John Murphy

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MARTIN MARIETTA

Oak Ridge Reservation Environmental Report for 1989

Volume 2: Data Presentation

OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

ES/ESH-13/V2

OAK RIDGE RESERVATION ENVIRONMENTAL REPORT FOR 1989

VOLUME 2: DATA PRESENTATION

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U.S. DEPARTMENT OF ENERGY
Under Contract No. DE-AC05-84OR21400

CONTENTS

1. INTRODUCTION

1. INTRODUCTION AND GENERAL INFORMATION

The first two volumes of this report are devoted to a presentation of environmental data and supporting narratives for the U.S. Department of Energy's (DOE's) Oak Ridge Reservation (ORR) and surrounding environs during 1989. Volume 1 includes all narrative descriptions, summaries, and conclusions and is intended to be a "stand-alone" report for the ORR for the reader who does not want to review in detail all of the 1989 data. Volume 2 includes the detailed data summarized in a format to ensure that all environmental data are represented in the tables. Narratives are not included in Vol. 2. The tables in Vol. 2 are addressed in Vol. 1. For this reason, Vol. 2 cannot be considered a stand-alone report but is intended to be used in conjunction with Vol. 1.

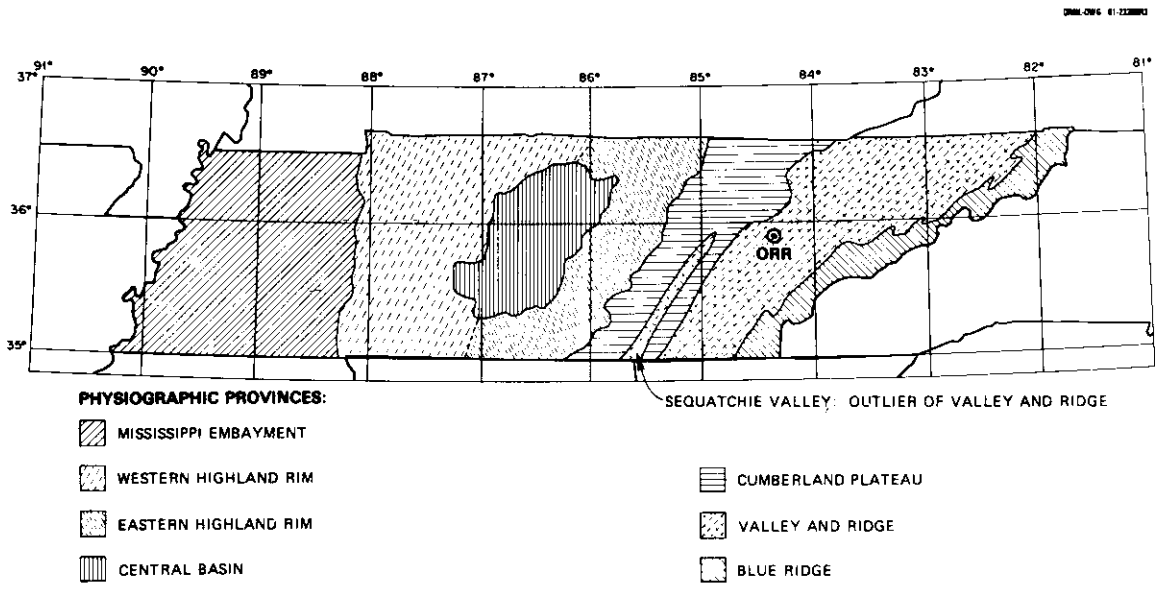

Fig. 1.3.1. Physiographic map of Tennessee.

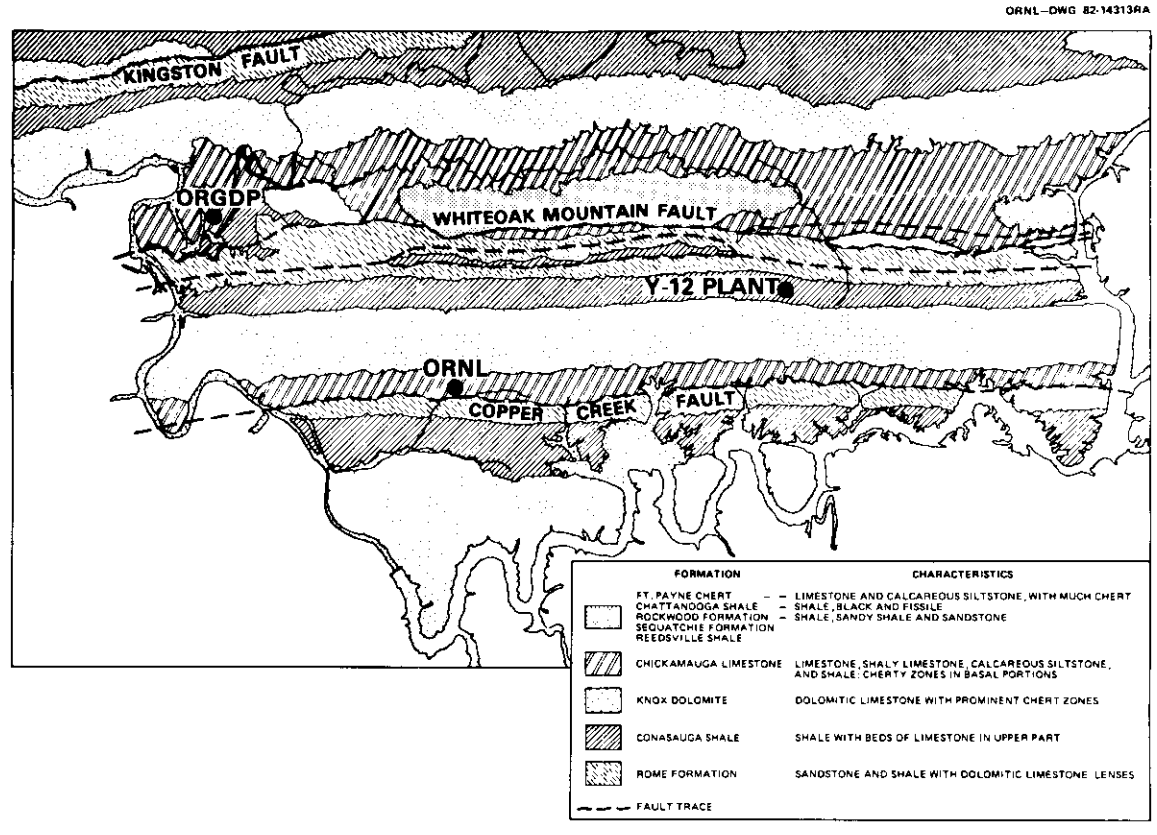

Fig. 1.3.2. Geologic map of the Department of Energy's Oak Ridge Reservation.

Table 1.1.1. Administrative[a] units on the ORR in 1989

Description	Area	
	Hectares	Acres
Oak Ridge Reservation[b]	12,684	31,343
Oak Ridge Y-12 Plant	328	811
Oak Ridge National Laboratory	445	1,100
Oak Ridge Gaseous Diffusion Plant	688	1,700
Oak Ridge Associated Universities[c]	121	298
Total	14,266	35,252

[a]Administrative units are those units that are managed by a major installation or by central Energy Systems.

[b]The Oak Ridge Reservation actually encompasses all of the contiguous land owned by DOE in the Oak Ridge Area; however, as an "administrative unit," it is all of the land area not controlled by the other units. Each unit includes some land outside the designated fenced area. The total combined fenced area of the three major facilities is 810 ha (2000 acres).

[c]Oak Ridge Associated Universities manages the Scarboro Facility, as well as, other facilities within the Oak Ridge area.

Table 1.2.1. Populations of central East Tennessee towns[a]

Town/city	Population
Anderson County	
Clinton	5,245
Lake City	2,335
Norris	1,374
Oak Ridge	27,662
Oliver Springs	3,600
Blount County	
Friendsville	694
Alcoa	6,870
Maryville	17,478
Knox County	
Knoxville	183,139
Loudon County	
Greenback	546
Lenoir City	5,446
Loudon	3,940
Morgan County	
Wartburg	761
Roane County	
Harriman	8,303
Kingston	4,441
Rockwood	5,767
Sevier County	
Sevierville	4,566
Union County	
Luttrell	962
Maynardville	924
Campbell County	
Caryville	2,039
Jellico	2,769
Jacksboro	1,620
LaFollette	8,176

[a]*Source: 1980 Census of Population, U.S. Department of Commerce, Bureau of the Census.*

Table 1.4.1. Use classifications for the Clinch River and its tributaries on the ORR[a]

Stream	Description	DOM[b]	IND[c]	FISH[d]	REC[e]	IRR[f]	LW&W[g]	NAV[h]
Clinch River	km 7.0–19.2 (Poplar Creek)	✓	✓	✓	✓	✓	✓	✓
Poplar Creek	km 0.0–0.8		✓	✓	✓	✓	✓	
Poplar Creek	km 0.8–2.1			✓		✓	✓	
Poplar Creek	km 2.1–8.8			✓	✓	✓	✓	
East Fork Poplar Creek	km 0.0–7.7			✓	✓	✓	✓	
Bear Creek	km 0.0–origin			✓	✓	✓	✓	
East Fork Poplar Creek	km 7.7–13.3			✓		✓	✓	
East Fork Poplar Creek	km 13.3–dam at Y-12 Plant			✓	✓	✓	✓	
Poplar Creek	km 8.8–19.8			✓	✓	✓	✓	
Poplar Creek	km 19.8–23.0			✓		✓	✓	
Indian Creek	At Poplar Creek (km 22.9); km 0.0–origin			✓	✓	✓	✓	
Poplar Creek	km 23.0–origin			✓	✓	✓	✓	
Clinch River	km 19.2–32.0	✓	✓	✓	✓	✓	✓	
White Oak Creek	km 0.0–origin			✓			✓	
Melton Branch	km 0.0–origin			✓			✓	
Clinch River	km 32.0–63.4	✓	✓	✓	✓	✓	✓	✓
Clinch River	km 63.4–65.8	✓	✓	✓	✓	✓	✓	✓
Scarboro Creek	km 0.0–1.6			✓	✓	✓	✓	
Scarboro Creek	km 1.6–2.1			✓		✓	✓	
Scarboro Creek	km 2.1–origin			✓	✓	✓	✓	
Clinch River	km 65.8–74.7	✓	✓	✓	✓	✓	✓	✓
All other tributaries in the Clinch River basin, named and unnamed, that have not been specifically treated shall be classified				✓	✓	✓	✓	

[a]*Source*: Tennessee's Water Quality Criteria and Stream Use Classifications for Interstate and Instrastate Steams, February 1987.

[b]DOM = Domestic water supply.

[c]IND = Industrial water supply.

[d]FISH = Fish and aquatic life.

[e]REC = Recreation.

[f]IRR = Irrigation.

[g]LW&W = Livestock watering and wildlife.

[h]NAV = Navigation.

2. ENVIRONMENTAL MONITORING SUMMARY

2.1 AIRBORNE DISCHARGES, AMBIENT AIR MONITORING, AND METEOROLOGICAL MONITORING

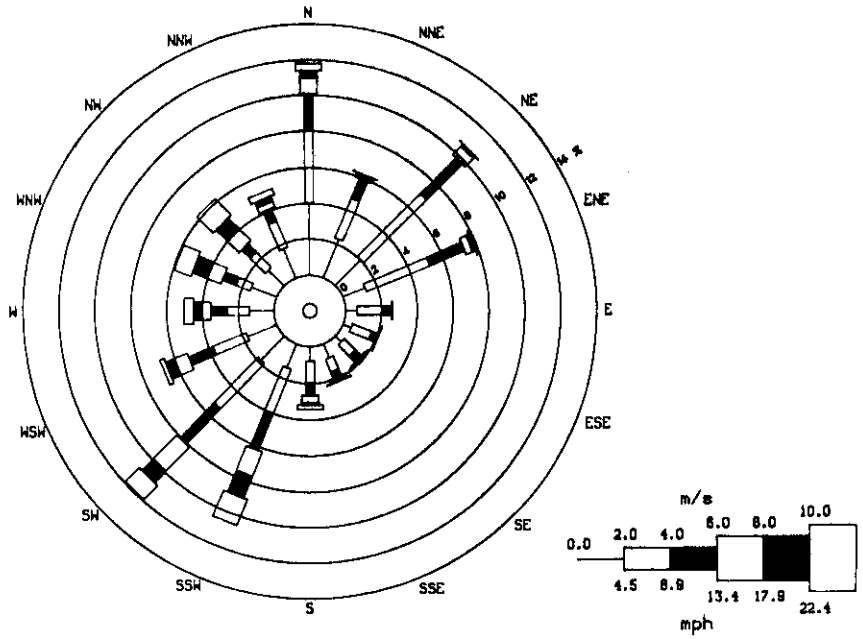

Fig. 2.1.1. 1989 Wind rose for ORGDP tower MT1 (10-m level), with 85.5% of possible data.

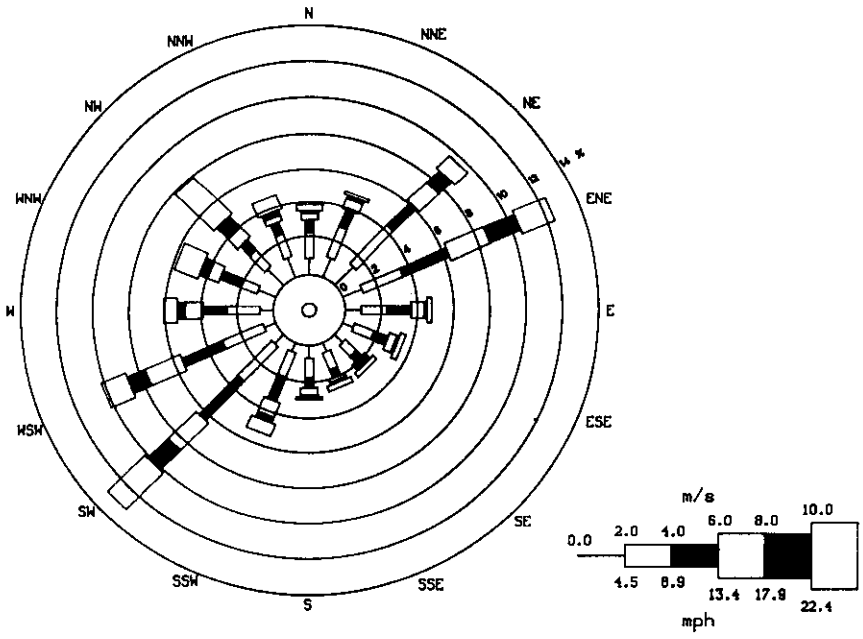

Fig. 2.1.2. 1989 Wind rose for ORGDP tower MT1 (60-m level), with 88.3% of possible data.

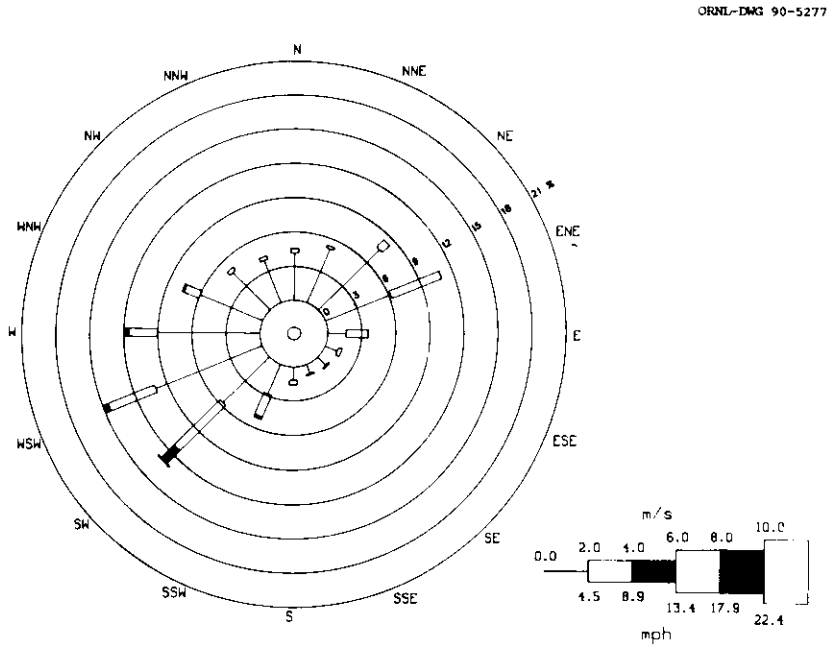

Fig. 2.1.3. 1989 Wind rose for ORNL tower MT2 (10-m level), with 71.5% of possible data.

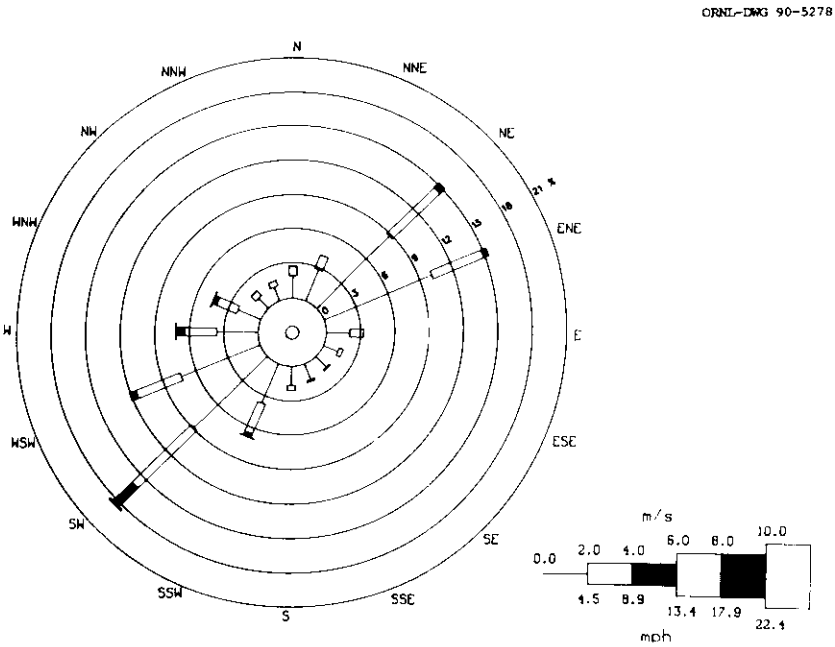

Fig. 2.1.4. 1989 Wind rose for ORNL tower MT2 (30-m level), with 71.2% of possible data.

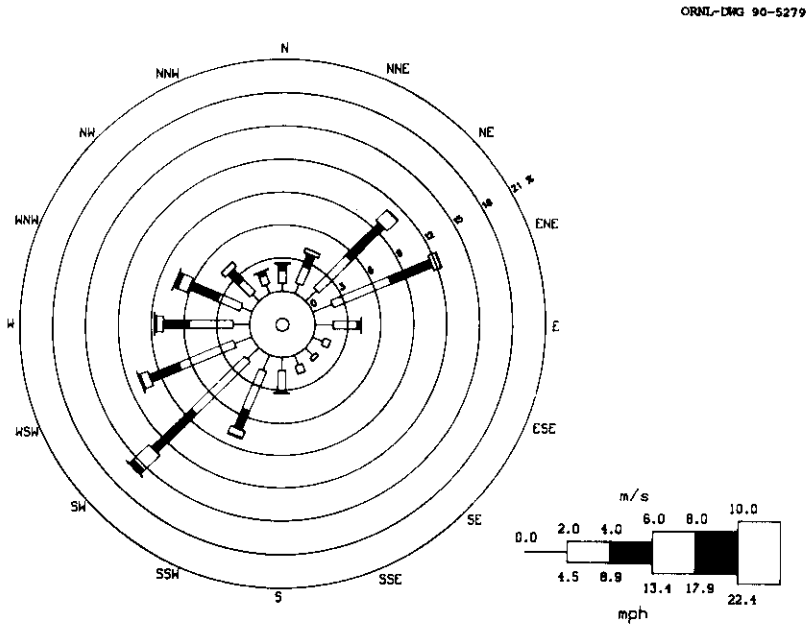

Fig. 2.1.5. 1989 Wind rose for ORNL tower MT2 (100-m-level), with 75.0% of possible data.

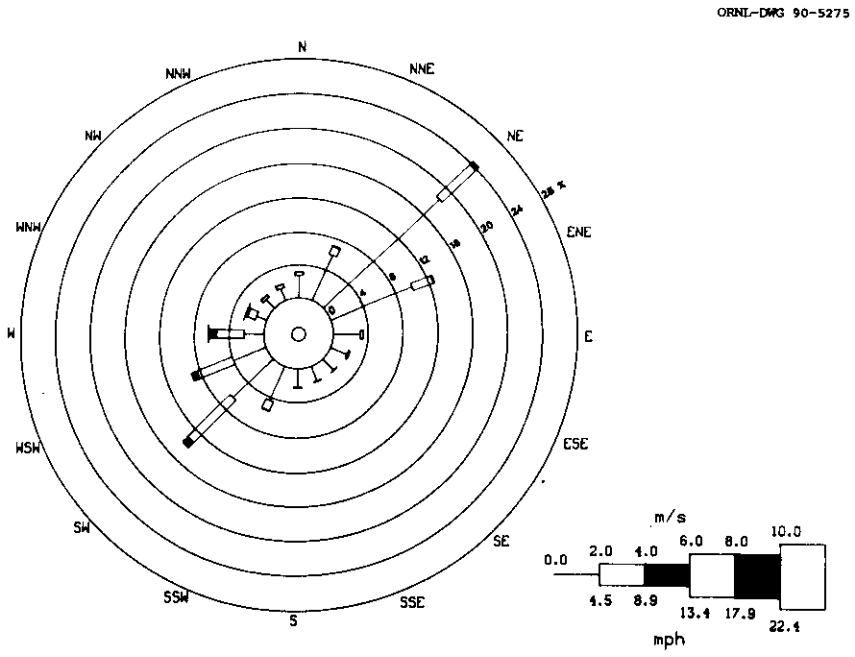

Fig. 2.1.6. 1989 Wind rose for ORNL tower MT3 (10-m level), with 82.7% of possible data.

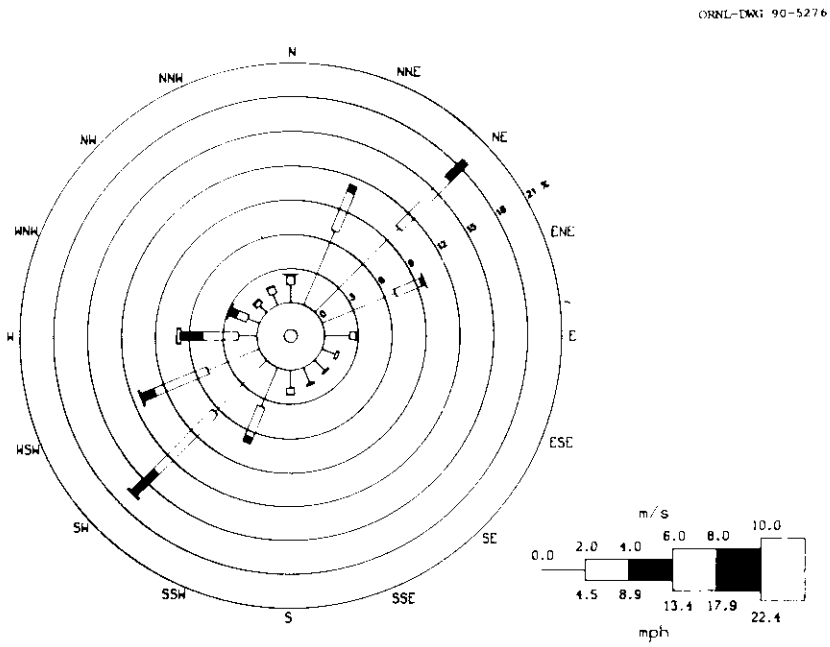

Fig. 2.1.7. 1989 Wind rose for ORNL tower MT3 (30-m level), with 83.0% of possible data.

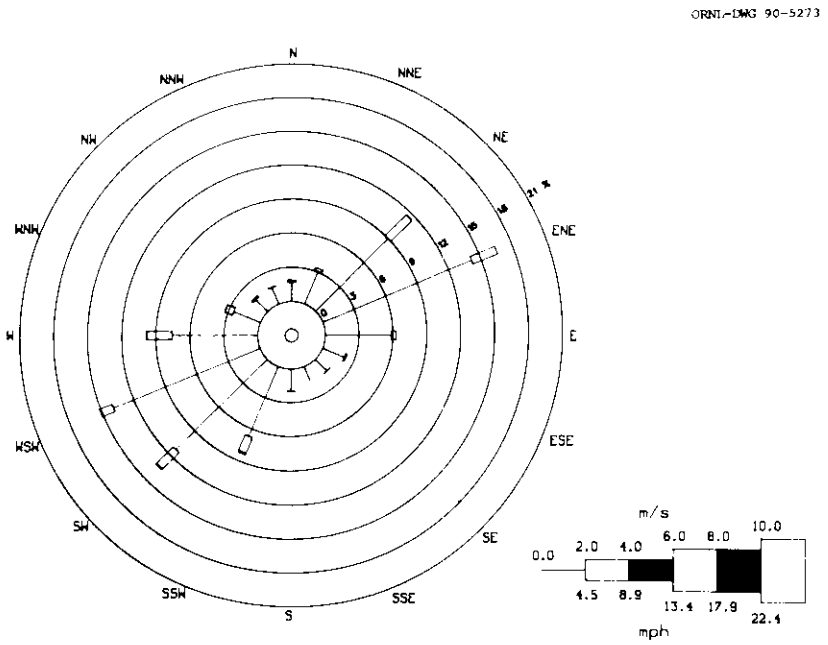

Fig. 2.1.8. 1989 Wind rose for ORNL tower MT4 (10-m level), with 78.1% of possible data.

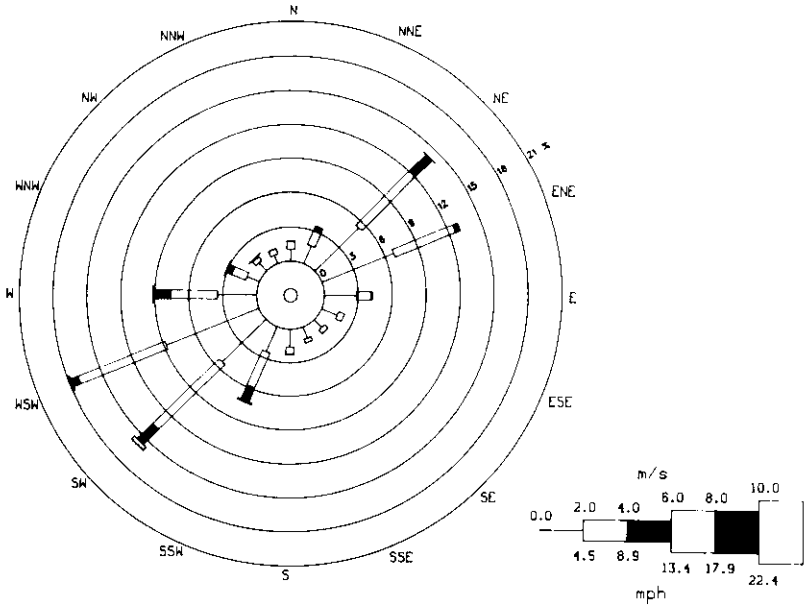

Fig. 2.1.9. 1989 Wind rose for ORNL tower MT4 (30-m level), with 84.4% of possible data.

