	2.2	5.0	<i>d</i>	[<i>d</i>]
Silicon, total	10/10	8.7	5.2	6.2	<i>d</i>	[<i>d</i>]
Sodium, total	10/10	110	4.3	40	<i>d</i>	[<i>d</i>]
Vanadium, total	6/10	0.0046	<0.0020	-0.0026	<i>d</i>	[<i>d</i>]
Zinc, total	2/10	0.015	<0.0050	-0.0062	5	0[3]
Others, unfiltered						
Alkalinity (mg/L)	10/10	430	240	350	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	10/10	8.8	0.58	2.2	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	5/10	22	<5.0	-10	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	2/10	9.0	<5.0	-5.5	<i>d</i>	[<i>d</i>]

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Table 7.65 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Radionuclides, filtered (pCi/L)^e						
¹³⁷ Cs	2/10	6.5*	-1.1	2.5*	120	0[4]
Gross alpha	5/10	10*	0.86	4.4*	15	0[2]
Gross beta	9/10	1,500*	1.9	260	50	4[2]
³ H	10/10	16,000*	1,000*	3,400*	20,000	0[2]
Total rad Sr	7/10	490*	-1.4	85	8	4[2]
Radionuclides, unfiltered (pCi/L)^e						
⁶⁰ Co	3/10	3.8*	-1.1	2.4*	200	0[4]
¹³⁷ Cs	1/10	3.0	-0.81	0.90*	120	0[4]
Gross alpha	6/10	14*	0.30	4.3*	15	0[2]
Gross beta	8/10	1,500*	0.32	260	50	4[2]
³ H	9/10	21,000*	270	4,000*	20,000	1[2]
Total rad Sr	5/10	650*	0.32	100	8	4[2]
Volatile organics, unfiltered (µg/L)						
1,2-Dichloroethene, total	2/10	U5.0	J1.6	-4.5	70	0[2]
2-Butanone	10/10	JB6.6	JB4.0	-4.6	<i>d</i>	[<i>d</i>]
Acetone	5/10	12	J3.9	-8.8	<i>d</i>	[<i>d</i>]
Trichloroethene	1/10	8.8	U5.0	-5.4	5	1[1]
Vinyl chloride	2/10	U10	J4.1	-8.9	2	10[1]
cis-1,2-Dichloroethene	4/10	16	J1.6	-5.6	<i>d</i>	[<i>d</i>]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	3/3	1.8	1.7	1.8	250	0[3]
Nitrate	2/3	0.85	<0.10	-0.45	10	0[2]
Sulfate, as SO ₄	3/3	15	6.6	10	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	3/3	0.77	0.26	0.54	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	3/3	14	11	12	<i>d</i>	[<i>d</i>]
Redox (mV)	3/3	490	190	350	<i>d</i>	[<i>d</i>]
Temperature (°C)	3/3	16	14	15	30.5	0[1]
Turbidity (JTU)	3/3	110	0	35	1	1[2]
pH (SU)	3/3	7.0	6.3	6.7	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	3/3	3.4	0.24	1.3	0.2	3[3]
Barium, total	3/3	0.053	0.025	0.037	2	0[2]
Calcium, total	3/3	130	52	100	<i>d</i>	[<i>d</i>]
Iron, total	3/3	2.4	0.48	1.2	0.3	3[3]

Table 7.65 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Magnesium, total	3/3	15	2.7	7.1	<i>d</i>	[<i>d</i>]
Manganese, total	3/3	0.099	0.011	0.044	0.05	1[3]
Silicon, total	3/3	11	2.9	6.6	<i>d</i>	[<i>d</i>]
Sodium, total	3/3	2.9	1.9	2.3	<i>d</i>	[<i>d</i>]
Vanadium, total	2/3	0.0077	<0.0020	~0.0042	<i>d</i>	[<i>d</i>]
Zinc, total	1/3	0.0092	<0.0050	~0.0064	5	0[3]
Others, unfiltered						
Alkalinity (mg/L)	3/3	350	130	270	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	3/3	2.7	0.73	1.7	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	1/3	6.1	<5.0	~5.4	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	1/3	110	<5.0	~39	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
Gross alpha	2/3	4.3*	-0.081	2.3	15	0[2]
Gross beta	2/3	5.7*	3.2	4.7*	50	0[2]
³ H	2/3	950*	140	640	20,000	0[2]
Total rad Sr	2/3	1.8*	-0.65	0.94	8	0[2]
Radionuclides, unfiltered (pCi/L) ^e						
Gross alpha	1/3	2.7*	0.32	1.3	15	0[2]
Gross beta	2/3	5.1*	-0.54	3.1	50	0[2]
³ H	1/3	920*	54	560	20,000	0[2]
Total rad Sr	1/3	3.0*	0.78	1.6	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	3/3	JB4.1	JB3.8	~3.9	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^dNot applicable.

^eIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

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Table 7.66. Constituents in Waste Area Grouping (WAG) 4 groundwater at ORNL, December 2, 1993–January 7, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	7/11	1.2	<0.10	-0.36	<i>d</i>	[<i>d</i>]
Chloride	11/11	140	1.9	45	250	0[3]
Fluoride	5/11	6.4	<0.10	-1.3	4	1[2]
Nitrate	6/11	0.64	<0.10	-0.30	10	0[2]
Phosphate	2/11	0.61	<0.50	-0.52	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	11/11	190	3.4	62	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
<i>N</i> -Nitrosodiphenylamine	1/11	U5.0	J2.0	-4.7	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	11/11	1.7	0.48	0.92	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	11/11	12	7.2	9.5	<i>d</i>	[<i>d</i>]
Redox (mV)	11/11	550	71	300	<i>d</i>	[<i>d</i>]
Temperature (°C)	11/11	16	13	14	30.5	0[1]
Turbidity (JTU)	11/11	64	0	9.2	1	7[2]
pH (SU)	11/11	9.4	6.7	7.7	(6.0, 9.0)	1[1]
Metals, unfiltered (mg/L)						
Aluminum, total	5/11	0.29	<0.050	-0.10	0.2	2[3]
Barium, total	11/11	0.60	0.027	0.15	2	0[2]
Boron, total	4/11	0.61	<0.080	-0.19	<i>d</i>	[<i>d</i>]
Calcium, total	11/11	120	1.3	59	<i>d</i>	[<i>d</i>]
Chromium, total	2/11	0.0056	<0.0040	-0.0042	0.05	0[1]
Iron, total	10/11	19	<0.050	-2.6	0.3	5[3]
Magnesium, total	11/11	28	0.18	13	<i>d</i>	[<i>d</i>]
Manganese, total	11/11	3.0	0.0032	0.44	0.05	6[3]
Nickel, total	4/11	0.14	<0.010	-0.041	0.1	2[2]
Potassium, total	7/11	4.9	<2.0	-3.1	<i>d</i>	[<i>d</i>]
Selenium, total	1/11	0.0074	<0.0050	-0.0052	0.01	0[1]
Silicon, total	11/11	15	3.9	8.1	<i>d</i>	[<i>d</i>]
Sodium, total	11/11	390	9.9	110	<i>d</i>	[<i>d</i>]
Vanadium, total	5/11	0.0094	<0.0020	-0.0036	<i>d</i>	[<i>d</i>]
Others, unfiltered						
Alkalinity (mg/L)	11/11	530	130	350	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	10/11	7.7	<0.50	-1.5	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	6/11	1,900	<5.0	-190	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	4/11	27	<5.0	-7.5	<i>d</i>	[<i>d</i>]

Table 7.66 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Radionuclides, filtered (pCi/L)^e						
¹³⁷ Cs	1/11	3.8*	-0.54	0.79*	120	0[4]
Gross alpha	7/11	4.3*	-0.41	1.7*	15	0[2]
Gross beta	7/11	1,500*	-0.27	140	50	1[2]
³ H	11/11	7,300,000*	1,000*	1,100,000	20,000	6[2]
Total rad Sr	4/11	730*	-0.86	68	8	1[2]
Radionuclides, unfiltered (pCi/L)^e						
⁶⁰ Co	1/11	5.1*	-1.4	0.81	200	0[4]
¹³⁷ Cs	2/11	4.6*	-6.2	-0.025	120	0[4]
Gross alpha	5/11	6.2*	0.30	2.9*	15	0[2]
Gross beta	11/11	1,400*	3.5*	140	50	1[2]
³ H	10/11	8,100,000*	350	1,100,000	20,000	6[2]
Total rad Sr	4/11	650*	-0.24	61	8	2[2]
Volatile organics, unfiltered (µg/L)						
1,1-Dichloroethene	1/11	17	U5.0	-6.1	7	1[1]
1,2-Dichloroethane	1/11	U5.0	J4.0	-4.9	5	0[1]
1,2-Dichloroethene, total	2/11	Y1,300	U5.0	-130	70	1[2]
Acetone	1/11	U10	J8.6	-9.9	<i>d</i>	[<i>d</i>]
Chlorobenzene	1/11	U5.0	J1.4	-4.7	100	0[2]
Trichloroethene	2/11	Y280	J1.6	-30	5	1[1]
Vinyl chloride	3/11	Y1,100	J4.2	-110	2	11[1]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	4/4	3.1	1.8	2.3	250	0[3]
Fluoride	3/4	0.60	<0.10	-0.40	4	0[2]
Nitrate	1/4	0.39	<0.10	-0.17	10	0[2]
Sulfate, as SO ₄	4/4	60	11	29	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Diethyl phthalate	1/4	7.0	U5.0	-5.5	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.47	0.21	0.32	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	4/4	13	12	12	<i>d</i>	[<i>d</i>]
Redox (mV)	4/4	440	220	350	<i>d</i>	[<i>d</i>]
Temperature (°C)	4/4	15	14	15	30.5	0[1]
Turbidity (JTU)	4/4	260	3.0	68	1	4[2]
pH (SU)	4/4	7.3	6.0	6.7	(6.0, 9.0)	0[1]

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Table 7.66 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Metals, unfiltered (mg/L)						
Aluminum, total	3/4	0.21	<0.050	-0.11	0.2	1[3]
Barium, total	4/4	0.22	0.034	0.14	2	0[2]
Calcium, total	4/4	65	12	33	<i>d</i>	[<i>d</i>]
Iron, total	4/4	7.3	0.23	3.9	0.3	3[3]
Magnesium, total	4/4	12	6.4	9.1	<i>d</i>	[<i>d</i>]
Manganese, total	4/4	2.7	0.59	1.6	0.05	4[3]
Potassium, total	2/4	5.3	<2.0	-3.1	<i>d</i>	[<i>d</i>]
Silicon, total	4/4	16	12	14	<i>d</i>	[<i>d</i>]
Sodium, total	4/4	17	7.4	11	<i>d</i>	[<i>d</i>]
Vanadium, total	2/4	0.0027	<0.0020	-0.0022	<i>d</i>	[<i>d</i>]
Others, unfiltered						
Alkalinity (mg/L)	4/4	200	68	130	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	1/4	6.0	<5.0	-5.3	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^f						
Gross beta	3/4	51*	-1.1	16	50	1[2]
³ H	1/4	810*	-490	230	20,000	0[2]
Total rad Sr	2/4	3.2*	0.43	2.1*	8	0[2]
Radionuclides, unfiltered (pCi/L) ^f						
⁶⁰ Co	1/4	5.4*	-1.6	1.0	200	0[4]
Gross beta	2/4	14*	0.27	6.0	50	0[2]
³ H	1/4	570*	-810	-180	20,000	0[2]
Volatile organics, unfiltered (µg/L)						
Carbon disulfide	1/4	U5.0	J2.1	-4.3	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "Y" indicates the value exceeded the calibration range and the sample was diluted and was reanalyzed; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^fNot applicable.

^gIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.67. Constituents in Waste Area Grouping (WAG) 5 groundwater at ORNL, October 12–November 4, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	7/17	0.39	<0.10	~0.14	<i>d</i>	[<i>d</i>]
Chloride	17/17	31	1.1	11	250	0[3]
Fluoride	2/17	0.49	<0.10	~0.14	4	0[2]
Nitrate	6/17	1.4	<0.10	~0.29	10	0[2]
Sulfate, as SO ₄	17/17	290	1.2	50	250	1[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
<i>Bis</i> (2-ethylhexyl) phthalate	3/16	33	JB2.0	~11	<i>d</i>	[<i>d</i>]
Diethyl phthalate	2/16	B13	JB2.0	~9.8	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	17/17	1.1	0.41	0.76	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	17/17	13	8.9	10	<i>d</i>	[<i>d</i>]
Redox (mV)	17/17	500	82	300	<i>d</i>	[<i>d</i>]
Temperature (°C)	17/17	18	13	15	30.5	0[1]
Turbidity (JTU)	17/17	470	0	55	1	11[2]
pH (SU)	17/17	8.5	5.9	6.8	(6.0, 9.0)	1[1]
Metals, unfiltered (mg/L)						
Aluminum, total	6/17	0.91	<0.050	~0.22	0.2	6[3]
Barium, total	17/17	0.76	0.019	0.27	2	0[2]
Boron, total	4/17	1.3	<0.080	~0.19	<i>d</i>	[<i>d</i>]
Calcium, total	17/17	170	2.8	95	<i>d</i>	[<i>d</i>]
Copper, total	9/17	0.024	<0.0070	~0.010	1.3	0[2]
Iron, total	16/17	1.3	<0.050	~0.55	0.3	12[3]
Magnesium, total	17/17	37	1.1	18	<i>d</i>	[<i>d</i>]
Manganese, total	17/17	1.1	0.0039	0.26	0.05	11[3]
Mercury, total	7/17	0.00034	<0.000050	~0.00016	0.002	0[1]
Nickel, total	7/17	0.032	<0.010	~0.013	0.1	0[2]
Potassium, total	5/17	8.0	<2.0	~2.6	<i>d</i>	[<i>d</i>]
Silicon, total	17/17	14	2.8	8.4	<i>d</i>	[<i>d</i>]
Sodium, total	17/17	130	5.0	24	<i>d</i>	[<i>d</i>]
Vanadium, total	10/17	0.0039	<0.0020	~0.0024	<i>d</i>	[<i>d</i>]
Zinc, total	9/17	0.016	<0.0050	~0.0078	5	0[3]

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Table 7.67 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Others, unfiltered						
Alkalinity (mg/L)	17/17	540	130	310	<i>d</i>	[<i>d</i>]
Phenolics, total recoverable (mg/L)	1/17	0.020	<0.0010	~0.0021	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	11/17	4.3	<0.50	~1.2	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	4/17	3,200	<5.0	~200	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	7/17	21	<5.0	~8.2	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^c						
¹³⁷ Cs	3/17	19*	-3.8	2.9*	120	0[4]
Gross alpha	7/17	13*	-1.6	2.9*	15	0[2]
Gross beta	14/17	1,500*	-0.54	120	50	3[2]
³ H	15/17	320,000,000*	-190	23,000,000	20,000	9[2]
Total rad Sr	7/17	540*	-0.70	44	8	3[2]
Radionuclides, unfiltered (pCi/L) ^c						
⁶⁰ Co	3/17	7.6*	-4.1	1.2*	200	0[4]
¹³⁷ Cs	4/17	23*	-0.81	3.1*	120	0[4]
Gross alpha	6/17	14*	0.19	2.6*	15	0[2]
Gross beta	11/17	1,100*	-0.27	99	50	3[2]
³ H	14/17	320,000,000*	-570	24,000,000	20,000	9[2]
Total rad Sr	7/17	380*	-0.86	36	8	3[2]
Volatile organics, unfiltered (µg/L)						
1,1-Dichloroethane	3/17	U5.0	J1.5	~4.7	<i>d</i>	[<i>d</i>]
1,1-Dichloroethene	1/17	5.5	U5.0	~5.0	7	0[1]
1,2-Dichloroethane	1/17	U5.0	J3.1	~4.9	5	0[1]
1,2-Dichloroethene, total	3/17	Y4,400	U5.0	~270	70	2[2]
2-Butanone	12/17	U10	JB3.3	~6.2	<i>d</i>	[<i>d</i>]
Acetone	2/17	14	J3.5	~9.9	<i>d</i>	[<i>d</i>]
Benzene	2/17	34	J1.0	~6.5	5	1[1]
Carbon disulfide	1/17	U5.0	J2.2	~4.8	<i>d</i>	[<i>d</i>]
Tetrachloroethene	1/17	U5.0	J1.5	~4.8	5	0[2]
Toluene	1/17	U5.0	J1.0	~4.8	1,000	0[2]
Trichloroethene	4/17	59	J3.5	~9.0	5	2[1]
Vinyl chloride	2/17	Y5,400	U10	~330	2	17[1]
Xylene, o	1/17	U5.0	J2.1	~4.8	<i>d</i>	[<i>d</i>]

Table 7.67 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^f
Xylene, total	1/17	U5.0	J2.1	~4.8	10,000	0[2]
<i>cis</i> -1,2-Dichloroethene	4/17	Y4,400	J3.1	~270	<i>d</i>	[<i>d</i>]
<i>trans</i> -1,2-Dichloroethene	1/17	6.6	U5.0	~5.1	<i>d</i>	[<i>d</i>]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	2/2	2.7	1.7	2.2	250	0[3]
Nitrate	1/2	0.50	<0.10	~0.30	10	0[2]
Phosphate	1/2	0.66	<0.50	~0.58	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	2/2	22	8.3	15	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	2/2	0.54	0.52	0.53	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	2/2	12	11	12	<i>d</i>	[<i>d</i>]
Redox (mV)	2/2	500	480	490	<i>d</i>	[<i>d</i>]
Temperature (°C)	2/2	15	15	15	30.5	0[1]
Turbidity (JTU)	2/2	12	9.0	11	1	2[2]
pH (SU)	2/2	7.0	6.6	6.8	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Barium, total	2/2	0.15	0.12	0.14	2	0[2]
Calcium, total	2/2	82	73	78	<i>d</i>	[<i>d</i>]
Copper, total	1/2	0.018	<0.0070	~0.013	1.3	0[2]
Magnesium, total	2/2	11	3.4	7.2	<i>d</i>	[<i>d</i>]
Manganese, total	2/2	0.037	0.0074	0.022	0.05	0[3]
Mercury, total	2/2	0.00027	0.00024	0.00026	0.002	0[1]
Silicon, total	2/2	12	6.9	9.5	<i>d</i>	[<i>d</i>]
Sodium, total	2/2	7.0	6.4	6.7	<i>d</i>	[<i>d</i>]
Vanadium, total	1/2	0.0029	<0.0020	~0.0025	<i>d</i>	[<i>d</i>]
Zinc, total	1/2	0.010	<0.0050	~0.0075	5	0[3]
Others, unfiltered						
Alkalinity (mg/L)	2/2	230	230	230	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	2/2	0.61	0.50	0.56	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^f						
³ H	2/2	1,200*	1,200*	1,200*	20,000	0[2]

Table 7.67 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Radionuclides, unfiltered (pCi/L) ^d						
¹³⁷ Cs	1/2	4.1*	-0.27	1.9	120	0[4]
³ H	2/2	1,300*	1,200*	1,200*	20,000	0[2]
Total rad Sr	1/2	1.9*	0.70	1.3	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	2/2	JB4.1	JB3.0	~3.6	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "B" indicates the compound was found in the laboratory blank; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; "Y" indicates the value exceeded the calibration range and the sample was diluted and was reanalyzed; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^dNot applicable.

*Individual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.68. Constituents in Waste Area Grouping (WAG) 6 groundwater at ORNL, during 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Nitrate	22/30	5.7	<0.10	~1.6	10	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	50/50	1.1	0.010	0.50	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	42/42	14	7.5	11	<i>d</i>	[<i>d</i>]
Redox (mV)	42/42	590	210	430	<i>d</i>	[<i>d</i>]
Temperature (°C)	50/50	19	11	15	30.5	0[2]
Turbidity (JTU)	42/42	300	0	20	1	28[3]
pH (SU)	50/50	7.8	4.9	6.6	(6.0, 9.0)	9[2]
Radionuclides, filtered (pCi/L) ^e						
⁶⁰ Co	10/42	410*	-3.8	20*	200	1[1]
¹³⁷ Cs	2/42	5.1*	-4.9	0.29	120	0[1]
Gross alpha	14/42	6.2*	-0.70	1.3*	15	0[3]
Gross beta	30/42	220*	-0.027	15*	50	3[3]
³ H	39/42	2,700,000*	270	270,000*	80,000	16[1]
Total rad Sr	15/42	3.8*	-1.8	1.1*	40	0[1]
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	2/8	140*	-2.2	21	200	0[1]
Gross alpha	3/8	3.0*	1.1	1.8*	15	0[3]
Gross beta	5/8	180*	0.27	27	50	1[3]
³ H	8/8	1,400,000*	32,000*	510,000*	80,000	7[1]
Total rad Sr	3/8	19*	-0.65	3.5	40	0[1]
Volatile organics, unfiltered (µg/L)						
1,1-Dichloroethane	2/50	5.0	J2.3	-4.9	<i>d</i>	[<i>d</i>]
1,2-Dichloroethane	4/50	12	U5.0	-5.4	5	4[2]
1,2-Dichloroethene, total	5/50	10	J3.5	-5.1	70	0[3]
2-Butanone	12/50	10	J1.0	-8.6	<i>d</i>	[<i>d</i>]
Acetone	7/50	43	J6.3	-11	<i>d</i>	[<i>d</i>]
Carbon tetrachloride	4/50	34	U5.0	-6.9	5	4[2]
Chloroform	9/50	41	J1.2	-7.3	100	0[3]
Diethyl phthalate	2/8	U11	JB1.0	-8.6	<i>d</i>	[<i>d</i>]
Methylene chloride	1/50	5.0	J1.8	-4.9	5	0[3]
Trichloroethene	8/50	180	J1.1	-17	5	5[2]
<i>cis</i> -1,2-Dichloroethene	8/50	10	J3.5	-5.2	<i>d</i>	[<i>d</i>]

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Table 7.68 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Nitrate	5/11	0.98	<0.10	~0.33	10	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	14/14	1.1	0.020	0.42	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	14/14	120	9.7	20	<i>d</i>	[<i>d</i>]
Redox (mV)	14/14	600	220	440	<i>d</i>	[<i>d</i>]
Temperature (°C)	14/14	17	13	15	30.5	0[2]
Turbidity (JTU)	14/14	98	0	21	1	13[3]
pH (SU)	14/14	7.9	5.5	6.8	(6.0, 9.0)	2[2]
Radionuclides, filtered (pCi/L) ^e						
⁶⁰ Co	2/14	4.1*	-2.2	1.3*	200	0[1]
¹³⁷ Cs	2/14	5.7*	-2.7	1.2*	120	0[1]
Gross alpha	4/14	3.8*	-0.27	1.2*	15	0[3]
Gross beta	7/14	5.4*	-0.27	2.5*	50	0[3]
³ H	6/14	2,500*	-540	700*	80,000	0[1]
Total rad Sr	6/14	5.4*	-1.8	1.3*	40	0[1]
Volatile organics, unfiltered (µg/L)						
2-Butanone	3/14	U10	JB1.0	~8.1	<i>d</i>	[<i>d</i>]
Acetone	1/14	U10	J1.0	~9.4	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^eNot applicable.