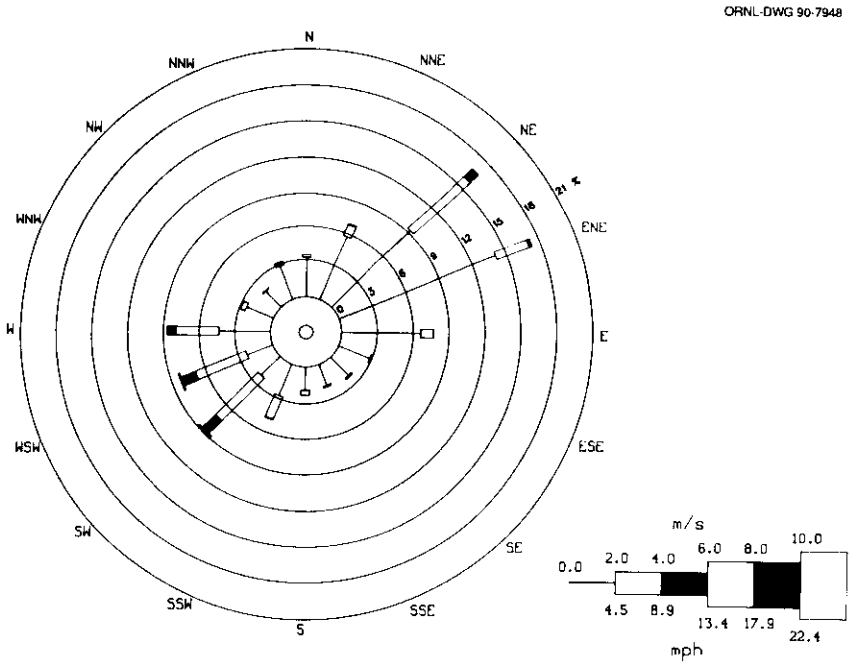

Fig. 2.1.10. 1989 Wind rose for Y-12 tower MTE (east) (10-m level), with 97.9% of possible data.

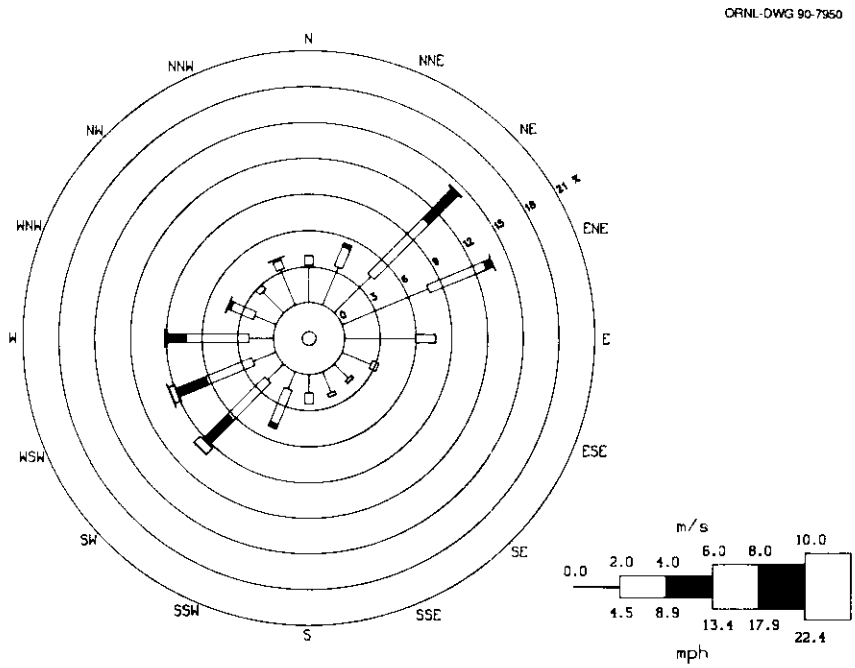

Fig. 2.1.11. 1989 Wind rose for Y-12 tower MTE (east) (30-m level), with 97.6% of possible data.

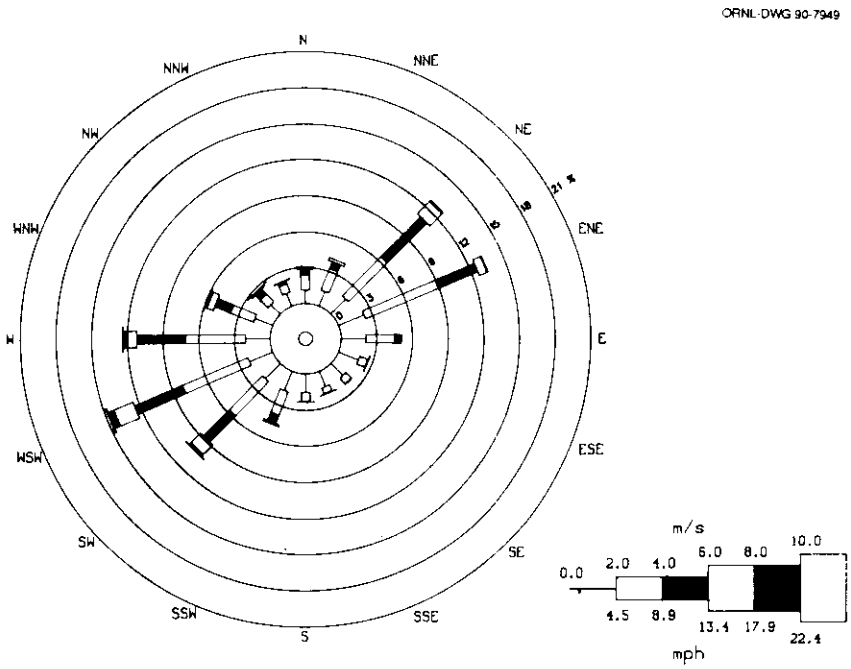

Fig. 2.1.12. 1989 Wind rose for Y-12 tower MTE (east) (100-m level), with 97.5% of possible data.

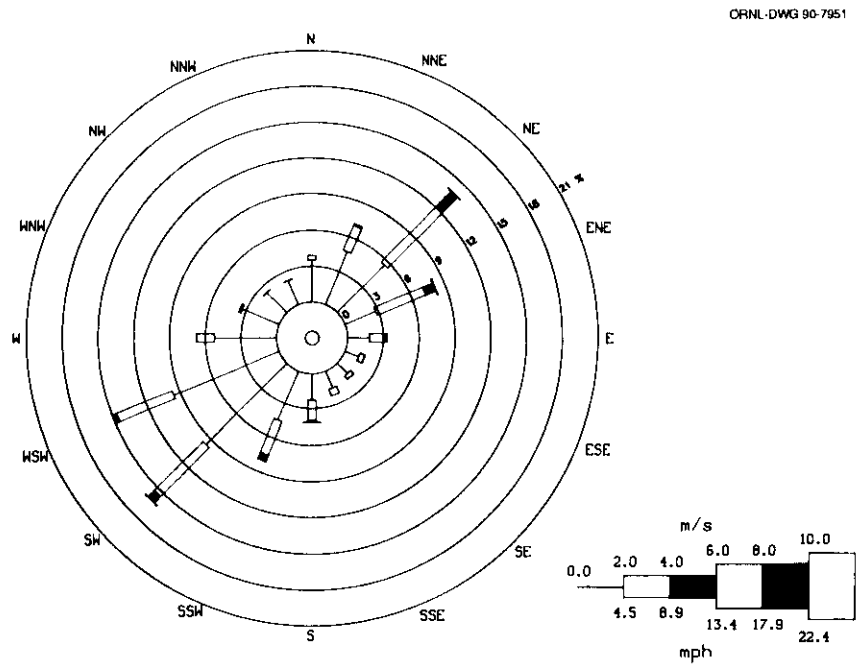

Fig. 2.1.13. 1989 Wind rose for Y-12 tower MTW (west) (10-m level), with 97.2% of possible data.

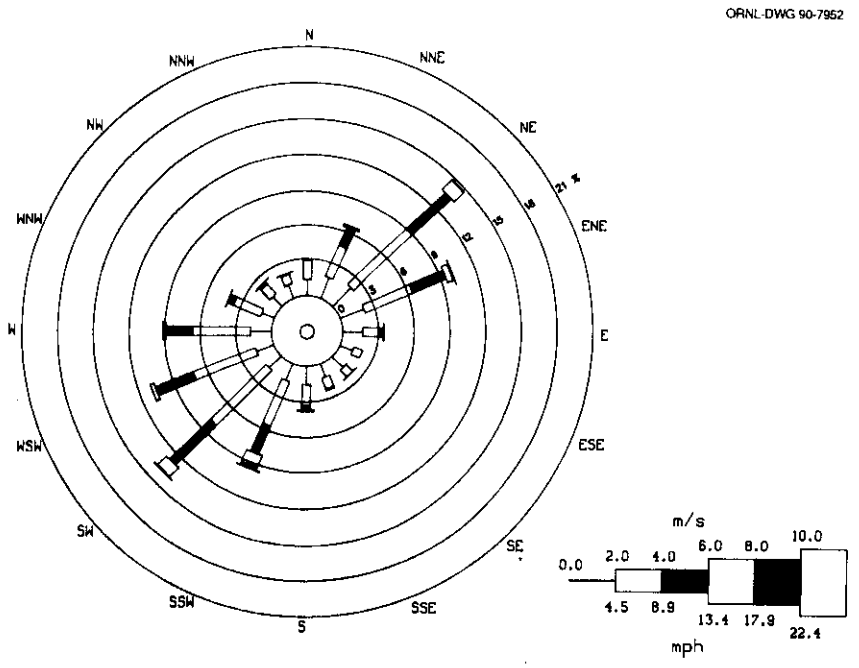

Fig. 2.1.14. 1989 Wind rose for Y-12 tower MTW (west) (60-m level), with 92.5% of possible data.

Table 2.1.1. 1989 Monthly fluoride averages in ambient air—Y-12 Plant[a]

Station ID	Average concentrations ($\mu g/m^3$)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
01	0.0194	0.0255	<0.0084	<0.0076	<0.0155	<0.0102	<0.0112	<0.0125	<0.0154	<0.0081	<0.0090	<0.0070
02	0.0389	0.0798	<0.0146	<0.0152	<0.0135	<0.0218	<0.0289	<0.0173	0.0156	<0.0080	<0.0086	<0.0070
03	0.0438	0.1136	<0.0270	<0.0705	<0.0509	<0.0314	0.0304	<0.0295	0.0200	0.0112	<0.0119	<0.0070
04	0.0726	0.1553	<0.0497	<0.0345	<0.0430	<0.0594	0.0656	<0.0547	<0.0170	<0.0085	<0.0092	<0.0070
05	0.0255	0.0303	<0.0256	<0.0378	<0.0579	<0.0311	0.0388	<0.0408	0.0193	<0.0085	<0.0096	<0.0072
06	0.0280	<0.0314	<0.0176	<0.0119	0.0246	<0.0191	<0.0304	<0.0351	<0.0118	<0.0086	<0.0992	<0.0070
07	0.0346	0.0320	<0.0202	<0.0170	<0.0239	<0.0242	<0.0189	<0.0365	0.0143	<0.0084	<0.0105	<0.0070
08	0.0483	0.0316	<0.0117	<0.0124	<0.0089	<0.0141	<0.0148	<0.0182	<0.0149	<0.0081	<0.0080	<0.0074
09	0.0453	0.0227	<0.0073	<0.0085	<0.0099	<0.0095	<0.0228	<0.0112	0.0148	0.0099	<0.0086	<0.0070
10	0.0237	<0.0175	<0.0087	<0.0075	<0.0139	<0.0093	<0.0086	<0.0123	<0.0143	<0.0074	<0.0072	<0.0070
11	0.0315	0.0196	<0.0083	<0.0083	<0.0153	<0.0111	<0.0112	<0.0128	<0.0149	<0.0090	<0.0076	<0.0070

[a]Tennessee standard for 30-d av = 1.2 $\mu g/m^3$.

Table 2.1.2. 1989 ^{234}U, ^{235}U, ^{236}U, and ^{238}U in air at the Y-12 Plant[a]

Station number	Concentration (10^{-15} μCi/cm³)			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		^{234}U		
1	1.74 ± 0.300	3.75 ± 0.321	0.401 ± 0.0788	0.367 ± 0.0587
2	1.79 ± 0.293	1.61 ± 0.152	1.15 ± 0.149	0.551 ± 0.0868
3	2.30 ± 0.379	0.959 ± 0.152	2.69 ± 0.279	1.11 ± 0.0133
4	2.50 ± 0.391	3.25 ± 0.289	2.36 ± 0.268	1.49 ± 0.181
5	3.94 ± 0.0826	4.95 ± 0.381	3.09 ± 0.314	0.985 ± 0.137
6	2.28 ± 0.365	4.04 ± 0.513	2.36 ± 0.245	0.817 ± 0.120
7	2.27 ± 0.327	2.11 ± 0.178	1.40 ± 0.162	0.831 ± 0.0975
8	1.95 ± 0.342	1.43 ± 0.136	2.46 ± 0.278	0.864 ± 0.112
9	1.33 ± 0.221	1.09 ± 0.114	0.487 ± 0.0600	0.494 ± 0.0740
10	1.23 ± 0.198	0.875 ± 0.103	0.815 ± 0.116	0.340 ± 0.0531
11	1.16 ± 0.189	1.83 ± 0.165	1.54 ± 0.173	0.361 ± 0.0602
12	2.54 ± 0.453	1.83 ± 0.165	0.561 ± 0.912	0.360 ± 0.0561
		^{235}U		
1	[b]	0.137 ± 0.0369	0.0129 ± 0.0130	0.0145 ± 0.0145
2	0.106 ± 0.0337	0.0881 ± 0.0295	0.012 ± 0.0194	0.0718 ± 0.0281
3	0.103 ± 0.0338	0.0183 ± 0.0183	0.179 ± 0.0433	0.109 ± 0.0308
4	0.0124 ± 0.0361	0.146 ± 0.0392	0.0777 ± 0.0303	0.039 ± 0.0242
5	0.444 ± 0.122	0.193 ± 0.0395	0.180 ± 0.0434	0.00969 ± 0.00168
6	0.0874 ± 0.0295	0.221 ± 0.0972	0.129 ± 0.0373	0.0214 ± 0.0153
7	0.0954 ± 0.0278	0.0808 ± 0.024	0.460 ± 0.0210	0.0539 ± 0.0196
8	0.268 ± 0.0677	0.0841 ± 0.026	0.120 ± 0.0382	0.0772 ± 0.0294
9	0.055 ± 0.0224	0.0398 ± 0.018	0.0441 ± 0.0159	0.151 ± 0.0151
10	0.0516 ± 0.0209	0.0453 ± 0.0242	0.0406 ± 0.0251	0.0141 ± 0.0101
11	0.044 ± 0.0191	0.068 ± 0.0232	0.0974 ± 0.0306	0.0324 ± 0.0165
12	0.244 ± 0.0649	0.068 ± 0.0232	0.0228 ± 0.0163	0.0355 ± 0.0162
		^{236}U		
1	[b]	0.0685 ± 0.0234	[b]	0.0189 ± 0.0111
2	0.0405 ± 0.0177	0.0196 ± 0.0114	[b]	0.0168 ± 0.0120
3	0.0282 ± 0.0148	0.0155 ± 0.0156	0.0515 ± 0.02	0.0450 ± 0.0175
4	0.0318 ± 0.0150	0.0644 ± 0.0233	[b]	0.0245 ± 0.0184
5	0.0748 ± 0.0341	0.114 ± 0.0272	0.00728 ± 0.00731	0.00174 ± 0.0124
6	0.0463 ± 0.0189	0.274 ± 0.0908	[b]	0.0181 ± 0.0130
7	0.0314 ± 0.0135	0.0334 ± 0.0138	0.00748 ± 0.00752	0.0110 ± 0.0784
8	0.201 ± 0.0526	0.0187 ± 0.0109	0.0269 ± 0.0157	0.0211 ± 0.0159
9	0.0397 ± 0.0173	0.0198 ± 0.0115	0.0182 ± 0.00921	0.0347 ± 0.0158
10	0.0245 ± 0.0127	0.0226 ± 0.0131	0.0344 ± 0.0246	0.00585 ± 0.00587
11	0.0245 ± 0.0127	0.0313 ± 0.0142	0.0144 ± 0.0103	0.0275 ± 0.0140
12	0.154 ± 0.0446	0.0313 ± 0.0142	[b]	0.0177 ± 0.0104
		^{238}U		
1	0.127 ± 0.376	0.125 ± 0.0316	0.156 ± 0.0443	0.0876 ± 0.0241
2	0.144 ± 0.0367	0.140 ± 0.0256	0.144 ± 0.0368	0.0120 ± 0.0325
3	0.171 ± 0.0423	0.568 ± 0.0405	0.159 ± 0.0349	0.161 ± 0.0338
4	0.205 ± 0.0459	0.246 ± 0.046	0.313 ± 0.0603	0.311 ± 0.0573
5	3.94 ± 0.826	0.165 ± 0.0322	0.171 ± 0.0374	0.178 ± 0.0423
6	0.142 ± 0.0362	0.344 ± 0.0978	0.153 ± 0.0335	0.160 ± 0.0403
7	0.218 ± 0.0439	0.161 ± 0.0321	0.137 ± 0.0331	0.109 ± 0.0252
8	0.380 ± 0.0820	0.234 ± 0.040	0.453 ± 0.0760	0.225 ± 0.0437
9	0.182 ± 0.0440	0.158 ± 0.0341	0.168 ± 0.0301	0.155 ± 0.0348
10	0.162 ± 0.0384	0.110 ± 0.286	0.174 ± 0.0408	0.125 ± 0.0283
11	0.209 ± 0.046	0.1486 ± 0.0328	0.398 ± 0.0626	0.944 ± 0.0259
12	0.166 ± 0.0445	0.1486 ± 0.0328	0.0932 ± 0.0926	0.0527 ± 0.0173

[a]See Fig. 2.1.17 in Vol. 1 for station locations.
[b]No data available.

Table 2.1.3. 1989 Sulfur dioxide in air at the Y-12 Plant[a,b]

Month/ station ID	Monthly av SO_2 (ppm)	Max 24-h av SO_2 (ppm)	Max 3-h av SO_2 (ppm)
January			
East	0.010	0.033	0.105
West	0.009	0.034	0.097
February			
East	0.009	0.025	0.065
West	0.010	0.017	0.026
March			
East	0.011	0.033	0.079
West	0.011	0.026	0.055
April			
East	0.007	0.016	0.038
West	0.005	0.010	0.023
May			
East	0.009	0.017	0.041
West	0.004	0.010	0.023
June			
East	0.009	0.024	0.106
West	0.005	0.010	0.023
July			
East	0.010	0.021	0.076
West	0.007	0.014	0.016
August			
East	0.019	0.034	0.090
West	0.006	0.011	0.035
September			
East	0.012	0.041	0.123
West	0.003	0.008	0.015
October			
East	0.011	0.019	0.050
West	0.006	0.009	0.014
November			
East	0.015	0.030	0.058
West	0.006	0.011	0.018
December			
East	0.024	0.063	0.113
West	0.010	0.042	0.083

[a]See Vol. 1, Fig. 2.1.17 for station locations.

[b]Tennessee 24-h average standard is 0.14 ppm; Tennessee 3-h average standard is 0.5 ppm.

Table 2.1.4. 1989 total suspended particulates in air at the Y-12 Plant[a]

Date sample collected	Concentration[b,c] ($\mu g/m^3$)		Date sample collected	Concentration ($\mu g/m^3$)	
	East	West		East	West
1/3	67.0	100.7	7/3	62.8[e]	289.6[b,e]
1/8	18.4	6.0	7/9	20.2[e]	*d*
1/15	8.5	3.2	7/15	73.6[e]	122.7[e]
1/24	51.1	31.4	7/21	40.5[e]	28.6
2/5	53.6	56.7	7/27	80.6[e]	136.3[e]
2/13	3.7	*d*	8/2	58.7[e]	42.9[e]
2/20	*d*	*d*	8/8	69.9[e]	57.7[e]
2/27	9.1	6.0	8/14	97.1[e]	87.4[e]
3/4	30.1	31.4	8/20	93.9[e]	92.0[e]
3/10	72.3	56.7	8/26	40.5[e]	*d*
3/16	129.2	145.4	9/1	*d*	*d*
3/22	110.0	86.0	9/7	*d*	*d*
3/28	86.0	*d*	9/13	*d*	*d*
4/5	6.9	*d*	9/19	*d*	*d*
4/10	*d*	*d*	9/25	*d*	*d*
4/16	49.1	*d*	10/1	8.4[e]	9.9[e]
4/22	32.7	*d*	10/7	*d*	*d*
4/28	53.4	*d*	10/13	*d*	*d*
5/4	16.3	*d*	10/19	*d*	*d*
5/10	29.3	*d*	10/25	67.1	54.5
5/16	*d*	*d*	10/31	30.0	13.8
5/22	*d*	*d*	11/6	18.0	27.0
5/28	*d*	*d*	11/12	19.6	39.5
6/3	35.6[e]	*d*	11/18	22.5	20.0
6/9	40.6[e]	*d*	11/24	22.0	17.2
6/15	14.4	68.2[e]	11/30	25.8	22.9
6/21	44.0	385.6[b,e]	12/6	13.2	101.0
6/27	124.7[e]	59.8[e]	12/18	38.8	275.9[e]
			12/24	25.7	25.4
			12/30	9.8	45.6

[a]See Fig. 2.1.17 in Vol. 1 for station locations.
[b]Tennessee primary air quality standard = 260 $\mu g/(m^3 \cdot 24\ h)$.
[c]Tennessee secondary air quality standard = 150 $\mu g/(m^3 \cdot 24\ h)$.
[d]Invalid sample or no sample (downtime).
[e]Low air flow: <35 cfm.

Table 2.1.5. 1989 gross alpha and beta in air at the Y-12 Plant[a]

Station number	Concentration (10^{-15} μCi/cm^3)			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
	Gross alpha			
1	4.49 ± 0.717	1.74 ± 0.608	2.11 ± 0.540	1.49 ± 0.435
2	3.43 ± 0.661	2.41 ± 0.646	2.38 ± 0.557	2.57 ± 0.533
3	5.94 ± 0.790	5.62 ± 0.809	3.69 ± 0.636	3.33 ± 0.560
4	3.96 ± 0.690	4.08 ± 0.734	2.84 ± 0.585	3.78 ± 0.623
5	5.54 ± 0.770	5.75 ± 0.816	3.43 ± 0.620	3.48 ± 0.574
6	4.42 ± 0.714	3.92 ± 1.01	6.00 ± 0.759	2.90 ± 0.551
7	6.20 ± 0.802	2.74 ± 0.664	3.23 ± 0.609	2.84 ± 0.562
8	5.17 ± 0.780	3.41 ± 0.70	4.75 ± 0.694	3.22 ± 0.560
9	3.63 ± 0.672	2.21 ± 0.635	3.10 ± 0.601	1.60 ± 0.481
10	4.22 ± 0.703	2.48 ± 0.649	3.30 ± 0.613	1.99 ± 0.505
11	3.17 ± 0.647	3.01 ± 0.678	2.24 ± 0.548	2.88 ± 0.571
12	3.83 ± 0.683	2.44 ± 0.646	3.30 ± 0.613	2.84 ± 0.554
	Gross beta			
1	16.0 ± 1.39	15.8 ± 1.36	19.7 ± 1.54	15.9 ± 1.22
2	16.6 ± 1.42	18.7 ± 1.52	21.2 ± 1.62	19.5 ± 1.45
3	20.9 ± 1.65	19.8 ± 1.57	20.5 ± 1.58	24.6 ± 1.73
4	16.3 ± 1.40	20.4 ± 1.61	21.8 ± 1.65	24.5 ± 1.76
5	18.9 ± 1.54	18.2 ± 1.49	21.5 ± 1.63	22.8 ± 1.63
6	20.7 ± 1.63	17.8 ± 1.75	20.1 ± 1.56	21.8 ± 1.58
7	18.0 ± 1.49	20.5 ± 1.62	23.5 ± 1.75	19.2 ± 1.44
8	18.0 ± 1.52	21.6 ± 1.68	25.0 ± 1.83	21.9 ± 1.58
9	19.1 ± 1.55	18.2 ± 1.49	23.3 ± 1.74	22.1 ± 1.60
10	17.9 ± 1.48	16.3 ± 1.39	20.9 ± 1.60	19.0 ± 1.42
11	15.3 ± 1.35	17.7 ± 1.46	24.0 ± 1.77	20.0 ± 1.50
12	19.5 ± 1.57	19.8 ± 1.58	21.0 ± 1.61	23.0 ± 1.65

[a]See Fig. 2.1.17 in Vol. 1 for station locations.

Table 2.1.6. Long-lived gross alpha activity in air—ORR, 1989

Location	No. of samples	Concentration (10^{-15} μCi/mL)			
		Max	Min	Av	Std. error
ORNL PAM stations[a]					
3	26	1.7	−0.73	0.73	0.10
4	11	1.2	−1.1	0.17	0.25
7	26	1.5	−1.5	0.52	0.17
9	17	1.7	−1.6	0.42	0.25
20	20	2.1	−1.4	0.73	0.21
21	26	2.1	−1.4	0.73	0.18
22	27	2.1	−1.6	0.61	0.19
Network summary	153	2.1	−1.6	0.60	0.070
Reservation PAM stations[a]					
8	6	2.5	−2.0	−0.56	0.64
23	23	2.3	−1.7	0.71	0.19
31	11	2.1	−1.4	0.0059	0.37
33	26	2.0	−1.1	0.60	0.15
34	26	1.6	−1.5	0.57	0.17
36	11	1.1	−1.7	−0.21	0.34
40	23	1.7	−1.5	0.69	0.18
41	24	1.8	−1.1	0.58	0.18
42	26	1.4	−1.6	0.44	0.19
43	25	1.7	−1.5	0.54	0.17
44	28	1.8	−1.3	0.53	0.16
45	24	2.2	−0.98	0.71	0.16
46	19	2.6	−1.1	0.82	0.24
Network summary	272	2.6	−2.0	0.53	0.057
RAM stations[b]					
51	15	1.2	−0.74	0.088	0.16
52	22	4.6	−1.6	1.3	0.31
53	14	2.8	−1.4	0.74	0.29
55	8	1.3	−1.5	−0.059	0.31
56	13	2.2	−1.6	−0.19	0.35
57	15	2.8	−0.90	0.89	0.26
58	21	2.5	−3.5	1.2	0.37
Network summary	108	4.6	−3.5	0.68	0.13
Overall summary	533	4.6	−3.5	0.58	0.044

[a]See Vol. 1, Fig. 2.1.18.
[b]See Vol. 1, Fig. 2.1.19.

Table 2.1.7. Long-lived gross beta activity in air—ORR, 1989

Location	No. of samples	Concentration (10^{-15} μCi/mL)			
		Max	Min	Av	Std. error
ORNL PAM stations[a]					
3	26	38	17	25	1.2
4	11	36	15	24	2.0
7	26	35	13	22	1.1
9	17	37	13	21	1.6
20	20	45	18	27	1.6
21	26	44	17	26	1.3
22	27	42	18	25	1.2
Network summary	153	45	13	24	0.52
Reservation PAM stations[a]					
8	6	42	22	35	3.1
23	23	38	17	23	1.1
31	11	32	18	24	1.6
33	26	40	12	21	1.5
34	26	40	9.3	21	1.5
36	11	38	9.7	22	2.6
40	23	29	9.1	20	1.2
41	24	31	11	21	1.1
42	26	30	11	20	1.1
43	25	40	10	21	1.5
44	28	36	5.0	20	1.3
45	24	38	9.0	23	1.5
46	19	39	11	24	1.5
Network summary	272	42	5.0	22	0.42
RAM stations[b]					
51	15	31	9.4	20	1.7
52	22	56	4.1	28	2.1
53	14	43	9.9	26	3.0
55	8	18	1.5	10	2.0
56	13	34	2.7	23	2.3
57	15	44	19	31	2.4
58	21	50	23	32	1.9
Network summary	108	56	1.5	26	1.0
Overall summary	533	56	1.5	23	0.34

[a]See Vol. 1, Fig. 2.1.18.
[b]See Vol. 1, Fig. 2.1.19.

Table 2.1.8. ^{131}I concentrations in air—ORR, 1989

Location	No. of samples	Concentration (10^{-15} μCi/mL)				DCG[a] (%)
		Max	Min	Av	Std. error	
ORNL PAM stations[b]						
3	26	13	−19	−0.63	1.1	<0.01
4	11	3.0	−0.59	0.51	0.32	<0.01
7	26	2.3	−3.7	0.018	0.24	<0.01
9	17	8.7	−2.4	1.8	0.81	<0.01
20	20	6.1	−6.0	0.11	0.59	<0.01
21	26	8.9	−2.6	0.94	0.49	<0.01
22	27	8.8	−8.3	0.32	0.54	<0.01
Network summary	153	13	−19	0.36	0.26	<0.01
Reservation PAM stations[b]						
8	6	2.3	0.65	1.4	0.26	<0.01
23	23	4.5	−2.3	0.51	0.37	<0.01
31	11	1.4	−1.3	0.24	0.24	<0.01
33	11	2.7	−1.1	0.46	0.32	<0.01
34	26	3.6	−7.8	−0.20	0.48	<0.01
36	11	22	−0.53	2.5	1.9	<0.01
40	23	2.3	−2.0	0.59	0.18	<0.01
41	24	3.7	−1.6	0.27	0.29	<0.01
42	11	2.1	−1.1	0.34	0.31	<0.01
43	11	2.1	−1.4	0.21	0.33	<0.01
44	28	9.4	−3.8	0.20	0.41	<0.01
45	24	4.4	−4.3	0.14	0.30	<0.01
46	19	5.7	−2.2	0.81	0.46	<0.01
Network summary	228	22	−7.8	0.44	0.14	<0.01
Overall summary	381	22	−19	0.41	0.13	<0.01

[a]Percentage derived concentration guide (DCG) = maximum/DCG × 100. The DCG for ^{131}I is 400,000 × 10^{-15} μCi/mL.

[b]See Vol. 1, Fig. 2.1.18.

Table 2.1.9. Estimated average total tritium activity in air—ORNL, 1989

Location[a]	Concentration (10^{-6} pCi/mL)	
	Total	DCG[b] (%)
3	35	0.035
8	25	0.025

[a]See Vol. 1, Fig. 2.1.18.

[b]Percentage derived concentration guide (DCG) = maximum/DCG × 100. The DCG for tritium is 0.1 pCi/mL. This assumes that 50% of the tritium is absorbed through the skin.

Table 2.1.10. 1989 continuous air monitoring data

Analysis	Concentration (10^{-15} μCi/mL)					
	Station[a] 34	Percentage[b] DCG	Station 40	Percentage DCG	Station 41	Percentage DCG
^{60}Co	0	<0.010	0.14	<0.010	−0.21	<0.010
^{137}Cs	0.058	<0.010	−0.058	<0.010	−0.037	<0.010
^{238}Pu	0.00016	<0.010	0.00036	<0.010	−0.00099	<0.010
^{239}Pu	−0.00054	<0.010	−0.0017	<0.010	−0.0031	<0.010
^{228}Th	0.033	0.084	0.038	0.094	0.033	0.083
^{230}Th	0.0061	0.015	0.0097	0.024	0.010	0.026
^{232}Th	0.0058	0.083	0.0091	0.13	0.0073	0.10
Total Sr	0.016	<0.010	−0.012	<0.010	−0.0063	<0.010
^{234}U	0.033	0.036	0.49	0.54	0.094	0.10
^{235}U	0.0019	<0.010	0.027	0.027	0.010	0.010
^{238}U	0.014	0.014	0.061	0.061	0.021	0.021
	Station 45	Percentage DCG	Station 46	Percentage DCG	LAMs	Percentage DCG
^{60}Co	−0.13	<0.010	0.26	<0.010	0.0041	<0.010
^{137}Cs	−0.075	<0.010	−0.0057	<0.010	0.038	<0.010
^{238}Pu	−0.00099	<0.010	−0.0024	<0.010	0.0013	<0.010
^{239}Pu	−0.0023	<0.010	−0.002	<0.010	0.00042	<0.010
^{228}Th	0.031	0.077	0.036	0.091	0.0096	0.024
^{230}Th	0.0084	0.021	0.0065	0.016	0.0056	0.014
^{232}Th	0.0065	0.093	0.0061	0.088	0.0059	0.084
Total Sr	0.056	<0.010	0.10	<0.010	0.059	<0.010
^{234}U	0.33	0.36	0.36	0.40	0.062	0.069
^{235}U	0.022	0.022	0.015	0.015	0.0039	<0.010
^{238}U	0.077	0.077	0.052	0.052	0.015	0.015
	PAMs	Percentage DCG	RAMs	Percentage DCG		
^{60}Co	0.020	<0.010	−0.019	<0.010		
^{137}Cs	−0.0081	<0.010	−0.0090	<0.010		
^{238}Pu	−0.00011	<0.010	0.00051	<0.010		
^{239}Pu	−0.00015	<0.010	−0.0015	<0.010		
^{228}Th	0.011	0.028	0.019	0.047		
^{230}Th	0.0054	0.014	0.0090	0.022		
^{232}Th	0.0053	0.075	0.0078	0.11		
Total Sr	0.0087	<0.010	0.015	<0.010		
^{234}U	0.086	0.096	0.015	0.017		
^{235}U	0.0051	<0.010	0.0016	<0.010		
^{238}U	0.020	0.020	0.016	0.016		

[a]See Figs. 2.1.18 and 2.1.19 in Vol. 1.

[b]Percentage of DCG = average/derived concentration guide (DCG) × 100. The DCG for ^{60}Co is 8×10^{-11} μCi/ml; ^{137}Cs is 4×10^{-10} μCi/ml; ^{238}Pu is 3×10^{-14} μCi/ml; ^{239}Pu is 2×10^{-14} μCi/ml; ^{228}Th is 4×10^{-14} μCi/ml; ^{230}Th is 4×10^{-14} μCi/ml; ^{232}Th is 7×10^{-15} μCi/ml; Total Sr is 9×10^{-12} μCi/ml; ^{234}U is 9×10^{-14} μCi/ml; ^{235}U is 1×10^{-13} μCi/ml; ^{238}U is 1×10^{-13}. Source for DCG is DOE Order 5400.5, "Radiation Protection of the Public and the Environment," Chapter III.

Table 2.1.11. Air permits at the Y-12 Plant

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Two gasoline tanks	01-0020-62	015114P	O
Y-1501-2-A(01)	01-0020-70	023506P	O
Y-1501-2-A(02)	01-0020-70	023506P	O
Y-9201-1-A(01)	01-0020-15	025974P	O
Y-9201-1-A(02)	01-0020-15	025974P	O
Y-9201-1-A(03)	01-0020-15	025974P	O
Y-9201-1-A(04)	01-0020-15	025974P	O
Y-9201-1-A(05)	01-0020-15	025974P	O
Y-9201-1-A(15)	01-0020-15	025974P	O
Y-9201-1-A(19)	01-0020-15	025974P	O
Y-9201-1-B(16)	01-0020-59	025898P	O
Y-9201-1-B(18)	01-0020-59	025898P	O
Y-9201-1-C(3)	01-0020-17	012665P	O
Y-9201-1-C(4)	01-0020-17	012665P	O
Y-9201-1-D(09)	01-0020-61	025958P	O
Y-9201-1-D(10)	01-0020-61	025958P	O
Y-9201-1-D(11)	01-0020-61	025958P	O
Y-9201-1-D(13)	01-0020-61	025958P	O
Y-9201-2-C(01)	01-0020-67	015146P	O
Y-9201-2-C(02)	01-0020-67	015146P	O
Y-9201-2-C(03)	01-0020-67	015146P	O
Y-9201-3-A(01)	01-0020-55	013002P	O
Y-9201-5-A(01)	01-0020-29	025964P	O
Y-9201-5-A(02)	01-0020-29	025964P	O
Y-9201-5-A(03)	01-0020-29	025964P	O
Y-9201-5-A(04)	01-0020-29	025964P	O
Y-9201-5-A(05)	01-0020-29	025964P	O
Y-9201-5-A(06)	01-0020-29	025964P	O
Y-9201-5-A(07)	01-0020-29	025964P	O
Y-9201-5-A(08)	01-0020-29	025964P	O
Y-9201-5-A(09)	01-0020-29	025964P	O
Y-9201-5-A(10)	01-0020-29	025964P	O
Y-9201-5-B(01)	01-0020-21	025956P	O
Y-9201-5-B(02)	01-0020-21	025956P	O
Y-9201-5-B(03)	01-0020-21	025956P	O
Y-9201-5-B(04)	01-0020-21	025956P	O
Y-9201-5-B(05)	01-0020-21	025956P	O
Y-9201-5-B(06)	01-0020-21	025956P	O
Y-9201-5-B(07)	01-0020-21	025956P	O
Y-9201-5-C(01)	01-1020-43	025949P	O
Y-9201-5-D(01)	01-1020-44	025902P	O
Y-9201-5-D(02)	01-1020-44	025902P	O
Y-9201-5-E(01)	01-1020-70	025983P	O
Y-9201-5-E(02)	01-1020-70	025983P	O
Y-9201-5-E(08)	01-1020-70	025983P	O
Y-9201-5-F(01)	01-0020-36	025973P	O
Y-9201-5-F(02)	01-0020-36	025973P	O
Y-9201-5-F(03)	01-0020-36	025973P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9201-5-F(04)	01-0020-36	025973P	O
Y-9201-5-F(05)	01-0020-36	025973P	O
Y-9201-5-G(01)	01-0020-44	025896P	O
Y-9201-5-G(02)	01-0020-44	025896P	O
Y-9201-5-G(03)	01-0020-44	025896P	O
Y-9201-5-G(04)	01-0020-44	025896P	O
Y-9201-5-G(05)	01-0020-44	025896P	O
Y-9201-5-G(06)	01-0020-44	025896P	O
Y-9201-5-G(07)	01-0020-44	025896P	O
Y-9201-5-H(01)	01-0020-16	026019P	O
Y-9201-5-H(02)	01-0020-16	026019P	O
Y-9201-5-H(03)	01-0020-16	026019P	O
Y-9201-5-H(04)	01-0020-16	026019P	O
Y-9201-5-H(05)	01-0020-16	026019P	O
Y-9201-5-H(06)	01-0020-16	026019P	O
Y-9201-5-H(07)	01-0020-16	026019P	O
Y-9201-5-H(08)	01-0020-16	026019P	O
Y-9201-5N-A(01)	01-0020-18	025950P	O
Y-9201-5N-B(03)	01-0020-30	025962P	O
Y-9201-5N-B(04)	01-0020-30	025962P	O
Y-9201-5N-B(05)	01-0020-30	025962P	O
Y-9201-5N-B(06)	01-0020-30	025962P	O
Y-9201-5N-B(07)	01-0020-30	025962P	O
Y-9201-5N-B(08)	01-0020-30	025962P	O
Y-9201-5N-B(09)	01-0020-30	025962P	O
Y-9201-5N-B(10)	01-0020-30	025962P	O
Y-9201-5N-B(11)	01-0020-30	025962P	O
Y-9201-5N-B(12)	01-0020-30	025962P	O
Y-9202-A-(01)	01-0020-21	021086P	O
Y-9202-A-(02)	01-0020-21	021086P	O
Y-9202-A-(03)	01-0020-21	021086P	O
Y-9202-A-(04)	01-0020-21	021086P	O
Y-9203-C(1,2)	01-1020-84	0997819P	C
Y-9204-2-A(01)	01-0020-46	026107P	O
Y-9204-2-A(02)	01-0020-46	026107P	O
Y-9204-2-A(03)	01-0020-46	026107P	O
Y-9204-2-A(04)	01-0020-46	026107P	O
Y-9204-2-A(05)	01-0020-46	026107P	O
Y-9204-2-A(06)	01-0020-46	026107P	O
Y-9204-2-A(07)	01-0020-46	026107P	O
Y-9204-2-A(08)	01-0020-46	026107P	O
Y-9204-2-A(09)	01-0020-46	026107P	O
Y-9204-2-A(10)	01-0020-46	026107P	O
Y-9204-2-A(11)	01-0020-46	026107P	O
Y-9204-2-A(12)	01-0020-46	026107P	O
Y-9204-2-A(13)	01-0020-46	026107P	O
Y-9204-2-B(14)	01-0020-71	025954P	O
Y-9204-2-B(15)	01-0020-71	025954P	O
Y-9204-2-B(16)	01-0020-71	025954P	O
Y-9204-2-B(17)	01-0020-71	025954P	O
Y-9204-2-B(18)	01-0020-71	025954P	O
Y-9204-2-B(19)	01-0020-71	025954P	O
Y-9204-2-B(20)	01-0020-71	025954P	O
Y-9204-2-B(21)	01-0020-71	025954P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9204-2-B(22)	01-0020-71	025954P	O
Y-9204-2-B(23)	01-0020-71	025954P	O
Y-9204-2-B(24)	01-0020-71	025954P	O
Y-9204-2-B(25)	01-0020-71	025954P	O
Y-9204-2-B(26)	01-0020-71	025954P	O
Y-9204-2-B(27)	01-0020-71	025954P	O
Y-9204-2-B(28)	01-0020-71	025954P	O
Y-9204-2-C(29)	01-1020-19	025900P	O
Y-9204-2-C(30)	01-1020-19	025900P	O
Y-9204-2-C(31)	01-1020-19	025900P	O
Y-9204-2-C(32)	01-1020-19	025900P	O
Y-9204-2-C(33)	01-1020-19	025900P	O
Y-9204-2-C(34)	01-1020-19	025900P	O
Y-9204-2-C(35)	01-1020-19	025900P	O
Y-9204-2-C(36)	01-1020-19	025900P	O
Y-9204-2-C(37)	01-1020-19	025900P	O
Y-9204-2-C(38)	01-1020-19	025900P	O
Y-9204-2-C(39)	01-1020-19	025900P	O
Y-9204-2-C(40)	01-1020-19	025900P	O
Y-9204-2-C(41)	01-1020-19	025900P	O
Y-9204-2-C(42)	01-1020-19	025900P	O
Y-9204-2-C(43)	01-1020-19	025900P	O
Y-9204-2-C(44)	01-1020-19	025900P	O
Y-9204-2-C(45)	01-1020-19	025900P	O
Y-9204-2-C(46)	01-1020-19	025900P	O
Y-9204-2-C(47)	01-1020-19	025900P	O
Y-9204-2-C(48)	01-1020-19	025900P	O
Y-9204-2-C(49)	01-1020-19	025900P	O
Y-9204-2-C(50)	01-1020-19	025900P	O
Y-9204-2-C(51)	01-1020-19	025900P	O
Y-9204-2-D(52)	01-1020-57	025967P	O
Y-9204-2-D(53)	01-1020-57	025967P	O
Y-9204-2-D(54)	01-1020-57	025967P	O
Y-9204-2-D(55)	01-1020-57	025967P	O
Y-9204-2-D(56)	01-1020-57	025967P	O
Y-9204-2-D(57)	01-1020-57	025967P	O
Y-9204-2-D(58)	01-1020-57	025967P	O
Y-9204-2-D(59)	01-1020-57	025967P	O
Y-9204-2-D(60)	01-1020-57	025967P	O
Y-9204-2-D(61)	01-1020-57	025967P	O
Y-9204-2-D(62)	01-1020-57	025967P	O
Y-9204-2-D(63)	01-1020-57	025967P	O
Y-9204-2-D(64)	01-1020-57	025967P	O
Y-9204-2-D(65)	01-1020-57	025967P	O
Y-9204-2-D(66)	01-1020-57	025967P	O
Y-9204-2-D(67)	01-1020-57	025967P	O
Y-9204-2-E(068)	01-1020-55	025959P	O
Y-9204-2-E(069)	01-1020-55	025959P	O
Y-9204-2-E(070)	01-1020-55	025959P	O
Y-9204-2-E(071)	01-1020-55	025959P	O
Y-9204-2-E(072)	01-1020-55	025959P	O
Y-9204-2-E(073)	01-1020-55	025959P	O
Y-9204-2-E(074)	01-1020-55	025959P	O
Y-9204-2-E(075)	01-1020-55	025959P	O
Y-9204-2-E(076)	01-1020-55	025959P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9204-2-E(077)	01-1020-55	025959P	O
Y-9204-2-E(078)	01-1020-55	025959P	O
Y-9204-2-E(079)	01-1020-55	025959P	O
Y-9204-2-E(080)	01-1020-55	025959P	O
Y-9204-2-E(081)	01-1020-55	025959P	O
Y-9204-2-F(082)	01-0020-51	025897P	O
Y-9204-2-F(083)	01-0020-51	025897P	O
Y-9204-2-F(084)	01-0020-51	025897P	O
Y-9204-2-F(085)	01-0020-51	025897P	O
Y-9204-2-F(086)	01-0020-51	025897P	O
Y-9204-2-F(087)	01-0020-51	025897P	O
Y-9204-2-G(088)	01-1020-72	028350P	O
Y-9204-2-G(089)	01-1020-72	028350P	O
Y-9204-2-G(090)	01-1020-72	028350P	O
Y-9204-2-G(091)	01-1020-72	028350P	O
Y-9204-2-G(092)	01-1020-72	028350P	O
Y-9204-2-G(093)	01-1020-72	028350P	O
Y-9204-2-H(01)	01-1020-42	025952P	O
Y-9204-2-H(02)	01-1020-42	025952P	O
Y-9204-2-H(03)	01-1020-42	025952P	O
Y-9204-2-H(04)	01-1020-42	025952P	O
Y-9204-2-H(05)	01-1020-42	025952P	O
Y-9204-2-H(06)	01-1020-42	025952P	O
Y-9204-2-I(94)	01-1020-71	026067P	O
Y-9204-2-I(95)	01-1020-71	026067P	O
Y-9204-2E-A(01)	01-0020-68	024598P	O
Y-9204-2E-A(02)	01-0020-68	024598P	O
Y-9204-2E-A(03)	01-0020-68	024598P	O
Y-9204-2E-A(04)	01-0020-68	024598P	O
Y-9204-2E-A(05)	01-0020-68	024598P	O
Y-9204-2E-A(06)	01-0020-68	024598P	O
Y-9204-2E-A(07)	01-0020-68	024598P	O
Y-9204-2E-A(08)	01-0020-68	024598P	O
Y-9204-2E-A(09)	01-0020-68	024598P	O
Y-9204-2E-A(10)	01-0020-68	024598P	O
Y-9204-2E-A(11)	01-0020-68	024598P	O
Y-9204-2E-A(16)	01-0020-68	024598P	O
Y-9204-2E-A(17)	01-0020-68	024598P	O
Y-9204-2E-A(18)	01-0020-68	024598P	O
Y-9204-2E-A(19)	01-0020-68	024598P	O
Y-9204-2E-B(12)	01-1020-41	025953P	O
Y-9204-2E-B(14)	01-1020-41	025953P	O
Y-9204-2E-B(15)	01-1020-41	025953P	O
Y-9204-2E-C(12)	01-1020-68	022890P	O
Y-9204-2E-C(13)	01-1020-68	022890P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	ermit type[a]
Y-904-4-AJ-106	01-0020-89	018208P	O
Y-9204-4-A(01)	01-1020-56	996205P	O
Y-9204-4-A(02)	01-1020-56	996205P	O
Y-9204-4-A(03)	01-1020-56	996205P	O
Y-9204-4-A(04)	01-1020-56	996205P	O
Y-9204-4-A(05)	01-1020-56	996205P	O
Y-9204-4-A(06)	01-1020-56	996205P	O
Y-9204-4-A(07)	01-1020-56	996205P	O
Y-9204-4-A(08)	01-1020-56	996205P	O
Y-9204-4-A(09)	01-1020-56	996205P	O
Y-9204-4-A(10)	01-1020-56	996205P	O
Y-9204-4-A(11)	01-1020-56	996205P	O
Y-9204-4-A(12)	01-1020-56	996205P	O
Y-9204-4-A(13)	01-1020-56	996205P	O
Y-9204-4-A(14)	01-1020-56	996205P	O
Y-9204-4-A(15)	01-1020-56	996205P	O
Y-9204-4-A(17)	01-1020-56	996205P	O
Y-9204-4-A(18)	01-1020-56	996205P	O
Y-9204-4-B(01)	01-0020-72	025961P	O
Y-9204-4-B(02)	01-0020-72	025961P	O
Y-9204-4-B(03)	01-0020-72	025961P	O
Y-9204-4-B(04)	01-0020-72	025961P	O
Y-9204-4-B(05)	01-0020-72	025961P	O
Y-9204-4-B(06)	01-0020-72	025961P	O
Y-9204-4-B(07)	01-0020-72	025961P	O
Y-9204-4-B(08)	01-0020-72	025961P	O
Y-9204-4-B(09)	01-0020-72	025961P	O
Y-9204-4-B(10)	01-0020-72	025961P	O
Y-9204-4-B(11)	01-0020-72	025961P	O
Y-9204-4-C(01)	01-1020-36	025968P	O
Y-9204-4-D(01)	01-1020-35	025963P	O
Y-9204-4-E(01)	01-0020-33	025002P	O
Y-9204-4-E(02)	01-0020-33	025002P	O
Y-9204-4-E(03)	01-0020-33	025002P	O
Y-9204-4-E(04)	01-0020-33	025002P	O
Y-9204-4-E(05)	01-0020-33	025002P	O
Y-9206-A(01)	01-0020-48	012892P	O
Y-9206-A(02)	01-0020-48	012892P	O
Y-9206-A(03)	01-0020-48	012892P	O
Y-9206-B(01)	01-0020-03	026765P	O
Y-9206-B(02)	01-0020-03	026765P	O
Y-9206-B(03)	01-0020-03	026765P	O
Y-9206-B(04)	01-0020-03	026765P	O
Y-9206-B(05)	01-0020-03	026765P	O
Y-9206-B(06)	01-0020-03	026765P	O
Y-9206-B(07)	01-0020-03	026765P	O
Y-9206-B(08)	01-0020-03	026765P	O
Y-9206-B(09)	01-0020-03	026765P	O
Y-9206-B(10)	01-0020-03	026765P	O
Y-9206-B(11)	01-0020-03	026765P	O
Y-9206-B(12)	01-0020-03	026765P	O
Y-9206-B(13)	01-0020-03	026765P	O
Y-9206-C(01)	01-1020-24	026766P	O
Y-9206-C(02)	01-1020-24	026766P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9206-D(13)	01-1020-38	025901P	O
Y-9212-A(01)	01-1020-72	0997756P	C
Y-9212-A(02)	01-1020-72	0997756P	C
Y-9212-A(03)	01-1020-72	0997756P	C
Y-9212-A(04)	01-1020-72	0997756P	C
Y-9212-A(05)	01-1020-72	0997756P	C
Y-9212-A(06)	01-1020-72	0997756P	C
Y-9212-A(07)	01-1020-72	0997756P	C
Y-9212-A(08)	01-1020-72	0997756P	C
Y-9212-A(10)	01-1020-72	0997756P	C
Y-9212-A(11)	01-1020-72	0997756P	C
Y-9212-A(12)	01-1020-72	0997756P	C
Y-9212-A(13)	01-1020-72	0997756P	C
Y-9212-A(14)	01-1020-72	0997756P	C
Y-9212-A(15)	01-1020-72	0997756P	C
Y-9212-A(16)	01-1020-72	0997756P	C
Y-9212-A(17)	01-1020-72	0997756P	C
Y-9212-A(18)	01-1020-72	0997756P	C
Y-9212-A(19)	01-1020-72	0997756P	C
Y-9212-A(20)	01-1020-72	0997756P	C
Y-9212-A(21)	01-1020-72	0997756P	C
Y-9212-A(22)	01-1020-72	0997756P	C
Y-9212-A(23)	01-1020-72	0997756P	C
Y-9212-A(24)	01-1020-72	0997756P	C
Y-9212-A(25)	01-1020-72	0997756P	C
Y-9212-A(26)	01-1020-72	0997756P	C
Y-9212-A(27)	01-1020-72	0997756P	C
Y-9212-A(28)	01-1020-72	0997756P	C
Y-9212-B(01)	01-0020-02	025955P	O
Y-9212-B(02)	01-0020-02	025955P	O
Y-9212-B(03)	01-0020-02	025955P	O
Y-9212-B(04)	01-0020-02	025955P	O
Y-9212-C(01)	01-0020-05	025984P	O
Y-9212-C(02)	01-0020-05	025984P	O
Y-9212-C(03)	01-0020-05	025984P	O
Y-9212-C(04)	01-0020-05	025984P	O
Y-9212-C(05)	01-0020-05	025984P	O
Y-9212-C(06)	01-0020-05	025984P	O
Y-9212-C(07)	01-0020-05	025984P	O
Y-9212-C(08)	01-0020-05	025984P	O
Y-9212-C(09)	01-0020-05	025984P	O
Y-9212-D(01)	01-1020-46	025904P	O
Y-9212-E(01)	01-1020-48	025969P	O
Y-9212-E(02)	01-1020-48	025969P	O
Y-9212-F(01)	01-1020-49	025960P	O
Y-9212-F(03)	01-1020-49	025960P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9212-F(04)	01-1020-49	025960P	O
Y-9212-F(05)	01-1020-49	025960P	O
Y-9212-G(01)	01-1020-47	022942P	O
Y-9215-A(01)	01-0020-37	022130P	O
Y-9215-B(02)	01-0020-38	012880P	O
Y-9215-B(05)	01-1020-51	022882P	O
Y-9215-B(10)	01-1020-51	028299P	O
Y-9215-B(18)	01-1020-51	028299P	O
Y-9215-B(20)	01-1020-51	028299P	O
Y-9215-C(02)	01-1020-52	025948P	O
Y-9215-C(03)	01-1020-52	025948P	O
Y-9215-C(10)	01-1020-52	025948P	O
Y-9215-C(11)	01-1020-52	025948P	O
Y-9215-C(17)	01-1020-52	025948P	O
Y-9215-C(19)	01-1020-52	025948P	O
Y-9215-D(12)	01-1020-53	025966P	O
Y-9215-D(13)	01-1020-53	025966P	O
Y-9215-D(14)	01-1020-53	025966P	O
Y-9215-D(15)	01-1020-53	025966P	O
Y-9215-E(06)	01-1020-54	025972P	O
Y-9215-E(07)	01-1020-54	025972P	O
Y-9215-E(08)	01-1020-54	025972P	O
Y-9401-2-B(02)	01-0020-06	012461P	O
Y-9401-2-C(03)	01-0020-07	012462P	O
Y-9401-2-D(04)	01-0020-08	012463P	O
Y-9401-2-E(05)	01-0020-09	021446P	O
Y-9401-2-F(06)	01-0020-10	021446P	O
Y-9401-2-G(07)	01-0020-88	021446P	O
Y-9401-2-H(08)	01-0020-88	021446P	O
Y-9401-2-J(10)	01-0020-88	021446P	O
Y-9401-2-K(11)	01-0020-88	021446P	O
Y-9401-2-L(12)	01-0020-88	021446P	O
Y-9401-2-M(13)	01-0020-88	021446P	O
Y-9401-2-N(14)	01-0020-88	021446P	O
Y-9401-2-P(15)	01-0020-88	021446P	O
Y-9401-2-Q(16)	01-0020-88	021446P	O
Y-9401-2-R(17)	01-0020-88	021446P	O
Y-9401-2-S(18)	01-0020-88	021446P	O
Y-9401-3-A	01-1020-31	027419F	O
Y-9401-3-B(1)	01-1020-32	027419F	O
Y-9401-3-C	01-1020-33	027419F	O
Y-9401-3-D(2)	01-1020-34	027419F	O
Y-9401-3-E	01-0030-39	012881P	O
Y-9401-3-F(04)	01-1020-27	023498P	O
Y-9401-3-G(01)	01-1020-61	026472P	O
Y-9401-3-G(02)	01-1020-61	926472P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9401-3-H(01)	01-1020-61	995278P	C
Y-9401-3-I(1)	01-1020-66	023852P	O
Y-9401-3-J-1	01-1020-82	997626P	C
Y-9401-4-A(01)	01-0020-65	022240P	O
Y-9401-5-A(01)	01-0020-92	026108P	O
Y-9404-11-A(1)	01-1020-81	028426P	O
Y-9404-11-A(2)	01-1020-81	028426P	O
Y-9404-11-A(3)	01-1020-81	028426P	O
Y-9404-11-A(4)	01-1020-81	028426P	O
Y-9404-5-B(02)	01-0020-25	012866P	O
Y-9404-5-B(03)	01-0020-25	012866P	O
Y-9404-9-C(03)	01-0020-40	012882P	O
Y-9404-9-D(04)	01-0020-40	012882P	O
Y-9404-9-E(05)	01-0020-40	012882P	O
Y-9616-7-A(01)	01-1020-74	026502P	O
Y-9616-7-A(02)	01-1020-74	026502P	O
Y-9616-7-A(03)	01-1020-74	026502P	O
Y-9616-7-A(04)	01-1020-74	026502P	O
Y-9616-7-A(05)	01-1020-74	026502P	O
Y-9616-7-A(06)	01-1020-74	026502P	O
Y-9616-7-A(07)	01-1020-74	026502P	O
Y-9616-7-A(08)	01-1020-74	026502P	O
Y-9616-7-A(09)	01-1020-74	026502P	O
Y-9616-7-A(10)	01-1020-74	026502P	O
Y-9616-7-A(11)	01-1020-74	026502P	O
Y-9616-7-A(12)	01-1020-74	026502P	O
Y-9616-7-B(1)	01-1020-80	0997583P	C
Y-9620-2A	01-0020-50	012894P	O
Y-9623-A(01)	01-1020-25	025970P	O
Y-9623-A(02)	01-1020-25	025970P	O
Y-9623-A(03)	01-1020-25	025970P	O
Y-9623-A(04)	01-1020-25	025970P	O
Y-9623-A(05)	01-1020-25	025970P	O
Y-9623-A(06)	01-1020-25	025970P	O
Y-9712-A(01)	01-1020-65	023851P	O
Y-9720-19-A(01)	01-0020-41	012885P	O
Y-9720-19-C(01)	01-0020-23	012864P	O
Y-9720-19-D(03)	01-0020-27	012869P	O
Y-9720-20-A(01)	01-1020-39	025971P	O
Y-9720-41-A(01)	01-1020-63	028384P	O
Y-9720-41-A(02)	01-1020-63	028384P	O
Y-9720-41-A(03)	01-1020-63	028384P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9720-41-A(04)	01-1020-63	028384P	O
Y-9720-41-A(05)	01-1020-63	028384P	O
Y-9720-5-A	01-1020-75	027379P	O
Y-9720-6-B(01)	01-0020-75	015154P	O
Y-9720-6-C(01)	01-0020-76	015155P	O
Y-9720-6-C(02)	01-0020-76	015155P	O
Y-9720-6-E(01)	01-0020-83	016548P	O
Y-9737-A(01)	01-0020-22	012863P	O
Y-9737-B(02)	01-0020-78	015157P	O
Y-9737-C(02)	01-0020-78	015157P	O
Y-9737-D(02)	01-0020-78	015157P	O
Y-9737-E(02)	01-0020-78	015157P	O
Y-9737-F(02)	01-0020-78	015157P	O
Y-9737-G(03)	01-0020-79	015160P	O
Y-9737-H(04)	01-0020-79	015160P	O
Y-9737-I(05)	01-0020-79	015160P	O
Y-9738-A(01)	01-0020-14	025975P	O
Y-9738-A(02)	01-0020-14	025975P	O
Y-9738-A(03)	01-0020-14	025975P	O
Y-9738-A(04)	01-0020-14	025975P	O
Y-9738-A(05)	01-0020-14	025975P	O
Y-9739-A(01)	01-1020-78	028105P	O
Y-9739-B(02)	01-1020-78	028105P	O
Y-9754-2-A(01)	01-0020-52	012897P	O
Y-9767-4-A(01)	01-0020-35	012877P	O
Y-9808-A(01)	01-1020-22	026109P	O
Y-9809-A(01)	01-0020-93	025899P	O
Y-9811-A(01)	01-0020-42	012886P	O
Y-9811-B(02)	01-1020-45	025903P	O
Y-9812-A(01)	01-1020-29	022474P	O
Y-9812-A(02)	01-1020-29	022474P	O
Y-9812-A(03)	01-1020-29	022474P	O
Y-9815-A(03)	01-0020-11	025895P	O
Y-9815-A(04)	01-0020-11	025895P	O
Y-9815-A(05)	01-0020-11	025895P	O
Y-9815-A(06)	01-0020-11	025895P	O
Y-9815-A(07)	01-0020-11	025895P	O
Y-9815-A(08)	01-0020-11	025895P	O
Y-9818-A(01)	01-0020-12	025965P	O
Y-9818-A(02)	01-0020-12	025965P	O
Y-9818-A(03)	01-0020-12	025965P	O
Y-9818-A(04)	01-0020-12	025965P	O
Y-9818-A(05)	01-0020-12	025965P	O
Y-9818-A(06)	01-0020-12	025965P	O