Individual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.69. Constituents in Waste Area Grouping (WAG) 7 groundwater at ORNL, November 10–December 6, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	5/13	0.52	<0.10	-0.15	<i>d</i>	[<i>d</i>]
Chloride	13/13	88	1.2	14	250	0[3]
Fluoride	3/13	8.5	<0.10	-0.93	4	1[2]
Nitrate	8/13	1,800	<0.10	-140	10	3[2]
Phosphate	1/13	0.76	<0.50	-0.52	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	13/13	670	9.2	160	250	3[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
4-Nitrophenol	1/13	U28	14.0	-25	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	13/13	2.9	0.59	1.1	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	13/13	12	8.4	10	<i>d</i>	[<i>d</i>]
Redox (mV)	13/13	400	97	300	<i>d</i>	[<i>d</i>]
Temperature (°C)	13/13	17	14	15	30.5	0[1]
Turbidity (JTU)	13/13	64	0	22	1	8[2]
pH (SU)	13/13	8.6	6.6	7.3	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	8/13	6.5	<0.050	-1.3	0.2	7[3]
Barium, total	13/13	0.22	0.0085	0.10	2	0[2]
Beryllium, total	1/13	0.0012	<0.0010	-0.0010	0.004	0[2]
Boron, total	4/13	0.42	<0.080	-0.15	<i>d</i>	[<i>d</i>]
Calcium, total	13/13	210	2.7	79	<i>d</i>	[<i>d</i>]
Chromium, total	3/13	0.0097	<0.0040	-0.0047	0.05	0[1]
Cobalt, total	3/13	0.030	<0.0040	-0.0083	<i>d</i>	[<i>d</i>]
Copper, total	3/13	0.014	<0.0070	-0.0078	1.3	0[2]
Iron, total	10/13	11	<0.050	-1.6	0.3	8[3]
Lead, total	1/13	0.023	<0.020	-0.020	0.05	0[1]
Magnesium, total	13/13	84	0.61	19	<i>d</i>	[<i>d</i>]
Manganese, total	12/13	1.3	<0.0010	-0.24	0.05	6[3]
Nickel, total	3/13	0.35	<0.010	-0.041	0.1	1[2]
Potassium, total	10/13	7.2	<2.0	-3.4	<i>d</i>	[<i>d</i>]
Silicon, total	13/13	16	3.8	8.7	<i>d</i>	[<i>d</i>]
Sodium, total	13/13	590	4.2	120	<i>d</i>	[<i>d</i>]
Vanadium, total	6/13	0.010	<0.0020	-0.0029	<i>d</i>	[<i>d</i>]
Zinc, total	5/13	0.019	<0.0050	-0.0075	5	0[3]

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Table 7.69 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Others, unfiltered						
Alkalinity (mg/L)	13/13	660	68	300	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	6/13	2.2	<0.50	-0.85	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	3/13	76	<5.0	-12	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	7/13	280	<5.0	-43	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L)^e						
⁶⁰ Co	3/13	410*	-1.4	35	200	1[4]
Gross alpha	6/13	16	-0.11	4.1*	15	1[2]
Gross beta	12/13	5,400*	2.6*	540	50	5[2]
³ H	10/13	430,000*	-2,700	65,000	20,000	4[2]
⁹⁹ Tc	4/4	8,900*	25*	2,300	4,000	1[4]
Total rad Sr	6/13	4.9*	-1.8	1.6*	8	0[2]
Radionuclides, unfiltered (pCi/L)^e						
⁶⁰ Co	5/13	410*	-0.27	37	200	1[4]
¹³⁷ Cs	2/13	7.8*	-2.2	0.91	120	0[4]
Gross alpha	5/13	22	-0.11	4.8*	15	1[2]
Gross beta	12/13	5,700*	2.2*	560	50	5[2]
³ H	9/13	430,000*	-140	64,000	20,000	4[2]
Total rad Sr	8/13	5.9*	-0.86	2.0*	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	12/13	U10	JB2.5	-4.0	<i>d</i>	[<i>d</i>]
Acetone	1/13	U10	J3.0	-9.5	<i>d</i>	[<i>d</i>]
Carbon disulfide	2/13	U5.0	J1.1	-4.5	<i>d</i>	[<i>d</i>]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	1/1	3.6	3.6	3.6	250	0[3]
Fluoride	1/1	0.30	0.30	0.30	4	0[2]
Sulfate, as SO ₄	1/1	83	83	83	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	1/1	0.69	0.69	0.69	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	1/1	11	11	11	<i>d</i>	[<i>d</i>]
Redox (mV)	1/1	400	400	400	<i>d</i>	[<i>d</i>]
Temperature (°C)	1/1	16	16	16	30.5	0[1]
Turbidity (JTU)	1/1	10	10	10	1	1[2]
pH (SU)	1/1	6.8	6.8	6.8	(6.0, 9.0)	0[1]

Table 7.69 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Metals, unfiltered (mg/L)						
Barium, total	1/1	0.036	0.036	0.036	2	0[2]
Boron, total	1/1	0.091	0.091	0.091	<i>d</i>	[<i>d</i>]
Calcium, total	1/1	34	34	34	<i>d</i>	[<i>d</i>]
Iron, total	1/1	0.20	0.20	0.20	0.3	0[3]
Magnesium, total	1/1	7.0	7.0	7.0	<i>d</i>	[<i>d</i>]
Manganese, total	1/1	0.47	0.47	0.47	0.05	1[3]
Potassium, total	1/1	4.2	4.2	4.2	<i>d</i>	[<i>d</i>]
Silicon, total	1/1	9.3	9.3	9.3	<i>d</i>	[<i>d</i>]
Sodium, total	1/1	64	64	64	<i>d</i>	[<i>d</i>]
Others, unfiltered						
Alkalinity (mg/L)	1/1	200	200	200	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^d						
Gross beta	1/1	5.7*	5.7*	5.7	50	0[2]
Radionuclides, unfiltered (pCi/L) ^d						
Gross beta	1/1	5.9*	5.9*	5.9	50	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	1/1	JB3.8	JB3.8	-3.8	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^dNot applicable.

^eIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

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Table 7.70. Constituents in Waste Area Groupings (WAGs) 8 and 9 groundwater at ORNL, December 8–22, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	9/9	10	4.1	5.6	250	0[3]
Fluoride	4/9	2.3	<0.10	-0.45	4	0[2]
Nitrate	3/9	10	<0.10	-1.5	10	0[2]
Phosphate	2/9	0.88	<0.50	-0.57	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	9/9	290	9.7	68	250	1[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
<i>Bis</i> (2-ethylhexyl) phthalate	1/8	U11	13.0	-9.4	<i>d</i>	[<i>d</i>]
<i>Di-n</i> -butylphthalate	1/8	U11	17.0	-9.9	<i>d</i>	[<i>d</i>]
Diethyl phthalate	1/8	U11	12.0	-9.3	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	9/9	0.99	0.32	0.58	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	9/9	9.5	6.4	8.5	<i>d</i>	[<i>d</i>]
Redox (mV)	9/9	260	120	190	<i>d</i>	[<i>d</i>]
Temperature (°C)	9/9	18	13	15	30.5	0[1]
Turbidity (JTU)	9/9	19	0	7.6	1	8[2]
pH (SU)	9/9	9.6	6.1	7.3	(6.0, 9.0)	1[1]
Metals, unfiltered (mg/L)						
Aluminum, total	5/9	1.0	<0.050	-0.22	0.2	3[3]
Arsenic, total	1/9	0.013	<0.010	-0.010	0.05	0[1]
Barium, total	9/9	0.17	0.027	0.096	2	0[2]
Boron, total	3/9	0.69	<0.080	-0.17	<i>d</i>	[<i>d</i>]
Calcium, total	9/9	99	1.4	47	<i>d</i>	[<i>d</i>]
Chromium, total	1/9	0.0069	<0.0040	-0.0043	0.05	0[1]
Cobalt, total	1/9	0.018	<0.0040	-0.0056	<i>d</i>	[<i>d</i>]
Iron, total	7/9	24	<0.050	-3.6	0.3	5[3]
Magnesium, total	9/9	22	0.11	12	<i>d</i>	[<i>d</i>]
Manganese, total	9/9	3.0	0.0047	0.65	0.05	6[3]
Potassium, total	6/9	5.0	<2.0	-3.0	<i>d</i>	[<i>d</i>]
Silicon, total	9/9	16	2.8	7.6	<i>d</i>	[<i>d</i>]
Sodium, total	9/9	190	4.8	43	<i>d</i>	[<i>d</i>]
Vanadium, total	2/9	0.0053	<0.0020	-0.0024	<i>d</i>	[<i>d</i>]
Zinc, total	8/9	0.014	<0.0050	-0.0065	5	0[3]
Others, unfiltered						
Alkalinity (mg/L)	9/9	350	95	200	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	3/9	1.4	<0.50	-0.61	<i>d</i>	[<i>d</i>]

Table 7.70 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Total organic halides (µg/L)	1/9	12	<5.0	~9.1	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	2/9	22	<5.0	~7.3	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
⁶⁰ Co	2/9	4.3*	-0.81	1.9*	200	0[4]
Gross alpha	3/9	3.8*	-0.81	1.3*	15	0[2]
Gross beta	8/9	4,100*	1.6	620	50	3[2]
³ H	6/9	62,000*	-160	7,900	20,000	1[2]
Total rad Sr	4/9	2,100*	0	300	8	3[2]
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	1/9	3.8	0.81	1.8*	200	0[4]
Gross alpha	5/9	4.6*	-2.0	1.4	15	0[2]
Gross beta	7/9	4,100*	-0.81	610	50	3[2]
³ H	4/9	62,000*	-220	7,700	20,000	1[2]
Total rad Sr	4/9	1,800*	-0.68	270	8	3[2]
Volatile organics, unfiltered (µg/L)						
1,2-Dichloroethene, total	1/9	12	U5.0	~5.8	70	0[2]
2-Butanone	6/9	U10	JB3.0	~6.8	<i>d</i>	[<i>d</i>]
Trichloroethene	1/9	U5.0	J4.0	~4.9	5	0[1]
Vinyl chloride	1/9	U10	J2.0	~9.1	2	8[1]
<i>cis</i> -1,2-Dichloroethene	1/9	12	U5.0	~5.8	<i>d</i>	[<i>d</i>]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	2/2	4.8	3.1	4.0	250	0[3]
Nitrate	1/2	0.28	<0.10	~0.19	10	0[2]
Sulfate, as SO ₄	2/2	120	24	72	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	2/2	0.56	0.48	0.52	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	2/2	9.6	9.5	9.6	<i>d</i>	[<i>d</i>]
Redox (mV)	2/2	280	170	230	<i>d</i>	[<i>d</i>]
Temperature (°C)	2/2	15	15	15	30.5	0[1]
Turbidity (JTU)	2/2	6.0	0	3.0	1	1[2]
pH (SU)	2/2	8.4	6.8	7.6	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	1/2	0.33	<0.050	~0.19	0.2	1[3]
Barium, total	2/2	0.082	0.040	0.061	2	0[2]
Boron, total	1/2	0.30	<0.080	~0.19	<i>d</i>	[<i>d</i>]
Calcium, total	2/2	44	15	30	<i>d</i>	[<i>d</i>]

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Table 7.70 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Iron, total	1/2	8.5	<0.050	-4.3	0.3	1{3}
Magnesium, total	2/2	18	3.4	11	<i>d</i>	[<i>d</i>]
Manganese, total	2/2	4.4	0.051	2.2	0.05	2{3}
Potassium, total	2/2	3.2	3.0	3.1	<i>d</i>	[<i>d</i>]
Silicon, total	2/2	13	5.3	9.2	<i>d</i>	[<i>d</i>]
Sodium, total	2/2	63	9.9	36	<i>d</i>	[<i>d</i>]
Vanadium, total	2/2	0.0021	0.0021	0.0021	<i>d</i>	[<i>d</i>]
Zinc, total	2/2	0.0072	0.0064	0.0068	5	0{3}
Others, unfiltered						
Alkalinity (mg/L)	2/2	170	120	140	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	1/2	14	<5.0	-9.5	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^d						
Gross alpha	1/2	2.0*	1.5	1.7*	15	0{2}
Gross beta	2/2	3.8*	3.8*	3.8	50	0{2}
Radionuclides, unfiltered (pCi/L) ^d						
Gross alpha	1/2	1.6*	0.41	1.0	15	0{2}
Gross beta	2/2	4.3*	2.7*	3.5	50	0{2}
Total rad Sr	1/2	1.4*	0.027	0.72	8	0{2}
Volatile organics, unfiltered (µg/L)						
2-Butanone	2/2	JB7.0	JB6.0	-6.5	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

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² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^dNot applicable.

*Individual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.71. Constituents in Waste Area Grouping (WAG) 11 groundwater at ORNL, March 14–24, July 22–27, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	5/5	2.6	0.54	1.3	250	0[3]
Fluoride	3/5	0.38	<0.10	-0.21	4	0[2]
Nitrate	4/5	1.4	<0.10	-0.97	10	0[2]
Sulfate, as SO ₄	5/5	12	0.85	4.7	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	5/5	0.33	0.13	0.23	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	5/5	13	9.7	12	<i>d</i>	[<i>d</i>]
Redox (mV)	5/5	530	350	450	<i>d</i>	[<i>d</i>]
Temperature (°C)	5/5	14	13	14	30.5	0[1]
Turbidity (JTU)	5/5	140	1.0	37	1	4[2]
pH (SU)	5/5	8.8	6.1	7.6	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	3/5	6.0	<0.050	-1.4	0.2	2[3]
Barium, total	5/5	0.15	0.014	0.064	2	0[2]
Calcium, total	5/5	40	14	28	<i>d</i>	[<i>d</i>]
Chromium, total	1/5	0.0090	<0.0040	-0.0050	0.05	0[1]
Cobalt, total	1/5	0.0040	<0.0040	-0.0040	<i>d</i>	[<i>d</i>]
Iron, total	3/5	7.0	<0.050	-1.5	0.3	2[3]
Magnesium, total	5/5	14	0.71	9.4	<i>d</i>	[<i>d</i>]
Manganese, total	3/5	0.39	<0.0010	-0.081	0.05	1[3]
Potassium, total	2/5	3.7	<2.0	-2.4	<i>d</i>	[<i>d</i>]
Silicon, total	5/5	15	3.5	7.4	<i>d</i>	[<i>d</i>]
Sodium, total	5/5	9.4	1.2	3.1	<i>d</i>	[<i>d</i>]
Vanadium, total	1/5	0.0085	<0.0020	-0.0033	<i>d</i>	[<i>d</i>]
Zinc, total	1/5	0.029	<0.0050	-0.0098	5	0[3]
Others, unfiltered						
Alkalinity (mg/L)	5/5	190	68	130	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	3/5	0.82	<0.50	-0.68	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	2/5	22	<5.0	-8.4	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	2/5	30	<5.0	-14	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
⁶⁰ Co	2/5	5.7*	-0.27	2.7*	200	0[4]
Gross alpha	3/5	3.8*	0.081	1.8*	15	0[2]
Gross beta	3/5	23*	-0.54	6.3	50	0[2]
Total rad Sr	1/5	1.2*	0.32	0.79*	8	0[2]

Table 7.71 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	1/5	3.8*	0.27	2.0*	200	0[4]
Gross alpha	5/5	5.1*	1.7*	2.9*	15	0[2]
Gross beta	4/5	18*	1.6	6.9*	50	0[2]
Total rad Sr	1/5	2.0*	-0.11	0.90*	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	1/5	U10	JB2.0	-8.4	<i>d</i>	[<i>d</i>]
Trichloroethene	2/5	32	U5.0	-13	5	2[1]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	1/6	0.14	<0.10	-0.11	<i>d</i>	[<i>d</i>]
Chloride	5/6	1.4	<0.10	-1.0	250	0[3]
Fluoride	3/6	0.55	<0.10	-0.25	4	0[2]
Nitrate	4/6	4.0	<0.10	-1.2	10	0[2]
Phosphate	1/6	1.7	<0.50	-0.70	<i>d</i>	[<i>d</i>]
Sulfate, as SO ₄	5/6	4.2	<0.20	-2.6	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Diethyl phthalate	1/6	U11	J4.0	-9.2	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	6/6	0.43	0.053	0.30	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	6/6	14	9.1	11	<i>d</i>	[<i>d</i>]
Redox (mV)	6/6	560	280	440	<i>d</i>	[<i>d</i>]
Temperature (°C)	6/6	15	13	14	30.5	0[1]
Turbidity (JTU)	6/6	24	0	7.3	1	3[2]
pH (SU)	6/6	7.9	6.0	7.3	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	2/6	0.29	<0.050	-0.12	0.2	1[3]
Barium, total	6/6	0.17	0.016	0.083	2	0[2]
Calcium, total	6/6	74	8.5	53	<i>d</i>	[<i>d</i>]
Chromium, total	1/6	0.0090	<0.0040	-0.0048	0.05	0[1]
Copper, total	1/6	0.011	<0.0070	-0.0077	1.3	0[2]
Iron, total	4/6	0.33	<0.050	-0.16	0.3	1[3]
Magnesium, total	6/6	14	2.6	7.4	<i>d</i>	[<i>d</i>]
Manganese, total	3/6	0.42	<0.0010	-0.10	0.05	2[3]
Mercury, total	1/6	0.000050	<0.000050	-0.000050	0.002	0[1]
Potassium, total	5/6	3.9	<2.0	-2.7	<i>d</i>	[<i>d</i>]
Silicon, total	6/6	12	5.0	7.1	<i>d</i>	[<i>d</i>]
Sodium, total	6/6	4.6	1.5	2.7	<i>d</i>	[<i>d</i>]

Table 7.71 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Others, unfiltered						
Alkalinity (mg/L)	6/6	250	43	170	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	2/6	1.1	<0.50	-0.65	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	1/6	17	<5.0	-7.0	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	1/6	14	<5.0	-6.5	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
Gross alpha	3/6	5.7*	-0.24	1.8*	15	0[2]
Gross beta	5/6	16*	0.81	6.4*	50	0[2]
Total rad Sr	1/6	2.1*	-0.14	0.62	8	0[2]
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	1/6	4.1*	-2.2	0.32	200	0[4]
Gross alpha	2/6	2.2*	-0.081	1.0*	15	0[2]
Gross beta	4/6	17*	2.4	5.9*	50	0[2]
³ H	2/6	970*	-350	200	20,000	0[2]
Total rad Sr	1/6	2.1*	-0.16	0.64	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	1/6	U10	JB1.0	-8.5	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^eNot applicable.

^fIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.72. Constituents in Waste Area Grouping (WAG) 17 groundwater at ORNL, July 11–20, 1994

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Downgradient Wells</i>						
Anions, unfiltered (mg/L)						
Bromide	3/4	0.13	<0.10	~0.12	<i>d</i>	[<i>d</i>]
Chloride	4/4	17	5.3	11	250	0[3]
Fluoride	2/4	0.58	<0.10	~0.27	4	0[2]
Nitrate	2/4	7.6	<0.10	~2.1	10	0[2]
Sulfate, as SO ₄	4/4	55	26	42	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.90	0.43	0.69	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	4/4	13	11	11	<i>d</i>	[<i>d</i>]
Redox (mV)	4/4	420	330	380	<i>d</i>	[<i>d</i>]
Temperature (°C)	4/4	20	16	18	30.5	0[1]
Turbidity (JTU)	4/4	67	5.0	33	1	4[2]
pH (SU)	4/4	7.5	6.6	7.0	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Barium, total	4/4	0.15	0.028	0.084	2	0[2]
Calcium, total	4/4	120	76	100	<i>d</i>	[<i>d</i>]
Chromium, total	1/4	0.012	<0.0040	~0.0060	0.05	0[1]
Iron, total	2/4	0.19	<0.050	~0.11	0.3	0[3]
Magnesium, total	4/4	37	7.1	23	<i>d</i>	[<i>d</i>]
Manganese, total	4/4	0.16	0.0021	0.053	0.05	1[3]
Nickel, total	1/4	0.010	<0.010	~0.010	0.1	0[2]
Silicon, total	4/4	5.6	2.5	4.4	<i>d</i>	[<i>d</i>]
Sodium, total	4/4	9.3	6.6	8.1	<i>d</i>	[<i>d</i>]
Others, unfiltered						
Alkalinity (mg/L)	4/4	420	200	320	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	4/4	2.6	1.4	2.0	<i>d</i>	[<i>d</i>]
Total organic halides (µg/L)	3/4	7,000	<5.0	~1,800	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^e						
Gross alpha	3/4	4.3*	1.6*	2.4*	15	0[2]
Gross beta	3/4	11*	0.27	5.0	50	0[2]
³ H	4/4	5,700*	2,000*	4,200*	20,000	0[2]
Total rad Sr	4/4	6.2*	3.5*	4.8*	8	0[2]
Radionuclides, unfiltered (pCi/L) ^e						
Gross alpha	3/4	4.1*	0.54	2.0*	15	0[2]
Gross beta	2/4	5.1*	1.1	3.0*	50	0[2]
³ H	4/4	5,700*	2,000*	3,900*	20,000	0[2]
Total rad Sr	2/4	5.7*	1.4	3.1*	8	0[2]

Table 7.72 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Volatile organics, unfiltered (µg/L)						
1,1,1-Trichloroethane	1/4	U5.0	J2.0	-4.3	200	0[1]
1,1-Dichloroethane	1/4	U5.0	J2.2	-4.3	<i>d</i>	[<i>d</i>]
1,1-Dichloroethene	1/4	19	U5.0	-8.5	7	1[1]
1,2-Dichloroethene, total	1/4	Y2.600	U5.0	-650	70	1[2]
2-Butanone	4/4	JB3.5	JB1.0	-2.2	<i>d</i>	[<i>d</i>]
Benzene	1/4	13	U5.0	-7.0	5	1[1]
Tetrachloroethene	1/4	15	U5.0	-7.5	5	1[2]
Trichloroethene	2/4	Y8.600	U5.0	-2.200	5	1[1]
Vinyl chloride	1/4	100	U10	-33	2	4[1]
<i>cis</i> -1,2-Dichloroethene	2/4	Y2.600	J2.0	-650	<i>d</i>	[<i>d</i>]
<i>trans</i> -1,2-Dichloroethene	1/4	18	U5.0	-8.3	<i>d</i>	[<i>d</i>]
<i>Upgradient Wells</i>						
Anions, unfiltered (mg/L)						
Chloride	4/4	7.9	1.3	4.0	250	0[3]
Fluoride	3/4	0.61	<0.10	-0.41	4	0[2]
Nitrate	2/4	0.79	<0.10	-0.39	10	0[2]
Sulfate, as SO ₄	4/4	61	11	31	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
<i>Di-n</i> -octylphthalate	1/4	40	U11	-18	<i>d</i>	[<i>d</i>]
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.75	0.51	0.67	<i>d</i>	[<i>d</i>]
Dissolved oxygen (mg/L)	4/4	13	12	12	<i>d</i>	[<i>d</i>]
Redox (mV)	4/4	560	330	490	<i>d</i>	[<i>d</i>]
Temperature (°C)	4/4	16	14	15	30.5	0[1]
Turbidity (JTU)	4/4	830	3.0	220	1	4[2]
pH (SU)	4/4	7.0	6.8	6.9	(6.0, 9.0)	0[1]
Metals, unfiltered (mg/L)						
Aluminum, total	2/4	0.67	<0.050	-0.31	0.2	2[3]
Barium, total	4/4	0.088	0.023	0.054	2	0[2]
Boron, total	2/4	0.17	<0.080	-0.11	<i>d</i>	[<i>d</i>]
Calcium, total	4/4	140	45	97	<i>d</i>	[<i>d</i>]
Iron, total	4/4	0.85	0.050	0.39	0.3	2[3]
Magnesium, total	4/4	37	5.3	22	<i>d</i>	[<i>d</i>]
Manganese, total	3/4	0.028	<0.0010	-0.012	0.05	0[3]
Potassium, total	1/4	2.7	<2.0	-2.2	<i>d</i>	[<i>d</i>]
Silicon, total	4/4	8.0	4.5	6.2	<i>d</i>	[<i>d</i>]
Sodium, total	4/4	6.8	5.3	6.3	<i>d</i>	[<i>d</i>]

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Table 7.72 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Others, unfiltered						
Alkalinity (mg/L)	4/4	370	260	320	<i>d</i>	[<i>d</i>]
Total organic carbon (mg/L)	4/4	2.2	1.1	1.7	<i>d</i>	[<i>d</i>]
Total suspended solids (mg/L)	2/4	110	<5.0	~33	<i>d</i>	[<i>d</i>]
Radionuclides, filtered (pCi/L) ^f						
⁶⁰ Co	2/4	5.1*	-0.81	1.8	200	0[4]
Gross alpha	3/4	5.1*	0.14	2.5*	15	0[2]
Gross beta	4/4	5.9*	3.8*	4.5*	50	0[2]
³ H	4/4	9,200*	3,000*	5,700*	20,000	0[2]
Radionuclides, unfiltered (pCi/L) ^f						
⁶⁰ Co	3/4	7.3*	0.81	4.7*	200	0[4]
Gross alpha	3/4	9.7*	-0.57	4.5	15	0[2]
Gross beta	3/4	32*	1.6	12	50	0[2]
³ H	4/4	9,200*	3,000*	5,800*	20,000	0[2]
Total rad Sr	2/4	3.0*	0.14	1.9*	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	4/4	JB3.7	JB2.0	~3.2	<i>d</i>	[<i>d</i>]

^aPrefix "<" indicates the value for a parameter (excluding organics) was not quantifiable at the analytical detection limit; "J" indicates the value was estimated at or below the analytical detection limit by the laboratory; "JB" indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; "Y" indicates the value exceeded the calibration range and the sample was diluted and was reanalyzed; and "U" indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^dNot applicable.

^fIndividual and average radionuclide concentrations significantly greater than zero are identified by an *.

Table 7.73. ORNL Plant Perimeter Monitoring summary statistics from 1994 events

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
<i>Melton Valley Exit Pathway</i>						
Field measurements, unfiltered						
Conductivity (mS/cm)	13/13	0.73	0.010	0.26	<i>d</i>	[<i>d</i>]
Dissolved oxygen (ppm)	13/13	120	9.7	20	<i>d</i>	[<i>d</i>]
Temperature (°C)	13/13	20	13	15	30.5	0[1]
pH (SU)	13/13	8.2	5.0	6.5	(6.0, 9.0)	4[1]
Radionuclides, filtered (pCi/L) ^f						
⁶⁰ Co	1/13	4.1*	-2.2	1.3*	200	0[4]
¹³⁷ Cs	2/13	38*	-3.0	3.4	120	0[4]
Gross alpha	3/13	3.8*	-0.54	0.91*	15	0[2]
Gross beta	7/13	1,000*	0.76	110	50	2[2]
³ H	10/13	180,000*	190	27,000*	20,000	3[2]
Total rad Sr	7/13	350*	-0.32	42	8	2[2]
Radionuclides, unfiltered (pCi/L) ^f						
⁶⁰ Co	1/5	7.3*	-1.1	1.5	200	0[4]
¹³⁷ Cs	1/5	43*	-1.4	8.6	120	0[4]
Gross alpha	1/5	1.9	0.081	1.0*	15	0[2]
Gross beta	5/5	810*	3.0*	250	50	2[2]
³ H	5/5	180,000*	2,600*	69,000	20,000	3[2]
Total rad Sr	5/5	320*	1.5*	100	8	2[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	3/13	U10	JB1.0	-8.2	<i>d</i>	[<i>d</i>]
Chloroform	1/13	U5.0	J1.1	-4.7	100	0[2]
<i>East Bethel Valley Exit Pathway</i>						
Field measurements, unfiltered						
Conductivity (mS/cm)	5/5	0.75	0.37	0.61	<i>d</i>	[<i>d</i>]
Dissolved oxygen (ppm)	5/5	13	12	12	<i>d</i>	[<i>d</i>]
Temperature (°C)	5/5	16	14	15	30.5	0[1]
pH (SU)	5/5	8.0	6.8	7.1	(6.0, 9.0)	0[1]
Radionuclides, filtered (pCi/L) ^f						
⁶⁰ Co	2/5	5.1*	-0.81	1.9	200	0[4]
Gross alpha	3/5	5.1*	0.14	2.0*	15	0[2]
Gross beta	5/5	5.9*	3.8*	4.4*	50	0[2]
³ H	5/5	9,200*	1,400*	4,900*	20,000	0[2]
Radionuclides, unfiltered (pCi/L) ^f						
⁶⁰ Co	3/5	7.3*	0.81	4.1*	200	0[4]
Gross alpha	3/5	9.7*	-0.57	3.9	15	0[2]

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Table 7.73 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Gross beta	4/5	32*	1.6	11	50	0[2]
³ H	5/5	9,200*	1,700*	5,000*	20,000	0[2]
Total rad Sr	2/5	3.0*	0.14	1.8*	8	0[2]
Volatile organics, unfiltered (µg/L)						
2-Butanone	5/5	JB3.8	JB2.0	~3.3	-d	[d]
Acetone	1/5	U10	J4.2	~8.8	d	[d]
<i>West Bethel Valley Exit Pathway</i>						
Field measurements, unfiltered						
Conductivity (mS/cm)	2/2	0.61	0.58	0.59	d	[d]
Dissolved oxygen (ppm)	2/2	12	9.4	11	d	[d]
Temperature (°C)	2/2	18	15	16	30.5	0[1]
pH (SU)	2/2	7.4	5.8	6.6	(6.0, 9.0)	1[1]
Radionuclides, filtered (pCi/L) ^c						
⁶⁰ Co	1/2	4.6*	0.81	2.7	200	0[4]
Gross beta	1/2	57*	1.9	29	50	1[2]
³ H	1/2	1,200*	270	730	20,000	0[2]
Total rad Sr	2/2	25*	1.8*	13	8	1[2]
Radionuclides, unfiltered (pCi/L) ^c						
Gross alpha	1/2	2.4*	0.38	1.4	15	0[2]
Gross beta	1/2	51*	0.32	26	50	1[2]
³ H	1/2	590*	410	500	20,000	0[2]
Total rad Sr	2/2	27*	1.2*	14	8	1[2]
Volatile organics, unfiltered (µg/L)						
1,1,1-Trichloroethane	1/2	U5.0	J1.1	~3.1	200	0[1]
2-Butanone	2/2	JB4.0	JB3.8	~3.9	d	[d]
Carbon disulfide	1/2	U5.0	J4.7	~4.9	d	[d]
<i>White Wing Scrapyard Exit Pathway</i>						
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.45	0.23	0.33	d	[d]
Dissolved oxygen (ppm)	4/4	12	11	12	d	[d]
Temperature (°C)	4/4	17	13	14	30.5	0[1]
pH (SU)	4/4	8.0	6.9	7.5	(6.0, 9.0)	0[1]
Radionuclides, filtered (pCi/L) ^c						
⁶⁰ Co	2/4	5.7*	-0.54	2.6	200	0[4]
Gross alpha	1/4	9.2*	-0.24	2.5	15	0[2]
Gross beta	2/4	11*	-0.54	4.1	50	0[2]

Table 7.73 (continued)

Parameter	No. detected/ No. total	Max ^a	Min ^a	Av ^b	Reference value	Number of values exceeding reference [ref] ^c
Radionuclides, unfiltered (pCi/L) ^e						
⁶⁰ Co	2/4	4.1*	0.27	2.3*	200	0[4]
Gross alpha	3/4	10*	1.2	4.0	15	0[2]
Gross beta	3/4	16*	2.4	7.0*	50	0[2]
Total rad Sr	1/4	2.0*	-0.46	0.80	8	0[2]
Volatile organics, unfiltered (µg/L)						
1,1,1-Trichloroethane	1/4	U5.0	J1.8	~4.2	200	0[1]
1,1-Dichloroethene	1/4	14	U5.0	~7.3	7	1[1]
2-Butanone	2/4	U10	JB2.0	~6.1	<i>d</i>	[<i>d</i>]
Carbon disulfide	1/4	15.0	U5.0	~5.0	<i>d</i>	[<i>d</i>]
Trichloroethene	1/4	19	U5.0	~8.5	5	1[1]

^a“J” indicates the value was estimated at or below the analytical detection limit by the laboratory; “JB” indicates the value was estimated at or below the analytical detection limit and was found in the laboratory blank; and “U” indicates the value for an organic parameter was undetected at the analytical detection limit.

^bA tilde (~) indicates that estimated and/or undetected values were used in the calculation.

^cIf a reference limit exists, the source is coded as:

¹ Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, Domestic Water Supply, as amended.

² 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

³ 40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

⁴ DOE Order 5400.5, Chap. III, Derived Concentration Guides for Air and Water.

^eNot applicable.

*Individual and average radionuclide concentrations significantly greater than zero are identified by an *.

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Table 7.74. Constituents in the groundwater wells at the K-901 Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/48	8.7	274.98	490	-	-
Dissolved oxygen (ppm)	n/48	3.1	10.046	124.6	5 F	7
Redox (mV)	n/48	-54	130.06	252	-	-
Temperature (°C)	n/48	13	18.471	130.5	30.5 D	0
Turbidity (NTU)	n/32	0.11	9.7337	42.5	1 P	24
pH (SU)	n/48	5.2	7.5596	9.2	6.5-8.5 S	14
<i>Herbicides (µg/L)</i>						
2,4-D	1/13	120	20	20	70 P	0
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	1/13	0.507	0.507	0.507	0.2 S	1
Barium	11/13	0.0208	0.0412	0.0666	2 P	0
Beryllium	2/13	0.0004	0.0004	0.0004	0.004 P	0
Calcium	13/13	1.5	34.982	64.6	-	-
Chromium	2/13	0.0227	0.0239	0.0251	0.1 P	0
Copper	5/12	0.0079	0.0121	0.0139	1.3 P	0
Iron	6/13	0.0143	0.3166	1.56	0.3 S	1
Magnesium	13/13	0.715	15.957	30.8	-	-
Manganese	7/13	0.002	0.2407	0.567	0.05 S	4
Potassium	4/13	3.46	19.015	28.9	-	-
Sodium	13/13	0.748	4.0233	15.2	-	-
Vanadium	1/13	0.0253	0.0253	0.0253	-	-
Zinc	6/13	0.0124	0.115	0.548	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	6/13	0.0313	0.3099	1.11	0.2 S	2
Barium	12/13	0.004	0.0395	0.07	2 P	0
Calcium	13/13	1.58	35.042	67.1	-	-
Chromium	4/13	0.0038	0.0146	0.0246	0.1 P	0
Iron	7/12	0.103	0.628	3.03	0.3 S	2
Magnesium	13/13	0.712	15.959	30	-	-
Manganese	8/13	0.012	0.2009	0.524	0.05 S	3
Nickel	2/13	0.0089	0.0292	0.0494	0.1 P	0
Potassium	6/13	1.67	11.017	24.2	-	-

Table 7.74 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Sodium	13/13	0.647	3.6088	13.3	–	–
Zinc	3/13	0.0213	0.1666	0.457	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	2/13	1.9±1.3	1.9±0.919	1.9±1.3	15 P	0
Beta activity	12/13	3.0±1.5	15.991±0.604	646.0±10	50 P	4
²¹⁴ Bi	1/4	37.0±21	37.0±21	37.0±21	24,000 G	0
²¹⁴ Pb	2/4	11.7±6.2	13.959±5.781	29.0±16	–	–
⁹⁹ Tc	4/4	1276.2±6.7	412.6±4.792	1847.3±15.2	4000 G	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	3/13	2.2±1.4	3.981±1.044	83.1±7.6	15 P	1
Beta activity	12/13	4.0±1.4	22.929±0.743	686.0±11	50 P	5
⁹⁰ Sr	1/4	1.21±0.62	1.21±0.62	1.21±0.62	–	–
⁹⁹ Tc	4/4	309.4±5.3	515.65±3.408	1103.2±9.5	4000 G	0
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Antimony	2/13	0.0022	0.0023	0.0023	0.006 P	0
Arsenic	2/13	0.0042	0.0043	0.0045	0.05 P	0
Mercury	2/13	0.0001	0.0001	0.0001	0.002 P	0
Selenium	1/13	0.0028	0.0028	0.0028	0.05 P	0
Thallium	1/13	0.0039	0.0039	0.0039	0.002 P	1
<i>Total metals by spectrochemistry (mg/L)</i>						
Mercury	1/12	0.0003	0.0003	0.0003	0.002 P	0
Thallium	1/13	0.0048	0.0048	0.0048	0.002 P	1
<i>Semivolatile organics (µg/L)</i>						
Butylbenzylphthalate	1/13	J1	1	J1	–	–
Di-n-butylphthalate	5/13	J2	2.4	J3	12,000 R	0
Phenol	1/13	J2	2	J2	–	–
Bis(2-ethylhexyl)phthalate	11/13	J5	90.091	200	59 R	6
Di-n-octylphthalate	1/13	J3	3	J3	–	–

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Table 7.74 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^c
		Min ^b	Av ^c	Max ^b		
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
Hexadecanoic acid	1/1	NJ3	3	NJ3	-	-
Phenol,4,4'-(1-methylethyl	1/1	NJ3	3	NJ3	-	-
Unknown	39/39	NJ2	5.1538	NJ19	-	-
Unknown alkane	10/10	NJ2	3.3	NJ5	-	-
Unknown phthalate	1/1	NJ2	2	NJ2	-	-
<i>Volatile organics (µg/L)</i>						
1,1,1-Trichloroethane	6/13	J2	90.333	440	200 P	1
1,1,2-Trichloroethane	2/13	J3	6.5	J10	5 P	1
1,1,2-Trichlorotri- fluoroethane	2/13	J9	29	49	-	-
1,1-Dichloroethane	1/13	J24	24	J24	-	-
1,1-Dichloroethene	6/13	J3	77.167	340	7 P	5
1,2-Dichloroethene (total)	4/13	J3	5.5	J7	70 P	0
2-Butanone	2/13	34	42.5	51	-	-
Acetone	1/13	25	25	25	-	-
Carbon tetrachloride	5/13	J9	81.2	320	5 P	5
Chloroform	5/13	J5	16.8	61	100 P	0
Methylene chloride	2/13	J4	4.5	J5	5 P	0
Tetrachloroethene	3/13	J4	16.667	42	5 P	1
Trichloroethene	11/13	J3	416.45	3200	5 P	7
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
Isopropanol	1/1	NJ11	11	NJ11	-	-
Unknown	10/10	NJ9	216.2	NJ670	-	-
Unknown alkane	13/13	NJ47	408.46	NJ1700	-	-
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	13/13	5	142.77	243	-	-
Chloride	8/13	1.05	2.425	5.2	250 S	0
Fluoride	6/13	0.14	0.1933	0.27	4 P	0

Table 7.74 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Nitrate/nitrite	9/13	0.22	0.5311	1.47	10 P	0
Sulfate	5/13	6.8	14.272	20.6	250 S	0
Total dissolved solids	13/13	10	164.23	270	500 S	0
Total suspended solids	5/13	4	7.6	19	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. *n* denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

G DOE Order 5400.5, Chap. III, Derived Concentration Guides (DCG) for Air and Water. Four percent of the DOE DCG represents the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.

P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.

R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

Table 7.75. Constituents in the groundwater wells at the North Main Plant Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/361	2.07	601.2	7300	—	—
Conductivity, initial (µmho/cm)	n/16	86	816	1555	—	—
Dissolved oxygen (ppm)	n/365	0.3	7.3029	150	5 F	155
Dissolved oxygen, initial (ppm)	n/16	0.81	2.2631	9	5 F	15
Redox (mV)	n/363	-227	78.367	281	—	—
Redox, initial (mV)	n/16	-97.5	114.15	244	—	—
Temperature (°C)	n/365	11	19.04	33	30.5 D	4
Temperature, initial (°C)	n/16	9.2	12.6	21.2	30.5 D	0
Turbidity (NTU)	n/193	0	12.361	210	1 P	155
pH (SU)	n/361	3.83	7.3106	12.71	6.5–8.5 S	139
pH, initial (SU)	n/16	5	6.6625	7.8	6.5–8.5 S	6
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	24/102	0.022	0.5327	5.65	0.2 S	5
Barium	100/105	0.0094	0.1291	0.891	2 P	0
Calcium	105/105	1.38	70.226	212	—	—
Chromium	13/105	0.0078	0.027	0.0989	0.1 P	0
Cobalt	20/105	0.0032	0.0234	0.0767	—	—
Copper	20/105	c0.005	0.0206	0.147	1.3 P	0
Iron	66/105	0.0052	4.0105	40.1	0.3 S	31
Lithium	2/13	0.0041	0.0045	0.0049	—	—
Magnesium	98/105	10.223	15.11	47.9	—	—
Manganese	83/105	0.0023	3.0061	19	0.05 S	62
Nickel	22/105	0.0055	0.0296	0.157	0.1 P	1
Niobium	5/13	0.0071	0.0106	0.016	—	—
Potassium	74/105	1.6	22.387	570	—	—
Silver	3/101	0.0047	0.0061	0.0073	0.1 S	0
Sodium	105/105	0.866	31.429	179	—	—
Strontium	13/13	0.039	0.2298	0.46	—	—
Vanadium	23/105	0.0096	0.0172	0.0356	—	—
Zinc	47/105	c0.0021	0.0392	0.2	5 S	0

Table 7.75 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Total metals by ICP (mg/L)</i>						
Aluminum	68/102	0.0251	1.166	15.2	0.2 S	32
Barium	102/104	0.0086	0.1467	0.859	2 P	0
Beryllium	1/104	0.0004	0.0004	0.0004	0.004 P	0
Cadmium	2/104	0.0038	0.0108	0.0178	0.005 P	1
Calcium	104/104	1.43	72.539	211	–	–
Chromium	23/104	0.0038	0.0254	0.162	0.1 P	1
Cobalt	29/104	0.0033	0.0197	0.095	–	–
Copper	23/104	0.0054	0.0135	0.0857	1.3 P	0
Iron	82/104	0.022	5.5942	52	0.3 S	60
Lithium	2/13	0.0041	0.0066	0.0092	–	–
Magnesium	100/104	0.134	14.809	48	–	–
Manganese	87/104	0.0032	3.2211	18	0.05 S	67
Nickel	29/104	0.0053	0.0254	0.158	0.1 P	1
Niobium	3/13	0.0073	0.0081	0.0093	–	–
Potassium	83/104	1.06	26.804	578	–	–
Silver	1/100	0.0049	0.0049	0.0049	0.1 S	0
Sodium	103/104	0.819	34.017	278	–	–
Strontium	13/13	0.039	0.2264	0.45	–	–
Titanium	11/13	0.0039	0.0355	0.13	–	–
Vanadium	30/104	0.006	0.0159	0.0499	–	–
Zinc	64/104	0.0054	0.0519	0.353	5 S	0
<i>Pesticides (µg/L)</i>						
gamma, BHC (Lindane)	2/90	0.056	0.0665	0.077	0.2 P	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	24/103	-0.876±2.2	2.174±0.431	40±6.9	15 P	5
²⁴¹ Am	2/4	0.049±0.039	0.062±0.037	0.2±0.13	1.2 G	0
Beta activity	76/103	-2.28±2.5	6.638±0.248	484.0±22	50 P	5
¹³⁷ Cs	1/3	F-7.62±20	-7.62±20	F-7.62±20	120 G	0
²³⁷ Np	1/3	0.51±0.26	0.51±0.26	0.51±0.26	1.2 G	0
²³⁸ Pu	1/4	0.64±0.19	0.64±0.19	0.64±0.19	1.6 G	0
⁴⁰ K	1/3	526.0±300	526.0±300	526.0±300	280 G	1
^{234m} Pa	1/1	HF-379.0±3000	-379.0±3000	HF-379.0±3000	2800 G	0
Strontium total	1/1	+1.51±19	1.51±19	+1.51±19	8 P	0
⁹⁹ Tc	15/15	110.4±1.8	21.503±1.27	783.0±80	4000 G	0