Table 2.1.11 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Permit type[a]
Y-9818-A(07)	01-0020-12	025965P	O
Y-9818-A(08)	01-0020-12	025965P	O
Y-9818-A(09)	01-0020-12	025965P	O
Y-9818-A(10)	01-0020-12	025965P	O
Y-9818-A(11)	01-0020-12	025965P	O
Y-9818-A(12)	01-0020-12	025965P	O
Y-9929-F(01)	01-0020-39	012881P	O
Y-9995-A(01)	01-0020-21	021086P	O
Y-9998-A(01)	01-0020-13	025957P	O
Y-9998-A(02)	01-0020-13	025957P	O
Y-9998-A(03)	01-0020-13	025957P	O
Y-9998-A(04)	01-0020-13	025957P	O
Y-9998-A(05)	01-0020-13	025957P	O
Y-9998-A(06)	01-0020-13	025957P	O
Y-9998-B(01)	01-1020-40	026110P	O
Y-9998-C(01)	01-1020-84	0997769P	C
Y-Townsite	01-0020-53	012889F	O

[a]O = operating; C = construction.

Table 2.1.12. Air permits at ORNL

ORNL source number	Emission source reference number	Permit number	Source	Permit type[a]
X-1506	73-0112-02	012452P	Hood	O
X-2000-02	73-0112-75	024473P	Furnace, ovens, hoods, pumps	O
X-2000-09	73-0112-32	024135P	Laser with wet scrubber	O
X-2013-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-2013-04	73-0112-52	024913P	Vapor blaster	O
X-2018-02	73-0112-13	024250P	Parts washer (degreaser)	O
X-2018-03	73-0112-44	024117P	Oven	O
X-2026-06	73-0112-77	024759P	Rad laboratory	O
X-2510-T1	73-0112-63	024402P	Tank, propane	O
X-2519-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-2519-1/5	73-0112-03	028027P	5 boilers at steam plant and ash	O
X-2519-T1	73-0112-57	024915P	Tank, sulfuric acid	O
X-2522-TIA	73-0112-10	024114P	Tank, fuel oil	O
X 2525-01	73-0112-14	013013P	Degreaser	O
X-2525-02	73-0112-65	026944P	Parts washer (degreaser)	O
X-2525-03	73-0112-65	026944P	Parts washer (degreaser)	O
X-2525-04	73-0112-38	023809P	Machine shop	O
X-2525-06	73-0112-95	027257P	Machine shop	O
X-2525-08	73-0112-62	024949P	Spray booth and oven	O
X-2525-11	73-0112-49	024151P	Electroplating shop	O
X-2525-13	73-0112-54	027392P	Vapor blaster and buffers	O
X-2525-T1	73-0112-72	024475P	Tank, waste oil	O
X-2525-T2	73-0112-72	024475P	Tank, waste oil	O
X-2547-01	73-0112-27	028439P	Spray booth	O
X-2547-02	73-0112-65	026944P	Parts washer (degreaser)	O
X-3003-06	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-3003-08	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-3004-T1	73-0112-46	024136P	Tank, nitric acid	O
X-3004-T2	73-0112-46	024136P	Tank, nitric acid	O
X-3004-T3	73-C112-46	024136P	Tank, nitric acid	O
X-3005-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-3005-02	73-0112-18	027214P	Parts washer (degreaser)	O
X-3012-01	73-0112-74	024449P	Furnace	O
X-3012-02	73-0112-50	024252P	Degreaser	O
X-3025-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-3039-01	73-0112-93	026525P	Off gas and hot cell ventilation	O
X-3074-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-3103-T1	73-0112-42	024113P	Tank, sulfuric acid	O
X-3104-03	73-0112-81	024511P	Carpenter shop	O
X-3117-T1	73-0112-42	024115P	Tank, sulfuric acid	O
X-3500-02	73-0112-65	026944P	Parts washer (degreaser)	O
X-3500-12	73-0112-73	024450P	Furnace	O
X-3502-01	73-0112-05	013022P	Spray booth	O
X-3502-02	73-0112-06	013023P	Spray booth	O
X-3502-03	73-0112-07	013024P	Spray booth	O
X-3502-09	73-0112-94	027194P	Hood, gluing	O
X-3502-SV1	73-0112-39	023808P	Oven, curing	O
X-3502-SV2	73-0112-40	023807P	Oven, tempering	O
X-3502-SV4	73-0112-30	024309P	Cyclone and carpentry shop	O
X-3504-01	73-0112-80	024451P	Oven	O
X-3544-01	73-0112-70	025552P	PWTP	OM
X-3587-1	73-0112-56	997551P	Electroplating shop	CM
X-3608-01	73-0112-37	995888P	NRWTP air stripper and tanks	O
X-4508-08	73-0112-61	025121P	Acid etching process	O

Table 2.1.12 (continued)

ORNL source number	Emission source reference number	Permit number	Source	Permit type[a]
X-4508-09	73-0112-55	024306P	Sand blaster	O
X-4508-16	73-0112-51	024909P	Spray booth	O
X-4508-T1	73-0112-64	024403P	Tank, freon	O
X-4515-00	73-0112-68	025239P	HTML	O
X-5500-00	73-0112-29	023760P	Tank	O
X-6000-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-6000-02	73-0112-59	024308P	Vapor blaster	O
X-6005-00	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-6010-00	73-0112-85	025282P	ORELA	O
X-6010-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-7002-01	73-0112-19	024251P	Parts washer (degreaser)	O
X-7002-03	73-0112-08	013025P	Spray booth	O
X-7002-03	73-0112-65	026944P	Parts washer (degreaser)	O
X-7002-04	73-0112-65	026944P	Parts washer (degreaser)	O
X-7002-T1	73-0112-88	025659P	Tank, waste oil	O
X-7003-01	73-0112-79	024452P	Furnace	O
X-7003-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-7005-00	73-0112-45	024118P	Machining tools	O
X-7005-3-7	73-0112-26	028438P	Lead shop	O
X-7007-1/2	73-0112-09	024134P	Spray booth	O
X-7012-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-7021-00	73-0112-58	024307P	Grinding shop	O
X-7021-T1	73-0112-58	025660P	Tank, waste oil	O
X-7025-00	73-0112-92	026070P	TTFF	O
X-7057-01	73-0112-76	024760P	Sand blaster	O
X-7069-C/D	73-0112-11	013030P	Tank, gasoline	O
X-7069-T	73-0112-60	026726P	Two gasoline tanks	O
X-7075-T1	73-0112-90	025661P	Tank, waste oil	O
X-7075-T2	73-0112-90	025661P	Tank, photographic waste	O
X-7075-T3	73-0112-90	025661P	Tank, photographic waste	O
X-7503-00	73-0112-83	025254P	Molten salt reactor	O
X-7600-01	73-0112-20	017930P	Nuclear fuel reprocessing	O
X-7601-T1	73-0112-47	024137P	Tank, nitric acid	O
X-7602-01	73-0112-24	027090P	Boiler, hot water	O
X-7603-01	73-0112-25	022743F	Boiler, steam	O
X-7606-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-7667-0	N/A		Chemical detonation site	OB
X-7822-00	73-0112-86	025340P	Solid waste shredder	O
X-7830-01	73-0112-71	027132P	EASC	O
X-7831-00	73-0112-84	025281P	Baler and box compactor	O
X-7900-T1	73-0112-43	024116P	Tank, nitric acid	O
X-7900-T2	73-0112-43	024116P	Tank, nitric acid	O
X-7900-T3	73-0112-66	025162P	Tank, nitric acid	O
X-7900-T4	73-0112-66	025162P	Tank, nitric acid	O
X-7903-T1	73-0112-48	024138P	Tank, sulfuric acid	O
X-7910-01	73-0112-65	026944P	Parts washer (degreaser)	O
X-7911-00	73-0112-82	025249P	HFIR, TRU, and TURF	O
X-7934-02	73-0112-53	C24912P	Silver recovery system	O
X-7935-01	73-0112-78	027393P	Equipment cleaning facility	O
X-4500N1-93	73-0112-65	026944P	Parts washer (degreaser)	O
X-4500S1-01	73-0112-87	026021P	Parts washer (degreaser)	O
X-4500S3-50	73-0112-31	024C88P	Mercury purification system	O

[a]O = operating; M = under modification; C = construction; OB = open burning.

Table 2.1.13. Air Permits at ORGDP

ORGDP source number	Emission source reference number (73-XXXX-XX)	Permit number	Source	Permit type[a]
K-402 8-16-990-cool-P-162539	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-402 9 PC	0101-42	012660P	Gas diffusion purge cascade	O
K-402 9-16-989-cool-P-162554	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-502 2-327298 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-502 2-327300 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-602 WAP	0106-93	024297P	Evacuation of cascade cells	O
K-602 2-325172 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-602 4-325285 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-832 chromate T	1106-10	024947P	Storage tank	O
K-892 chromate T	1106-10	024947P	Storage tank	O
K-892 lime silo	1106-10	025120P	Lime storage silo	O
K-892 sulfuric acid tank, N	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-892 sulfuric acid tank, S	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-894 sulfuric acid tank	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-896 soda silo	1106-24	024758P	Soda ash silo	O
K-902 WAP & jet	0106-93	024298P	Evacuation of cascade cells	O
K-902 3-324383 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-902 3-324389			Storage tank	
K-902 3-324469 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-902 3-324470 Freon R-114	0106-28	024500P	Misc. chemical storage (18 tanks)	O
K-902 5 PCB (1-4)	1106-10	024947P	PCB storage tanks (4)	O
K-902 6 PCB (1-3)	1106-10	024947P	PCB storage tanks (4)	O
K-902 6 PCB	1106-10	024947P	PCB storage tank	O
K-1001 C Blueprint 1 and 2	1106-11	024943P	Blueprint machines (2)	O
K-1001 Opti-copy	1106-07	024395P	Photographic reproduction	O
K-1004 L oven	0106-95	024299P	Sintering operation	O
K-1004 T center b hood	1106-04	024756P	Resin and hardener mixer with hoods	O
K-1004 T hood	1106-04	024498P	Resin and hardener mixer with hood	O
K-1004 T hood-methchlor	1106-15	025493P	Ultrasonic epoxy parts cleaner	O
K-1004 T south oven	1106-01	024304P	Matrix composites cure	O
K-1004 T west n oven	0106-96	024301P	Matrix composites cure	O
K-1004 T wind 1	1106-27	025843P	Winding and coating operations	O
K-1004 T wind 2	1106-27	025843P	Winding and coating operations	O
K-1004 T wind 3	1106-27	025843P	Winding and coating operations	O
K-1004 T wind 4	1106-27	025843P	Winding and coating operations	O
K-1010 bond hood	1106-06	024502P	Parts clean and adhesives mix	O
K-1010 bond oven	0106-90	024270P	Matrix composites cure	O
K-1023 R oven 323-586	0106-91	024271P	Matrix composites cure	O
K-1024 FT-1	0106-18	025655P	Filter-testing facility	O
K-1035 plate 1	0106-99	024305P	Potting and developing ops	O
K-1035 plate 2	1106-05	024503P	Instrument-cleaning operation	O
K-1035 plate 3	0106-97	024302P	Acid cleaning and decontamination	O
K-1035 plate 4			Degreaser and cleaner	
K-1035 plate 5	0106-98	024303P	Printed circuit board Mfg.	O
K-1037 AVLIS furnace	0106-81	023119P	AVLIS furnace	O
K-1037 AVLIS grieve oven	0106-80	023118P	AVLIS grieve oven (TB-500)	O
K-1037 AVLIS quincy oven	0106-79	023120P	AVLIS quincy oven (73-6 OOM)	O

Table 2.1.13 (continued)

ORGDP source number	Emission source reference number (73-XXXX-XX)	Permit number	Source	Permit type[a]
K-1037 dry spray booth	0106-76	994500P	DeVilbiss spray booth ELD #432	PTC
K-1037 grit blast facility	0106-77	022111P	Grit blast facility with baghouse	O
K-1037 MLBH mechanical lab	0106-84	023662P	Mechanical lab, cut and shape parts	O
K-1200 center bay	0106-87	026548P	Center bay	O
K-1200 center bay hood	0106-87	026548P	Center bay hood	O
K-1200 center bay oven	0106-87	026548P	Center bay oven	O
K-1200 FAE	0106-86	9954-92P	Isotope separation facility	PTC
K-1200 north bay oven	0106-922	024272P	Matrix composites cure	O
K-1202 ST-1	1106-20	024911P	Solvents storage tank	O
K-1232 acetic acid tank, N	1106-23	024614P	Acetic acid tank, N	O
K-1232 acetic acid tank, S	1106-23	02414P	Acetic acid tank, S	O
K-1232 lime storage silo			Lime storage silo	
K-1300 B	0106-37	012505P	Hazardous ops emergency vent	O
K-1302 stack	0106-42		Process effluent emissions point	O
K-1401 BOP assembly hood			BOP assembly hood	O
K-1401 composite machining	0106-88	025514P	Composite machining process	O
K-1401 foam pack	1106-12	025490P	Foam-packing operation	O
K-1401 H-304 w acid tank	1106-30	025656P	Acid cleaning of steel parts	O
K-1401 H-306 acid tank	1106-30	025656P	Acid cleaning of steel parts	O
K-1401 HCL tank E	0106-228	024500P	HCl storage tank	O
K-1401 LH glove box 1,2	1106-03	026679P	LH-glove box 1,2	O
K-1401 LH glove box 3	1106-03	026679P	LH-glove box 3	O
K-1401 machine shop	1106-09	025585P	Grinding & machining stations	O
K-1401 seal shop acid cleaning	1106-14	025492P	Seal shop acid-machining stations	O
K-1401 seal shop cleaning	1106-17	025495P	Cleaning process	O
K-1401 seal shop 1	1106-13	025491P	Seal shop process	O
K-1401 slope testing stand	1106-29	9963838	Uranium hexafluoride converters	PTC
K-1401 T-104	1106-32	025658P	Acid cleaning of steel parts	O
K-1401 tricho e tank	1106-10	024947P	Trichloroethane storage tank	O
K-1401 000 oven, NE	0106-89	995772P	Electric bake oven	PTC
K-1401 000 oven, NE-2	0106-89	997364P	Oven for curing	PTC
K-1401 121659	0106-09	016306P	Trichloroethane degreaser	O
K-1407 A lime-silo	1106-25	0224455P	Lime storage silo	O
K-1407 H-F-210, lime bin CNF	1106-18	025443P	Hydrated lime storage silo	O
K-1413 propane LBD121422	0106-28	024500P	Propane storage tank	O
K-1414 diesel	1106-02	024335P	Underground storage tank	O
K-1414 UG methanol, unleaded gas	0106-28	024500P	Methanol/gasoline storage tank	O
K-1419 F-200CBP	1106-19	025243P	Sulfuric acid storage tank	O
K-1419 F-4860-CBP	1106-19	0252243P	Sulfuric acid storage tank	O
K-1419 20	0106-83	025250P	Scrubber & cleaning facility	O
K-1420 CP-02	0106-46	026164P	Concrete batch plant	O
K-1420 A1	0106-82	024396P	Flammable waste storage tank	O
K-1420 I-1 incinerator	0106-08	015691P	Waste incinerator	O
K-1420 nitric acid tank, NE	1106-22	024453P	Nitric acid tank, NE	O
K-1420 nitric acid tank, NW	1106-22	024453P	Nitric acid tank, NW	O
K-1420 nitric acid tank, SE	1106-22	024453P	Nitric acid tank, SE	O
K-1420 nitric acid tank, SW	1106-22	024453P	Nitric acid tank, SW	O
K-1420	0106-70	023798P	Phillips vapor degreaser	O

Table 2.1.13 (continued)

ORGDP source number	Emission source reference number (73-XXXX-XX)	Permit number	Source	Permit type[a]
K-1420 237306 vapor degreaser	0106-49	023797P	Detrex vapor degreaser	O
K-1423 process	0106-37	023001P	Toll enrichment facility	O
K-1435 TSCA incinerator	0106-78	996254I	TSCA incinerator	PTC
K-1435 C tank farm	0106-75	024105P	Hazardous liquid wastes	O
K-1501 A1,A2,A3	0106-01, 02,03,04 05,06,17	027049F	Steam plant	O
K-1501 sulfuric acid tank	0106-28	024500P	Sulfuric acid storage tank	O
K-1505 E	0106-39	023796P	Coal sizing & conveying system	O
K-1515 north alum tank	0106-28	024500P	Alum sulfate storage tank	O
K-1515 south alum tank	0106-28	024500P	Alum sulfate storage tank	O
K-1580 blueprint	1106-16	025494P	Blueprint machine	O
Y-12 SDDP	1106-33	996949P	Sludge detoxification demo project	PTC

[a]O = operating; PTC = permit to construct.

2.2 SURFACE WATER

Table 2.2.1. Radionuclide concentrations in surface water around ORNL in 1989[a]

Radionuclide	No. of samples	Concentration (pCi/L)				Percentage of DCG[c]
		Max	Min	Av	Std. error[b]	
			Melton Hill Dam			
^{241}Am	4	1.5	−0.032	0.50	0.35	1.7
^{244}Cm	2	1.4	0.24	0.84	0.59	1.4
^{60}Co	12	22	−16	3.1	3.5	0.062
^{137}Cs	12	14	−24	−5.3	2.8	<0.0010
Gross alpha	12	19	−3.8	5.8	1.9	*d*
Gross beta	12	43	−49	9.9	8.2	*d*
^{238}Pu	4	0.027	−0.065	0.0027	0.023	0.0068
^{239}Pu	4	0.054	−0.13	−0.016	0.040	<0.001
Total Sr[e]	5	4.1	−0.95	1.7	0.94	0.17
^{3}H	4	1200	−81	470	280	0.024
			White Oak Creek headwaters			
^{241}Am	4	0.38	−0.081	0.13	0.098	0.43
^{244}Cm	1	0.35	0.35	0.35	*d*	0.59
^{60}Co	12	49	−51	0.86	7.4	0.017
^{137}Cs	12	24	−24	0.27	4.1	0.0090
Gross alpha	12	46	−5.4	9.4	4.1	*d*
Gross beta	12	46	2.7	17	3.6	*d*
^{238}Pu	4	0.059	−0.022	0.016	0.020	0.039
^{239}Pu	4	0.027	−0.089	−0.015	0.026	<0.001
Total Sr[e]	4	1.6	−1.6	0.47	0.72	0.047
^{3}H	4	620	−110	310	150	0.016
			7500 bridge			
^{60}Co	12	54	−24	13	6.1	0.25
^{137}Cs	12	180	−5.4	70	14	2.3
Total Sr[e]	12	240	49	88	16	8.8
^{3}H	12	24000	2400	7700	1700	0.38
			First Creek			
^{60}Co	12	57	−7.6	8.4	5.3	0.17
^{137}Cs	12	51	−22	5.6	5.3	0.19
Total Sr[e]	12	510	190	310	31	31
			Fifth Creek			
^{60}Co	12	51	−14	10	4.8	0.20
^{137}Cs	12	14	−27	−6.4	3.5	<0.001
Total Sr[e]	12	54	1.4	34	3.5	3.4
			Melton Branch 2			
^{60}Co	12	54	−11	17	5.5	0.34
^{137}Cs	12	41	−2.7	9.4	3.9	0.31
Total Sr[e]	12	13	−2.4	2.6	1.1	0.26
^{3}H	12	460000	890	41000	38000	2.0

Table 2.2.1 (continued)

Radionuclide	Number of samples	Concentration (pCi/L)				Percentage of DCG[c]
		Max	Min	Av	Std. error[b]	
			Northwest tributary			
^{60}Co	12	41	−35	−0.52	6.1	<0.001
^{137}Cs	12	24	−27	4.3	3.8	0.14
Total Sr[e]	12	78	23	54	4.4	5.4
			Raccoon Creek			
^{60}Co	12	24	−16	0.78	3.8	0.016
^{137}Cs	12	30	−19	3.7	3.8	0.12
Total Sr[e]	12	81	11	24	5.6	2.4

[a]Locations are shown in Fig. 2.2.4 in Vol. 1.
[b]Standard error of the mean.
[c]Average concentration as a percentage of the derived concentration guide (DCG).
[d]Not applicable.
[e]Total radioactive Sr (^{89}Sr + ^{90}Sr).

Table 2.2.2. Radionuclide concentrations in water around ORGDP in 1989

Parameter	Number of samples	Concentration (pCi/L)			Percentage of DCG[a]
		Max	Min	Av	
		West Fork Poplar Creek			
^{237}Np	4	0.08	−0.73	−0.14	<0.01
$^{239/240}Pu$	4	1.2	−0.08	0.44	1.5
^{99}Tc	4	43	−1529	−402	<0.01
^{137}Cs	4	0	0	0	<0.01
U[b]	4	<0.7	<0.7	<0.7	NA
U (mg/L)	4	<0.001	<0.001	<0.001	NA
		K-1710			
^{237}Np	12	0.28	−0.66	−0.09	<0.01
$^{239/240}Pu$	12	0.79	−0.99	0.06	0.2
^{99}Tc	12	265	−1529	−247	<0.01
^{137}Cs	12	0	0	0	<0.01
U[b]	12	1.30	<0.7	<1.10	<0.2
U (mg/L)	12	0.0020	<0.0010	<0.0017	NA
		K-716			
^{237}Np	11	0.91	−0.7	0.095	<0.01
$^{239/240}Pu$	11	1.0	−0.72	0.22	0.7
^{99}Tc	11	321	−1529	−258	<0.01
^{137}Cs	11	0	0	0	<0.01
U[b]	11	1.3	<0.7	<0.9	<0.2
U (mg/L)	11	0.0020	<0.0010	<0.0013	NA
		K-1513			
^{237}Np	12	0.26	−0.65	−0.11	<0.01
$^{239/240}Pu$	12	9	−0.39	0.87	2.9
^{99}Tc	12	298	−1529	−233	<0.01
^{137}Cs	12	0	0	0	<0.01
U[b]	12	<0.7	<0.7	<0.7	NA
U (mg/L)	12	<0.001	<0.001	<0.001	NA

Table 2.2.2. (continued)

Parameter	Number of samples	Concentration (pCi/L)			Percentage of DCG[a]
		Max	Min	Av	
		K-901 at 892			
^{237}Np	1	0	0	0	<0.01
$^{239/240}Pu$	1	0.06	0.06	0.06	0.2
^{99}Tc	1	−29	−29	−29	<0.01
^{137}Cs	1	0	0	0	<0.01
U[b]	1	<0.7	<0.7	<0.7	NA
U (mg/L)	1	<0.001	<0.001	<0.001	NA
		K-1770			
^{237}Np	12	0.25	−0.65	−0.11	<0.01
$^{239/240}Pu$	12	0.72	−0.77	0.11	0.4
^{99}Tc	12	198	−1529	−224	<0.01
^{137}Cs	12	0	0	0	<0.01
U[b]	12	0.7	<0.7	<0.7	<0.1
U (mg/L)	12	0.001	<0.001	<0.001	NA
		Clinch River			
^{237}Np	4	0.16	−0.66	−0.17	<0.01
$^{239/240}Pu$	4	0.79	−0.08	0.16	0.5
^{99}Tc	4	148	−1529	−359	<0.01
^{137}Cs	4	0	0	0	<0.01
U[b]	4	<0.7	<0.7	<0.7	NA
U (mg/L)	4	<0.001	<0.001	<0.001	NA
		Mitchell Branch			
Gross Alpha	3	1	−1	0.03	NA
Gross Beta	3	13	1	5	NA
Gross Gamma	3	0	0	0	NA

[a]Average concentration as a percentage of the derived concentration guide (DCG) from DOE Order 5400.5.