Table 7.75 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
²²⁸ Th	2/4	0.105±0.068	0.121±0.064	0.23±0.18	16 G	0
²³⁰ Th	4/4	0.229±0.064	0.242±0.049	0.31±0.14	12 G	0
²³² Th	2/4	0.046±0.029	0.052±0.028	0.102±0.086	2 G	0
²³⁴ Th	1/3	HE58.2±280	58.2±280	HE58.2±280	400 G	0
^{233/234} U	4/4	5.41±0.51	8.712±0.391	30.9±2	20 G	2
²³⁵ U	5/7	F-13.9±17	0.578±0.078	3.08±0.44	24 G	0
²³⁸ U	4/4	2.95±0.35	4.002±0.233	17.2±1.3	24 G	0
<i>Total^f radiochemistry (pCi/L)</i>						
Alpha activity	20/90	J1.38±0.9	3.341±0.437	362.0±24	15 P	5
Beta activity	75/90	J2.6±1.4	8.808±0.247	531.0±22	50 P	6
^{239/240} Pu	1/4	0.056±0.049	0.056±0.049	0.056±0.049	1.2 G	0
⁹⁹ Tc	2/2	8.9±1.3	16.133±1.054	30.0±1.8	4000 G	0
²²⁸ Th	3/4	0.101±0.072	0.179±0.046	0.35±0.1	16 G	0
²³⁰ Th	4/4	0.091±0.05	0.117±0.024	0.286±0.072	12 G	0
²³² Th	1/4	0.054±0.032	0.054±0.032	0.054±0.032	2 G	0
^{233/234} U	4/4	3.53±0.39	6.023±0.340	112.8±6	20 G	2
²³⁵ U	4/6	0.239±0.095	0.514±0.076	9.68±0.78	24 G	0
²³⁸ U	4/4	1.64±0.25	3.104±0.210	25.6±1.6	24 G	1
<i>Dissolved^f metals by spectrochemistry (mg/L)</i>						
Antimony	21/87	0.0017	0.0061	0.0137	0.006 P	9
Arsenic	12/105	0.0019	0.0057	0.0118	0.05 P	0
Lead	3/100	0.0019	0.0147	J0.0316	0.015 P	1
Mercury	5/105	0.0001	0.0001	0.0001	0.002 P	0
Selenium	2/101	0.002	0.0025	0.0029	0.05 P	0
Thallium	9/105	0.0031	0.0043	0.0083	0.002 P	9
<i>Total^f metals by spectrochemistry (mg/L)</i>						
Antimony	1/83	J0.004	0.004	J0.004	0.006 P	0
Arsenic	13/104	0.0023	0.0077	0.0174	0.05 P	0
Lead	11/104	0.0011	0.0121	0.0375	0.015 P	4
Mercury	2/104	0.0001	0.0002	0.0002	0.002 P	0
Selenium	6/104	0.0022	0.005	0.0128	0.05 P	0
Thallium	10/104	0.0037	0.0051	0.0076	0.002 P	10
<i>Semivolatile organics (µg/L)</i>						
2-Methylnaphthalene	3/104	J2	3.6667	J6	-	-
2-Methylphenol	1/101	J3	3	J3	-	-
Acenaphthene	3/104	J2	2	J2	-	-

Table 7.75 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Anthracene	1/104	J3	3	J3	0.03 R	1
Carbazole	4/91	J1	3.5	J6	-	-
<i>Di-n</i> -butylphthalate	35/104	J1	2.7714	JB7	12,000 R	0
Dibenzofuran	1/103	J2	2	J2	-	-
Diethylphthalate	3/103	J0.8	2.2667	J4	120,000 R	0
Fluorene	2/103	J3	3.5	J4	0.03 R	2
Naphthalene	4/104	J8	13.75	20	-	-
Phenanthrene	2/104	J2	2.5	J3	0.03 R	2
Phenol	4/101	J3	3.75	J4	-	-
<i>Bis</i> (2-Ethylhexyl) phthalate	85/104	J2	212.51	J620	59 R	76
<i>Di-n</i> -Octylphthalate	9/91	J1	2.2222	J5	-	-
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
1,4-Dioxane	2/2	J4	5	J6	-	-
1-Propanol,2-(2-hydroxypropoxy)	1/1	NJ87	87	NJ87	-	-
2,5,8,11,14-Pentaoxahexadeca	1/1	NJ55	55	NJ55	-	-
2-Pentanone,4-hydroxy-4-methyl	6/6	JAB16	138.17	JAB260	-	-
2-Propanol,1,1'-[(1-methyl)-	2/2	NJ35	122.5	NJ210	-	-
Aldol condensation	1/1	NJ8	8	NJ8	-	-
Benzaldehyde	1/1	NJ5	5	NJ5	-	-
Benzene, propyl-	1/1	NJ11	11	NJ11	-	-
Benzoic acid	2/2	NJ10	11	NJ12	-	-
Ethanol,2[2-(2-butoxyethoxy)et	1/1	NJ13	13	NJ13	-	-
Ethanone, 1-phenyl-	1/1	NJ2	2	NJ2	-	-
Ethene, tetrachloro-	1/1	NJ26	26	NJ26	-	-
Phenol, 4,4'-(1-methylethyl)	17/17	NJ2	6.5294	NJ23	-	-
Trichloroethene	3/3	J8	28.667	J41	5 P	3
Unknown	496/496	NJ2	25.933	NJ3000	-	-
Unknown adipate	10/10	NJ4	12.2	NJ28	-	-
Unknown alkane	92/92	NJ2	7.5	NJ38	-	-
Unknown C ₁₀ H ₁₂	7/7	NJ7	15.286	NJ29	-	-
Unknown C ₁₀ H ₁₄	11/11	NJ7	16.182	NJ45	-	-
Unknown C ₁₁ H ₁₀	3/3	NJ11	18.333	NJ31	-	-

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Table 7.75 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Unknown C ₁₁ H ₁₄	4/4	NJ7	8.25	NJ10	-	-
Unknown C ₁₂ H ₁₂	8/8	NJ7	22.375	NJ63	-	-
Unknown C ₁₃ H ₁₂	1/1	NJ7	7	NJ7	-	-
Unknown C ₈ H ₁₀	4/4	NJ3	34.5	NJ61	-	-
Unknown C ₈ H ₁₆ O	1/1	NJ23	23	NJ23	-	-
Unknown C ₉ H ₁₀	3/3	NJ13	19.667	NJ30	-	-
Unknown C ₉ H ₁₂	15/15	NJ12	44	NJ190	-	-
Unknown phthalate	6/6	NJ2	4	NJ10	-	-
Unknown silicone	8/8	NJ2	5.5	NJ9	-	-
<i>Total petroleum hydrocarbon organics</i>						
Benzene (µg/L)	10/20	2.1	38.39	127	5 P	8
Ethylbenzene (µg/L)	3/20	57	115.67	200	700 P	0
Gasoline range organics (µg/L)	10/20	100	993	3300	-	-
Toluene (µg/L)	8/20	3.2	13.4	44	1000 P	0
Total petroleum hydrocarbons (mg/L)	2/20	0.65	1.085	1.52	-	-
Xylene (total) (µg/L)	6/20	7.4	68.3	220	10,000 P	0
<i>Volatile organics (µg/L)</i>						
1,1,1-Trichloroethane	20/105	J1	5063.5	J100,000	200 P	2
1,1,2-Trichloroethane	2/105	J3	76.5	150	5 P	1
1,1,2-Trichlorotri fluoroethane	15/92	J3	1307.3	10,000	-	-
1,1-Dichloroethane	23/105	J3	536.65	6200	-	-
1,1-Dichloroethene	27/105	J1	184.59	J2000	7 P	19
1,2-Dichloroethane	2/105	J6	12	18	5 P	2
1,2-Dichloroethene (total)	57/105	J2	547.58	5500	70 P	32
2-Butanone	1/105	J1	1	J1	-	-
Acetone	7/105	10	385.43	1400	-	-
Benzene	12/105	J2	52	J200	5 P	9
Carbon disulfide	5/105	J1	2	J3	-	-
Chlorobenzene	3/105	J1	21	56	100 P	0
Chloroethane	4/105	10	44.25	130	200 P	0
Chloroform	11/105	J1	9.9091	43	100 P	0
Ethylbenzene	6/105	J1	78.5	J200	700 P	0
Methylene chloride	2/105	JB2	9.5	J17	5 P	1

Table 7.75 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Tetrachloroethene	21/105	J1	135.81	850	5 P	14
Toluene	12/105	J1	399.08	14600	1000 P	1
Trichloroethene	57/105	J1	865.21	10,000	5 P	47
Vinyl chloride	25/105	13	147.48	600	2 P	25
Xylene (total)	6/105	9	156	1500	10,000 P	0
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
2-Propanol	3/3	NJ11	13.667	NJ15	-	-
Chlorotrifluoroethene	1/1	NJ2000	2000	NJ2000	-	-
Cyclohexane (Dot	1/1	NJ7	7	NJ7	-	-
Dichlorofluoro- methane	1/1	NJ18	18	NJ18	-	-
Ethane,1,2-dichloro- 1,1,2-t	15/15	NJ8	615.93	NJ5200	-	-
Freon 113	2/2	J1400	1550	J1700	-	-
Freon 123	2/2	J6	8	J10	-	-
Isopropanol	1/1	NJ5	5	NJ5	-	-
Nonanal	1/1	NJ8	8	NJ8	-	-
Unknown	61/61	NJ5	54.066	NJ410	-	-
Unknown alkane	10/10	NJ7	19.2	NJ49	-	-
Unknown C ₁₀ H ₁₂	2/2	NJ50	80	NJ110	-	-
Unknown C ₁₀ H ₁₄	3/3	NJ11	14	NJ16	-	-
Unknown C ₁₄ H ₂₂ O	1/1	NJ120	120	NJ120	-	-
Unknown C ₉ H ₁₂	14/14	NJ26	104.07	NJ470	-	-
<i>Dissolved wet chemistry (mg/L)</i>						
Uranium fluorometric	8/13	0.001	0.0014	0.004	-	-
<i>Total wet chemistry</i>						
Alkalinity (mg/L)	103/103	9	220.46	885	-	-
Chloride (mg/L)	90/104	1.04	37.333	304	250 S	2
Conductivity (µmho/cm)	52/52	155	870.73	1710	-	-
Cyanide (mg/L)	2/90	0.0077	0.009	0.0104	0.2 P	0
Fluoride (mg/L)	49/104	0.15	0.4578	1.88	4 P	0
Nitrate (mg/L)	6/13	0.12	0.3233	0.6	10 P	0
Nitrate/nitrite (mg/L)	25/92	0.22	2.0212	25.9	10 P	1
Sulfate (mg/L)	71/104	3	47.311	260	250 S	1

Table 7.75 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Total dissolved solids (mg/L)	102/103	27	403.04	2190	500 S	21
Total organic carbon (mg/L)	28/48	1	6.7857	50	–	–
Total organic halide (µg/L)	24/52	17.3	2840.7	10,210	–	–
Total suspended solids (mg/L)	65/103	4	38.246	1040	500 S	1
Turbidity (NTU)	13/13	4.2	38.438	240	1 P	13
pH (SU)	52/52	6.2	6.9115	7.5	6.5–8.5 S	8

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. *n* denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A denotes the tentatively identified compound (TIC) is a suspected aldol condensation product.

B denotes the analyte was found in the blank as well as the sample.

c denotes possible contamination.

E denotes the result is less than the MDA. Confidence level is less than 95%.

F denotes the result was less than background.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

H denotes a daughter of uranium isotopes. Reported for comparison purposes only.

M denotes the laboratory control sample recovery was not within limits.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

+ denotes the duplicate control limits do not apply; duplicate and sample are near the minimum detectable activity (MDA).

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

G DOE Order 5400.5, Chap. III, Derived Concentration Guides (DCG) for Air and Water. Four percent of the DOE DCG represents the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.

P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.

R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

– denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

– denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

Table 7.76. Constituents in the groundwater wells at the Powerhouse Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/84	17.8	525.75	2400	-	-
Dissolved oxygen (ppm)	n/82	10.3	6.6524	125.4	5 F	27
Redox (mV)	n/84	1-200	85.774	239	-	-
Temperature (°C)	n/82	13.3	19.023	127	30.5 D	0
Turbidity (NTU)	n/62	0.48	19.556	1166	1 P	54
pH (SU)	n/82	4.73	6.5754	11.2	6.5-8.5 S	41
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	7/21	0.0336	0.8926	2.48	0.2 S	4
Barium	21/21	0.0091	0.0565	0.126	2 P	0
Beryllium	4/21	10.0003	0.0005	10.0008	0.004 P	0
Cadmium	3/21	0.0067	0.0115	0.0176	0.005 P	3
Calcium	21/21	2.3	79.086	1303	-	-
Chromium	4/21	0.0051	0.0098	0.0194	0.1 P	0
Cobalt	2/21	1.21	1.26	1.31	-	-
Copper	7/21	0.0109	0.0152	0.0237	1.3 P	0
Iron	12/21	0.0291	19.948	98.4	0.3 S	10
Magnesium	21/21	0.425	29.257	1190	-	-
Manganese	18/21	0.0032	12.869	112	0.05 S	13
Nickel	5/21	0.0169	0.0787	0.227	0.1 P	2
Potassium	11/21	2.78	5.45	20.2	-	-
Silver	3/21	0.0038	0.0168	0.0247	0.1 S	0
Sodium	21/21	1.09	6.9133	121.5	-	-
Zinc	12/21	0.006	0.083	10.513	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	9/21	0.0377	1.2036	3.49	0.2 S	6
Barium	18/21	0.0095	0.0652	0.181	2 P	0
Cadmium	1/21	0.0038	0.0038	0.0038	0.005 P	0
Calcium	21/21	1.94	67.361	233	-	-
Chromium	6/21	0.0044	0.0097	0.0171	0.1 P	0
Cobalt	2/21	1.01	1.07	1.13	-	-
Copper	1/21	0.0067	0.0067	0.0067	1.3 P	0
Iron	17/21	0.131	12.866	84.4	0.3 S	13

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Table 7.76 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Magnesium	21/21	0.564	26.634	1165	-	-
Manganese	20/21	0.0092	11.634	119	0.05 S	13
Nickel	4/21	0.0184	0.0715	0.171	0.1 P	1
Potassium	9/21	2.6	5.4322	17	-	-
Sodium	21/21	0.894	6.473	21.3	-	-
Vanadium	1/21	0.0102	0.0102	0.0102	-	-
Zinc	6/21	0.0294	0.2043	0.472	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	1/21	27.3±4.7	27.3±4.7	27.3±4.7	15 P	1
Beta activity	14/21	3.3±1.4	7.761±0.512	201.3±7.8	50 P	2
⁹⁹ Tc	4/4	15.9±1.1	36.17±1.039	405.3±5.6	4000 G	0
²³⁰ Th	1/1	0.2±0.063	0.2±0.063	0.2±0.063	12 G	0
^{233/234} U	1/1	10.178±0.056	0.178±0.056	10.178±0.056	20 G	0
²³⁵ U	1/5	10.074±0.037	0.074±0.037	10.074±0.037	24 G	0
²³⁸ U	1/1	10.113±0.045	0.113±0.045	10.113±0.045	24 G	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	3/21	3.6±2.6	5.913±2.544	92.0±18	15 P	2
²⁴¹ Am	1/1	0.037±0.029	0.037±0.029	0.037±0.029	1.2 G	0
Beta activity	16/21	3.3±2	8.646±0.529	253.0±12	50 P	4
^{239/240} Pu	1/1	10.046±0.047	0.046±0.047	10.046±0.047	1.2 G	0
⁹⁰ Sr	1/4	1.09±0.56	1.09±0.56	1.09±0.56	-	-
⁹⁹ Tc	4/4	39.9±2.2	149.95±1.858	515.6±7.4	4000 G	0
²²⁸ Th	1/1	0.5±0.11	0.5±0.11	0.5±0.11	16 G	0
²³⁰ Th	1/1	0.21±0.06	0.21±0.06	0.21±0.06	12 G	0
^{233/234} U	1/1	0.33±0.14	0.33±0.14	0.33±0.14	20 G	0
²³⁵ U	1/5	0.061±0.06	0.061±0.06	0.061±0.06	24 G	0
²³⁸ U	1/1	0.089±0.08	0.089±0.08	0.089±0.08	24 G	0
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Antimony	1/21	0.0027	0.0027	0.0027	0.006 P	0
Arsenic	2/21	0.0022	0.0199	0.0375	0.05 P	0
Lead	1/18	10.0074	0.0074	10.0074	0.015 P	0
Selenium	5/21	0.0035	0.0326	0.076	0.05 P	2
Thallium	2/21	0.0031	0.0032	0.0033	0.002 P	2

Table 7.76 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Total metals by spectrochemistry (mg/L)</i>						
Antimony	1/21	0.0887	0.0887	0.0887	0.006 P	1
Arsenic	1/21	0.159	0.159	0.159	0.05 P	1
Lead	2/21	0.0113	0.0131	0.015	0.015 P	0
Selenium	2/21	0.0682	0.0696	0.0711	0.05 P	2
<i>Semivolatile organics (µg/L)</i>						
Butylbenzylphthalate	1/21	J1	1	J1	-	-
Di-n-butylphthalate	4/21	J1	1.25	J2	12,000 R	0
Phenol	1/21	J4	4	J4	-	-
bis(2-Ethylhexyl) phthalate	18/21	J4	116.28	520	59 R	13
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
Ethanol, 2-butoxy phosphate	2/2	NJ14	18	NJ22	-	-
Unknown	91/91	NJ2	7.6154	NJ62	-	-
Unknown adipate	1/1	NJ37	37	NJ37	-	-
Unknown C ₄ H ₈ O	1/1	NJ7	7	NJ7	-	-
Unknown C ₆ H ₁₂ O ₂	1/1	NJ2	2	NJ2	-	-
Unknown C ₇ H ₅ NS	1/1	NJ13	13	NJ13	-	-
Unknown phthalate	4/4	NJ2	15.5	NJ37	-	-
<i>Volatile organics (µg/L)</i>						
Carbon tetrachloride	1/21	J3	3	J3	5 P	0
Tetrachloroethene	1/21	7	7	7	5 P	1
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
Unknown	2/2	NJ6	6.5	NJ7	-	-
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	21/21	2	136.57	272	-	-
Chloride	17/21	1.31	3.4812	10.2	250 S	0
Fluoride	9/21	0.18	0.2567	0.51	4 P	0
Nitrate/nitrite	11/21	0.48	2.02	16.15	10 P	0

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Table 7.76 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Sulfate	14/21	7.4	245.22	1380	250 S	3
Total dissolved solids	21/21	58	435.24	2300	500 S	3
Total suspended solids	13/21	6	24.615	82	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. n denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

G DOE Order 5400.5, Chap. III, Derived Concentration Guides (DCG) for Air and Water. Four percent of the DOE DCG represents the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.

P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.