[b]The specific activity for natural uranium of 1.49×1^6 g/Ci; was used to determine pCi/L.

Table 2.2.3. 1989 ORGDP concentrations at West Fork Poplar Creek

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.002	<0.002	<0.002
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	<5	<5	<5
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.3 (Continued)

Parameter	Concentration		
	Max	Min	Av
Chromium, mg/L	<0.010	<0.010	<0.010
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	<0.0040	<0.0040	<0.0040
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	160	98	136
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	<0.1	<0.1	<0.1
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	0.0047	<0.0040	<0.0042
Manganese, mg/L	0.19	0.11	0.16
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Methylene chloride, μg/L	<10	<10	<10
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	0.36	0.20	0.24
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	4.1	2.8	3.4
Sulfate, mg/L	43.0	36.0	38.5
Suspended solids, mg/L	21.0	7.0	14.5
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	0.033	<0.020	<0.022
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	<10	<10	<10
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.6	7.6	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.4. 1989 ORGDP concentrations at Clinch River

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.002	<0.002	<0.002
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	<8	<5	<6
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.4 (Continued)

	Concentration		
	Max	Min	Av
Chromium, mg/L	<0.010	<0.010	<0.010
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	0.0044	<0.0040	<0.0041
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	176	132	152
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	<0.1	<0.1	<0.1
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	<0.0040	<0.0040	<0.0040
Manganese, mg/L	0.10	0.069	0.079
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Methylene chloride, μg/L	<5	<5	<5
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	0.50	0.20	0.38
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	4.3	3.6	4.0
Sulfate, mg/L	22.0	17.0	20.0
Suspended solids, mg/L	28.0	9.0	22.0
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	0.033	<0.020	<0.022
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	<10	<10	<10
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.5	7.6	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.5. 1989 ORGDP concentrations at K-716

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.002	<0.002	<0.002
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	14	<5	<7
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.5 (Continued)

	Concentration		
	Max	Min	Av
Chromium, mg/L	0.018	<0.010	<0.011
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	0.0086	<0.0040	<0.0048
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	196	74	131
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	<0.20	<0.10	<0.14
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	0.022	<0.0040	<0.0063
Manganese, mg/L	0.42	0.052	0.152
Mercury, mg/L	0.0018	<0.0002	<0.0016
Methylene chloride, μg/L	<5	<5	<5
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	0.80	0.30	0.54
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	5.6	2.5	4.4
Sulfate, mg/L	38.0	20.0	29.4
Suspended solids, mg/L	96.0	7.0	30.3
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	0.045	<0.020	<0.024
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	170	<10	<33
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.4	7.4	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.6. 1989 ORGDP concentrations at K-901 at 892

Parameter	Concentration (mg/L)		
	Max	Min	Av
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Arsenic, mg/L	<0.005	<0.005	<0.005
Cadmium, mg/L	<0.002	<0.002	<0.002
Chemical oxygen demand (COD), mg/L	<5	<5	<5
Chromium, mg/L	<0.010	<0.010	<0.010
Copper, mg/L	<0.0040	<0.0040	<0.0040
Cyanide, mg/L	0.004	0.004	0.004
Dissolved solids, mg/L	114	114	114
Fluoride, mg/L	<0.10	<0.10	<0.10
Lead, mg/L	<0.004	<0.004	<0.004
Manganese, mg/L	0.084	0.084	0.084
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	0.41	0.41	0.41
Sodium, mg/L	3.9	3.9	3.9
Sulfate, mg/L	20.0	20.0	20.0
Suspended solids, mg/L	11.0	11.0	11.0
Zinc, mg/L	0.054	0.054	0.054
pH	8.0	7.8	

Table 2.2.7. 1989 ORGDP concentrations at K-1513

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.002	<0.002	<0.002
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	8.0	<5	<5.3
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.7 (Continued)

Parameter	Concentration		
	Max	Min	Av
Chromium, mg/L	<0.010	<0.010	<0.010
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	<0.0071	<0.0040	<0.0043
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	194	118	160
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	0.20	<0.10	<0.11
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	0.0055	<0.0040	<0.0042
Manganese, mg/L	0.059	0.016	0.035
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Methylene chloride, μg/L	<5	<5	<5
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	0.50	0.20	0.40
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	5.3	3.9	4.6
Sulfate, mg/L	27.0	18.0	20.7
Suspended solids, mg/L	23.0	2.0	6.8
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	<0.020	<0.020	<0.020
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	62	<5	<15
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.7	7.5	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.8. 1989 ORGDP concentrations at K-1710

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.002	<0.002	<0.002
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	18.0	<5	<6.7
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.8 (Continued)

Parameter	Concentration		
	Max	Min	Av
Chromium, mg/L	<0.010	<0.010	<0.010
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	0.0086	<0.0040	<0.0049
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	258	62	157
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	0.03	<0.10	<0.17
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	0.0080	<0.0040	<0.0045
Manganese, mg/L	0.18	0.046	0.11
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Methylene chloride, μg/L	<5	<5	<5
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	1.7	<0.20	<0.71
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	11.0	1.7	4.9
Sulfate, mg/L	42.0	20.0	33.6
Suspended solids, mg/L	74.0	1.0	18.4
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	0.021	<0.020	<0.020
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	100	<5	<20
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.3	7.4	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.9. 1989 ORGDP concentrations at K-1770

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.0038	<0.0020	<0.0022
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	38.0	<5	<8.9
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.9 (Continued)

Parameter	Concentration		
	Max	Min	Av
Chromium, mg/L	<0.010	<0.010	<0.010
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	<0.0071	<0.0040	<0.0044
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	216	106	161
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	0.30	<0.10	<0.16
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	0.0094	<0.0040	<0.0050
Manganese, mg/L	0.42	0.018	0.11
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Methylene chloride, μg/L	<5	<5	<5
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	2.0	<0.20	<0.51
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	11.0	2.0	5.1
Sulfate, mg/L	47.0	20.0	25.8
Suspended solids, mg/L	143.0	3.0	23.6
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	0.040	<0.020	<0.022
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	370	<10	<40
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.5	7.3	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.10. 1989 ORGDP concentrations at Mitchell Branch

Parameter	Concentration		
	Max	Min	Av
1,1,1-Trichloroethane, μg/L	<5	<5	<5
1,1,2,2-Tetrachloroethane, μg/L	<5	<5	<5
1,1,2-Trichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethane, μg/L	<5	<5	<5
1,1-Dichloroethene, μg/L	<5	<5	<5
1,2,4-Trichlorobenzene, μg/L	<10	<10	<10
1,2-Dichlorobenzene, μg/L	<10	<10	<10
1,2-Dichloroethane, μg/L	<5	<5	<5
1,2-Dichloropropane, μg/L	<5	<5	<5
1,3-Dichlorobenzene, μg/L	<10	<10	<10
1,4-Dichlorobenzene, μg/L	<10	<10	<10
2,4,6-Trichlorophenol, μg/L	<10	<10	<10
2,4-Dichlorophenol, μg/L	<10	<10	<10
2,4-Dimethylphenol, μg/L	<10	<10	<10
2,4-Dinitrophenol, μg/L	<10	<10	<10
2,4-Dinitrotoluene, μg/L	<10	<10	<10
2,6-Dinitrotoluene, μg/L	<10	<10	<10
2-Chloroethylvinyl ether, μg/L	<10	<10	<10
2-Chloronaphthalene, μg/L	<10	<10	<10
2-Chlorophenol, μg/L	<10	<10	<10
2-Nitrophenol, μg/L	<10	<10	<10
3,3'-Dichlorobenzidine, μg/L	<20	<20	<20
4,6-Dinitro-2-methylphenol, μg/L	<50	<50	<50
4-Bromophenyl-phenylether, μg/L	<10	<10	<10
4-Chloro-3-methylphenol, μg/L	<10	<10	<10
4-Chlorophenyl-phenylether, μg/L	<10	<10	<10
4-Nitrophenol, μg/L	<50	<50	<50
Acenaphthene, μg/L	<10	<10	<10
Acenaphthylene, μg/L	<10	<10	<10
Ammonia nitrogen, mg/L	<0.2	<0.2	<0.2
Anthracene, μg/L	<10	<10	<10
Arsenic, mg/L	<0.005	<0.005	<0.005
Benzene, μg/L	<5	<5	<5
Benzidine, μg/L	<10	<10	<10
Benzo(a)anthracene, μg/L	<10	<10	<10
Benzo(a)pyrene, μg/L	<10	<10	<10
Benzo(b)fluoranthene, μg/L	<10	<10	<10
Benzo(g,h,i)perylene, μg/L	<10	<10	<10
Benzo(k)fluoranthene, μg/L	<10	<10	<10
Bromodichloromethane, μg/L	<5	<5	<5
Bromoform, μg/L	<5	<5	<5
Bromomethane, μg/L	<10	<10	<10
Butylbenzylphthalate, μg/L	<10	<10	<10
Cadmium, mg/L	<0.002	<0.002	<0.002
Carbon tetrachloride, μg/L	<5	<5	<5
Chemical oxygen demand (COD), mg/L	<5	<5	<5
Chlorobenzene, μg/L	<5	<5	<5
Chloroethane, μg/L	<10	<10	<10
Chloroform, μg/L	<5	<5	<5
Chloromethane, μg/L	<10	<10	<10

Table 2.2.10 (Continued)

Parameter	Concentration		
	Max	Min	Av
Chromium, mg/L	<0.010	<0.010	<0.010
Chrysene, μg/L	<10	<10	<10
Copper, mg/L	<0.004	<0.004	<0.004
Cyanide, mg/L	<0.1	<0.1	<0.1
Di-n-butylphthalate, μg/L	<10	<10	<10
Dibenz(a,h)anthracene, μg/L	<10	<10	<10
Dibromochloromethane, μg/L	<5	<5	<5
Diethylphthalate, μg/L	<10	<10	<10
Dimethylphthalate, μg/L	<10	<10	<10
Dissolved solids, mg/L	106	86	97
Ethylbenzene, μg/L	<5	<5	<5
Fluoranthene, μg/L	<10	<10	<10
Fluorene, μg/L	<10	<10	<10
Fluoride, mg/L	<0.10	<0.10	<0.10
Hexachlorobenzene, μg/L	<10	<10	<10
Hexachlorobutadiene, μg/L	<10	<10	<10
Hexachlorocyclopentadiene, μg/L	<10	<10	<10
Hexachloroethane, μg/L	<10	<10	<10
Indeno(1,2,3-cd)pyrene, μg/L	<10	<10	<10
Isophorone, μg/L	<10	<10	<10
Lead, mg/L	0.0049	<0.0040	<0.0043
Manganese, mg/L	0.28	0.07	0.15
Mercury, mg/L	<0.0002	<0.0002	<0.0002
Methylene chloride, μg/L	<5	<5	<5
N-nitroso-di-n-propylamine, μg/L	<10	<10	<10
N-nitrosodimethylamine, μg/L	<10	<10	<10
N-nitrosodiphenylamine, μg/L	<10	<10	<10
Naphthalene, μg/L	<10	<10	<10
Nickel, mg/L	<0.05	<0.05	<0.05
Nitrate nitrogen, mg/L	<0.2	<0.2	<0.2
Nitrobenzene, μg/L	<10	<10	<10
Pentachlorophenol, μg/L	<50	<50	<50
Phenanthrene, μg/L	<10	<10	<10
Phenol, μg/L	<10	<10	<10
Pyrene, μg/L	<10	<10	<10
Sodium, mg/L	1.2	0.89	1.0
Sulfate, mg/L	4	2	3
Suspended solids, mg/L	13	4	8
Tetrachloroethene, μg/L	<5	<5	<5
Toluene, μg/L	<5	<5	<5
Trichloroethene, μg/L	<5	<5	<5
Vinyl chloride, μg/L	<10	<10	<10
Zinc, mg/L	<0.02	<0.02	<0.02
bis(2-Chloroethoxy)methane, μg/L	<10	<10	<10
bis(2-Chloroethyl)ether, μg/L	<10	<10	<10
bis(2-Chloroisopropyl)ether, μg/L	<10	<10	<10
bis(2-Ethylhexyl)phthalate, μg/L	370	<10	<40
cis-1,3-Dichloropropene, μg/L	<5	<5	<5
di-n-Octylphthalate, μg/L	<10	<10	<10
pH	8.0	7.6	
trans-1,2-Dichloroethene, μg/L	<5	<5	<5
trans-1,3-Dichloropropene, μg/L	<5	<5	<5

Table 2.2.11. NPDES-permitted outfalls

Outfall number	Effluent description
	Oak Ridge Y-12 Plant *NPDES Permit Number TN 0002968*
301	Kerr Hollow Quarry
302	Rogers Quarry
303	New Hope Pond
304	Bear Creek
305	Leaking Burial Grounds—Oil Pond 1
306	Seepage from Burial Pit—Oil Pond 2
Category I	Uncontaminated precipitation runoff and/or groundwater
Category II	Cooling water, condensate, building area, and foundation drains and/or precipitation runoff contaminated by area sources of pollution
Category III	Any of the Category I or II outfalls or process wastewater requiring treatment at one of the on-site Y-12 treatment facilities
401–422	Category IV Discharges—Process wastewaters requiring minimal treatment
623	Steam Plant fly ash sluice water
501	Central Pollution Control Facility
502	West End Treatment Facility
503	Steam Plant Wastewater Treatment Facility
504	Plating Rinsewater Treatment Facility
508	Experimental Mobile Wastewater Treatment Facility
506	Building 9204-3 Sump Pump Oil Separator
	Oak Ridge National Laboratory *NPDES Permit Number TN 0002941*
X01	ORNL sewage treatment plant
X02	Coal Yard Runoff Treatment Facility
X03	1500 Area (Environmental Sciences)
X04	2000 area
X06	190 Ponds
X06A	1500/2000/190 Ponds
X07	Process Waste Treatment Plant (3544)
X08	TRU ponds
X09	HFIR ponds
X09A	TRU/HFIR ponds
X10	Oak Ridge Research Reactor resin regeneration facility (closed)
X11	Acid neutralization facility (3518)
X13	Melton Branch (ambient station)
X14	White Oak Creek (ambient station)
X15	White Oak Dam
VC7002	Vehicle cleaning facility (7002) Cooling towers
EF7002	Equipment maintenance facility (7002)
SP2519	Steam plant boiler drainage (2519)
Category I	Storm drains
Category II	Parking lot drains, storage area drains, once-through cooling water, cooling water blowdown, condensate
Category III	Process and/or laboratory drains

Table 2.2.11 (continued)

Outfall number	Effluent description
	Oak Ridge Gaseous Diffusion Plant NPDES Permit Number TN 0002950
K-1700	K-1407-E/F effluent, surface runoff, once-through cooling
K-1203	Sanitary wastewaters, organic industrial wastewaters
K-1007-B	Potable water from once-through cooling systems, firewater from once-through systems, surface runoff
K-901-A	Lime-softening sludges from firewater makeup treatment, surface runoff
K-710-A	Sanitary wastewater (inactive)
K-1515-C	Water from sludge and backwash systems associated with the potable water plant, surface runoff
K-1407-E and K-1407-F	Steam plant and coal yard effluent (since November 1988)
K-1407-J	Central neutralization facility effluent (since November 1988)

Table 2.2.12. Radionuclide concentrations in water from NPDES stations[a] at ORNL in 1989

Radionuclide	No. of samples	Concentration (pCi/L)				Percentage of DCG[c]
		Max	Min	Av	Std. error[b]	
		Sewage Treatment Plant (X01)				
^{60}Co	12	54	−30	6.4	6.4	0.13
^{137}Cs	12	32	−19	4.2	4.2	0.14
Gross alpha	1	−7.6	−7.6	−7.6	*d*	*d*
Gross beta	12	4,900	59	610	390	*d*
Total Sr[e]	12	180	12	97	15	9.7
		1500 area (X03)				
Gross alpha	4	14	2.4	7.5	2.7	*d*
Gross beta	4	22	0.0	12	5.1	*d*
		2000 area (X04)				
^{60}Co	4	5.4	−8.1	−0.41	2.9	<0.001
^{137}Cs	4	35	−19	0.068	12	0.0023
Gross beta	4	59	0.0	26	12	*d*
Total Sr[e]	4	11	−0.27	4.1	2.6	0.41
		190 ponds (X06)				
^{60}Co	4	22	−24	−3.6	9.5	<0.001
^{137}Cs	4	41	−2.7	12	9.7	0.39
Gross alpha	4	30	−2.7	13	6.7	*d*
Gross beta	4	46	32	38	2.9	*d*
		190 ponds, 1500 Area and 2000 Area (X06A)				
^{60}Co	8	24	−32	−4.0	6.2	<0.001
^{137}Cs	8	24	−8.1	10	3.5	0.34
Gross alpha	8	16	−5.4	5.4	2.1	*d*
Gross beta	8	81	−11	27	11	*d*
Total Sr[e]	8	17	2.4	8.1	1.6	0.81
		Process Waste Treatment Plant (X07)				
^{60}Co	12	2,600	14	260	210	5.2
^{137}Cs	12	2,700	57	1,900	220	63
Gross alpha	12	140	−3.0	54	12	*d*
Gross beta	12	3,200	380	1,800	210	*d*
Total Sr[e]	12	350	15	110	33	11
		TRU ponds (X08)				
Gross beta	1	130	130	130	*d*	*d*
		HFIR ponds (X09)				
^{60}Co	1	2,700	2,700	2,700	*d*	54
^{137}Cs	1	−11	−11	−11	*d*	<0.001
Gross alpha	1	5.7	5.7	5.7	*d*	*d*
Gross beta	1	2,400	2,400	2,400	*d*	*d*
^{54}Mn	1	−2.7	−2.7	−2.7	*d*	<0.001

Table 2.2.12 (continued)

Radionuclide	Number of samples	Concentration (pCi/L)				Percentage of DCG[c]
		Max	Min	Av	Standard[b] error	
			TRU/TURF and HFIR ponds (X09A)			
^{60}Co	8	5,100	32	1,500	670	30
^{137}Cs	8	430	−5.4	71	52	2.4
^{152}Eu	2	680	350	510	160	2.6
^{154}Eu	5	970	250	560	120	2.8
^{155}Eu	6	510	89	270	66	0.27
Gross alpha	8	19	−1.9	8.0	2.9	*d*
Gross beta	8	3,500	14	1,400	410	*d*
			Acid Neutralization Facility (X11)			
Gross alpha	12	43	−5.4	9.2	3.6	*d*
Gross beta	12	84	−22	28	9.5	*d*
			Melton Branch 1 (X13)			
^{60}Co	12	86	−2.7	25	6.9	0.51
^{137}Cs	12	27	−16	−0.36	4.1	<0.001
Total Sr[e]	12	650	190	410	45	41
^{3}H	12	1,800,000	350,000	1,300,000	120,000	67
			White Oak Creek (X14)			
^{60}Co	12	41	−8.1	10	4.3	0.20
^{137}Cs	12	210	30	76	15	2.5
Total Sr[e]	12	380	65	160	25	16
^{3}H	12	150,000	7,800	73,000	11,000	3.6
			White Oak Dam (X15)			
^{241}Am	18	1.6	−0.23	0.40	0.097	1.3
^{244}Cm	10	1.7	−1.6	0.48	0.27	0.80
^{60}Co	52	27	−14	8.3	0.87	0.17
^{137}Cs	52	320	−11	69	9.3	2.3
Gross alpha	30	33	−38	9.5	2.3	*d*
Gross beta	40	930	210	450	23	*d*
^{238}Pu	18	0.51	−0.068	0.077	0.029	0.19
^{239}Pu	18	0.76	−0.30	0.11	0.058	0.35
Total Sr[e]	26	380	100	180	18	18
^{3}H	26	430,000	76,000	260,000	22,000	13

[a]See Fig. 2.2.9 in Vol. 1 for NPDES station locations.
[b]Standard error of the mean.
[c]Average concentration as a percentage of the derived concentration guide (DCG).
[d]Not applicable.
[e]Total radioactive Sr (^{89}Sr + ^{90}Sr).

Table 2.2.13. 1989 ORGDP radiological effluent at K-1203

Radionuclide	Emission source (Ci)	DCG (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
^{99}Tc	1.67×10^{-2}	100,000	24.9	0.03
^{234}U	2.35×10^{-3}	500	17.7	3.55
^{235}U	1.11×10^{-4}	600	0.17	0.03
^{236}U	2.85×10^{-5}	500	0.04	<0.01
^{238}U	1.17×10^{-3}	600	2.55	0.42

Table 2.2.14. 1989 ORGDP radiological effluent at K-1700

Radionuclide	Emission source (Ci)	DCG (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
^{237}Np	1.02×10^{-4}	30	0.05	0.15
^{239}Pu	1.58×10^{-4}	30	0.07	0.24
^{99}Tc	2.13×10^{-1}	100,000	96.8	0.10
^{137}Cs	0	3,000	0	<0.01
^{234}U	2.99×10^{-2}	500	32.8	6.5
^{235}U	1.76×10^{-3}	600	0.80	0.13
^{236}U	4.45×10^{-4}	500	0.20	0.04
^{238}U	1.38×10^{-2}	600	6.27	1.05

Table 2.2.15. 1989 ORGDP radiological effluent at K-1007-B

Radionuclide	Emission source (Ci)	DCG (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
^{237}Np	9.12×10^{-6}	30	2.67×10^{-3}	0.01
^{239}Pu	1.32×10^{-4}	30	3.87×10^{-2}	0.13
^{99}Tc	-3.62×10^{-1}[a]	100,000	-106[a]	<0.01
^{137}Cs	0	3,000	0	<0.01
^{234}U	4.54×10^{-3}	500	7.95	1.59
^{235}U	1.94×10^{-4}	600	0.06	0.01
^{236}U	5.71×10^{-5}	500	0.02	<0.01
^{238}U	2.20×10^{-3}	600	0.65	0.11

[a]Because of the intrinsic uncertainties associated with making radiation measurements, it is possible to subtract a background value from a sample result and obtain a negative number. Statistical summaries previously used detection limits to represent sample results even when samples were less than detection limits, which resulted in high biases. To remove these biases and to enable statistical summaries to be equally representative of all component values, recent changes in reporting methods include accepting all results at face value.

Table 2.2.16. 1989 ORGDP radiological effluent at K-901A

Radionuclide	Emission source (Ci)	DCG (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
^{237}Np	3.43×10^{-5}	30	0.04	0.13
^{239}Pu	1.07×10^{-4}	30	0.12	0.40
^{99}Tc	-5.93×10^{-2}[a]	100,000	-66.8[a]	<0.01
^{137}Cs	0	3,000	0	<0.01
^{234}U	2.06×10^{-3}	500	0.40	0.08
^{235}U	9.70×10^{-5}	600	0.11	0.02
^{236}U	2.54×10^{-5}	500	0.03	0.01
^{238}U	1.05×10^{-3}	600	1.18	0.20

[a]Because of the intrinsic uncertainties associated with making radiation measurements, it is possible to subtract a background value from a sample result and obtain a negative number. Statistical summaries previously used detection limits to represent sample results even when samples were less than detection limits, which resulted in high biases. To remove these biases and to enable statistical summaries to be equally representative of all component values, recent changes in reporting methods include accepting all results at face value.

Table 2.2.17. 1989 ORGDP radiological effluent at K-1407-J[a]

Radionuclide	Emission source (Ci)	DCG (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
^{237}Np	6.71×10^{-6}	30	0.64	2
^{239}Pu	3.42×10^{-6}	30	0.31	1
^{99}Tc	6.68×10^{-3}	100,000	526	0.53
^{137}Cs	0	3,000	0	<0.01
^{234}U	5.91×10^{-3}	500	465	93
^{235}U	2.51×10^{-4}	600	19.8	3.3
^{236}U	5.04×10^{-5}	500	3.97	0.79
^{238}U	2.93×10^{-3}	600	231	38.5

[a]Data are for September through December 1989 only. Beginning in September, the K-1407-J effluent was discharged through the CNF pipeline to Poplar Creek. Prior to that time discharge was to Mitchell Branch, and subsequently through K-1700, which is located downstream. During previous years the off-site discharge point was K-1700.