R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

Table 7.77. Constituents in the groundwater wells at the South Main Plant Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/62	366	634.55	820	–	–
Dissolved oxygen (ppm)	n/62	1.6	12.582	150	5 F	21
Redox (mV)	n/58	-112	88.276	212	–	–
Temperature (°C)	n/62	16	21.15	33.4	30.5 D	4
Turbidity (NTU)	n/36	10	4.7408	15.2	1 P	23
pH (SU)	n/62	6.6	7.2794	8.8	6.5–8.5 S	2
<i>Herbicides (µg/L)</i>						
2,4-D	2/14	119	79.5	1140	70 P	1
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	1/16	0.0347	0.0347	0.0347	0.2 S	0
Barium	15/16	0.0355	0.0675	0.152	2 P	0
Calcium	16/16	52.5	100.38	131	–	–
Cobalt	1/16	0.0038	0.0038	0.0038	–	–
Iron	4/16	0.0792	0.4738	1.39	0.3 S	1
Magnesium	16/16	6.67	18.716	46.2	–	–
Manganese	15/16	0.0131	0.4408	4	0.05 S	8
Nickel	6/16	0.0421	0.1931	0.566	0.1 P	3
Potassium	4/16	3.42	8.18	19.2	–	–
Silver	1/16	0.0043	0.0043	0.0043	0.1 S	0
Sodium	16/16	4.11	13.378	37.4	–	–
Vanadium	1/16	0.0349	0.0349	0.0349	–	–
Zinc	9/16	0.0083	0.0447	0.0791	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	2/16	0.0634	0.0695	0.0756	0.2 S	0
Barium	16/16	0.013	0.0597	0.152	2 P	0
Calcium	16/16	41.9	99.169	130	–	–
Chromium	3/16	0.0111	0.0409	0.092	0.1 P	0
Cobalt	1/16	0.0043	0.0043	0.0043	–	–
Iron	9/16	0.128	0.5209	11.44	0.3 S	5
Magnesium	16/16	6.89	18.069	47.7	–	–
Manganese	10/16	0.0308	0.6623	4.09	0.05 S	7
Nickel	7/16	0.011	0.1657	0.603	0.1 P	2
Potassium	4/16	2.24	7.12	18	–	–

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Table 7.77 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Sodium	16/16	3.95	12.991	36.9	–	–
Vanadium	1/16	0.0296	0.0296	0.0296	–	–
Zinc	13/16	0.0039	0.0465	0.222	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Beta activity	5/16	4.1±1.5	5.471±0.986	17.3±3.8	50 P	0
<i>Total radiochemistry (pCi/L)</i>						
Beta activity	4/16	3.4±1.4	5.832±1.008	18.5±2.7	50 P	0
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Antimony	2/16	0.0031	0.004	0.0049	0.006 P	0
Mercury	1/16	0.0001	0.0001	0.0001	0.002 P	0
Selenium	8/16	0.0022	0.0032	0.0044	0.05 P	0
<i>Total metals by spectrochemistry (mg/L)</i>						
Antimony	2/15	0.0016	0.0407	0.0798	0.006 P	1
Arsenic	3/16	0.0026	0.0536	0.155	0.05 P	1
<i>Semivolatile organics (µg/L)</i>						
Di-n-butylphthalate	2/16	J2	2	J2	12,000 R	0
bis(2-Ethylhexyl)phthalate	15/16	65	209.6	460	59 R	15
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
2(3H)-Benzothiazolethione	2/2	NJ46	55	NJ64	–	–
Benzothiazole	2/2	NJ28	129	NJ230	–	–
Ethanone, 1-phenyl-	1/1	NJ2	2	NJ2	–	–
Unknown	58/58	NJ2	14.207	NJ110	–	–
<i>Volatile organics (µg/L)</i>						
1,1,2-Trichlorotrifluoroethane	6/16	J9	465.67	2600	–	–
1,2-Dichloroethene (total)	9/16	J2	11.556	J49	70 P	0
Acetone	3/16	J14	36	J60	–	–
Chloroform	3/16	J1	1.3333	J2	100 P	0
Methylene chloride	1/16	J2	2	J2	5 P	0
Tetrachloroethene	3/16	J2	14.333	J36	5 P	1
Trichloroethene	10/16	J2	30.5	170	5 P	6

Table 7.77 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
2-Propanol	2/2	NJ64	142	NJ220	-	-
Ethane, 1,2-dichloro-1,1,2-t	7/7	NJ7	104.43	NJ580	-	-
Unknown	4/4	NJ5	5.75	NJ7	-	-
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	16/16	123	264.25	353	-	-
Chloride	15/16	3.24	22.449	52	250 S	0
Fluoride	14/16	0.16	0.2364	0.46	4 P	0
Nitrate/nitrite	4/16	10.29	0.625	10.89	10 P	0
Sulfate	9/16	5.92	34.147	65.7	250 S	0
Total dissolved solids	16/16	188	355.44	503	500 S	1
Total suspended solids	3/16	4	6	8	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. *n* denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.

R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

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Table 7.78. Constituents in groundwater wells at the Duct Island Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^a	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/19	320	599.63	978	-	-
Dissolved oxygen (ppm)	n/19	3.2	6.0474	117.5	5 F	8
Redox (mV)	n/19	61	161.05	230	-	-
Temperature (°C)	n/19	14.9	16.732	26.1	30.5 D	0
Turbidity (NTU)	n/18	1.9	33.206	114.5	1 P	18
pH (SU)	n/19	6.7	7.3926	9.69	6.5-8.5 S	2
<i>Dissolved metals by ICP (mg/L)</i>						
Barium	6/6	10.0024	0.0356	10.095	2 P	0
Calcium	6/6	0.962	90.444	1186	-	-
Copper	2/6	0.0087	0.0096	0.0105	1.3 P	0
Iron	2/6	0.187	0.2215	0.256	0.3 S	0
Magnesium	6/6	10.333	13.641	132.6	-	-
Manganese	3/6	0.0155	0.0999	0.231	0.05 S	2
Potassium	4/6	3.51	12.278	23.7	-	-
Sodium	6/6	1.21	48.358	1207	-	-
Vanadium	2/6	0.0533	0.0565	0.0596	-	-
Zinc	3/6	0.0111	0.0435	10.107	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	2/6	0.552	0.971	1.39	0.2 S	2
Barium	3/6	0.0481	0.0637	0.0933	2 P	0
Calcium	6/6	1.44	77.04	139	-	-
Chromium	1/6	0.0038	0.0038	0.0038	0.1 P	0
Iron	3/6	0.313	1.285	2.78	0.3 S	3
Magnesium	5/6	17.17	16.096	129	-	-
Manganese	4/6	0.0165	0.0996	0.272	0.05 S	2
Potassium	3/6	2.88	13.127	21.3	-	-
Sodium	6/6	1.19	49.75	215	-	-
Zinc	2/6	0.0451	0.0811	0.117	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Beta activity	2/6	2.7±1.4	5.092±1.309	21.8±3.7	50 P	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	1/6	2.3±1.7	2.3±1.7	2.3±1.7	15 P	0
Beta activity	5/6	4.7±2.9	7.707±1.161	21.6±3.2	50 P	0

Table 7.78 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Mercury	2/6	0.0001	0.0001	0.0001	0.002 P	0
<i>Semivolatile organics (µg/L)</i>						
1,2,4-Trichlorobenzene	1/6	J280	280	J280	70 P	1
1,4-Dichlorobenzene	1/6	J250	250	J250	75 P	1
2,4-Dinitrotoluene	1/6	J330	330	J330	42 R	1
4-Chloro-3-methylphenol	1/6	J430	430	J430	-	-
4-Nitrophenol	1/6	J580	580	J580	-	-
Acenaphthene	1/6	J300	300	J300	-	-
<i>Di-n</i> -butylphthalate	4/6	J1	17.5	J64	12.000 R	0
<i>N</i> -Nitroso- <i>di-n</i> -propylamine	1/6	J300	300	J300	-	-
Pentachlorophenol	1/6	J660	660	J660	1 P	1
Phenol	1/6	J410	410	J410	-	-
Pyrene	1/6	J310	310	J310	0.03 R	1
<i>Bis</i> (2-Ethylhexyl)phthalate	6/6	J7	186.5	J440	59 R	4
<i>Di-n</i> -Octylphthalate	1/6	J2	2	J2	-	-
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
Unknown	10/10	NJ2	3.6	NJ6	-	-
Unknown alkane	4/4	NJ2	3	NJ4	-	-
Unknown C ₁₅ H ₁₆ O ₂	1/1	NJ3	3	NJ3	-	-
<i>Volatile organics (µg/L)</i>						
1,1,1-Trichloroethane	1/6	J2	2	J2	200 P	0
Benzene	1/6	J4	4	J4	5 P	0
Toluene	1/6	J2	2	J2	1000 P	0
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	6/6	173	333	432	-	-
Chloride	5/6	1.03	1.264	1.61	250 S	0
Fluoride	4/6	0.16	0.7425	2.02	4 P	0
Nitrate/nitrite	2/6	0.32	0.33	0.34	10 P	0

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Table 7.78 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Sulfate	5/6	6.25	11.778	29.8	250 S	0
Total dissolved solids	6/6	210	384.67	514	500 S	1
Total suspended solids	3/6	5	18	38	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. n denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.

R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

Table 7.79. Constituents in Exit Pathway groundwater wells at the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/36	295	510.56	811	—	—
Dissolved oxygen (ppm)	n/36	2.8	8.8917	15.5	5 F	8
Redox (mV)	n/36	-221	64.444	202	—	—
Temperature (°C)	n/36	15.4	20.097	29	30.5 D	0
Turbidity (NTU)	n/25	0.78	23.539	184.5	1 P	24
pH (SU)	n/36	6.23	6.9939	9.05	6.5-8.5 S	15
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	4/9	0.0388	0.4165	1.5	0.2 S	1
Barium	10/10	0.0221	0.0455	10.0892	2 P	0
Calcium	10/10	25.4	80.77	105	—	—
Copper	1/10	10.0204	0.0204	10.0204	1.3 P	0
Iron	5/10	0.0275	1.4313	4.22	0.3 S	4
Magnesium	10/10	6.78	12.848	126.8	—	—
Manganese	7/10	0.0297	1.2025	1.98	0.05 S	6
Nickel	1/10	0.0375	0.0375	0.0375	0.1 P	0
Potassium	5/10	1.57	8.086	14.1	—	—
Silver	1/9	10.0051	0.0051	10.0051	0.1 S	0
Sodium	10/10	11.47	13.212	77.5	—	—
Vanadium	1/10	0.025	0.025	0.025	—	—
Zinc	7/10	0.0129	0.0489	0.201	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	2/7	0.0319	0.4185	0.805	0.2 S	1
Barium	9/9	0.0308	0.0467	0.0814	2 P	0
Calcium	9/9	21.7	76.356	95.9	—	—
Chromium	1/9	0.0059	0.0059	0.0059	0.1 P	0
Cobalt	2/9	0.0035	0.0036	0.0036	—	—
Iron	4/9	0.526	2.3215	4.71	0.3 S	4
Magnesium	9/9	6.31	13.069	26.4	—	—
Manganese	6/9	0.23	1.505	1.92	0.05 S	6
Nickel	2/9	0.0195	0.0251	0.0307	0.1 P	0
Potassium	6/9	2.01	6.7317	14.2	—	—
Sodium	9/9	1.45	15.453	87.7	—	—
Zinc	4/9	0.0094	0.0597	0.176	5 S	0

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Table 7.79 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	4/10	2.8±2	4.378±1.237	18.5±2.8	15 P	0
Beta activity	5/10	4.2±2.1	8.840±1.104	13.1±2.5	50 P	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	2/10	2.2±1.5	3.569±1.372	10.6±3.4	15 P	0
Beta activity	8/10	2.2±1.4	4.377±0.626	14.8±3.4	50 P	0
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Mercury	3/10	0.0001	0.0003	0.0007	0.002 P	0
Selenium	1/10	0.0053	0.0053	0.0053	0.05 P	0
Thallium	1/10	0.007	0.007	0.007	0.002 P	1
<i>Total metals by spectrochemistry (mg/L)</i>						
Mercury	2/9	0.0001	0.0001	0.0001	0.002 P	0
<i>Semivolatile organics (µg/L)</i>						
Di-n-butylphthalate	3/10	J1	2	J3	12,000 R	0
Bis(2-Ethylhexyl)phthalate	10/10	J25	169	360	59 R	6
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
Unknown	23/23	NJ2	4.0435	NJ13	-	-
<i>Volatile organics (µg/L)</i>						
1,2-Dichloroethene (total)	1/10	J2	2	J2	70 P	0
Benzene	1/10	J2	2	J2	5 P	0
Chloroform	1/10	J4	4	J4	100 P	0
Trichloroethene	1/10	8	8	8	5 P	1
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
2-Propanol	1/1	NJ10	10	NJ10	-	-
Unknown	2/2	NJ6	6.5	NJ7	-	-
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	10/10	134	218.1	335	-	-
Chloride	6/10	1.08	4.3	10.4	250 S	0
Cyanide	2/10	0.0018	0.0028	0.0038	0.2 P	0
Fluoride	4/10	0.28	0.395	0.61	4 P	0
Nitrate/nitrite	2/10	J0.22	0.22	J0.22	10 P	0

Table 7.79 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Sulfate	8/10	7.9	26.166	66.4	250 S	0
Total dissolved solids	10/10	145	270.4	488	500 S	0
Total suspended solids	3/10	4	9.3333	18	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. n denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

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F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.

R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

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Table 7.80. Constituents in groundwater wells at the K-25 and K-1064 Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/52	301	607.69	1094	–	–
Dissolved oxygen (ppm)	n/52	0.9	6.6577	14.5	5 F	19
Redox (mV)	n/52	32	151.46	377	–	–
Temperature (°C)	n/52	14.9	19.41	23.3	30.5 D	0
Turbidity (NTU)	n/27	0.16	3.2689	20.1	1 P	14
pH (SU)	n/52	4.44	7.3087	9.78	6.5–8.5 S	8
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	1/13	0.0265	0.0265	0.0265	0.2 S	0
Barium	12/13	0.0128	0.042	0.0781	2 P	0
Calcium	13/13	1.71	102.26	165	–	–
Chromium	3/13	0.0126	0.0167	0.0197	0.1 P	0
Copper	6/13	0.0092	0.0107	0.0118	1.3 P	0
Iron	5/13	0.0164	0.0371	0.0591	0.3 S	0
Magnesium	13/13	0.624	19.943	148	–	–
Manganese	4/13	0.0133	0.2414	0.904	0.05 S	1
Nickel	1/13	10.0512	0.0512	10.0512	0.1 P	0
Potassium	8/13	2.02	3.95	5.94	–	–
Sodium	13/13	4.24	26.168	234	–	–
Zinc	5/13	0.0079	0.0301	10.0808	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	4/13	0.0367	1.0704	3	0.2 S	3
Barium	8/13	0.0086	0.0429	0.0784	2 P	0
Cadmium	1/13	0.0039	0.0039	0.0039	0.005 P	0
Calcium	13/13	1.66	96.335	172	–	–
Chromium	5/13	0.0037	0.0117	0.0199	0.1 P	0
Iron	5/11	0.0596	0.7267	2.68	0.3 S	3
Magnesium	13/13	0.758	18.681	141.8	–	–
Manganese	3/11	0.008	0.3833	0.997	0.05 S	2
Nickel	2/13	0.0158	0.0294	0.0429	0.1 P	0
Potassium	7/13	1.71	3.3314	5.26	–	–
Sodium	13/13	3.76	25.776	236	–	–
Zinc	1/13	0.0291	0.0291	0.0291	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	6/13	9.2±3.8	18.248±2.299	33.0±7.2	15 P	5
²⁴¹ Am	1/3	0.243±0.093	0.243±0.093	0.243±0.093	1.2 G	0

Table 7.80 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Beta activity	11/13	2.2±1.3	6.455±0.663	42.9±4.9	50 P	0
²¹⁴ Bi	1/4	33±21	33±21	33±21	24,000 G	0
²¹⁴ Pb	1/4	39±17	39±17	39±17	–	–
²³⁷ Np	2/3	0.18±0.16	0.222±0.131	0.31±0.23	1.2 G	0
⁹⁰ Sr	2/4	0.98±0.55	1±0.385	1.02±0.54	–	–
⁹⁹ Tc	4/4	13.6±1.1	21.483±0.857	173.5±2.6	4000 G	0
²²⁸ Th	2/3	0.109±0.073	0.123±0.054	0.14±0.081	16 G	0
²³⁰ Th	3/3	0.31±0.08	0.342±0.048	0.407±0.089	12 G	0
²³² Th	1/3	0.069±0.038	0.069±0.038	0.069±0.038	2 G	0
^{233/234} U	3/3	13.51±0.97	16.619±0.68	20.1±1.4	20 G	1
²³⁵ U	3/7	1.1±0.21	1.331±0.141	2.42±0.38	24 G	0
²³⁸ U	3/3	9.14±0.73	10.775±0.5	13.2±1.1	24 G	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	7/13	4.8±1.9	10.872±1.511	39.1±8.2	15 P	5
²⁴¹ Am	1/2	0.023±0.026	0.023±0.026	0.023±0.026	1.2 G	0
Beta activity	13/13	2.6±1.3	7.959±0.641	43.8±4.1	50 P	0
²¹⁴ Pb	1/4	9.5±5.9	9.5±5.9	9.5±5.9	–	–
²³⁷ Np	1/3	0.21±0.15	0.21±0.15	0.21±0.15	1.2 G	0
^{239/240} Pu	1/3	0.084±0.075	0.084±0.075	0.084±0.075	1.2 G	0
⁹⁰ Sr	2/4	1.03±0.62	1.041±0.427	1.05±0.59	–	–
⁹⁹ Tc	3/4	32.4±1.8	44.296±1.289	159.4±4.8	4000 G	0
²²⁸ Th	3/3	0.114±0.074	0.123±0.045	0.134±0.083	16 G	0
²³⁰ Th	3/3	0.239±0.073	0.264±0.042	0.303±0.075	12 G	0
²³² Th	3/3	0.037±0.03	0.05±0.019	0.064±0.035	2 G	0
^{233/234} U	3/3	11.6±0.88	15.131±0.658	20±1.4	20 G	0
²³⁵ U	3/7	0.71±0.17	1.088±0.131	2.01±0.33	24 G	0
²³⁸ U	3/3	8.16±0.69	10.563±0.505	13.6±1.1	24 G	0
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Antimony	1/13	0.0017	0.0017	0.0017	0.006 P	0
Arsenic	3/13	0.0105	0.0573	0.104	0.05 P	2
Selenium	1/13	0.0032	0.0032	0.0032	0.05 P	0
Thallium	1/13	0.0111	0.0111	0.0111	0.002 P	1

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Table 7.80 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Total metals by spectrochemistry (mg/L)</i>						
Arsenic	2/13	0.062	0.086	0.11	0.05 P	2
Lead	1/13	0.0019	0.0019	0.0019	0.015 P	0
Mercury	2/12	0.0001	0.0002	0.0002	0.002 P	0
<i>Semivolatile organics (µg/L)</i>						
Butylbenzylphthalate	1/13	J1	1	J1	–	–
Di-n-butylphthalate	3/13	J1	1	J1	12,000 R	0
Diethylphthalate	1/13	J2	2	J2	120,000 R	0
Bis(2-Ethylhexyl) phthalate	13/13	22	114.9	2250	59 R	10
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
10-Dimethylsqualene	1/1	NJ6	6	NJ6	–	–
Phenol, 4,4'- (1-methylethyl)	1/1	NJ2	2	NJ2	–	–
Unknown	18/18	NJ2	4.1667	NJ10	–	–
Unknown alkane	7/7	NJ2	7.7143	NJ14	–	–
<i>Volatile organics (µg/L)</i>						
1,1,1-Trichloroethane	5/13	5	14	30	200 P	0
1,1,2-Trichloroethane	4/13	J1	4	6	5 P	2
1,1-Dichloroethane	3/13	6	9.3333	14	–	–
1,1-Dichloroethene	4/13	J2	2.5	J3	7 P	0
1,2-Dichloroethene (total)	2/13	J4	6	8	70 P	0
Acetone	1/13	J2	2	J2	–	–
Benzene	1/13	7	7	7	5 P	1
Bromodichloro- methane	3/13	J3	3.3333	J4	100 P	0
Carbon tetrachloride	1/13	J3	3	J3	5 P	0
Chloroform	6/13	J2	27	44	100 P	0
Methylene chloride	1/13	J2	2	J2	5 P	0
Trichloroethene	5/13	J1	6.6	17	5 P	3
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
Unknown	6/6	NJ5	7	NJ9	–	–

Table 7.80 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	13/13	103	244.23	406	-	-
Chloride	10/13	2.45	9.601	27.7	250 S	0
Fluoride	10/13	0.16	0.836	4.76	4 P	1
Nitrate/nitrite	11/13	0.35	1.1318	3.34	10 P	0
Sulfate	12/13	20.3	92.433	192	250 S	0
Total dissolved solids	13/13	119	413.54	665	500 S	5
Total suspended solids	2/13	5	37	69	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. *n* denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

- D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.
- F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.
- G DOE Order 5400.5, Chap. III, Derived Concentration Guides (DCG) for Air and Water. Four percent of the DOE DCG represents the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.
- P 40 CFR Part 141 National Primary Drinking Water Regulations, Subparts B and G, as amended.
- R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.
- S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

Oak Ridge Reservation

Table 7.81. Constituents in groundwater wells at the K-27 and K-29 Area of the K-25 Site, 1994

Analyte	No. detected No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/69	188	446.74	779	–	–
Dissolved oxygen (ppm)	n/69	1.2	7.1725	15.1	5 F	26
Redox (mV)	n/69	–235	39.014	245	–	–
Temperature (°C)	n/69	15.4	21.591	35.1	30.5 D	4
Turbidity (NTU)	n/62	0.26	9.0552	33.4	1 P	49
pH (SU)	n/69	4.1	7.7687	112.16	6.5–8.5 S	29
<i>Dissolved metals by ICP (mg/L)</i>						
Aluminum	3/18	0.27	0.378	0.446	0.2 S	3
Barium	18/18	0.0136	0.061	0.299	2 P	0
Calcium	18/18	1.83	46.159	98.3	–	–
Chromium	3/18	0.0156	0.1602	0.334	0.1 P	2
Cobalt	4/18	0.0035	0.0047	0.0068	–	–
Copper	1/12	0.0195	0.0195	0.0195	1.3 P	0
Iron	5/18	0.0474	0.3721	0.686	0.3 S	3
Magnesium	18/18	0.757	15.185	38.8	–	–
Manganese	10/18	0.017	1.6843	10.9	0.05 S	6
Nickel	4/18	0.0289	0.0766	0.185	0.1 P	1
Potassium	10/18	2	7.003	17.9	–	–
Silver	2/17	0.0039	0.0044	0.0049	0.1 S	0
Sodium	18/18	2.43	21.797	153	–	–
Zinc	6/18	0.0156	0.0418	0.131	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	11/18	0.0545	0.3301	0.719	0.2 S	6
Barium	17/18	0.0128	0.0606	0.27	2 P	0
Calcium	18/18	1.94	44.678	93.1	–	–
Chromium	8/18	0.004	0.0941	0.424	0.1 P	3
Cobalt	7/18	0.0032	0.0051	0.0076	–	–
Iron	12/18	0.176	0.6348	1.46	0.3 S	7

Table 7.81 (continued)

Analyte	No. detected No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Magnesium	17/18	2.78	15.094	34.6	–	–
Manganese	10/18	0.011	1.7119	11	0.05 S	8
Nickel	2/18	0.0398	0.044	0.0481	0.1 P	0
Potassium	8/18	2.57	8.2325	17.6	–	–
Sodium	18/18	2.41	21.012	149	–	–
Zinc	6/18	0.0072	0.0391	0.122	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	1/18	5±2	5±2	5±2	15 P	0
Beta activity	16/18	2.5±1.4	9.67±0.492	43.4±2.9	50 P	0
⁹⁹ Tc	1/16	7.2±2.6	67.2±2.6	67.2±2.6	4000 G	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	3/18	2.1±1.6	4.377±1.074	6.4±2.1	15 P	0
Beta activity	17/18	3.5±1.4	9.911±0.492	37.1±2.8	50 P	0
⁹⁹ Tc	1/10	2.9±2.5	62.9±2.5	62.9±2.5	4000 G	0
	1/1	67.2±2.6				
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Mercury	1/18	0.0001	0.0001	0.0001	0.002 P	0
<i>Total metals by spectrochemistry (mg/L)</i>						
Arsenic	1/18	0.003	0.003	0.003	0.05 P	0
Lead	1/18	0.0012	0.0012	0.0012	0.015 P	0
Mercury	2/18	0.0001	0.0003	0.0005	0.002 P	0
<i>Semivolatile organics (µg/L)</i>						
<i>Di-n</i> -butylphthalate	2/18	J2	2	J2	12,000 R	0
Diethylphthalate	1/18	J67	67	J67	120,000 R	0
<i>Bis</i> (2-Ethylhexyl)phthalate	16/18	27	120	400	59 R	10
<i>Di-n</i> -Octylphthalate	1/18	J2	2	J2	–	–
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
1,3,5-Triazine-2,4,6(1H,3H,5	1/1	NJ3	3	NJ3	–	–
1,3,5-Triazine-2,4-Diamine	1/1	NJ3	3	NJ3	–	–

Oak Ridge Reservation

Table 7.81 (continued)

Analyte	No. detected No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
1-Penten-3-ol, 2-methyl-	1/1	NJ4	4	NJ4	-	-
Dodecanoic acid	1/1	NJ4	4	NJ4	-	-
Hexanedioic acid, dioctyles	1/1	NJ22	22	NJ22	-	-
Hexanoic acid	1/1	NJ4	4	NJ4	-	-
Phenol, 4,4'-(1-methylethyl	1/1	NJ4	4	NJ4	-	-
Unknown	50/50	NJ2	6.36	NJ26	-	-
Unknown alkane	10/10	NJ2	13.9	NJ26	-	-
Unknown hydrocarbon	1/1	NJ4	4	NJ4	-	-
Unknown phthalate	5/5	NJ2	3	NJ4	-	-
<i>Volatile organics (µg/L)</i>						
1,1-Dichloroethene	1/18	J2	2	J2	7 P	0
1,2-Dichloroethene (total)	7/18	5	34.714	130	70 P	1
Acetone	2/18	J25	48.5	72	-	-
Carbon tetrachloride	2/18	J4	5	J6	5 P	1
Chloroform	10/18	J1	3.8	12	100 P	0
Methylene chloride	3/18	J2	2	J2	5 P	0
Toluene	1/18	J1	1	J1	1000 P	0
Trichloroethene	14/18	J1	70	390	5 P	9
Vinyl chloride	1/18	60	60	60	2 P	1
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
2-Propanol	1/1	NJ31	31	NJ31	-	-
Unknown	2/2	NJ14	24.5	NJ35	-	-
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	18/18	7	153.83	280	-	-
Chloride	17/18	1.5	17.913	117	250 S	0
Cyanide	1/18	0.0083	0.0083	0.0083	0.2 P	0
Fluoride	12/18	0.17	1.1983	6.86	4 P	1
Nitrate/nitrite	8/18	0.27	0.84	1.7	10 P	0

Table 7.81 (continued)

Analyte	No. detected No. of results ^d	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Sulfate	11/18	9.96	28.287	53.4	250 S	0
Total dissolved solids	18/18	73	235.28	419	500 S	0
Total suspended solids	9/18	5	8.8889	18	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. *n* denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

D Tennessee water quality criteria for domestic water supply, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

F Tennessee water quality criteria for fish and aquatic life, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

G DOE Order 5400.5, Chap. III, Derived Concentration Guides (DCG) for Air and Water. Four percent of the DOE DCG represents the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.

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R Tennessee water quality criteria for recreation, Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chap. 1200-4-3, General Water Quality Criteria, as amended.

S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.

Oak Ridge Reservation

Table 7.82. Constituents in groundwater wells at the K-33 and K-31 Area of the K-25 Site, 1994

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Field measurements</i>						
Conductivity (µmho/cm)	n/89	7.42	475.4	874	-	-
Dissolved oxygen (ppm)	n/89	12.8	7.5562	15.7	5 F	21
Redox (mV)	n/89	-248	82.933	210	-	-
Temperature (°C)	n/89	15.6	19.98	133.8	30.5 D	2
Turbidity (NTU)	n/64	0.01	4.6425	17.1	1 P	44
pH (SU)	n/89	6.08	7.3884	8.97	6.5-8.5 S	16
<i>Herbicides (µg/L)</i>						
Simazine	1/22	14.6	4.6	14.6	4 P	1
<i>Dissolved metals by ICP (mg/L)</i>						
Barium	23/23	0.0211	0.0481	0.163	2 P	0
Calcium	23/23	24.9	82.283	177	-	-
Chromium	12/23	0.0074	0.0582	0.138	0.1 P	3
Cobalt	4/23	0.0036	0.0273	0.0977	-	-
Copper	3/16	10.0032	0.0079	0.011	1.3 P	0
Iron	5/23	0.0284	0.3221	1.15	0.3 S	1
Magnesium	23/23	3.12	14.491	36.8	-	-
Manganese	7/23	0.0088	0.5135	1.5	0.05 S	4
Nickel	7/23	0.0157	0.5804	3.1	0.1 P	3
Potassium	13/23	1.03	4.3938	7.44	-	-
Silver	3/23	0.0043	0.007	0.0114	0.1 S	0
Sodium	23/23	2.92	18.484	50.3	-	-
Vanadium	3/23	0.0229	0.0373	0.0648	-	-
Zinc	6/23	0.007	0.0552	0.21	5 S	0
<i>Total metals by ICP (mg/L)</i>						
Aluminum	8/23	0.0261	0.2849	1.32	0.2 S	3
Barium	23/23	0.0197	0.0471	0.16	2 P	0
Calcium	23/23	22.4	79.917	172	-	-

Table 7.82 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Chromium	19/23	0.0042	0.0453	0.132	0.1 P	4
Cobalt	4/23	0.0034	0.0239	0.0849	–	–
Copper	2/18	0.0082	0.0091	0.0101	1.3 P	0
Iron	7/23	0.126	0.532	1.12	0.3 S	3
Magnesium	23/23	3.02	13.666	33.6	–	–
Manganese	7/23	0.0189	0.5112	1.3	0.05 S	5
Nickel	6/23	0.0161	0.6434	3.02	0.1 P	3
Potassium	7/23	0.865	4.165	6.27	–	–
Silver	2/23	0.0038	0.0046	0.0054	0.1 S	0
Sodium	23/23	2.58	17.253	45.6	–	–
Vanadium	2/23	0.0105	0.0241	0.0376	–	–
Zinc	4/23	0.0222	0.134	0.415	5 S	0
<i>Dissolved radiochemistry (pCi/L)</i>						
Alpha activity	4/23	3.2±2.1	6.461±1.54	58.2±9.4	15 P	1
Beta activity	18/23	2.4±1.3	5.995±0.437	23±4	50 P	0
<i>Total radiochemistry (pCi/L)</i>						
Alpha activity	4/23	2.7±1.6	4.057±1.109	7.6±2.9	15 P	0
Beta activity	18/23	2.9±1.7	6.726±0.449	17±2.9	50 P	0
<i>Dissolved metals by spectrochemistry (mg/L)</i>						
Antimony	2/21	0.0019	0.0022	0.0024	0.006 P	0
Arsenic	2/23	0.0026	0.0027	0.0028	0.05 P	0
<i>Total metals by spectrochemistry (mg/L)</i>						
Arsenic	1/23	0.0029	0.0029	0.0029	0.05 P	0
<i>Semivolatile organics (µg/L)</i>						
Butylbenzylphthalate	1/23	J2	2	J2	–	–
Di-n-butylphthalate	2/23	J2	2.5	J3	12,000 R	0
bis(2-Ethylhexyl)phthalate	17/23	J2	105.88	300	59 R	7
di-n-Octylphthalate	4/23	J1	1.5	J2	–	–

Table 7.82 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
<i>Semivolatile organics, tentatively identified compounds (µg/L)</i>						
1,2-Benzenedicarboxylic acid	1/1	NJ74	74	NJ74	–	–
2H-Indol-2-one, 1,3-dihydro-	2/2	NJ4	7.5	NJ11	–	–
Ethanone, 1-phenyl-	1/1	NJ2	2	NJ2	–	–
Phenol, 2,6-bis(1,1-dimethylethyl)	1/1	NJ6	6	NJ6	–	–
Phenol, 4,4'-(1-methylethyl)	1/1	NJ15	15	NJ15	–	–
Unknown	85/85	NJ2	6.3412	NJ38	–	–
Unknown alkane	5/5	NJ3	4.6	NJ7	–	–
Unknown C ₆ H ₁₁ NO	1/1	NJ2	2	NJ2	–	–
Unknown C ₇ H ₅ NS	1/1	NJ23	23	NJ23	–	–
Unknown ethanol	1/1	NJ6	6	NJ6	–	–
Unknown phthalate	7/7	NJ2	3.1429	NJ6	–	–
<i>Volatile organics (µg/L)</i>						
1,1,1-Trichloroethane	1/23	J2	2	J2	200 P	0
1,1-Dichloroethene	1/23	J2	2	J2	7 P	0
1,2-Dichloroethene (total)	2/23	14	14	14	70 P	0
2-Butanone	1/23	170	170	170	–	–
Acetone	1/23	J16	16	J16	–	–
Carbon disulfide	2/23	J1	1.5	J2	–	–
Chloroform	6/23	J1	4.5	21	100 P	0
Methylene chloride	4/23	J2	2.25	J3	5 P	0
Toluene	1/23	J2	2	J2	1000 P	0
Trichloroethene	7/23	J1	11.286	35	5 P	2
<i>Volatile organics, tentatively identified compounds (µg/L)</i>						
Unknown	6/6	NJ6	11	NJ20	–	–
Unknown alkane	2/2	NJ8	8	NJ8	–	–
Unknown C ₁₂ H ₁₂	3/3	NJ6	7.3333	NJ9	–	–
<i>Total wet chemistry (mg/L)</i>						
Alkalinity	23/23	41	189.17	410	–	–
Chloride	23/23	1.62	15.677	46.5	250 S	0
Fluoride	12/23	0.15	0.2658	0.41	4 P	0

Table 7.82 (continued)

Analyte	No. detected/ No. of results ^a	Detected results			Reference value ^d	Number exceeding reference value ^e
		Min ^b	Av ^c	Max ^b		
Nitrate/nitrite	16/23	0.33	0.6731	1.4	10 P	0
Sulfate	21/23	13.3	64.357	227	250 S	0
Total dissolved solids	22/22	150	315.64	576	500 S	2
Total suspended solids	4/22	6	19.5	54	500 S	0

^aBoth the number of detected results and the total number of results include all duplicate and replicate measurements. No blanks, matrix spikes, equipment rinsate or other QA/QC data are reported in this table. n denotes not applicable.

^bThe minimum and maximum detected results are listed with their laboratory analytical qualifiers.

J denotes the associated numerical value is the approximate concentration of the analyte in the sample.

N denotes the analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

^cThe average radiochemistry results and their associated limits of error were calculated from all of the detected results using optimally weighted mean and variance estimates assuming independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137-139. For the non-radiochemistry analytes the average listed is the unweighted arithmetic mean of all detected results. No analytical qualifiers are listed for the average.

^dIf a reference value exists it originates from the following sources:

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S 40 CFR Part 143 National Secondary Drinking Water Regulations, as amended.

- denotes no reference value exists for this analyte.

^eThe number of detected results exceeding the reference value is given.

- denotes that since no reference value exists for this analyte, the number exceeding is not applicable.

^f"Total" = unfiltered sample (soluble + suspended) and "dissolved" = filtered sample (soluble only). ICP = Inductively Coupled Plasma.



8. Quality Assurance

Table 8.1. QA/QC results for the Oak Ridge Reservation, 1994

Program	Total number of analytes	Acceptable	
		Total	Percentage
EPA Contract Laboratory Program (CLP) ^a			90.0
EPA Discharge Monitoring Report Quality Assurance Study (DMR) ^b	94	88	93.6
AIHA Environmental Lead Proficiency Analytical Testing Program (ELPAT)	124	120	96.8
DOE Environmental Measurements Laboratory (EML)	170	159	93.5
EPA EMSL-LV Intercomparison Radionuclide Control Program	212	183	86.3
DOE Mixed Analyte Performance Evaluation Program (MAPEP) ^c			
AIHA Proficiency Analytical Testing Program (PAT) ^d	288	269	93.4
Proficiency Environmental Testing Program (PET)	4371	4327	99.0
Water Pollution Performance Evaluation QC Program (WP) ^e	233	227	97.4
Water Supply Laboratory Performance QC Program (WS) ^e	341	329	96.5

^aThe CLP Program scores its results on other factors besides quantitation. An average score was determined by averaging each site's average score from the CLP Program.

^bIncludes toxicology data from the ORNL Environmental Sciences Division.

^cNo MAPEP data received yet.

^dIncludes asbestos data from the K-25 Site Technical Division.

^eAll data not available at press time.



Appendices



Appendix A. Radiation



Table A.1. Radionuclide nomenclature

Radionuclide	Symbol	Half-life	Radionuclide	Symbol	Half-life
Americium-241	²⁴¹ Am	432.2 years	Plutonium-238	²³⁸ Pu	87.75 years
Americium-243	²⁴³ Am	7.38E+3 years	Plutonium-239	²³⁹ Pu	2.41E+4 years
Antimony-125	¹²⁵ Sb	2.77 years	Plutonium-240	²⁴⁰ Pu	6.569E+3 years
Argon-41	⁴¹ Ar	1.827 hours	Potassium-40	⁴⁰ K	1.2777E+9 years
Beryllium-7	⁷ Be	53.44 days	Promethium-147	¹⁴⁷ Pm	2.6234 years
Californium-252	²⁵² Cf	2.639 years	Protactinium-234m	^{234m} Pa	1.17 minutes
Carbon-14	¹⁴ C	5.730E+3 years	Radium-226	²²⁶ Ra	1.6E+3 years
Cerium-141	¹⁴¹ Ce	32.50 days	Radium-228	²²⁸ Ra	5.75 years
Cerium-143	¹⁴³ Ce	1.38 days	Ruthenium-103	¹⁰³ Ru	39.35 days
Cerium-144	¹⁴⁴ Ce	284.3 days	Ruthenium-106	¹⁰⁶ Ru	368.2 days
Cesium-134	¹³⁴ Cs	2.062 years	Strontium-89	⁸⁹ Sr	50.55 days
Cesium-137	¹³⁷ Cs	30.17 years	Strontium-90	⁹⁰ Sr	28.6 years
Cobalt-58	⁵⁸ Co	70.80 days	Technetium-99	⁹⁹ Tc	2.13E+5 years
Cobalt-60	⁶⁰ Co	5.271 years	Thorium-228	²²⁸ Th	1.9132 years
Curium-242	²⁴² Cm	163.2 days	Thorium-230	²³⁰ Th	7.54E+4 years
Curium-244	²⁴⁴ Cm	18.11 years	Thorium-232	²³² Th	1.405E+10 years
Iodine-129	¹²⁹ I	157E+7 years	Thorium-234	²³⁴ Th	2.41E+1 days
Iodine-131	¹³¹ I	8.04 days	Tritium	³ H	12.28 years
Krypton-85	⁸⁵ Kr	10.72 years	Uranium-234	²³⁴ U	2.445E+5 years
Krypton-88	⁸⁸ Kr	2.84 hours	Uranium-235	²³⁵ U	7.038E+8 years
Manganese-54	⁵⁴ Mn	312.7 days	Uranium-236	²³⁶ U	2.3415E+7 years
Neptunium-237	²³⁷ Np	2.14E+6 years	Uranium-238	²³⁸ U	4.468E+9 years
Niobium-95	⁹⁵ Nb	35.06 days	Xenon-133	¹³³ Xe	5.245E+9 years
Osmium-185	¹⁸⁵ Os	93.6 days	Xenon-135	¹³⁵ Xe	9.11 hours
Phosphorus-32	³² P	14.29 days	Yttrium-90	⁹⁰ Y	64.1 hours
Polonium-210	²¹⁰ Po	138.378 days	Zirconium-95	⁹⁵ Zr	64.02 days

Source: Kocher, David C. 1981. *Radioactive Decay Tables: A Handbook of Decay Data for Application to Radioactive Dosimetry and Radiological Assessments*, DOE/TIC-11026.

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Table A.2. Comparison and description of various dose levels

Dose level	Description
1 mrem	Approximate daily dose from natural background radiation, including radon
2.5 mrem	Cosmic dose to a person on a one-way airplane flight from New York to Los Angeles
10 mrem	Annual exposure limit set by EPA for exposures from airborne emissions from operations of nuclear fuel cycle facilities, including power plants, uranium mines, and mills
45 mrem	Average yearly dose from cosmic radiation received by people in the Paducah area
46 mrem	Estimate of the largest dose any off-site person could have received from the March 28, 1979, Three Mile Island nuclear accident
66 mrem	Average yearly dose to people in the United States from human-made sources
100 mrem	Annual limit of dose from all DOE facilities to a member of the public who is not a radiation worker
110 mrem	Average occupational dose received by U.S. commercial radiation workers in 1980
244 mrem	Average dose from an upper gastrointestinal diagnostic X-ray series
300 mrem	Average yearly dose to people in the United States from all sources of natural background radiation
1 to 5 rem	Level at which EPA Protective Action Guidelines state that public officials should take emergency action when this is a probable dose to a member of the public from a nuclear accident
5 rem	Annual limit for occupational exposure of radiation workers set by the U.S. Nuclear Regulatory Commission and DOE
10 rem	Estimated level at which an acute dose would result in a lifetime excess risk of death from cancer 0.8%
25 rem	EPA guideline for voluntary maximum dose to emergency workers for non-lifesaving work during an emergency
75 rem	EPA guideline for maximum dose to emergency workers volunteering for lifesaving work
50 to 600 rem	Level at which doses received over a short period of time produce radiation sickness in varying degrees. At the lower end of this range, people are expected to recover completely, given proper medical attention. At the top of this range, most people will die within 60 days

Adapted from *Savannah River Site Environmental Report for 1993, Summary Pamphlet*, WSRC-TR-94-076, Westinghouse Savannah River Company, 1994.

Appendix B. Chemicals



Table B.1. Nomenclature for elements and chemical constituents

Constituent	Symbol	Constituent	Symbol
Aluminum	Al	Nickel	Ni
Ammonia	NH ₃	Nitrogen	N
Antimony	Sb	Nitrate	NO ₃
Arsenic	As	Nitrite	NO ₂
Barium	Ba	Oxygen	O
Beryllium	Be	Ozone	O ₃
Cadmium	Cd	Phosphorus	P
Calcium	Ca	Phosphate	PO ₄
Calcium carbonate	CaCO ₃	Potassium	K
Carbon	C	Radium	Ra
Chlorine	Cl	Rhenium	Re
Chromium	Cr	Selenium	Se
Cobalt	Co	Silver	Ag
Copper	Cu	Sodium	Na
Fluorine	F	Sulfate	SO ₄
Iron	Fe	Sulfur dioxide	SO ₂
Lead	Pb	Thallium	Tl
Lithium	Li	Uranium	U
Magnesium	Mg	Vanadium	V
Manganese	Mn	Zinc	Zn
Mercury	Hg		



Appendix C. Air Permits



Table C.1. Air permits at the Y-12 Plant

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
<i>Part I—operating permits at Y-12 Plant</i>				
Y-9201-1-A	01-0020-15	730303P	582	Weld booths sanders and grinders
			583	Metal sanders and grinders
			584	Plasma torch
			585	Grinding room area exhaust
Y-9201-1-B	01-0020-59	730310P	586	Tool grinding machine shop
			587	Sand blaster exhaust
Y-9201-1-C	01-0020-17	036057P	278	Graphite carbon machine shop
			279	Graphite carbon machine shop
Y-9201-1-E	01-1020-92	035050P	00	Lead machining operations
			6	Welding shop sanding
Y-9201-1W-A	01-0020-99	036129P	00	Machine shop equipment
			272	Grit blasting, painting
Y-9201-4-A	01-1020-96	032956P	264	Mercury flasking hood
Y-9201-5-H	01-0020-16	026019P	762	Mixing process material
			763	Setup and sample area
			764	Vapor blaster
			765	Nickel plating tank exhaust
			766	Material handling
			767	Material handling
			768	Glovebox and blending station
			769	Inspection house vacuum
Y-9201-5-J	01-0020-21	730305P	276	Tool grinding machine shop
Y-9201-5E-B	01-0020-21	730305P	273	Electrochemical machine shop
			71	Machining operations L5N
			72	Vacuum inlets L5E machining
			73	Palarite shop—Machine
Y-9201-5N-A	01-1020-18	730314P	67	Machine shop exhaust
Y-9201-5N-B	01-0020-30	030484P	239	Plating tanks and hoods
			240	Plating tanks and hoods
			241	Plating tanks and hoods
			242	Incinerator
			243	Grit blaster
			244	Grit blaster and area exhaust
			245	Process hoods
			454	Plating hoods
			8	Degreaser (removed)

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Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
Y-9201-5W-I	01-0020-24	730305P	00	Machine shop equipment
			455	Rubber-gel potting hood exhaust
Y-9202-A	01-0020-06	031696P	160	Laboratory beryllium
			161	Laboratory beryllium
			3	Laboratory beryllium
			4	Laboratory beryllium
Y-9204-2-A	01-0020-46	026107P	301	Storage tank
			302	Storage tank
			303	Storage tank
			304	Storage tank
			305	Storage tank
			306	Storage tank
			307	Storage tank
			308	Storage tank
			309	Storage tank
			310	Storage tank
			311	Storage tank/head tank
			312	Storage tank
			Y-9204-2-D	01-1020-57
343	Storage tank			
344	Lithium chloride crystallizer			
345	Lithium chloride crystallizer			
346	Neutralizer			
347	Processor tank			
348	Lithium chloride crystallizer			
349	Processor tanks			
350	Processor tank			
Y-9204-2-E	01-1020-55	730325P	351	Oven
			352	Oven
			356	Tungsten screener
			357	Dry box vent
			358	Material handling
			359	Gloveboxes
			360	Outgassing/annealing oven
			361	Material handling
			362	Gloveboxes
			363	Reactor unloading station
			364	Reactor unloading station

Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			365	Metal ingot storage glovebox
			366	New metal ingot storage glovebox
Y-9204-2-F	01-0020-51	730309P	368	Classified
			369	Classified
			370	Classified
Y-9204-2E-A	01-1020-91	730312P	202	Positive ion accelerator
			436	Oven
			439	Hood exhaust
			441	Hood
			442	Hood
			443	Perc degreaser
			444	Chromic acid electropolish
			445	Surface coating
Y-9204-3-A	01-0020-89	018208P	106	Furnaces
Y-9204-4-B	01-0020-72	730313P	481	Exhaust from machining operations
			482	Exhaust from hood—reclamation
			484	Rolling mill—1st floor
			485	Exhaust from paint hood
			486	Filtering exhaust from paint booths
			488	Laboratory hoods—1st floor
			489	Laboratory hoods—reclamation area
			490	Assembly process—1st floor
			491	Assembly process—1st floor
Y-9204-4-E	01-0020-33	032932P	258	Plating equipment
			259	Plating equipment
			260	Plating equipment
			261	Plating equipment
Y-9206-A	01-0020-48	012892P	421	Storage tank, tank farm
Y-9206-B	01-0020-03	731689P	013	South stack incinerator
			015	West stack
			016	Dissolving hood
			017	Steam cleaning hoods
			115	Reduction fluid bed
			135	AEC scrubber stack
			136	AEC consolidated stack
			208	Conversion fluid bed
			209	HF purge vent
			210	Chemical makeup area

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Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			211	Hood 29 and 30
			212	DRY vacuum system
Y-9206-C	01-1020-24	730316P	12	Classified
			14	Uranium alloy production
Y-9212-A	01-1020-72	036942P	111	Reduction fluid bed
			112	Conversion fluid beds
			132	Decontamination facility
			134	B-Wing and C-1 Wing exhaust
			19	FILT Exhaust, denitrator, fluid bed, etc.
			21	Centrifuges, liquid pour up station, etc.
			22	Reduction salvage crusher
			24	Calciner and dry vacuum system enclosure
			25	Denitrator area and fluid bed room enclosure
			27	D-Wing room 1010 hoods
			28	Reduction shear and room
			33	Headhouse equipment incinerator
			36	East scrubber (C-1 wing)
			40	B-1 sampling lab hood
			42	Chloride removal system (C-1)
			429	Fluorine cylinder rack enclosure
			430	HF dock cylinder/vaporizer
			431	N ₂ O ₄ cylinder purge vent
			432	Muffle furnaces (2) vent Room 229
			50	C-1 chip burner enclosure
			500	Primary extraction vent
			501	Secondary extraction vent
Y-9212-B	01-0020-02	730301P	110	U metal and U metal alloy
			38	U metal drying and briquetting process
			43	Exhaust from chip washing
			48	E-Wing machine shop
Y-9212-C	01-0020-05	025984P	113	Dissolver trays/scrubber
			114	Shear and hacksaw hood
			128	Precipitation process
			26	Drum receiving/sampling hood and glovebox
			290	Tube furnace/gas purge vent
			44	Leaching and dissolving hoods

Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			45	Muffle furnace dry hoods
			46	Tray dissolver hoods
			47	Dissolver tray hoods/room 1
Y-9215-A	01-0020-37	731839P	3	Machine shop hood exhaust
Y-9215-B	01-1020-51	732125P	1	O-wing metal working operations
			2	Turco pretreat spray hood
			4	O-wing metal working operations
			6	O-wing metal working operations
Y-9215-D	01-1020-53	025966P	10	Roll mill exhaust
			11	Furnance/quench tank/conveyor exhaust
			12	Hydraulic shear exhaust
			9	Rolling mill/ salt bath
Y-9401-3-A	01-1020-31	034809F	170	Coal-fired boiler
Y-9401-3-B	01-1020-32	034809F	170	Coal-fired boiler
Y-9401-3-C	01-1020-33	034809F	171	Coal-fired boiler
Y-9401-3-D	01-1020-34	034809F	171	Coal-fired boiler
Y-9404-11-A	01-1020-81	28426P	373	Purification plant reator
			374	Purification plant glovebox
			375	Purification plant glovebox
			376	Purification plant glovebox
Y-9404-5-A	01-0020-25	012866P	676	Paint spray booth
			677	Paint spray booth
Y-9404-7-A	01-1020-89	034295P	00	Maintenance shop
Y-9404-9-C	01-1020-19	730315P	323	Halar oven
			324	Urethane warming oven
			325	Urethane oven #3
			326	PVC oven #4
			327	PVC oven #5
			328	Steam autoclave
			329	General use oven
			330	Halar spray booth
			331	Blue M oven
			332	Drape forming equipment
			333	Vacuum system
			336	Despatch oven
			337	Rubber preparation equipment
			338	Lab hood
			339	Despatch oven

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Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			340	Vacuum pumps
			341	Plastics fume hood
Y-9616-10-A	01-1020-62	029280P	428	Sulfuric acid storage tank
Y-9616-7-A	01-1020-80	031254P	271	Vent from air stripper
Y-9616-7-B	01-1020-74	737019P	459	West end treatment storage
			460	West end treatment storage
			461	West end treatment storage
			462	West end treatment storage
			463	West end treatment vent reactor vessel
			464	West end treatment storage
			465	West end treatment vent degasifier unit
			466	West end treatment storage
			467	West end treatment storage
			468	West end treatment storage
			469	West end treatment vent lime silo
			470	West end treatment storage
			471	WETF laboratory hood
			472	WETF sodium hydroxide tank
			473	WETF clarifier (6-315)
			650	Biological treatment tank
			651	Biological treatment tank
			652	Biological treatment tank
			653	Biological treatment tank
			654	Biological treatment tank
			655	Biological treatment tank
			656	Solids storage tank
			657	Solids storage tank
			658	Solids storage tank
			659	Solids storage tank
			660	Solids storage tank
			661	Solids storage tank
			662	Solids storage tank
			665	WETF-F-380A sludge settling
			666	WETF-F-380B sludge settling
			667	WETF-F-381A sludge concentrator
			668	WETF-F-381B sludge denitrator
			669	WETF-F-384 decant hold tank
			670	WETF-F-382 decant tank/30

Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			671	WETF-F-385 decant tank/30
			672	WETF-F-390A calcium carbonate
			673	WETF-F-390B calcium carbonate
			674	WETF-F-390C calcium carbonate
			675	WETF-F-400 F-401 slurry tank
Y-9720-12-A	01-1020-89	034295P	00	Non-special nuclear material
Y-9720-25-A	01-1020-89	034295P	00	Drum storage warehouse
Y-9720-28-A	01-1020-89	034295P	00	Drum storage warehouse
Y-9720-31-A	01-1020-89	034295P	00	RCRA and mixed waste storage
Y-9720-32-A	01-0020-42	032547P	201	Classified waste shredder
			435	Classified paper incinerator
Y-9720-44-A	01-1020-89	034295P	00	Low-level waste storage pad
Y-9720-58-A	01-1020-89	034295P	00	PCB and RCRA staging and storage
Y-9720-6-A	01-0020-26	012867P	678	Paint spray booth
			679	Oven
Y-9720-60-A	01-1020-89	034295P	00	DARA solids storage unit
Y-9720-9-A	01-1020-89	034295P	00	PCB and RCRA hazardous waste
Y-9738-A	01-0020-14	036776P	576	Sand blaster
			577	Hood with fan
			578	Sand blaster
			579	Hood with fan
			580	Hood with fan (removed)
Y-9767-4-B	01-0020-35	012877P	00	Chilled water circulating system
Y-9811-1-A	01-1020-95	731997P	400	Waste oil/storage bulk storage
			401	Waste oil/storage bulk storage
			402	Waste oil/storage bulk storage
			403	Waste oil/storage bulk storage
			404	Waste oil/storage bulk storage
			405	Waste oil/storage bulk storage
Y-9811-1-B	01-1020-89	034295P	00	Waste oil/solvent drum storage
Y-9811-6-A	01-1020-82	029415P	377	Dry ash handling system
			378	Dry ash handling system
Y-9811-8-A	01-1020-63	032988P	407	Waste oil/solvent storage
			408	Waste oil/solvent storage
			409	Waste oil/solvent storage
			410	Waste oil/solvent storage
			411	Waste oil/solvent storage
Y-9811-8-B	01-1020-89	034295P	00	Waste oil/solvent drum storage

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Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
Y-9815-A	01-0020-11	025895P	780	Vent from dissolvers
			781	Nitric acid storage tank
			782	Nitric acid storage tank
			783	Storage tank/4400 gal
			784	Storage tank/1800 gal
			785	2 storage tanks/2200 gal
Y-9818-A	01-0020-12	025965P	790	Hot well seal tank
			791	10 storage tanks—nitric acid
			792	Bioreactor tanks/ozonation
			793	Basement exhaust
			794	Nitric acid supply line vent
			795	Calcium acetate storage tank
			796	Nitric waste storage tank
			797	Nitric waste storage tank
			798	Nitric acid storage tank
			799	Nitric acid storage tank
			800	Ozone generator/area exhaust
			801	Nitric acid waste tank
			802	Caustic waste tank
			803	Still condensers
Y-9828-6-A	01-1020-89	034295P	00	Trash monitoring station
Y-9983-74-A	01-1020-89	034295P	00	Old salvage yard
<i>Part II—construction permits at Y-12 Plant</i>				
Y-9201-1-A	01-0020-15	730303P	582	Weld booths sanders and grinders
			583	Metal sanders and grinders
			584	Plasma torch
			585	Grinding room area exhaust
			586	Tool grinding machines
Y-9201-1-B	01-0020-59	730310P	587	Sand blaster exhaust
			588	
Y-9201-5-J	01-0020-21	730305P	276	Tool grinding machines
Y-9201-5E-B	01-0020-21	730305P	273	Electrochemical machine, stainless steel
			71	Machining operations L5N
			72	Vacuum inlets L5E machining
			73	Palarite shop—machine
Y-9201-5N-A	01-1020-18	730314P	67	Machine shop exhaust
Y-9201-5W-I	01-0020-24	730305P	00	Machine shop equipment
			455	Rubber-gel potting hood exhaust
Y-9204-2-D	01-1020-57	730327P	342	Salvage vats

Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			343	Storage tank
			344	Lithium chloride crystallizer
			345	Lithium chloride crystallizer
			346	Neutralizer
			347	Processor tank
			348	Lithium chloride crystallizer
			349	Processor tanks
			350	Processor tank
Y-9204-2-E	01-1020-55	730325P	351	Oven
			352	Oven
			356	Tungsten screener
			357	Dry box vent
			358	Material handling
			359	Gloveboxes
			360	Outgassing/annealing oven
			361	Material handling
			362	Gloveboxes
			363	Reactor unloading station
			364	Reactor unloading station
			365	Metal ingot storage glovebox
			366	New metal ingot storage glovebox
Y-9204-2-F	01-0020-51	730309P	368	Classified
			369	Classified
			370	Classified
Y-9204-2E-A	01-1020-91	730312P	202	Positive ion accelerator
			436	Oven
			439	Hood exhaust
			441	Hood
			442	Hood
			443	Perc degreaser
			444	Chromic acid electropolish
			445	Surface coating
Y-9204-4-B	01-0020-72	730313P	481	Exhaust from machining operations
			482	Exhaust from hood, reclamation area
			484	Rolling mill, 1st floor
			485	Exhaust from paint hood
			486	Filtering exhaust from paint booths
			488	Laboratory hoods, 1st floor

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Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
Y-9206-B	01-0020-03	731689P	489	Laboratory hoods, reclamation area
			490	Assembly process, 1st floor
			491	Assembly process, 1st floor
			013	South stack incinerator
			015	West stack
			016	Dissolving hood
			017	Steam cleaning hoods
			115	Reduction fluid bed
			135	AEC scrubber stack
			136	AEC consolidated stack
			208	Conversion fluid bed
			209	HF purge vent
			210	Chemical makeup area
			211	Hood 29 and 30
Y-9206-C	01-1020-24	730316P	212	Dry vacuum system
			12	Classified
Y-9212-B	01-0020-02	730301P	14	Uranium alloy production
			110	U metal and U metal alloy
			38	U metal drying and briquetting process
Y-9215-A	01-0020-37	731839P	43	Exhaust from chip washing
			48	E-wing machine shop
Y-9215-B	01-1020-51	732125P	3	Machine shop hood exhaust
			1	O-wing metal working operations
			2	Turco pretreat spray hood
			4	O-wing metal working operations
Y-9404-9-C	01-1020-19	730315P	6	O-wing metal working operations
			323	Halar oven
			324	Urethane warming oven
			325	Urethane oven #3
			326	PVC oven #4
			327	PVC oven #5
			328	Steam autoclave
			329	General use oven
			330	Halar spray booth
			331	Blue M oven
	332	Drape forming equipment		
	333	Vacuum system		
	336	Despatch oven		

Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			337	Rubber preparation equipment
			338	Lab hood
			339	Despatch oven
			340	Vacuum pumps
			341	Plastics fume hood
Y-9616-7-B	01-1020-74	737019P	459	West end treatment storage
			460	West end treatment storage
			461	West end treatment storage
			462	West end treatment storage
			463	West end treatment vent reactor vessel
			464	West end treatment storage
			465	West end treatment vent degasifier unit
			466	West end treatment storage
			467	West end treatment storage
			468	West end treatment storage
			469	West end treatment vent lime silo
			470	West end treatment storage
			471	WETF laboratory hood
			472	WETF sodium hydroxide tank
			473	WETF clarifier (6-315)
			650	Biological treatment tank
			651	Biological treatment tank
			652	Biological treatment tank
			653	Biological treatment tank
			654	Biological treatment tank
			655	Biological treatment tank
			656	Solids storage tank
			657	Solids storage tank
			658	Solids storage tank
			659	Solids storage tank
			660	Solids storage tank
			661	Solids storage tank
			662	Solids storage tank
			665	WETF-F-380A sludge settling
			666	WETF-F-380B sludge settling
			667	WETF-F-381A sludge concentrator
			668	WETF-F-381B sludge denitrator
			669	WETF-F-384 decant hold tank

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Table C.1 (continued)

Y-12 Plant source number	Source reference number	Permit number	Stack	Stack description
			670	WETF-F-382 decant tank/30
			671	WETF-F-385 decant tank/30
			672	WETF-F-390A calcium carbonate
			673	WETF-F-390B calcium carbonate
			674	WETF-F-390C calcium carbonate
			675	WETF-F-400 F-401 slurry tank
Y-9811-1-A	01-1020-95	31997P	400	Waste oil/storage bulk storage tank
			401	Waste oil/storage bulk storage tank
			402	Waste oil/storage bulk storage tank
			403	Waste oil/storage bulk storage tank
			404	Waste oil/storage bulk storage tank
			405	Waste oil/storage bulk storage tank

Table C.2. ORNL air pollution emission sources permitted with the Tennessee Department of Environment and Conservation

Source number	Emission source reference number	TDEC permit number	Source description
X-2519-1/5	73-0112-03	030284P	Steam plant
X-2522-T1A	73-0112-10	024114P	No. 2 fuel oil storage tank
X-2525-SV-11	73-0112-49	035026P	Electroplating
X-2547-01	73-0112-27	740817P	Surface coating spray booth
X-3039	73-0112-93	035494P	Off gas and hot cell ventilation
X-3500-SV12	73-0112-73	036689P	Electric belt furnace
X-3502-01	73-0112-05	030881P	Spray booths (3)
X-3502-09	73-0112-94	027194P	Hood gluing
X-3502-SV1	73-0112-39	023808P	Oven curing
X-3502-SV2	73-0112-40	023807P	Oven tempering
X-3502-SV4	73-0112-30	036053P	Carpenter shop
X-3544-SV1	73-0112-70	730468P	PWTP
X-3587-SV1	73-0112-56	029830P	Printed circuit board facility
X-3608-01	73-0112-37	730489P	NRWTP air stripper column
X-4508-SV8	73-0112-61	040077P	Acid etching process
X-4508-SV9	73-0112-55	024306P	Sandblaster
X-7002-04	73-0112-08	037231P	Vehicle spray booth
X-7005-00	73-0112-45	037516P	Lead shop machining operation
X-7005-3/7	73-0112-26	739585P	Five lead melting furnaces
X-7007-1/2	73-0112-09	030824P	Spray booth and cleaning booth
X-7021-00	73-0112-58	038357P	Grinding shop and sandblaster
X-7057-SV1	73-0112-76	030101P	Sandblaster
X-7069-T1	73-0112-60 NSPS	730836P	Gasoline storage tank
X-7600-01	73-0112-20	017930P	Nuclear fuel reprocessing
X-7602-01	73-0112-24	027090P	Boiler, hot water
X-7603-01	73-0112-25	740219F	Steam-generating process
X-7667-0	73-0112-0067-6	73-0112-0067-6	Chemical detonation facility
X-7830-SV1	73-0112-71	731010P	Liquid Waste Solidification Project
X-7911-00	73-0112-82	034381P	HFIR, REDC 7920 and 7930
X-7934-SV2	73-0112-53	024912P	Silver recovery system
X-7935-SV1	73-0112-78	027393P	Equipment cleaning facility
X-FE	73-0112-97	029660P	Fugitive emission source
X-FLC	73-0112-99	034960P	Fluorescent lamp disposers

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Table C.3. K-25 Site air permits

K-25 source number	Emission source reference number	Permit number	Source description	Permit type
K1004L	73-0106-35	012503P	Main vent of development facility	Operating
K1004THOOD	73-1106-04	024498P	Hood evacuates fumes from mixing epoxy resin and hardener	Operating
K1004TWIND3	73-1106-28	029901P	Fiber-winding spools with epoxy dip	Operating
K1004TWIND2	73-1106-28	029901P	Fiber-winding spools with epoxy dip	Operating
K1004TWIND4	73-1106-28	029901P	Fiber-winding spools with epoxy dip	Operating
K1004TWIND1	73-1106-28	029901P	Fiber-winding spools with epoxy dip	Operating
K1024FT1	73-0106-18	025655P	Filter test facility	Operating
K1037AVLISLCDEV	73-0106-69	029897P	Expansion Lab C spray coating W exhaust filters	Operating
K1037AVLISOOVEN	73-0106-73	029900P	Electric oxidation oven	Operating
K1037AVLISEXLAB	73-0106-68	031404P	Materials Test Unit (MTU)	Operating
K1037AVLISEXLAB	73-0106-68	031404P	Vacuum system vents	Operating
K1037AVLISEXLAB	73-0106-68	031404P	Materials-Handling Development Module (MHDM)	Operating
K1037AVLISEXLAB	73-0106-68	031404P	Electron Beam One (EB-1)	Operating
K1037AVLISLGB	73-0106-77	032345P	Grit blast facility with baghouse	Operating
K1037AVLISQOVEN	73-0106-79	034645P	Quincy oven	Operating
K1037AVLISGOVEN	73-0106-80	034646P	Grieve oven TB-500 electric	Operating
K1037AVLISFURN	73-0106-81	034647P	Huppert furnace	Operating
K1037MLBH	73-0106-84	035867P	Mechanical lab—shaping graphite and metal parts	Operating
K1037AVLISSSB	73-0106-85	035868P	Small sandblaster	Operating
K1037AVLISLAB	73-1106-35	932953P	AVLIS Lab—metallothermic reduction unit, chlorinator, and oxide cell	Permit to construct
K1037AVLISPRODCON	73-1106-36	933170P	Products conversion demonstration	Permit to construct
K1095PS1234	73-0106-14	734461P	Paint spray operation, one oven, two spray booths, and one silk screen degreaser	Operating
K1098FSB1	73-0106-13	034231P	Sandblast facility with baghouse and grit recycle	Operating

Table C.3 (continued)

K-25 source number	Emission source reference number	Permit number	Source description	Permit type
K1200CENTERBAY	73-0106-87	732346P	Two hoods vent mixing epoxy resins, coating fibers, winding fibers	Operating
K1202ST1	73-1106-20	033203P	Tank stores waste oils and solvents for incinerator	Operating
K1202ST2	73-1106-41	034392P	Tank stores waste oils and solvents for incinerator	Operating
K1401275029PL	73-0106-38	012506P	Plastic shop curing oven	Operating
K1401MSMC1	73-0106-32	017337P	Motor curing oven	Operating
K1401JIGANDFIXT	73-0106-71	029898P	Vacuum exhaust for parts fabrication in the jig and fixture shop	Operating
K1401PLS1,4,6	73-0106-72	029899P	Ovens 1, 4, and 6 used for curing plastic parts in the plastic shop	Operating
K1401CARPENTERSHOP	73-1106-40	032930P	Miscellaneous wood and acrylic plastic working operations with cyclone control	Operating
K25BULBCRUSHER	73-1106-43	934193P	Flourescent lamp disposers with fabric/carbon filters	Operating
K1414UNLGAS	73-1106-39	035063P	20,000-gal unleaded gasoline underground storage tank	Operating
K1414UG	73-0106-28	037113P	Methanol, unleaded gasoline storage tank	perating
K1420PHILLIPVA	73-0106-70	023798P	Phillips vapor degreaser, perchloroethylene	Operating
K1420DISASSEMBL	73-0106-74	032344P	Disassembly stand for dismantling parts	Operating
K1420A1	73-0106-82	034619P	Flammable materials storage tank	Operating
K1425WOSC	73-0106-11	029895P	Waste oil and solvent storage tanks	Operating
K1425WOSA	73-0106-11	029895P	Waste oil and solvent storage tanks	Operating
K1425WOSD	73-0106-11	029895P	Waste oil and solvent storage tanks	Operating
K1425WOSB	73-0106-11	029895P	Waste oil and solvent storage tanks	Operating
K1435TSCAINCIN	73-0106-78	032449I	TSCA Incinerator	Operating
K1435CTANKFARM	73-0106-75	024105P	Tank farm for hazardous liquid wastes	Operating
K15012720FO	73-0106-28	016312P	K-1501 613,000-gal fuel oil tank	Operating
K15012810FO	73-0106-28	016312P	K-1501 15,228-gal fuel oil tank	Operating