Table 2.2.18. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 301[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Total suspended solids	14	20	<5	<6	0.3
Mercury	14	0.0002	<0.0002	<0.0002	0.0000
Lithium	14	0.188	0.017	0.068	0.004
Zirconium	14	<0.002	<0.002	<0.002	0.000
Potassium	14	3.0	0.7	1.1	0.04
Sodium	14	0.71	0.45	0.59	0.01
pH, standard units	15	8.3	6.9	NA[b]	0.02
Arsenic	14	<0.04	<0.04	<0.04	0.00
Cadmium	14	<0.006	<0.003	<0.003	0.000
Chromium	14	0.013	<0.006	<0.006	0.00014
Copper	14	0.007	<0.002	<0.002	0.0001
Iron	14	0.44	0.02	0.13	0.01
Nickel	14	0.010	<0.007	<0.008	0.0001
Selenium	14	<0.002	<0.002	<0.002	0.000
Zinc	14	0.101	<0.003	<0.024	0.002
Lead	14	<0.02	<0.02	<0.02	0.00
Temperature, °C	14	27.3	8.0	16.8	0.5
Flow, Mgd[c]	9	3.2880	0.0030	0.4810	0.1250

[a]Y-12 Plant, Kerr Hollow Quarry.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.19. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 302[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Total suspended solids	52	40	<5	<6	1
Chemical oxygen demand (COD)	52	16	4	<6	0.30
Sulfate	52	91	32	51	3
Oil and grease	52	3	<2	<2	0.03
Settleable solids	52	0.1	<0.1	<0.1	0.0
Selenium	52	0.0180	0.0002	<0.0055	0.0006
Mercury	52	0.0004	<0.0002	<0.0002	0.000004
Arsenic	52	0.18	<0.04	<0.07	0.01
Cadmium	52	0.006	<0.003	<0.003	0.000
Chromium	52	0.010	<0.006	<0.006	0.0002
Copper	52	0.004	<0.002	<0.002	0.0001
Iron	52	2.18	0.02	0.14	0.04
Nickel	52	0.012	<0.007	<0.008	0.0002
Zinc	52	0.059	<0.001	<0.008	0.001
Lead	52	0.05	<0.02	<0.02	0.001
pH, standard units	52	9.1	6.9	NA[b]	0.1
Temperature, °C	52	29.6	7.5	17.5	1.0
Turbidity, NTU	52	32.00	0.63	3.48	0.75
Flow, Mgd[c]	365	9.02	0.14	1.07	0.06

[a]Y-12 Plant, Rogers Quarry.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.20. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 303[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Ammonia, as N	49	6.3	<0.2	<1.8	0.2
Chromium	50	0.145	<0.006	<0.009	0.003
Fluoride	49	0.74	0.28	0.54	0.02
Lithium	50	0.039	0.006	0.014	0.001
Surfactants, as MBAS	49	5.00	<0.05	<0.25	0.14
Dissolved solids	49	610	100	373	20
Nickel	50	0.131	<0.007	<0.012	0.002
Beryllium	50	0.0027	<0.0001	<0.0002	0.0001
Residual chlorine	53	0.16	<0.10	<0.10	0.00
Perchloroethylene	22	0.010	<0.010	<0.010	0.000
Settleable solids	53	0.1	<0.1	<0.1	0.0
Dissolved oxygen	54	19.1	3.3	9.5	0.5
Oil and grease	53	4	<2	<2	0
Suspended solids, total	49	650	<5	<34	13
Zinc	50	1.240	0.007	0.059	0.024
Nitrogen	49	5.8	1.1	3.2	0.2
Cadmium	50	0.01400	<0.00005	<0.00225	0.00030
Lead	50	0.1200	<0.0005	<0.0147	0.0025
Copper	50	0.360	<0.002	<0.016	0.007
Mercury	49	0.1200	<0.0002	<0.0038	0.0024
Temperature, °C	57	14.0	4.5	7.9	0.3
Biological oxygen demand	0				
Chemical oxygen demand	0				
pH, standard units	58	9.4	6.6	NA[b]	0.1
Flow, Mgd[c]	59	0.6429	0.0015	0.2272	0.0341

[a]Y-12 Plant, New Hope Pond.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.21. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 304[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	52	5	<2	<2	0.08
Biological oxygen demand	49	6	<5	<5	0.02
Chemical oxygen demand	52	53	<5	<11	1
Dissolved solids	52	300	94	196	6
Total suspended solids	52	430	<5	<50	12
Nitrates, as N	52	10.0	0.7	4.0	0.3
Conductivity, μmhos/cm	53	570.0	<0.5	<334.3	13.6
Dissolved oxygen	76	14.5	7.1	9.0	0.2
Turbidity, NTU	52	150.00	2.00	25.85	5.01
pH, standard units	82	8.3	6.8	NA[b]	0.04
Flow, Mgd[c]	353	25.44	0.16	4.09	0.24

[a]Y-12 Plant, Bear Creek.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.22. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 305[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	257	54	<2	<2	0.2
Total suspended solids	257	140	<1	<11	1
Mercury	257	0.0027	<0.0002	<0.0002	0.00001
pH, standard units	252	9.1	6.6	NA[b]	0.02
Beryllium	257	0.0003	<0.0001	<0.0001	0.000002
Cadmium	257	<0.006	<0.003	<0.004	0.0001
Lead	257	0.29	<0.02	<0.02	0.001
Silver	257	<0.004	<0.004	<0.004	0.000
Flow, gal/d[c]	235	152,381	0	54,878	2,381

[a]Y-12 Plant, Oil Pond No. 1.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.23. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 306[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	90	70	<2	<3	1
Total suspended solids	90	61	<5	<7	1
Mercury	90	0.0002	<0.0002	<0.0002	0.0000
pH (standard units)	90	10.0	5.7	*b*	0.1
Cadmium	90	0.049	<0.003	<0.004	0.001
Nickel	90	0.080	<0.007	<0.008	0.001
Lead	90	0.02	<0.02	<0.02	0.00
Silver	90	0.004	<0.004	<0.004	0.000
Flow, gal/d[c]	88	190,476	0	5,599	2,199

[a]Y-12 Plant, Oil Pond No. 2.
[b]Not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.24. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 307[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	4	3	<2	<2.3	0.25
Total suspended solids	4	103	28	52.8	17
pH, standard units	4	8.4	7.0	NA[b]	0.3
Temperature, °C	4	26.9	4.9	17.5	4.9
Flow, gal/d[c]	1	7610	7610	7610	0.0

[a]Y-12 Plant, West Borrow Area.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.25. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 308[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	4	3	<2	<2.3	0.25
Total suspended solids	4	84	7	39.0	16.6
pH, standard units	4	9.5	7.5	NA[b]	0.4
Temperature, °C	4	26.9	4.5	16.9	4.9
Flow, gal/d[c]	1	57,600	57,600	57,600	0.0

[a]Y-12 Plant, East Borrow Area.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.26. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 501[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	45	5	<2	<2	0.07
Cyanide	45	0.140	<0.002	<0.011	0.003
Copper	45	0.025	<0.002	<0.010	0.001
Chromium	45	0.024	<0.006	<0.007	0.001
Lead	45	0.05	<0.02	<0.02	0.001
Nickel	45	0.871	<0.010	<0.297	0.033
Temperature, °C	45	29.0	17.2	23.2	0.5
Cadmium	45	0.077	<0.003	<0.006	0.002
Zinc	45	3.200	0.009	0.424	0.102
Total toxic organics	44	0.270	<0.010	<0.029	0.010
Total suspended solids	45	20	<5	<8	1
Silver	45	0.008	<0.004	<0.004	0.0001
pH, standard units	46	8.8	6.2	NA[b]	0.1
Color, NTU	45	50.0	<5.0	<24.4	2.3
Sodium	45	932.0	11.1	262.2	28.9
Nitrates, as N	45	20.0	<0.1	<1.0	0.5
Surfactants, as MBAS	45	0.24	<0.05	<0.06	0.004
Beryllium	45	0.0003	<0.0001	<0.0001	0.000004
Phosphorus	45	124.00	0.39	6.83	2.98
Chlorides	45	430	48	194	12
Phenols	45	0.360	<0.001	<0.058	0.012
Sulfates	45	2900	1400	1959	66
Fluorides	45	1.9	0.4	1.0	0.05
Aluminum	45	0.45	<0.01	<0.15	0.02
Iron	45	10.10	0.09	2.50	0.39
Mercury	45	0.0002	<0.0002	<0.0002	0.0000
Flow, gal/d[c]	45	15878	3782	11596	396

[a]Y-12 Plant, Central Pollution Control Facility.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.27. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 502[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Silver	64	0.011	<0.004	<0.004	0.0002
Cadmium	64	<0.010	<0.003	<0.003	0.0001
Cyanide	66	1.900	<0.002	<0.109	0.042
Chromium	64	<0.006	<0.006	<0.006	0.000
Copper	64	1.070	0.008	0.135	0.024
Nickel	64	4.900	0.182	1.641	0.155
Lead	64	<0.020	<0.005	<0.020	0.0002
Zinc	64	1.39	0.07	0.40	0.04
Total toxic organics	15	0.520	<0.010	<0.044	0.034
Total suspended solids	64	50	<5	<10	1
Oil and grease	65	4	<2	<2	0.04
Temperature, °C	64	22.0	10.1	15.9	0.3
pH, standard units	64	8.7	7.3	*b*	0.04
Arsenic	64	0.09	<0.04	<0.04	0.001
Aluminum	64	1.71	0.19	0.59	0.03
Mercury	64	0.0004	<0.0002	<0.0002	0.000004
Beryllium	64	0.0017	<0.0001	<0.0003	0.00004
Sulfate	64	28000	2200	20903	500
Barium	64	0.0659	0.0102	0.0327	0.0019
Nitrate, as N	64	<0.1	<0.1	<0.1	0.0
Fluoride	64	110.0	1.3	63.8	2.7
Calcium	64	28.30	3.16	15.66	0.76
Residual chlorine	64	19.6	<0.1	<0.4	0.3
Phosphorus	64	<0.06	<0.06	<0.06	0.00
Iron	64	1.24	0.10	0.38	0.03
Cobalt	64	0.127	0.007	0.040	0.004
Magnesium	64	70.90	7.23	29.56	2.11
Manganese	64	0.24	0.01	0.08	0.01
Molybdenum	64	1.240	0.164	0.506	0.032
Sodium	64	12000	3050	8297	325
Chloride	64	1300	790	1100	18
Potassium	64	434.0	87.2	215.8	11.7
Flow, gal/d[c]	77	28001	0	14720	1039

[a]Y-12 Plant, West end treatment facility (WETF).
[b]Not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.28. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 503[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	150	16	1	<2	0.12
Phenols	149	0.033	<0.001	<0.003	0.0004
Mercury	152	0.0176	<0.0002	<0.0004	0.0001
Selenium	151	0.0180	<0.0004	<0.0024	0.0002
Chloride	152	2500	18	298	25
Fluoride	152	18.0	1.0	2.6	0.1
Total suspended solids	152	28	<5	<6	0.2
Sulfate	152	2800	56	1474	41
Sulfide	152	3.6	<0.1	<0.9	0.03
Temperature, °C	164	30.5	7.1	24.8	0.3
pH, standard units	166	9.2	6.2	*b*	0.05
Aluminium	152	3.41	<0.01	<0.29	0.03
Arsenic	152	0.19	<0.04	<0.04	0.001
Barium	152	0.2120	0.0167	0.0929	0.0033
Beryllium	152	0.0072	<0.0001	<0.0002	0.00005
Boron	152	8.140	<0.007	<0.186	0.070
Cadmium	152	0.064	<0.003	<0.004	0.0004
Calcium	152	1090.0	73.4	549.1	16.8
Cerium	152	0.06	<0.02	<0.02	0.0003
Chromium	152	0.075	<0.006	<0.007	0.0005
Cobalt	152	0.079	<0.002	<0.003	0.001
Copper	152	0.112	<0.002	<0.004	0.001
Gallium	127	<0.01	<0.01	<0.01	0.00
Iron	152	2.33	<0.02	<0.33	0.02
Lanthanum	152	<0.003	<0.003	<0.003	0.000
Lead	152	0.08	<0.02	<0.02	0.0004
Lithium	152	0.279	<0.001	<0.056	0.003
Magnesium	152	47.9	0.1	4.1	0.5
Manganese	152	0.938	<0.001	<0.010	0.006
Molybdenum	152	0.079	<0.006	<0.007	0.001
Nickel	152	0.075	<0.007	<0.008	0.0005
Niobium	152	<0.01	<0.01	<0.01	0.00
Phosphorus	152	2.30	<0.06	<0.52	0.03
Potassium	152	22.6	1.6	7.3	0.3
Scandium	151	<0.0004	<0.0004	<0.0004	0.0000
Silver	152	0.014	<0.004	<0.004	0.0001
Sodium	152	3500.0	9.2	249.5	25.0
Strontium	152	1.210	0.120	0.560	0.017
Thorium	152	<0.01	<0.01	<0.01	0.00
Titanium	151	0.071	<0.002	<0.003	0.0005
Vanadium	152	0.150	<0.004	<0.006	0.001
Zinc	152	0.109	<0.001	<0.028	0.001
Zirconium	152	0.072	<0.002	<0.002	0.0005
Flow, gal/d[c]	362	507500	0	153701	4214

[a]Y-12 Plant, Steam Plant Wastewater Treatment Facility.
[b]Not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.29. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 504[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Silver	22	<0.004	<0.004	<0.004	0.000
Cadmium	22	<0.0060	<0.0005	<0.0033	0.0003
Cyanide	22	0.044	<0.002	<0.010	0.003
Chromium	22	0.018	<0.006	<0.008	0.001
Copper	22	0.007	<0.002	<0.003	0.0004
Nickel	22	1.400	<0.007	<0.417	0.070
Lead	22	<0.020	<0.001	<0.019	0.001
Zinc	22	0.695	0.009	0.158	0.049
Total toxic organics	22	0.290	<0.010	<0.025	0.013
Total suspended solids	22	12	<5	<5	0.3
Oil and grease	22	5	<2	<2	0.14
Temperature, °C	23	28.9	15.4	22.7	0.8
pH, standard units	24	9.2	6.5	NA[b]	0.1
Aluminum	22	0.96	0.07	0.31	0.04
Mercury	22	0.0003	<0.0002	<0.0002	0.000005
Beryllium	22	0.0001	<0.0001	<0.0001	0.0000
Sulfate	22	1000	40	199	43
Nitrate, as N	22	26.0	<0.1	<5.9	1.4
Fluoride	22	2.0	0.5	1.2	0.1
Phosphorus	22	4.72	0.20	0.93	0.21
Iron	22	7.67	0.11	3.42	0.47
Sodium	22	466	14	67	20
Chloride	22	62	12	29	3
Potassium	22	39.2	1.0	12.9	2.2
Flow, gal/d[c]	22	34390	8166	22011	1338

[a]Y-12 Plant, Plating Rinsewater Treatment Facility (PRTF).
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.30. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 501/504[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	31	3	<2	<2	0.04
Cyanide	32	0.018	<0.002	<0.006	0.001
Chromium	31	0.059	<0.006	<0.008	0.002
Copper	31	0.185	<0.002	<0.012	0.006
Lead	31	<0.02	<0.02	<0.02	0.00
Nickel	31	1.250	0.110	0.450	0.044
Temperature, °C	32	29.3	20.6	24.5	0.4
Cadmium	31	0.031	<0.003	<0.005	0.001
Zinc	31	1.020	0.020	0.236	0.051
Total toxic organics	31	0.100	<0.010	<0.013	0.003
Total suspended solids	31	11	<5	<6	0.3
Silver	31	0.129	<0.004	<0.008	0.004
pH, standard units	34	9.2	6.3	NA[b]	0.1
Potassium	31	299.0	10.5	89.3	11.7
Sodium	31	6070.0	79.8	349.4	192.4
Nitrates	30	12.0	<0.1	<1.3	0.5
Fluorides	31	15.0	0.6	1.6	0.5
Aluminum	31	0.88	0.08	0.30	0.04
Iron	31	13.20	0.42	2.29	0.46
Mercury	31	0.0005	<0.0002	<0.0002	0.00001
Beryllium	31	0.0072	<0.0001	<0.0003	0.0002
Phosphorus	31	190.00	0.33	7.32	6.09
Chlorides	31	220	12	103	9
Sulfates	31	2900	90	1044	111
Phenols	32	0.410	<0.001	<0.037	0.014
Color	31	75	1	29	4
Flow, gal/d[c]	30	37834	9002	24001	1509

[a]Y-12 Plant, Central Pollution Control Facility/Plating Rinsewater Treatment Facility
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.31. CY 1989 NPDES Permit Number TN 002968

Discharge Point = 506[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
Oil and grease	52	5	<2	<2	0
pH, standard units	53	9.2	7.0	*b*	0.1
Temperature, °C	52	39.8	20.3	27.1	0.4
Flow, gal/d[c]	43	72,000	72,000	72,000	0

[a]Y-12 Plant, Building 9204-3 Sump Pump Oil Separator.
[b]Not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.32. CY 1989 NPDES Permit Number TN 002968

Cooling towers[a]

Parameter	No. samples	Discharge point	Concentration (mg/L)			Std. error
			Max	Min	Av	
		602				
Temperature, °C	4		30.0	23.0	26.0	1.6
pH, standard units	4		8.9	8.2	*b*	0.2
Free chlorine	4		0.22	<0.10	<0.15	0.03
Chromium	4		0.008	<0.006	<0.007	0.0004
Copper	4		0.025	0.010	0.015	0.003
Zinc	4		0.139	0.083	0.114	0.012
Flow, gal/d[c]	4		10800	8930	9828	403
		604				
Temperature, °C	4		23.6	15.1	17.8	2.0
pH, standard units	4		8.7	7.3	*b*	0.3
Free chlorine	4		0.17	<0.10	<0.12	0.02
Chromium	4		0.013	<0.006	<0.008	0.002
Copper	4		0.010	0.005	0.007	0.001
Zinc	4		0.764	0.174	0.403	0.127
Flow, gal/d[c]	4		10030	6640	8758	754
		610				
Temperature, °C	4		30.0	16.4	25.3	3.1
pH, standard units	4		8.8	8.3	*b*	0.1
Free chlorine	4		0.43	<0.10	<0.22	0.08
Chromium	4		0.010	0.006	0.008	0.001
Copper	4		0.028	0.020	0.025	0.002
Zinc	4		0.239	0.117	0.150	0.030
Flow, gal/d[c]	4		28830	10320	18045	3896
		612				
Temperature, °C	2		25.2	22.7	24.0	1.2
pH, standard units	2		8.4	8.2	*b*	0.1
Free chlorine	2		0.12	<0.10	<0.11	0.01
Chromium	2		0.006	<0.006	<0.006	0.000
Copper	2		0.021	0.014	0.018	0.003
Zinc	2		0.136	0.084	0.110	0.026
Flow, gal/d[c]	4		89310	0	55970	20686
		613				
Temperature, °C	4		27.1	21.4	24.6	1.4
pH, standard units	4		8.8	8.3	*b*	0.1
Free chlorine	4		0.40	<0.10	<0.20	0.07
Chromium	4		0.006	<0.006	<0.006	0.000
Copper	4		0.036	0.026	0.031	0.002
Zinc	4		0.148	0.072	0.109	0.019
Flow, gal/d[c]	4		37880	14850	26770	4996

Table 2.2.32 (continued)

Parameter	No. samples	Discharge point	Concentration (mg/L)			Std. error
			Max	Min	Av	
		615				
Temperature, °C	4		30.5	22.4	26.5	1.7
pH, standard units	4		8.9	6.6	*b*	0.6
Free chlorine	4		0.29	<0.10	<0.16	0.04
Chromium	4		0.060	<0.006	<0.020	0.013
Copper	4		0.103	0.010	0.035	0.023
Zinc	4		2.620	0.130	0.788	0.611
Flow, gal/d[c]	4		9	0	9	0
		617				
Temperature, °C	4		25.6	17.0	21.3	2.3
pH, standard units	4		8.8	8.2	*b*	0.1
Free chlorine	4		0.32	<0.10	<0.16	0.05
Chromium	4		0.044	<0.006	<0.017	0.009
Copper	4		0.030	0.017	0.025	0.003
Zinc	4		0.175	0.080	0.115	0.021
Flow, gal/d[c]	4		32750	12930	18980	4623
		618				
Temperature, °C	4		29.9	23.2	25.5	1.5
pH, standard units	4		8.8	8.2	*b*	0.2
Free chlorine	4		0.34	<0.10	<0.16	0.06
Chromium	4		0.007	<0.006	<0.007	0.0003
Copper	4		0.124	0.026	0.067	0.022
Zinc	4		0.284	0.064	0.137	0.050
Flow, gal/d[c]	4		22450	16110	19720	1361
		619				
Temperature, °C	4		26.5	15.2	21.0	2.3
pH, standard units	4		8.8	8.3	*b*	0.1
Free chlorine	4		1.46	<0.10	<0.55	0.32
Chromium	4		0.033	0.012	0.018	0.005
Copper	4		0.033	0.011	0.018	0.005
Zinc	4		0.153	0.096	0.124	0.012
Flow, gal/d[c]	4		15310	6230	9745	1946
		620				
Temperature, °C	4		25.0	12.6	19.4	3.1
pH, standard units	4		8.5	7.3	*b*	0.3
Free chlorine	4		2.90	0.14	1.26	0.59
Chromium	4		<0.006	<0.006	<0.006	0.000
Copper	4		0.020	0.005	0.012	0.003
Zinc	4		0.437	0.128	0.212	0.075
Flow, gal/d[c]	4		0	0	0	0

Table 2.2.32 (continued)

Parameter	No. samples	Discharge point	Concentration (mg/L)			Std. error
			Max	Min	Av	
		622				
Temperature, °C	4		27.8	18.6	24.6	2.1
pH, standard units	4		8.9	8.1	*b*	0.2
Free chlorine	4		0.36	<0.10	<0.19	0.06
Chromium	4		<0.006	<0.006	<0.006	0.000
Copper	4		0.027	0.009	0.018	0.004
Zinc	4		0.531	0.112	0.237	0.100
Flow, gal/d[c]	4		49640	12960	30453	9859
		624				
Temperature, °C	2		27.3	13.2	20.3	7.0
pH, standard units	2		8.6	8.4	*b*	0.1
Free chlorine	2		0.44	<0.10	<0.27	0.17
Chromium	2		0.006	<0.006	<0.006	0.000
Copper	2		0.015	0.012	0.014	0.002
Zinc	2		0.121	0.088	0.105	0.017
Flow, gal/d[c]	4		53110	0	18750	12562
		626				
Temperature, °C	4		28.6	14.2	21.5	3.3
pH, standard units	4		8.9	7.1	*b*	0.4
Free chlorine	4		0.34	<0.10	<0.17	0.06
Chromium	4		0.034	0.024	0.029	0.002
Copper	4		0.097	0.025	0.048	0.017
Zinc	3		0.642	0.055	0.275	0.185
Flow, gal/d[c]	4		48220	16400	25815	7504
		628				
Temperature, °C	2		24.1	20.5	22.3	1.8
pH, standard units	2		8.5	8.0	*b*	0.3
Free chlorine	2		0.10	<0.10	<0.10	0.00
Chromium	2		0.032	0.010	0.021	0.011
Copper	2		0.037	0.013	0.025	0.012
Zinc	2		0.182	0.068	0.125	0.057
Flow, gal/d[c]	4		2740	0	685	685
		630				
Temperature, °C	3		26.9	22.0	25.1	1.6
pH, standard units	3		8.5	7.9	*b*	0.2
Free chlorine	3		0.32	<0.10	<0.19	0.07
Chromium	3		0.026	<0.006	<0.013	0.007
Copper	3		0.021	<0.002	<0.011	0.005
Zinc	3		0.253	0.101	0.191	0.046
Flow, gal/d[c]	4		15990	0	7572	4086

Table 2.2.32 (continued)

Parameter	No. samples	Discharge point	Concentration (mg/L)			Std. error
			Max	Min	Av	
		632				
Temperature, °C	1		23.7	23.7	23.7	0.0
pH, standard units	1		8.9	8.9	*b*	0.0
Free chlorine	1		0.32	0.32	0.32	0.00
Chromium	1		0.006	<0.006	<0.006	0.000
Copper	1		0.038	0.038	0.038	0.000
Zinc	1		0.066	0.066	0.066	0.000
Flow, gallons per day[c]	4		8690	0	3963	2309
		634				
Temperature, °C	2		23.6	16.8	20.2	3.4
pH, standard units	2		7.8	7.2	*b*	0.3
Free chlorine	2		0.10	<0.10	<0.10	0.00
Chromium	2		0.045	0.010	0.028	0.017
Copper	2		0.102	0.028	0.065	0.037
Zinc	2		2.370	0.293	1.332	1.039
Flow, gallons per day[c]	4		22870	0	11128	6429

[a]Y-12 Plant.
[b]Not applicable.
[c]Flow during operations and/or discharging.

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Discharge Point = 623[a]

Parameter	No. samples	Concentration (mg/L)			Std. error
		Max	Min	Av	
pH, standard units	53	8.70	7.4	NA[b]	0.04
Flow, gal/Mgd[c]	19	3.31	3.31	3.31	0.00

[a]Y-12 Plant, steam plant fly ash sluice water.
[b]NA = not applicable.
[c]Flow during operations and/or discharging.

Table 2.2.34. CY 1989 Permit Number TN 0002968

Category I Outfalls[a]

Outfall no.	No. samples	pH (units)			Std. error	Flow[b] (gal/d)			Std. error
		Max	Min	Av		Max	Min	Av	
1	1	8.2	8.2	NA[c]	0	17120	17120	17120	0
3	1	6.9	6.9	NA[c]	0	5922	5922	5922	0
6	1	7.6	7.6	NA[c]	0	3600	3600	3600	0
7	1	7.3	7.3	NA[c]	0	12500	12500	12500	0
9	1	8.2	8.2	NA[c]	0	9511	9511	9511	0
15	1	8.4	8.4	NA[c]	0	1141	1141	1141	0
17	1	7.9	7.9	NA[c]	0	79088	79088	79088	0
18	1	7.9	7.9	NA[c]	0	2282	2282	2282	0
19	1	7.8	7.8	NA[c]	0	1140	1140	1140	0
41	1	8.2	8.2	NA[c]	0	3044	3044	3044	0
44	1	8.2	8.2	NA[c]	0	11413	11413	11413	0
45	1	7.9	7.9	NA[c]	0	190	190	190	0
57	1	8.4	8.4	NA[c]	0	4506	4506	4506	0
170	1	4.3	4.3	NA[c]	0	150218	150218	150218	0
186	1	8.1	8.1	NA[c]	0	11413	11413	11413	0
193	1	7.6	7.6	NA[c]	0	4150	4150	4150	0
194	1	8.1	8.1	NA[c]	0	761	761	761	0
198	1	8.2	8.2	NA[c]	0	7910	7910	7910	0
207	1	7.8	7.8	NA[c]	0	1522	1522	1522	0
221	1	7.7	7.7	NA[c]	0	133800	133800	133800	0
236	1	8.2	8.2	NA[c]	0	1141	1141	1141	0

[a]Y-12 Plant, Category I outfalls.
[b]Flow during operations and/or discharging.
[c]NA = not applicable.

Table 2.2.35. CY 1989 NPDES Permit Number TN 0002968

Category II outfalls[a]

Outfall No.	No. samples	pH (units)			Std. error	No. samples	Temperature (°C)			Std. error	No. samples	Flow[b] (gal/d)			Std. error
		Max	Min	Av			Max	Min	Av			Max	Min	Av	
16	3	8.4	7.8	NA[c]	0.2	3	21.1	9.2	13.8	3.7	3	15218	2282	6974.7	4134.8
20	4	8.3	7.3	NA	0.4	4	23.6	7.3	15.7	3.9	4	22827	550	7461.3	5258.7
23	2	7.9	7.2	NA	0.3	2	33.4	13.1	23.3	10.1	2	1141	126	633.5	507.5
25	2	8.5	7.0	NA	0.7	2	34.0	32.1	33.1	0.9	2	115	95	105.0	10.0
26	1	7.6	7.6	NA	0.0	1	32.1	32.1	32.1	0.0	1	13	13	13.0	0.0
35	4	8.2	6.5	NA	0.4	4	22.4	16.4	19.2	1.4	4	13316	380	4978.3	3043.5
43	2	7.8	6.6	NA	0.6	2	19.4	11.5	15.5	3.9	2	1522	1141	1331.5	190.5
46	2	8.4	8.1	NA	0.2	2	35.3	22.7	29.0	6.3	2	5707	570	3138.5	2568.5
53	1	7.2	7.2	NA	0.0	1	8.7	8.7	8.7	0.0	1	200	200	200.0	0.0
54	4	8.8	8.2	NA	0.1	4	26.7	15.6	20.2	2.4	4	114130	190	46447.3	24353.5
58	4	8.2	6.7	NA	0.4	4	22.8	6.9	14.7	3.8	4	1148	380	572.0	192.0
60	4	8.1	6.8	NA	0.3	4	23.4	11.8	18.9	2.5	4	1522	95	546.8	330.4
66	3	7.9	7.4	NA	0.1	3	22.6	15.5	18.9	2.1	3	127	63	95.0	18.5
68	3	8.5	7.4	NA	0.3	3	34.2	8.9	21.2	7.3	3	560	120	290.0	136.5
73	4	8.0	6.9	NA	0.2	4	16.2	11.9	13.7	1.0	4	16100	2282	8019.3	2815.1
75	1	8.0	8.0	NA	0.0	1	20.1	20.1	20.1	0.0	1	130	130	130.0	0.0
76	1	7.8	7.8	NA	0.0	1	18.2	18.2	18.2	0.0	1	32	32	32.0	0.0
77	2	8.5	7.1	NA	0.7	2	26.4	19.1	22.8	3.6	2	76088	57066	66577.0	9511.0
78	1	7.8	7.8	NA	0.0	1	16.2	16.2	16.2	0.0	1	95	95	95.0	0.0
81	1	8.4	8.4	NA	0.0	1	23.6	23.6	23.6	0.0	1	761	761	761.0	0.0
87	3	8.2	6.7	NA	0.5	3	20.9	8.3	13.2	3.9	3	3044	540	1378.0	833.0
95	1	7.9	7.9	NA	0.0	1	15.2	15.2	15.2	0.0	1	36	36	36.0	0.0
98	1	8.4	8.4	NA	0.0	1	22.6	22.6	22.6	0.0	1	95	95	95.0	0.0
111	2	8.4	8.1	NA	0.2	2	24.0	17.1	20.6	3.5	2	5707	127	2917.0	2790.0
112	1	8.3	8.3	NA	0.0	1	17.3	17.3	17.3	0.0	1	49	49	49.0	0.0
117	3	8.4	8.0	NA	0.1	3	31.6	22.8	26.9	2.6	3	1141	190	540.3	301.7
131	2	8.0	7.7	NA	0.1	2	10.5	7.4	9.0	1.5	2	32	16	24.0	8.0
133	3	7.9	7.7	NA	0.1	3	23.2	12.2	19.0	3.4	3	1522	200	954.3	392.9
144	2	7.8	7.7	NA	0.1	2	24.3	19.6	22.0	2.3	2	1141	200	670.5	470.5
185	4	8.2	7.7	NA	0.1	4	24.2	15.7	20.2	2.0	4	56102	5707	20369.5	12068.7
201	4	8.3	7.0	NA	0.3	4	22.8	12.1	17.7	2.2	4	6848	308	3120.5	1369.7
203	3	8.2	6.6	NA	0.5	3	20.5	11.5	16.1	2.6	3	2648	190	1706.3	765.5
204	3	8.1	6.8	NA	0.4	3	18.1	10.9	15.1	2.2	3	1553	400	1158.3	379.3
213	2	8.2	7.6	NA	0.3	2	21.5	11.7	16.6	4.9	2	2282	1141	1711.5	570.5
238	4	8.4	7.6	NA	0.2	4	24.6	9.2	17.7	3.6	4	15200	2282	7406.0	3152.8
239	4	8.4	7.6	NA	0.2	4	24.6	9.2	17.7	3.6	4	15200	2282	7406.0	3152.8
240	3	8.3	7.6	NA	0.2	3	24.6	9.2	18.8	4.8	3	15200	2282	9114.0	3747.7
241	3	8.4	7.6	NA	0.2	3	24.6	9.2	16.1	4.5	3	9860	2282	4808.0	2526.0

[a]Y-12 Plant, Category II outfalls. Note: All outfalls not listed did not discharge.
[b]Flow during operations and/or discharging.
[c]NA = not applicable.