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Table C.3 (continued)

K-25 source number	Emission source reference number	Permit number	Source description	Permit type
K1501BOILER4	73-0106-04	029902F	Natural gas boiler	Operating
K1501BOILER7	73-0106-07	029902F	Gas/oil boiler	Operating
K1501BOILER8	73-0106-12	937114F	Gas/oil boiler	Permit to construct
K1501BOILER9	73-0106-12	937114F	Gas/oil boiler	Permit to construct
K1600TTFL	73-0106-59	017053P	Development lab with two hoods and one small oven	Operating
K1652FECS	73-1106-42	733774P	Fire extinguisher charging station	Operating
K-25-B-1	73-0106-19	016309P	Heat exchange medium freon for plant	Operating

Appendix D. Drinking Water Standards



Table D.1. Reference standards for water

Parameter	All parameters				Radionuclides only		
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^c	Tennessee water quality criteria—recreation “organisms-only” values ^c	4% of DOE DCG ^d	DOE DCG
Chloride		250					
Fluoride	4	2					
Nitrate	10						
Nitrite	1						
Sulfate, as SO ₄		250					
			<i>Anions (mg/L)</i>				
1,2-Dichlorobenzene	600				17,000		
1,2,4-Trichlorobenzene	70				2,600		
1,3-Dichlorobenzene					2,600		
1,4-Dichlorobenzene (para)	75	5	75		14,000		
2,4-Dinitrophenol					91		
2,4-Dinitrotoluene					65		
2,4,6-Trichlorophenol					765		
2-Methyl-4,6-Dinitrophenol					0.49		
3,4-Benzofluoranthene					0.49		
Benzo(k)fluoranthene					0.3		
Acenaphthylene					110,000		
Anthracene					0.3		
Benzo(a)anthracene					0.3		
Benzo(a)pyrene	0.2				14		
bis-(2-chloroethyl)ether					59		
bis-(2-ethylhexyl)phthalate							
			<i>Base/neutral/acid extractable organics (µg/L)</i>				

Table D.1 (continued)

Parameter	All parameters				Radionuclides only		
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^c	Tennessee water quality criteria—recreation "organisms-only" values ^c	4% of DOE DCG ^d	DOE DCG
Di-n-butyl phthalate					12,000		
Diethyl phthalate					120,000		
Dimethyl phthalate					2,900,000		
Fluoranthene					32		
Fluorene					14,000		
Hexachlorobenzene	1				0.007		
Hexachlorocyclopentadiene	50				17,000		
Hexachloroethane					89		
Nitrobenzene					1,900		
Pentachlorophenol	1			20			
Phenathrene					0.03		
Pyrene					11,000		
<i>Field measurements</i>							
Dissolved oxygen, mg/L				5			
Temperature, °C			30.5		30.5		
Turbidity, JTU ^e	1						
pH, standard units		(6.5, 8.5)	(6.0, 9.0)	(6.5, 8.5)	(6.0, 9.0)		
<i>Metals (mg/L)</i>							
Aluminum		0.2					
Antimony	0.006				4.31		

Table D.1 (continued)

Parameter	All parameters					Radionuclides only	
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^d	Tennessee water quality criteria—recreation ^e	4% of DOE DCG ^d	DOE DCG
Arsenic	0.05		0.05	0.36			
Barium	2						
Beryllium	0.004				0.0013		
Cadmium	0.005		0.005	0.0039			
Chromium (hexavalent)	0.1		0.100	0.016	670		
Copper	1.3 ^f	1		0.018			
Cyanide	0.2			0.022			
Iron		0.3					
Lead	0.015 ^f		0.05	0.082			
Manganese		0.05					
Mercury	0.002		0.002	0.0024	0.00015		
Nickel	0.1			1.418	4.6		
Selenium	0.05		0.050	0.02			
Silver		0.1	NA	0.004			
Thallium	0.002						
Zinc		5		0.117			
Asbestos (fibers/L)	7,000,000						
Coliform Bacteria (mL)	0.01						
Color (color units)		15					
Cyanide (mg/L)				0.022			
Odor (T.O.N.)		3					
Total dissolved solids, mg/L		500					

Table D.1 (continued)

Parameter	All parameters				Radionuclides only		
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^d	Tennessee water quality criteria—recreation "organisms-only" values ^e	4% of DOE DCG ^f	DOE DCG
<i>Pesticides/herbicides/PCBs (µg/L)</i>							
2,3,7,8-TCDD (Dioxin)	0.00003				0.000001		
2,4-D	70						
2,4,5-TP (Silvex)	50						
4,4'-DDT				1.1	0.006		
4,4'-DDE					0.006		
4,4'-DDD					0.008		
Alachlor	2						
Aldicarb sulfoxide	4						
Aldrin				3	0.014		
Altrazine	3						
Carbofuran	40						
Chlordane	2						
Dalapon	200			2.4	0.006		
Dibromochloropropane	0.2						
Di(ethylhexyl)adipate	400						
Di(ethylhexyl)phthalate	7						
Dinoseb	7						
Diquat	20						
a-Endosulfan				0.22	1.59		
b-Endosulfan				0.22	1.59		

Table D.1 (continued)

Parameter	All parameters					Radionuclides only	
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^d	Tennessee water quality criteria—recreation “organisms-only” values ^e	4% of DOE DCG ^f	DOE DCG
Endothall	100						
Endrin	2			0.18			
Ethylene dibromide	0.05						
Glyphosate	700						
Heptachlor	0.4			0.52	0.002		
Heptachlor epoxide	0.2			0.52	0.001		
g-BHC (Lindane)	0.2			2	0.63		
Methoxychlor	40						
Oxamyl (Vydate)	200						
PCB-1242						0.0005	
PCB-1254						0.0005	
PCB-1221						0.0005	
PCB-1232						0.0005	
PCB-1248						0.0005	
PCB-1260						0.0005	
PCB-1016						0.0005	
PCB, total	0.5					0.0005	
Picloram	500					0.00045	

Table D.1 (continued)

Parameter	All parameters				Radionuclides only		
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^d	Tennessee water quality criteria—recreation ^e	4% of DOE DCG ^d	DOE DCG
Simazine	4						
Toxaphene	3		0.73	0.008			
<i>Radionuclides (pCi/L)^f</i>							
²⁴¹ Am						1.2	30
²¹⁴ Bi						24,000	600,000
¹⁰⁹ Cd						400	10,000
¹³⁷ Cs						1,200	30,000
⁶⁰ Co						200	5,000
⁵¹ Cr						4,000	100,000
¹³⁷ Cs						120	3,000
¹⁵² Eu						4,000	100,000
Gross alpha	15						
Gross beta	50 ^g						
³ H	20,000					80,000	2,000,000
¹³¹ I						120	3,000
⁴⁰ K						280	7,000
²³⁷ Np						1.2	30
²³⁸ Pa						2,800	70,000
²³⁸ Pu						1.6	40
^{239/240} Pu						1.2	30
²²⁶ Ra	5					4	100

Table D.1 (continued)

Parameter	All parameters				Radionuclides only			
	National primary drinking water ^d	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^c	Tennessee water quality criteria—recreation ^c	4% of DOE DCG ^d	DOE DCG	
²²⁸ Ra	5					4	100	
¹⁰⁶ Ru						240	6000	
Sr, total rad	8					40	1,000	
⁹⁹ Tc						4,000	100,000	
²³² Th						16	400	
²³⁰ Th						12	300	
²³² Th						2	50	
²³⁴ Th						400	10,000	
Thorium, natural						2	50	
²³⁵ U						20	500	
²³⁸ U						24	600	
Uranium, natural						24	600	
Uranium, total ^f						24	600	
1,1,1-Trichloroethane	200				170,000			
1,1-Dichloroethene	7				32			
1,1,2-Trichloroethane	5				420			
1,1,2,2-Tetrachloroethane					110			
1,2-Dichloroethane	5				990			
1,2-Dichloroethene	70							
<i>Volatiles organics (µg/L)</i>								
			200					
			7					
			5					
			5					
			70					

Table D.1 (continued)

Parameter	All parameters					Radionuclides only	
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^d	Tennessee water quality criteria—recreation ^e	4% of DOE DCG ^f	DOE DCG
<i>cis</i> -1,2-Dichloroethene	70						
<i>trans</i> -1,2-Dichloroethene	100						
1,2-Dichloropropane	5				1,700		
<i>cis</i> -1,3-Dichloropropane					1,700		
<i>trans</i> -1,2-Dichloropropane					780		
Acrolein					6.7		
Acrylonitrile					710		
Benzene	5		5				
Bromodichloromethane	100 ^g						
Bromoform	100 ^g				4,700		
Carbon tetrachloride	5		5		44		
Chlorobenzene	100						
Chloroethane	200						
Chloroform	100 ^g				4,700		
Dibromochloromethane	100 ^g				4,700		
Ethylbenzene	700				29,000		
Methylene chloride					16,000		
Styrene	100						
Tetrachloroethene	5				88		
Toluene	1,000				300,000		
Trichloroethene	5		5		807		

Table D.1 (continued)

Parameter	All parameters			Radionuclides only			
	National primary drinking water ^a	National secondary drinking water ^b	Tennessee water quality criteria—domestic water supply ^c	Tennessee water quality criteria—fish and aquatic life ^d	Tennessee water quality criteria—recreation “organisms-only” values ^e	4% of DOE DCG ^f	DOE DCG
Trihalomethanes, total	100				100		
Vinyl chloride	2		2		5,250		
Xylene, total	10,000						

^a40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.

^b40 CFR Part 143—National Secondary Drinking Water Regulations, as amended.

^cRules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.

^dDOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water. Four percent of the DOE DCG to represent the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.

^eNTU an NTU are roughly equivalent in the range of 25 to 1000 JTU.

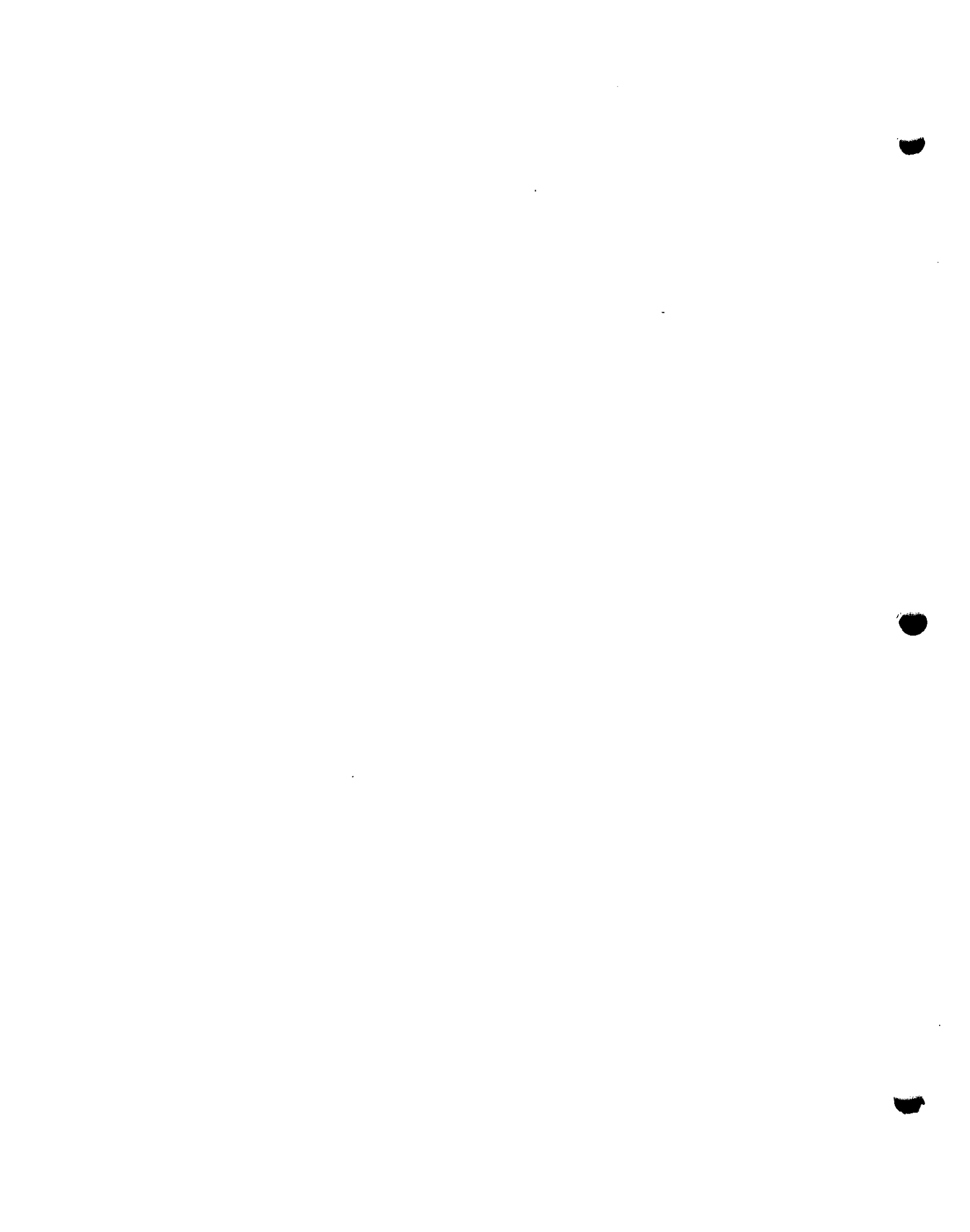
^fAction level, which is applicable to community water systems and non-transient, non-community water systems.

^gOnly the radionuclides that were sought at the Oak Ridge Reservation are listed.

^hRegulatory guide for assessing compliance without further analysis.

ⁱMinimum of uranium isotopes.

^jLimit for total trihalomethanes (bromodichloromethane + bromoform + chloroform + dibromochloromethane).



**Appendix E. Underground Storage
Tank Data**



Table E.1. Underground storage tanks (USTs) at the Y-12 Plant

Location	Tank identification number	Installation date	Out-of-service date	Capacity (gallons)	Contents	Status	Preliminary investigation(s)	Environmental assessment () date to regulatory agency	Corrective action
<i>Petroleum USTs</i>									
9722-6	2312-U	1987	1994	550	Diesel	Inert filled 2/95	CR (4/95)	NA	NA
9722-5	2313-U	1987	1994	550	Diesel	Inert filled 2/95	CR (4/95)	NA	NA
9999-7	2316-U	1986	1994	550	Diesel	Inert filled 2/95	CR (4/95)	NA	NA
9999-5	2320-U	1986	1994	550	Diesel	Removed 2/95	CR (4/95)	NA	NA
9722-4	2333-U	1988	1994	550	Diesel	Inert filled 3/95	CR (4/95)	NA	NA
9714	2334-U	1987	In use	6,000	Gasoline	Full compliance	Site check	NA	NA
9714	2335-U	1987	In use	10,000	Diesel	Full compliance	Site check	NA	NA
9754-3	2396-U	1993	In use	10,000	Diesel	Full compliance	NA	NA	NA
9754-3	2397-U	1993	In use	20,000	Gasoline	Full compliance	NA	NA	NA
9712	0084-U	1958	1988	500	Used oil	Removed 6/88	CERCLA	TRD	TRD
9204-2	0134-U	1966	1982	117	Gasoline	Removed 8/88	ISCR, FPRR	SIR (3/92)	EAR/CAP (8/92), CAP approval (5/93), CR (4/94), SRF (1/95)
9754-2	0439-U	1978	1989	20,000	Gasoline	Removed 9/89	IAR, ISCR, FPRR	SIR/CAP (3/91)	CAP (7/92), CAP approval (5/93), BNR (3/94), SSSR (4/94)
9754-2	0440-U	1978	1989	10,000	Diesel	Removed 9/89	IAR, ISCR, FPRR	SIR/CAP (3/91)	CAP (7/92), CAP approval (5/93), BNR (3/94), SSSR (4/94)
9754	2073-U	1944	1979	1,000	Gasoline	Removed 10/93	SI	SIR/CAP (3/91)	CAP (7/92), CAP approval (5/93), BNR (3/94), SSSR (4/94)
9754	2074-U	1944	1979	1,000	Gasoline	Removed 10/93	SI	SIR/CAP (3/91)	CAP (7/92), CAP approval (5/93), BNR (3/94), SSSR (4/94)
9754	2075-U	1944	1979	1,000	Diesel	Removed 10/93	SI	SIR/CAP (3/91)	CAP (7/92), CAP approval (5/93), BNR (3/94), SSSR (4/94)
9754-1	1219-U	1964	1988	12,000	Diesel	Removed 12/89	EA	SIR (3/91)	CAP (5/92), SRF (2/94), SRF approval (3/94), SSSR (9/94), SSSR revised (1/95)
9754-1	1222-U	1968	1988	12,000	Gasoline	Removed 12/89	EA	SIR (3/91)	CAP (5/92), SRF (2/94), SRF approval (3/94), SSSR (9/94), SSSR revised (1/95)

Table E.1 (continued)

Location	Tank identification number	Installation date	Out-of-service date	Capacity (gallons)	Contents	Status	Preliminary investigation(s)	Environmental assessment () date to regulatory agency	Corrective action
9720-15	2068-U	1968	1980	1,000	Gasoline	Removed 2/90	EA/FPRR	SIR (3/91)	CAP (5/92), SRF (2/94), SRF approval (3/94), SSSR (9/94), SSSR revised (1/95)
9754-1	2082-U	1981	1988	8,000	Gasoline	Removed 12/89	EA	SIR (3/91)	CAP (5/92), SRF (2/94), SRF approval (3/94), SSSR (9/94), SSSR revised (1/95)
PRW	2310-U	1975	1989	200	Gasoline	Removed 11/89	ISCR	SIR/CAP (7/91)	FAR/CAP (3/93), CAP approval (12/93), OI (4/94, 5/94), CR (7/94)
9201-1	2331-U	1973	1988	560	Gasoline	Removed 12/88	ISCR, FPRR	SIR (3/92)	FAR/CAP (7/92), CAP approval (12/93), IMR (3/94), SRF (4/94), SRF approval (5/94)
9401-3	0713-U	1955	1988	10,500	No. 2 fuel oil	Removed 11/88	NI	NA	NA
9754	0836-U	1944	1989	10,000	Used oil	Removed 10/89	RCRA	RCRA	RCRA
9204-3	0928-U	1966	1989	200	Gasoline	Removed 5/89	RIR, closure approved 8/92	NA	NA
9995	2078-U	1965	1979	110	Gasoline	Inert filled 1979	CERCLA	TBD	TBD
9995	2079-U	1965	1979	55	Gasoline	Inert filled 1979	CERCLA	TBD	TBD
9996	2080-U	1971	1987	560	Gasoline	Removed 12/88	RIR	NA	NA
9212	2081-U	1958	1970	280	Gasoline	Removed 4/91	ISCR	NA	OF/CR (12/91)
9201-5	2099-U	1971	1989	560	Gasoline	Removed 7/89	IAR, RIR, closure approved 3/90	NA	NA
9929-1	2117-U	1971	1983	550	No. 2 fuel oil	Removed 10/88	NI	NA	NA
9201-4	2130-U	1960	1992	550	Gasoline	Removed 12/92	RIR	NA	NA
9999	2293-U	1954	1974	58	Gasoline	Removed 1974	NI	NA	NA
9999	2294-U	1954	1974	58	Gasoline	Removed 1974	NI	NA	NA
9998	2305-U	1956	1990	55	Diesel	Removed 10/90	RIR, closure approved 1/95	NA	NA

Table E.1 (continued)

Location	Tank identification number	Installation date	Out-of-service date	Capacity (gallons)	Contents	Status	Preliminary investigation(s)	Environmental assessment () date to regulatory agency	Corrective action
PRE	2315-U	1960	1988	64	Gasoline	Removed 11/89	ISCR	EAR/CAP (2/91)	OE/CAR (12/92), closure approval 1/95
9769	2330-U	1949	1988	5,000	No. 2 fuel oil	Inert filled 4/88	NI	NA	NA
Chestnut Ridge	2336-U	1981	1991	550	Gasoline	Removed 5/91	RIR, closure approved 1/95	NA	NA
Buff. Mtn.	2337-U	1972	1990	250	Gasoline	Removed 3/90	IAR, ISCR	SIR (5/91), SIR Phase II (1/92)	Closure approval 2/95
9720-13	2338-U	1970	1984	200	Used oil	Removed 7/90	RIR	TBD	TBD
9219	2395-U	1964	1977	2,000	No. 2 fuel oil	Removed 6/93	NI	NA	NA
SYDD	2063-U	1959	1989	130	Oil/solvent	Removed 7/89	IAR, ISCR/FPRR	CERCLA	CERCLA
SYDD	2328-U	1959	1989	475	Oil/solvent	Removed 7/89	IAR, ISCR/FPRR	CERCLA	CERCLA
SYDD	2329-U	1959	1989	475	Oil/solvent	Removed 7/89	IAR, ISCR/FPRR	CERCLA	CERCLA
<i>Hazardous Substance USTs</i>									
9767-13	2102-U	1987	1992	7,500	Methanol	Removed 1/93	CR	NA	NA
9418-3	2072-U	1943	1960	45,000	Solid uranium oxide	Exempt	CERCLA	CERCLA	CERCLA
9825-1	2129-U	1984	In use	240,000	Solid uranium oxide	Exempt	NA	NA	NA

Notes

- BMR baseline monitoring report
- CAP corrective action plan
- CAR corrective action report
- CERCLA conducted under the Comprehensive Environmental Response, Compensation and Liability Act
- CR closure report
- EA environmental assessment
- EAR environmental assessment report
- FPRR free product removal report
- IAR initial abatement report
- ISCR initial site characterization report
- NA not applicable
- NI not investigated
- OE overexcavation
- RCRA conducted under Resource Conservation and Recovery Act, Subtitle C
- RIR release investigation report to be determined
- TBD to be determined
- SIR site investigation report
- SRF site ranking form
- SSSR site-specific standard request
- SYDD salvage yard drum deheader