Table 2.2.36. CY 1989 NPDES Permit Number TN 0002968

Category III outfalls[a]

Outfall No.	No samples	pH (units)			Std. error	Temperature (C)			Std. error	Flow[b] (gal/d)			Std. error
		Max	Min	Av		Max	Min	Av		Max	Min	Av	
2	4	7.8	7	NA[c]	0.2	19.1	8.7	13.9	2.4	273900	92500	196223	38574
71	4	7.9	7.2	NA	0.2	20.2	12.5	17.2	1.8	125543	95110	112196	6305
135	4	8.5	7	NA	0.3	29.6	21.8	25.6	1.9	1166000	330644	653811	183300
147	4	9.8	7.1	NA	0.6	24.1	14.5	19.0	2.1	6848	3044	5303	928
150	4	8.3	7.3	NA	0.2	26.1	18.1	23.6	1.8	4676500	700000	2871175	892734
157	3	8.4	6.7	NA	0.5	25.3	8.5	17.6	4.9	5707	24	2291	1738
160	4	8.4	7.6	NA	0.2	26.8	19.3	22.5	1.6	158700	42000	109025	24445
163	4	8.2	7.3	NA	0.2	26.3	19.5	23.0	1.7	854700	128600	426550	157028
169	4	8.6	7.2	NA	0.3	24.8	21	23.7	0.9	1881600	309900	1079975	349228
181	4	8	7.1	NA	0.2	22	13.9	19.4	1.9	5372000	161000	1569050	1270682
192	4	7	6.6	NA	0.1	24.7	13.1	18.6	2.5	29000	3044	14193	5416

[a]Y-12 Plant, Category III outfalls. Note: outfalls not listed did not discharge during this period.
[b]Flow during operations and/or discharging.
[c]NA = not applicable.

Table 2.2.37. CY 1989 NPDES Permit Number TN 002968

Category IV outfalls[a]

Outfall No.	No. samples	pH (units)			Std. error	Flow[b] (gal/d)			No. flows	Std. error
		Max	Min	Av		Max	Min	Av		
401	5	8.2	7.6	NA[c]	0.1					
402	0									NF[d]
403	53	8.1	4.7	NA	0.1	26.4	26.4	26.4	1	0.0
404	52	8.0	6.9	NA	0.04					
405	47	8.5	6.8	NA	0.05	0.05	0.05	0.05	1	0.0
406	16	8.7	6.5	NA	0.2	3.2	3.2	3.2	1	0.0
407	1	7.7	7.7	NA	0.0					
408	53	8.5	7.1	NA	0.04	2.6	2.6	2.6	1	0.0
409	51	10.6	6.5	NA	0.1					
410	22	8.5	6.9	NA	0.1					
411	48	7.9	7.0	NA	0.03					
412	52	8.0	6.8	NA	0.04	1.1	1.1	1.1	1	0.0
413	52	7.8	6.9	NA	0.03	1.0	1.0	1.0	1	0.0
414	53	8.0	6.8	NA	0.03	5.28	5.28	5.28	1	0.0
415	10	7.9	7.0	NA	0.1					
416	0									NF
417	0									NF
418	17	7.8	6.8	NA	0.1	5.28	5.28	5.28	1	0.0
419	3	7.6	7.4	NA	0.1					
420	0									NF
421	0									NF
422	1	7.0	7.0	NA	0.0					

[a]Y-12 Plant.
[b]Flow during operations and/or discharging.
[c]NA = not applicable.
[d]NF = no flow.

Table 2.2.38. CY 1989 NPDES Permit Number TN 002968

Miscellaneous Discharge Points[a]

Parameter	Outfall	No. samples	Concentration (mg/L)			Std. error
			Max	Min	Av	
Total suspended solids	702	1	25	25	25	0
pH, standard units		1	7.2	7.2	NA[c]	0
Total suspended solids	703	0	NF[b]	NF	NF	
pH, standard units		0	NF	NF	NF	
Total suspended solids	704	0	NF	NF	NF	
pH, standard units		0	NF	NF	NF	

[a]Y-12 Plant.
[b]NF = no flow.
[c]NA = not applicable.

Table 2.2.39. NPDES flows at ORNL in 1989

Serial # discharge	Effluent discharges	Flow[a] ($L \times 10^6$/d)		
X01	Sewage treatment plant	Av	0.88	(0.23)
		Max	1.87	(0.49)
X02	Coal yard runoff, final	Av	0.11	(0.029)
		Max	0.94	(0.25)
X03	1500 area	Av	0.077	(0.02)
X04	2000 area	Av	0.055	(0.015)
X06	3539 and 3540 ponds	Av	0.60	(0.16)
X06A	3539 and 3540 ponds	Av	0.72	(0.19)
X07	3544 Process Waste Plant	Av	0.74	(0.2)
		Max	1.16	(0.31)
X08	TRU waste basins	Av	0.0012	(0.00032)
X09	HFIR basins	Av	0.023	(0.006)
X09A	TRU/TURF/HFIR storage tanks	Av	0.009	(0.0024)
X11	3518 Acid Neutralization Facility	Av	0.18	(0.047)
X13	Melton Branch	Av	13.4	(3.54)
X14	White Oak Creek	Av	35.2	(9.29)
X15	White Oak Lake Dam	Av	51.4	(13.6)

[a]Flow in millions of gallons per day is given in parentheses.

Table 2.2.40. ORNL Sewage Treatment Plant (X01), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
BOD	3/week	24-h composite	3/week
TSS	3/week	24-h composite	3/week
Ammonia	3/week	24-h composite	3/week
Oil and grease	3/week	Grab	3/week
DO	5/week	Grab	5/week
Residual chlorine	3/week	Grab	3/week
Fecal coliform bacteria, geometric mean	3/week	Grab	3/week
Cyanide, total	Monthly	Grab	Monthly
Copper, total	Monthly	24-h composite	Monthly
Mercury, total	Monthly	24-h composite	Monthly
Silver, total	Monthly	24-h composite	Monthly
Zinc, total	Monthly	24-h composite	Monthly
Trichlorethylene	Monthly	Grab	Monthly
Dichlorobromomethane	Monthly	Grab	Monthly
Phenols, total	Monthly	Grab	Monthly

Table 2.2.41. ORNL coalyard runoff treatment facility (X02), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
pH	Weekly	Grab	Weekly
Temperature	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
TSS	Weekly	24-h composite	Weekly
Oil and grease	Weekly	Grab	Weekly
Chromium, total	Weekly	24-h composite	Weekly
Copper, total	Weekly	24-h composite	Weekly
Iron	Weekly	24-h composite	Weekly
Zinc, total	Weekly	24-h composite	Weekly
Sulfate	Monthly	24-h composite	Monthly
Arsenic, total	Weekly	24-h composite	Weekly
Cadmium, total	Weekly	24-h composite	Weekly
Lead, total	Weekly	24-h composite	Weekly
Manganese, total	Weekly	24-h composite	Weekly
Nickel, total	Weekly	24-h composite	Weekly
Selenium, total	Weekly	24-h composite	Weekly
Silver, total	Weekly	24-h composite	Weekly

Table 2.2.42. ORNL 1500 area (X03), 1989[a]

Parameter	Collection frequency	Type	Analysis frequency
Flow	Monthly	Continuous	Monthly
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
Temperature	2/month	Grab	2/month
TSS	2/month	24-h composite	2/month
TOC	2/month	Grab	2/month
Oil and grease	2/month	Grab	2/month
Phosphorus, total	2/month	24-h composite	2/month
Arsenic, total	2/month	24-h composite	2/month
Cadmium, total	2/month	24-h composite	2/month
Chromium, total	2/month	24-h composite	2/month
Copper, total	2/month	24-h composite	2/month
Iron	2/month	24-h composite	2/month
Lead, total	2/month	24-h composite	2/month
Nickel, total	2/month	24-h composite	2/month
Zinc, total	2/month	24-h composite	2/month

[a]**Note:** No discharge after May 1, 1989.

Table 2.2.43. ORNL 2000 area (X04), 1989[a]

Parameter	Collection frequency	Type	Analysis frequency
Flow	Monthly	Continuous	Monthly
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
Temperature	2/month	Grab	2/month
TSS	2/month	24-h composite	2/month
TOC	2/month	Grab	2/month
Oil and grease	2/month	Grab	2/month
Phosphorus, total	2/month	24-h composite	2/month
Arsenic, total	2/month	24-h composite	2/month
Cadmium, total	2/month	24-h composite	2/month
Chromium, total	2/month	24-h composite	2/month
Copper, total	2/month	24-h composite	2/month
Lead, total	2/month	24-h composite	2/month
Nickel, total	2/month	24-h composite	2/month
Silver, total	2/month	24-h composite	2/month
Zinc, total	2/month	24-h composite	2/month

[a]**Note:** No discharge after May 1, 1989.

Table 2.2.44. ORNL 3539 and 3540 ponds (X06), 1989[a]

Parameter	Collection frequency	Type	Analysis frequency
Flow	Per batch	Total volume	Per batch
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
Temperature	2/month	Grab	2/month
TSS	2/month	24-h composite	2/month
TOC	2/month	Grab	2/month
Oil and grease	2/month	Grab	2/month
Sulfate	2/month	24-h composite	2/month
Arsenic, total	2/month	24-h composite	2/month
Cadmium, total	2/month	24-h composite	2/month
Chromium, total	2/month	24-h composite	2/month
Copper, total	2/month	24-h composite	2/month
Lead, total	2/month	24-h composite	2/month
Nickel, total	2/month	24-h composite	2/month
Selenium, total	2/month	24-h composite	2/month
Zinc, total	2/month	24-h composite	2/month

[a]**Note:** No discharge after May 1, 1989.

Table 2.2.45. ORNL 3539 and 3540 ponds (X06A), 1989[a]

Parameter	Collection frequency	Type	Analysis frequency
Flow	Weekly	Continuous	Weekly
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
Temperature	2/month	Grab	2/month
TSS	2/month	24-h composite	2/month
TOC	2/month	Grab	2/month
Oil and grease	2/month	Grab	2/month
Sulfate	2/month	Grab	2/month
Phosphorous	2/month	Grab	2/month
Arsenic, total	2/month	Grab	2/month
Cadmium, total	2/month	Grab	2/month
Chromium, total	2/month	Grab	2/month
Copper, total	2/month	Grab	2/month
Iron, total	2/month	Grab	2/month
Lead, total	2/month	Grab	2/month
Mercury, total	2/month	Grab	2/month
Nickel, total	2/month	Grab	2/month
Selenium, total	2/month	Grab	2/month
Silver, total	2/month	Grab	2/month
Zinc, total	2/month	Grab	2/month

[a]ORNL 1500 Area, ORNL 2000 Area, and ORNL 3539 and 3540 ponds were combined to form X06A, May 1, 1989.

Table 2.2.46. ORNL Process Waste Treatment Plant (X07), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
Temperature	2/month	Grab	2/month
TSS	2/month	24-h composite	2/month
TOC	2/month	Grab	2/month
TTO	2/month	Grab	2/month
Oil and grease	2/month	Grab	2/month
Nitrate, as N	2/month	24-h composite	2/month
Sulfate	2/month	24-h composite	2/month
Arsenic, total	2/month	24-h composite	2/month
Cadmium, total	2/month	24-h composite	2/month
Chromium, total	2/month	24-h composite	2/month
Copper, total	2/month	24-h composite	2/month
Lead, total	2/month	24-h composite	2/month
Nickel, total	2/month	24-h composite	2/month
Silver, total	2/month	24-h composite	2/month
Zinc, total	2/month	24-h composite	2/month

Table 2.2.47. ORNL TRU/TURF process waste basin (X08), 1989[a]

Parameter	Collection frequency	Type	Analysis frequency
Flow	Per discharge	Total volume	Per discharge
pH	1/discharge	Grab	1/discharge
Downstream pH	1/discharge	Grab	1/discharge
Temperature	1/discharge	Grab	1/discharge
TSS	1/discharge	Grab	1/discharge
TOC	1/discharge	Grab	1/discharge
Oil and grease	1/discharge	Grab	1/discharge
Nitrate, as N	1/discharge	Grab	1/discharge
Sulfate	1/discharge	Grab	1/discharge
Arsenic, total	1/discharge	Grab	1/discharge
Cadmium, total	1/discharge	Grab	1/discharge
Chromium, total	1/discharge	Grab	1/discharge
Copper, total	1/discharge	Grab	1/discharge
Lead, total	1/discharge	Grab	1/discharge
Nickel, total	1/discharge	Grab	1/discharge
Zinc, total	1/discharge	Grab	1/discharge

[a]Last discharge, May 26, 1989.

Table 2.2.48. ORNL HFIR process waste basin (X09), 1989[a]

Parameter	Collection frequency	Type	Analysis frequency
Flow	Per discharge	Total volume	Per discharge
pH	1/discharge	Grab	1/discharge
Downstream pH	1/discharge	Grab	1/discharge
Temperature	1/discharge	Grab	1/discharge
TSS	1/discharge	Grab	1/discharge
TOC	1/discharge	Grab	1/discharge
Oil and grease	1/discharge	Grab	1/discharge
Nitrate, as N	1/discharge	Grab	1/discharge
Sulfate	1/discharge	Grab	1/discharge
Arsenic, total	1/discharge	Grab	1/discharge
Cadmium, total	1/discharge	Grab	1/discharge
Chromium, total	1/discharge	Grab	1/discharge
Copper, total	1/discharge	Grab	1/discharge
Lead, total	1/discharge	Grab	1/discharge
Nickel, total	1/discharge	Grab	1/discharge
Zinc, total	1/discharge	Grab	1/discharge

[a]Last discharge, May 26, 1989.

Table 2.2.49. TRU/TURF/HFIR Storage Tanks (X09A)—ORR, 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Per discharge	Volume	Per discharge
pH	1/discharge	Grab	1/discharge
Downstream pH	1/discharge	Grab	1/discharge
Temperature	1/discharge	Grab	1/discharge
TSS	1/discharge	Grab	1/discharge
TOC	1/discharge	Grab	1/discharge
Oil and grease	1/discharge	Grab	1/discharge
Nitrate, as N	1/discharge	Grab	1/discharge
Sulfate	1/discharge	Grab	1/discharge
Arsenic, total	1/discharge	Grab	1/discharge
Cadmium, total	1/discharge	Grab	1/discharge
Chromium, total	1/discharge	Grab	1/discharge
Copper, total	1/discharge	Grab	1/discharge
Lead, total	1/discharge	Grab	1/discharge
Nickel, total	1/discharge	Grab	1/discharge
Zinc, total	1/discharge	Grab	1/discharge

Table 2.2.50. ORNL 3518 Acid Neutralization Facility (X11), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Per discharge	Total volume	Per discharge
pH	Weekly	Grab	Weekly
Downstream pH	Weekly	Grab	Weekly
Temperature	2/month	Grab	2/month
TSS	2/month	Grab	2/month
TOC	Weekly	Grab	Weekly
Oil and grease	2/month	Grab	2/month
Nitrate, as N	Weekly	Grab	Weekly
Sulfate	Weekly	Grab	Weekly
Phosphorus, total	2/month	Grab	2/month
Arsenic, total	2/month	Grab	2/month
Cadmium, total	2/month	Grab	2/month
Chromium, total	2/month	Grab	2/month
Copper, total	2/month	Grab	2/month
Lead, total	2/month	Grab	2/month
Nickel, total	2/month	Grab	2/month
Zinc, total	2/month	Grab	2/month

Table 2.2.51. ORNL Melton Branch (X13), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
TSS	Monthly	24-h composite	Monthly
Ammonia	Monthly	24-h composite	Monthly
BOD	Monthly	24-h composite	Monthly
TOC	Monthly	Grab	Monthly
pH	Monthly	Grab	Monthly
Fluoride	Monthly	24-h composite	Monthly
Nitrate	Monthly	24-h composite	Monthly
Phosphorus	Monthly	24-h composite	Monthly
Sulfate	Monthly	24-h composite	Monthly
Temperature	Monthly	Grab	Monthly
Conductivity	Monthly	Grab	Monthly
Turbidity	Monthly	Grab	Monthly
Phenols, total	Monthly	Grab	Monthly
DO	Weekly	Grab	Weekly
TDS	Monthly	Grab	Monthly
Oil and grease	Weekly	Grab	Weekly
Residual chlorine	Weekly	Grab	Weekly
Chloroform	Monthly	Grab	Monthly
Trichloroethylene	Monthly	Grab	Monthly
PCB	Monthly	24-h composite	Monthly
Aluminum, total	Monthly	24-h composite	Monthly
Arsenic, total	Monthly	24-h composite	Monthly
Cadmium, total	Monthly	24-h composite	Monthly
Chromium, total	Monthly	24-h composite	Monthly
Copper, total	Monthly	24-h composite	Monthly
Iron, total	Monthly	24-h composite	Monthly
Lead, total	Monthly	24-h composite	Monthly
Manganese, total	Monthly	24-h composite	Monthly
Mercury, total	Monthly	24-h composite	Monthly
Nickel, total	Monthly	24-h composite	Monthly
Silver, total	Monthly	24-h composite	Monthly
Zinc, total	Monthly	24-h composite	Monthly

Table 2.2.52. ORNL White Oak Creek (X14), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
TSS	Monthly	24-h composite	Monthly
Ammonia	Monthly	24-h composite	Monthly
BOD	Monthly	24-h composite	Monthly
TOC	Monthly	Grab	Monthly
pH	Monthly	Grab	Monthly
Fluoride	Monthly	24-h composite	Monthly
Nitrate	Monthly	24-h composite	Monthly
Phosphorus	Monthly	24-h composite	Monthly
Sulfate	Monthly	24-h composite	Monthly
Temperature	Monthly	Grab	Monthly
Conductivity	Monthly	Grab	Monthly
Turbidity	Monthly	Grab	Monthly
Phenols, total	Monthly	Grab	Monthly
DO	Weekly	Grab	Weekly
TDS	Monthly	Grab	Monthly
Oil and grease	Weekly	Grab	Weekly
Residual chlorine	Weekly	Grab	Weekly
Chloroform	Monthly	Grab	Monthly
Trichloroethylene	Monthly	Grab	Monthly
PCB	Monthly	24-h composite	Monthly
Aluminum, total	Monthly	24-h composite	Monthly
Arsenic, total	Monthly	24-h composite	Monthly
Cadmium, total	Monthly	24-h composite	Monthly
Chromium, total	Monthly	24-h composite	Monthly
Copper, total	Monthly	24-h composite	Monthly
Iron, total	Monthly	24-h composite	Monthly
Lead, total	Monthly	24-h composite	Monthly
Manganese, total	Monthly	24-h composite	Monthly
Mercury, total	Monthly	24-h composite	Monthly
Nickel, total	Monthly	24-h composite	Monthly
Silver, total	Monthly	24-h composite	Monthly
Zinc, total	Monthly	24-h composite	Monthly

Table 2.2.53. ORNL White Oak Lake (X15), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
TSS	Monthly	24-h composite	Monthly
Ammonia	Monthly	24-h composite	Monthly
BOD	Monthly	24-h composite	Monthly
TOC	Monthly	Grab	Monthly
pH	Monthly	Grab	Monthly
Fluoride	Monthly	24-h composite	Monthly
Nitrate	Monthly	24-h composite	Monthly
Phosphorus	Monthly	24-h composite	Monthly
Sulfate	Monthly	24-h composite	Monthly
Temperature	Monthly	Grab	Monthly
Conductivity	Monthly	Grab	Monthly
Turbidity	Monthly	Grab	Monthly
Phenols, total	Monthly	Grab	Monthly
DO	Weekly	Grab	Weekly
TDS	Monthly	Grab	Monthly
Oil and grease	Weekly	Grab	Weekly
Residual chlorine	Weekly	Grab	Weekly
Chloroform	Monthly	Grab	Monthly
Trichloroethylene	Monthly	Grab	Monthly
PCB	Monthly	24-h composite	Monthly
Aluminum, total	Monthly	24-h composite	Monthly
Arsenic, total	Monthly	24-h composite	Monthly
Cadmium, total	Monthly	24-h composite	Monthly
Chromium, total	Monthly	24-h composite	Monthly
Copper, total	Monthly	24-h composite	Monthly
Iron, total	Monthly	24-h composite	Monthly
Lead, total	Monthly	24-h composite	Monthly
Manganese, total	Monthly	24-h composite	Monthly
Mercury, total	Monthly	24-h composite	Monthly
Nickel, total	Monthly	24-h composite	Monthly
Silver, total	Monthly	24-h composite	Monthly
Zinc, total	Monthly	24-h composite	Monthly

Table 2.2.54. ORNL category I outfalls (storm drains), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Yearly	Instantaneous	Yearly
pH	Yearly	Grab	Yearly
Temperature	Yearly	Grab	Yearly
Oil and grease	Yearly	Grab	Yearly
TSS	Yearly	Grab	Yearly

Table 2.2.55. ORNL category II outfalls (parking lot drains, storage area drains, once-through water, condensate), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Quarterly	Instantaneous	Quarterly
pH	Quarterly	Grab	Quarterly
Temperature	Quarterly	Grab	Quarterly
Oil and grease	Quarterly	Grab	Quarterly
TSS	Quarterly	Grab	Quarterly

Table 2.2.56. ORNL category III outfalls (process and/or lab drains), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Quarterly	Instantaneous	Quarterly
pH	Quarterly	Instantaneous	Quarterly

Table 2.2.57. ORNL paint facility (PF7007), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Per discharge	Volume	Per discharge
pH	1/month	Grab	Per discharge
Oil and grease	1/month	Grab	Per discharge
TSS	1/month	Grab	Per discharge
Phenols, total	1/quarter	Grab	Per discharge

Note: No discharges during 1989.

Table 2.2.58. ORNL steam plant (SP2519), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Quarterly	*a*	Quarterly
Temperature	Quarterly	Grab	Quarterly
pH	Quarterly	Grab	Quarterly

[a]Not applicable.

Table 2.2.59. ORNL vehicle cleaning facilities (VC7002), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
pH	1/month	Grab	1/month
Oil and grease	1/month	Grab	1/month
TSS	1/month	Grab	1/month
Phenols, total	1/month	Grab	1/month
BOD	1/month	Grab	1/month
Fecal coliform bacteria	1/month	Grab	1/month

Table 2.2.60. ORNL equipment maintenance facility (EF7002), 1989

Parameter	Collection frequency	Type	Analysis frequency
Oil and grease	Quarterly	Grab	Quarterly
pH	Quarterly	Grab	Quarterly

Table 2.2.61. ORNL cooling systems (cooling tower blowdown), 1989

Parameter	Collection frequency	Type	Analysis frequency
Flow	Quarterly	*a*	Quarterly
Chromium, total	Quarterly	Grab	Quarterly
Zinc, total	Quarterly	Grab	Quarterly
Copper, total	Quarterly	Grab	Quarterly
Temperature	Quarterly	Grab	Quarterly
Residual chlorine	During addition	Grab	During addition

[a]Not applicable.

Table 2.2.62. NPDES Permit Number TN 0002941, 1989
Discharge point X01 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Ammonia, as N	156	1.3	0.0060	0.081	0.011
BOD	156	<5.0	<5.0	<5.0	0
Bromodichloromethane	11	<0.0050	J0.00090	J0.0022	0.00045
Chlorine, total residual	156	0.49	<0.010	<0.28	0.010
Copper, total	12	0.060	<0.0040	<0.016	0.0043
Cyanide, total	12	<0.0020	<0.0020	<0.0020	0
Downstream pH, standard units	52	8.1	6.7	*b*	*b*
Fecal coliform, col./100 mL	157	190	<1.0	<1.4[c]	1.1
Flow, Mgd	251	0.49	0.096	0.23	0.0040
Mercury, total	12	0.00099	<0.000050	<0.00017	0.000077
Oil and grease	156	160	<2.0	<3.3	1.0
Oxygen, dissolved	249	14	6.0	8.2	0.090
pH, standard units	52	8.0	6.6	*b*	*b*
Recoverable phenolics, total	12	0.0020	<0.0010	<0.0011	0.000083
Silver, total	12	<0.0060	<0.0050	<0.0052	0.00012
TSS	156	73	<2.0	<6.4	0.61
Trichloroethene	11	<0.0050	J0.00080	J0.0046	0.00038
Zinc, total	12	0.11	0.025	0.069	0.0056

[a]< = Undetected; J = below detection limit, but estimated.
[b]Not applicable.
[c]Geometric mean.

Table 2.2.63. NPDES Permit Number TN 0002941, 1989
Discharge point X02 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	52	0.29	0.033	0.13	0.0089
Cadmium, total	52	0.017	<0.0020	<0.0048	0.00063
Chromium, total	52	0.041	<0.0030	<0.012	0.0013
Copper, total	52	0.067	<0.0040	<0.012	0.0013
Downstream pH, standard units	247	8.9	6.4	*b*	*b*
Flow, Mgd	249	0.25	0	0.029	0.0024
Iron, total	52	4.7	<0.010	<0.21	0.089
Lead, total	52	<0.050	<0.030	<0.036	0.0013
Manganese, total	52	0.097	<0.0020	<0.024	0.0028
Nickel, total	52	0.021	<0.0050	<0.010	0.00081
Oil and grease	52	120	<2.0	<5.4	2.4
pH, standard units	247	11	3.1	*b*	*b*
Selenium, total	52	<0.080	<0.030	<0.066	0.0023
Silver, total	52	0.021	<0.0040	<0.0058	0.00032
Sulfate, as SO_4	12	1900	580	1100	110
TSS	52	24	<2.0	<6.7	0.62
Temperature, °C	247	30	3.0	17	0.45
Zinc, total	52	0.16	<0.0080	<0.026	0.0037

[a]< = Undetected.
[b]Not applicable.

Table 2.2.64. NPDES Permit Number TN 0002941, 1989
Discharge point X03 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	8	<0.060	<0.050	<0.056	0.0018
Cadmium, total	8	0.016	<0.0020	<0.0062	0.0019
Chromium, total	8	0.050	<0.0050	<0.020	0.0062
Copper, total	8	0.020	0.0050	0.011	0.0015
Downstream pH, standard units	17	7.9	5.8	*b*	*b*
Flow, Mgd	4	0.041	0.0094	0.020	0.0073
Iron, total	8	0.19	<0.0040	<0.065	0.022
Lead, total	8	<0.055	<0.050	<0.051	0.00063
Nickel, total	8	0.033	<0.0050	<0.012	0.0034
Oil and grease	8	5.0	<2.0	<2.6	0.42
Organic carbon, total	8	4.5	3.3	3.9	0.14
pH, standard units	17	8.1	3.4	*b*	*b*
Phosphorus, total	8	0.68	0.30	0.49	0.049
TSS	8	<5.0	<5.0	<5.0	0
Temperature, °C	17	23	11	16	0.71
Zinc, total	8	0.18	0.040	0.11	0.015

[a]< = Undetected.
[b]Not applicable.

Table 2.2.65. NPDES Permit Number TN 0002941, 1989 Discharge point X04 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	8	0.060	<0.050	<0.059	0.0013
Cadmium, total	8	0.018	<0.0020	<0.0068	0.0022
Chromium, total	8	0.020	<0.0050	<0.011	0.0018
Copper, total	8	0.016	<0.0040	<0.010	0.0012
Downstream pH, standard units	17	8.0	6.9	*b*	*b*
Flow, Mgd	3	0.034	0.00049	0.015	0.010
Lead, total	8	0.23	<0.050	<0.073	0.023
Nickel, total	8	0.017	<0.0050	<0.0090	0.0017
Oil and grease	8	10	<2.0	<4.6	1.2
Organic carbon, total	8	2.2	1.2	1.6	0.11
pH, standard units	17	8.2	6.1	*b*	*b*
Phosphorus, total	8	0.50	0.20	0.33	0.037
Silver, total	8	0.029	<0.0050	<0.0085	0.0029
TSS	8	<5.0	<5.0	<5.0	0
Temperature, °C	17	21	9.8	14	0.64
Zinc, total	8	0.17	0.025	0.11	0.018

[a]< = Undetected.
[b]Not applicable.

Table 2.2.66. NPDES Permit No. TN 0002941, 1989 Discharge point X06 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	8	<0.060	0.040	0.055	0.0027
Cadmium, total	8	0.022	<0.0020	<0.0074	0.0026
Chromium, total	8	0.11	<0.010	<0.037	0.012
Copper, total	8	0.15	<0.010	<0.043	0.016
Downstream pH, standard units	17	8.2	6.5	*b*	*b*
Flow, Mgd	4	0.17	0.15	0.16	0.0039
Lead, total	8	0.13	<0.050	<0.069	0.012
Nickel, total	8	0.017	<0.0050	<0.012	0.0016
Oil and grease	8	3.0	<2.0	<2.1	0.13
Organic carbon, total	8	6.3	2.6	4.3	0.50
pH, standard units	17	8.1	6.2	*b*	*b*
Selenium, total	8	<0.060	<0.030	<0.054	0.0038
Sulfate, as SO_4	8	35	22	30	1.9
TSS	8	22	<5.0	<7.1	2.1
Temperature, °C	17	21	11	15	0.68
Zinc, total	8	0.13	0.059	0.10	0.010

[a]< = Undetected.
[b]Not applicable.

Table 2.2.67. NPDES Permit Number TN 0002941, 1989
Discharge point X06A at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	16	<0.050	<0.050	<0.050	0
Cadmium, total	16	0.069	<0.0020	<0.0077	0.0042
Chromium, total	16	0.025	<0.0030	<0.0087	0.0018
Copper, total	16	0.095	0.017	0.054	0.0065
Downstream pH, standard units	35	8.3	6.9	*b*	*b*
Flow, Mgd	13	0.23	0.12	0.19	0.0077
Iron, total	16	1.5	0.043	0.20	0.089
Lead, total	16	0.088	<0.030	<0.034	0.0036
Mercury, total	16	0.0035	0.00050	0.0014	0.00021
Nickel, total	16	<0.020	<0.0060	<0.0087	0.0014
Oil and grease	16	5.0	<2.0	<2.3	0.19
Organic carbon, total	16	10	2.0	4.8	0.51
pH, standard units	35	8.6	6.5	*b*	*b*
Phosphorus, total	16	0.60	0.30	0.43	0.024
Selenium, total	16	<0.080	<0.040	<0.073	0.0040
Silver, total	16	0.036	<0.0050	<0.0096	0.0020
Sulfate, as SO_4	16	30	23	26	0.45
TSS	16	<5.0	<5.0	<5.0	0
Temperature, °C	35	25	12	20	0.59
Zinc, total	16	1.0	0.060	0.17	0.056

[a]< = Undetected.
[b]Not applicable.

Table 2.2.68. NPDES Permit Number TN 0002941, 1989
Discharge point X07 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	24	<0.060	<0.050	<0.052	0.00085
Cadmium, total	24	0.018	<0.0020	<0.0044	0.00087
Chromium, total	24	0.030	<0.0030	<0.0083	0.0014
Copper, total	24	0.019	<0.0040	<0.0094	0.00060
Downstream pH, standard units	52	8.2	6.3	*b*	*b*
Flow, Mgd	249	0.31	0.0063	0.20	0.0035
Lead, total	24	<0.050	<0.030	<0.037	0.0020
Nickel, total	24	0.029	<0.0050	<0.0099	0.0013
Nitrate	24	37	<5.0	<7.3	1.3
Oil and grease	24	3.0	<2.0	<2.0	0.042
Organic carbon, total	24	2.4	0.40	1.5	0.091
pH, standard units	52	8.8	6.2	*b*	*b*
Silver, total	24	<0.0060	<0.0050	<0.0051	0.000069
Sulfate, as SO_4	24	770	100	290	30
TSS	24	11	<5.0	<5.3	0.26
Temperature, °C	52	28	9.2	19	0.76
Total toxic organics	24	0.091	0	0.017	0.0041
Zinc, total	24	0.027	0.0040	0.013	0.0014

[a]< = Undetected.
[b]Not applicable.

Table 2.2.69. NPDES Permit Number TN 0002941, 1989
Discharge point X08 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	1	<0.050	<0.050	<0.050	*b*
Cadmium, total	1	<0.0020	<0.0020	<0.0020	*b*
Chromium, total	1	0.12	0.12	0.12	*b*
Copper, total	1	0.092	0.092	0.092	*b*
Downstream pH, standard units	1	7.7	7.7	*b*	*b*
Flow, Mgd	1	0.00032	0.00032	0.00032	*b*
Lead, total	1	<0.030	<0.030	<0.030	*b*
Nickel, total	1	0.018	0.018	0.018	*b*
Nitrate	1	<0.50	<0.50	<0.50	*b*
Oil and grease	1	3.0	3.0	3.0	*b*
Organic carbon, total	1	80	80	80	*b*
pH, standard units	1	7.6	7.6	*b*	*b*
Sulfate, as SO_4	1	10	10	10	*b*
TSS	1	38	38	38	*b*
Temperature, °C	1	28	28	28	*b*
Zinc, total	1	0.77	0.77	0.77	*b*

[a]< = Undetected.
[b]Not applicable.

Table 2.2.70. NPDES Permit Number TN 0002941, 1989
Discharge point X09 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	9	0.096	<0.050	<0.062	0.0045
Cadmium, total	9	0.018	<0.0020	<0.0060	0.0020
Chromium, total	9	0.078	<0.0030	<0.020	0.0083
Copper, total	9	0.055	<0.010	<0.028	0.0059
Downstream pH, standard units	6	8.3	7.3	*b*	*b*
Flow, Mgd	9	0.0097	0.0032	0.0060	0.00065
Lead, total	9	<0.050	<0.030	<0.046	0.0029
Nickel, total	9	0.018	<0.0050	<0.0098	0.0017
Nitrate	9	7.9	<5.0	<5.4	0.32
Oil and grease	9	24	<2.0	<6.0	2.3
Organic carbon, total	9	8.1	2.1	4.4	0.55
pH, standard units	9	8.6	7.3	*b*	*b*
Sulfate, as SO_4	9	110	20	55	9.5
TSS	9	14	<5.0	<7.6	1.1
Temperature, °C	9	24	5.4	14	2.2
Zinc, total	9	0.11	<0.0080	<0.048	0.0096

[a]< = Undetected.
[b]Not applicable.

Table 2.2.71. NPDES Permit Number TN 0002941, 1989
Discharge point X09A at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	35	0.080	<0.050	<0.051	0.00087
Cadmium, total	35	0.014	<0.0020	<0.0039	0.00059
Chromium, total	35	0.031	<0.0030	<0.0093	0.0012
Copper, total	35	0.27	<0.0080	<0.10	0.0091
Downstream pH, standard units	35	9.6	6.5	*b*	*b*
Flow, Mgd	35	0.0037	0.0011	0.0024	0.000090
Lead, total	35	0.041	<0.030	<0.030	0.00032
Nickel, total	35	<0.020	<0.0060	<0.0090	0.00095
Nitrate	35	11	0.80	5.1	0.32
Oil and grease	35	5.0	<2.0	<2.1	0.10
Organic carbon, total	35	5.4	1.1	2.5	0.17
pH, standard units	35	11	6.5	*b*	*b*
Sulfate, as SO_4	35	240	22	47	7.8
TSS	35	51	2.0	8.3	1.8
Temperature, °C	35	32	13	24	0.94
Zinc, total	35	0.27	0.025	0.12	0.0087

[a]< = Undetected.
[b]Not applicable.

Table 2.2.72. NPDES Permit Number TN 0002941, 1989
Discharge point X11 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Arsenic, total	24	0.22	<0.050	<0.11	0.012
Cadmium, total	24	0.016	<0.0020	<0.0045	0.00086
Chromium, total	24	0.085	<0.0030	<0.025	0.0044
Copper, total	24	0.077	<0.010	<0.019	0.0030
Downstream pH, standard units	52	9.0	6.5	*b*	*b*
Flow, Mgd	12	0.29	0.014	0.047	0.022
Lead, total	24	<0.050	<0.030	<0.037	0.0020
Nickel, total	24	0.047	<0.0050	<0.013	0.0019
Nitrate	52	<50	2.5	6.1	0.88
Oil and grease	24	41	<2.0	<3.8	1.6
Organic carbon, total	52	8.5	0.70	4.5	0.29
pH, standard units	52	8.8	6.2	*b*	*b*
Phosphorus, total	24	5.9	0.60	3.4	0.36
Sulfate, as SO_4	52	2800	620	1700	87
TSS	24	46	<5.0	<19	2.3
Temperature, °C	52	26	13	19	0.50
Zinc, total	24	1.2	0.26	0.72	0.054

[a]< = Undetected.
[b]Not applicable.

Table 2.2.73. NPDES Permit Number TN 0002941, 1989
Discharge point X13 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Aluminum, total	12	7.1	<0.050	<1.1	0.56
Ammonia, as N	12	0.070	0.0090	0.030	0.0045
Arsenic, total	12	<0.060	<0.050	<0.052	0.0011
BOD	12	<5.0	<5.0	<5.0	0
Cadmium, total	12	<0.0020	<0.0020	<0.0020	0
Chlorine, total residual	52	<0.010	<0.010	<0.010	0
Chloroform	11	<0.025	J0.00050	J0.0056	0.0020
Chromium, total	12	0.027	<0.0030	<0.012	0.0022
Conductivity, mS/cm	12	1.4	0.10	0.61	0.14
Copper, total	12	0.23	<0.0040	<0.029	0.018
Dissolved solids, total	12	280	120	190	14
Flow, Mgd	249	73	0.40	3.5	0.57
Fluoride, total	12	1.0	<1.0	<1.0	0
Iron, total	12	10	0.12	1.1	0.81
Lead, total	12	0.010	<0.0040	<0.0046	0.00050
Manganese, total	12	2.1	<0.0020	<0.27	0.17
Mercury, total	12	0.00010	<0.000050	<0.000056	0.0000043
Nickel, total	12	<0.020	<0.0060	<0.0094	0.0015
Nitrate	12	<5.0	<5.0	<5.0	0
Oil and grease	52	88	<2.0	<7.0	2.3
Organic carbon, total	12	5.1	1.6	2.9	0.29
Oxygen, dissolved	52	15	5.1	9.3	0.30
PCB's, total	11	<0.00050	<0.00050	<0.00050	0
pH, standard units	12	8.0	6.5	*b*	*b*
Phosphorus, total	12	0.60	0.10	0.19	0.043
Recoverable phenolics, total	12	0.0030	<0.0010	<0.0015	0.00026
Silver, total	12	<0.0050	<0.0050	<0.0050	0
Sulfate, as SO_4	12	27	2	21	1.3
TSS	12	390	<5.0	<45	32
Temperature, °C	64	27	1.6	15	0.78
Trichloroethene	11	<0.025	J0.00030	J0.0046	0.0021
Turbidity, NTU	12	220	10	92	17
Zinc, total	12	0.16	<0.0080	<0.028	0.012

[a]< = Undetected; J = below detection limit, but estimated.
[b]Not applicable.

Table 2.2.74. NPDES Permit Number TN 0002941, 1989
Discharge point X14 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Aluminum, total	12	3.2	<0.050	<0.72	0.27
Ammonia, as N	12	0.10	0.018	0.041	0.0071
Arsenic, total	12	<0.060	<0.050	<0.052	0.0011
BOD	12	>34	<5.0	<7.4	2.4
Cadmium, total	12	<0.0020	<0.0020	<0.0020	0
Chlorine, total residual	52	<0.010	<0.010	<0.010	0
Chloroform	11	<0.025	J0.00060	J0.0055	0.0020
Chromium, total	12	0.035	<0.0030	<0.013	0.0026
Conductivity, mS/cm	12	1.8	0.20	0.79	0.15
Copper, total	12	0.15	<0.0040	<0.024	0.012
Dissolved solids, total	12	300	130	210	15
Flow, Mgd	249	81	0.98	9.3	0.51
Fluoride, total	12	1.0	<1.0	<1.0	0
Iron, total	12	4.1	0.088	0.66	0.32
Lead, total	12	0.0080	<0.0040	<0.0043	0.00033
Manganese, total	12	0.26	0.017	0.067	0.020
Mercury, total	12	0.00012	<0.000050	<0.000076	0.0000076
Nickel, total	12	<0.020	<0.0050	<0.0093	0.0015
Nitrate	12	<5.0	<5.0	<5.0	0
Oil and grease	52	42	<2.0	<3.9	0.85
Organic carbon, total	12	6.9	1.3	2.7	0.42
Oxygen, dissolved	52	19	6.0	9.1	0.34
PCBs, total	11	<0.00050	<0.00050	<0.00050	0
pH, standard units	12	8.5	6.5	*b*	*b*
Phosphorus, total	12	0.40	0.10	0.26	0.036
Recoverable phenolics, total	12	0.0040	<0.0010	<0.0013	0.00025
Silver, total	12	<0.0050	<0.0050	<0.0050	0
Sulfate, as SO_4	12	67	18	40	4.1
TSS	12	130	<5.0	<19	10
Temperature, °C	64	26	7.1	16	0.65
Trichloroethene	11	<0.025	J0.00060	J0.0060	0.0020
Turbidity, NTU	12	270	16	100	26
Zinc, total	12	0.13	<0.0080	<0.047	0.0088

[a]< = Undetected; J = below detection limit, but estimated.
[b]Not applicable.

Table 2.2.75. NPDES Permit Number TN 0002941, 1989
Discharge point X15 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max[a]	Min[a]	Av[a]	Std. error
Aluminum, total	12	2.8	<0.050	<0.86	0.22
Ammonia, as N	12	0.16	0.011	0.046	0.012
Arsenic, total	12	0.090	<0.050	<0.055	0.0034
BOD	12	>34	<5.0	<7.4	2.4
Cadmium, total	12	<0.0020	<0.0020	<0.0020	0
Chlorine, total residual	52	<0.010	<0.010	<0.010	0
Chloroform	11	<0.025	J0.0010	J0.0041	0.0021
Chromium, total	12	0.028	<0.0030	<0.016	0.0025
Conductivity, mS/cm	12	1.7	0.23	0.87	0.14
Copper, total	12	0.13	0.0050	0.019	0.010
Dissolved solids, total	12	240	140	200	9.4
Flow, Mgd	249	150	4.2	14	1.0
Fluoride, total	12	1.0	<1.0	<1.0	0
Iron, total	12	2.3	0.20	0.67	0.16
Lead, total	12	0.0040	<0.0040	<0.0040	0
Manganese, total	12	0.10	<0.0020	<0.060	0.0081
Mercury, total	12	0.00011	<0.000050	<0.000063	0.0000058
Nickel, total	12	<0.020	<0.0050	<0.010	0.0017
Nitrate	12	<5.0	<5.0	<5.0	0
Oil and grease	52	>200	<2.0	<10	4.3
Organic carbon, total	12	6.4	1.7	2.9	0.37
Oxygen, dissolved	52	14	4.0	8.5	0.29
PCBs, total	11	<0.00050	<0.00050	<0.00050	0
pH, standard units	12	8.9	6.7	*b*	*b*
Phosphorus, total	12	0.50	0.10	0.23	0.031
Silver, total	12	<0.0050	<0.0050	<0.0050	0
Sulfate, as SO_4	12	48	12	34	2.9
TSS	12	37	<5.0	<13	3.2
Temperature, °C	64	28	3.9	17	0.80
Trichloroethene	11	<0.025	J0.00070	J0.0064	0.0019
Turbidity, NTU	12	240	10	74	23
Zinc, total	12	0.040	<0.0080	<0.024	0.0036

[a]< = Undetected; J = below detection limit, but estimated.
[b]Not applicable.

Table 2.2.76. NPDES Permit Number TN 0002941, 1989 Discharge point EF7002 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max	Min	Av	Std. error
Oil and grease	4	310	9.0	100	72
pH, standard units	4	7.8	6.2	*a*	*a*

[a]Not applicable.

Table 2.2.77. NPDES Permit Number TN 0002941, 1989 Discharge point SP2519 at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max	Min	Av	Std. error
Flow, Mgd	4	0.011	0.000046	0.0051	0.0029
pH, standard units	4	10	7.7	*a*	*a*
Temperature, °C	4	49	21	31	6.1

[a]Not applicable.

Table 2.2.78. NPDES Permit Number TN 0002941, 1989 Discharge point VC7002 at ORNL

Parameter	No. of samples	Concentration[a] (mg/L)			
		Max	Min	Av	Std. error
BOD	11	>400	<5.0	<99	41
Fecal coliform, col./100 mL	11	>80000	<1.0	<8500	7200
Flow, Mgd	167	0.00044	0	0.000072	0.0000066
Oil and grease	11	1200	<2.0	<230	110
pH, standard units	12	11	5.3	*b*	*b*
Recoverable phenolics, total	11	7.5	<0.0010	<0.76	0.68
TSS	11	24000	<5.0	<5000	2800

[a]< = Undetected.
[b]Not applicable.

Table 2.2.79. NPDES Permit Number TN 0002941, 1989 Cooling systems at ORNL

Parameter	No. of samples	Concentration[a] (mg/L)			
		Max	Min	Av	Std. error
Chlorine, total residual	54	3.6	<0.010	<0.19	0.073
Chromium, total	54	0.49	<0.0030	<0.029	0.0091
Copper, total	54	2.4	<0.0040	<0.21	0.063
Downstream pH, standard units	43	9.0	7.4	*b*	*b*
Flow, Mgd	54	0.18	0.0010	0.019	0.0063
pH, standard units	54	9.0	7.5	*b*	*b*
Temperature, °C	54	33	9.9	23	0.63
Zinc, total	54	10	0.034	0.72	0.19

[a]< = Undetected.
[b]Not applicable.

Table 2.2.80. NPDES Permit Number TN 0002941, 1989 Category I outfalls at ORNL

Parameter	No. of samples	Concentration[a] (mg/L)			
		Max	Min	Av	Std. error
Downstream pH, standard units	25	8.8	6.9	*b*	*b*
Flow, Mgd	25	0.11	0.00014	0.012	0.0055
Oil and grease	25	210	<2.0	<19	8.5
pH, standard units	25	8.5	3.3	*b*	*b*
TSS	25	3700	<5.0	<300	160
Temperature, °C	25	38	15	21	0.81

[a]< = Undetected.
[b]Not applicable.

Table 2.2.81. NPDES Permit Number TN 0002941, 1989 Category II outfalls at ORNL

Parameter	No. of samples	Concentration[a] (mg/L)			
		Max	Min	Av	Std. error
Downstream pH, standard units	147	8.3	6.8	*b*	*b*
Flow, Mgd	147	0.26	0.000029	0.029	0.0036
Oil and grease	147	150	<2.0	<9.0	1.7
pH, standard units	147	8.5	6.2	*b*	*b*
TSS	147	1100	<5.0	<32	10
Temperature, °C	147	57	5.2	18	0.65

[a]< = Undetected.
[b]Not applicable.

Table 2.2.82. NPDES Permit Number TN 0002941, 1989 Category III outfalls at ORNL

Parameter	No. of samples	Concentration (mg/L)			
		Max	Min	Av	Std. error
Flow, Mgd	85	0.32	0.00014	0.027	0.0060
pH, standard units	85	8.4	4.6	*a*	*a*

[a]Not applicable.

Table 2.2.83. 1989 ORNL gross beta concentrations at category I and II outfalls.

Station	Date	Concentration (pCi/L)
	Category I Outfalls	
102	29 Sep	2.7
103	29 Sep	300
104	29 Sep	−11
106	29 Sep	35
108	29 Sep	−11
109	29 Sep	22
110	29 Sep	27
111	29 Sep	−22
113	29 Sep	−2.7
114	29 Sep	22
116	30 Sep	22
141	29 Sep	240
142	29 Sep	35
143	29 Sep	24
144	29 Sep	2.7
161	30 Sep	−19
162	30 Sep	−22
164	30 Sep	43
165	30 Sep	26000
168	30 Sep	54
169	30 Sep	−14
171	30 Sep	−8.1
172	30 Sep	11
173	30 Sep	11
191	29 Sep	24
	Category II Outfalls	
204	22 Sep	810
	27 Nov	4100
205	11 Sep	27
	27 Nov	18
206	22 Sep	41
207	11 Sep	140
	27 Nov	180
208	22 Sep	6.5
209	22 Sep	11
210	11 Sep	2.4
	27 Nov	3.5
211	11 Sep	1.1
	08 Dec	11
212	27 Nov	4.6
214	22 Sep	11
216	22 Sep	9.2
217	11 Sep	3.2
	27 Nov	7.6
218	11 Sep	6.2
	27 Nov	2.7
219	11 Sep	1.9
	27 Nov	6.8
222	15 Sep	10

Table 2.2.83 (continued)

Station	Date	Concentration (pCi/L)
223	11 Sep	4.3
	15 Sep	5.1
224	22 Sep	0.81
226	11 Sep	1.9
	27 Nov	−0.81
227	11 Sep	2.4
	27 Nov	5.1
230	15 Sep	6.5
231	15 Sep	2.7
	27 Nov	2.7
232	22 Sep	6.5
233	15 Sep	2.2
	27 Nov	4.9
234	15 Sep	12
	27 Nov	4.3
241	22 Sep	4.3
242	22 Sep	2.2
243	22 Sep	3.8
	08 Dec	−16
244	22 Sep	5.9
	08 Dec	22
245	22 Sep	3.0
247	15 Sep	14
	27 Nov	5.9
248	22 Sep	6.5
	08 Dec	−51
249	15 Sep	3.5
	27 Nov	8.4
250	15 Sep	3.0
	27 Nov	3.0
261	22 Sep	1.6
	27 Nov	23
262	22 Sep	1.1
	27 Nov	3.0
265	22 Sep	54
	27 Nov	76
266	22 Sep	3.2
267	22 Sep	7.6
	27 Nov	4.6
268	11 Sep	5.4
	27 Nov	4.9
281	15 Sep	11
	27 Nov	11
282	15 Sep	250
	27 Nov	190
283	22 Sep	1.9
	27 Nov	81
284	22 Sep	7.0
	27 Nov	13
285	21 Feb	35
	22 Sep	16
291	15 Sep	0.97
	08 Dec	24

Table 2.2.84. 1989 mercury concentrations in ORNL area surface water[a]

Station	Number of samples	Concentration (μg/L)				Percentage TWQ[b]
		Max	Min	Av	Std. error	
			First Creek			
141	6	<0.050	<0.050	<0.050	0	<2.1
142	6	<0.050	<0.050	<0.050	0	<2.1
143	6	<0.050	<0.050	<0.050	0	<2.1
241	6	<0.050	<0.050	<0.050	0	<2.1
243	6	<0.050	<0.050	<0.050	0	<2.1
244	6	<0.050	<0.050	<0.050	0	<2.1
246	6	0.060	<0.050	<0.052	0.0017	<2.2
247	6	<0.050	<0.050	<0.050	0	<2.1
248	6	<0.050	<0.050	<0.050	0	<2.1
341	6	0.39	<0.050	<0.21	0.071	<8.7
342	6	<0.050	<0.050	<0.050	0	<2.1
343	6	<0.050	<0.050	<0.050	0	<2.1
344	3	<0.050	<0.050	<0.050	0	<2.1
X12	6	<0.050	<0.050	<0.050	0	<2.1
Stream summary	81	0.39	<0.050	<0.062	0.0067	2.6
			Fifth Creek			
161	6	<0.050	<0.050	<0.050	0	<2.1
162	6	<0.050	<0.050	<0.050	0	<2.1
163	6	<0.050	<0.050	<0.050	0	<2.1
164	6	<0.050	<0.050	<0.050	0	<2.1
261	6	0.50	<0.050	<0.19	0.073	<8.0
262	6	<0.050	<0.050	<0.050	0	<2.1
265	6	<0.050	<0.050	<0.050	0	<2.1
268	6	<0.050	<0.050	<0.050	0	<2.1
361	6	<0.050	<0.050	<0.050	0	<2.1
362	6	<0.050	<0.050	<0.050	0	<2.1
363	6	0.60	0.10	0.30	0.099	13
364	6	<0.050	<0.050	<0.050	0	<2.1
365	6	<0.050	<0.050	<0.050	0	<2.1
366	6	<0.050	<0.050	<0.050	0	<2.1
367	6	3.7	<0.050	<1.5	0.68	<64
368	6	<0.050	<0.050	<0.050	0	<2.1
X10	3	<0.050	<0.050	<0.050	0	<2.1
Stream summary	99	3.7	<0.050	<0.16	0.053	6.8
			Melton Branch			
181	6	<0.050	<0.050	<0.050	0	<2.1
281	6	<0.050	<0.050	<0.050	0	<2.1
283	6	<0.050	<0.050	<0.050	0	<2.1
381	6	<0.050	<0.050	<0.050	0	<2.1
382	6	<0.050	<0.050	<0.050	0	<2.1
383	6	<0.050	<0.050	<0.050	0	<2.1
384	6	<0.050	<0.050	<0.050	0	<2.1
385	3	<0.050	<0.050	<0.050	0	<2.1
386	6	<0.050	<0.050	<0.050	0	<2.1

Table 2.2.84 (continued)

Station	Number of samples	Concentration (μg/L)				Percentage TWQ[b]
		Max	Min	Av	Std. error	
HDWTR	6	<0.050	<0.050	<0.050	0	<2.1
MBS	6	<0.050	<0.050	<0.050	0	<2.1
MHD	6	<0.050	<0.050	<0.050	0	<2.1
X08	3	<0.050	<0.050	<0.050	0	<2.1
X09	6	<0.050	<0.050	<0.050	0	<2.1
Stream summary	78	<0.050	<0.050	<0.050	0	2.1
		Northwest Tributary				
X03	3	<0.050	<0.050	<0.050	0	<2.1
Stream summary	3	<0.050	<0.050	<0.050	0	2.1
		White Oak Creek				
101	6	0.20	<0.050	<0.092	0.024	<3.8
103	6	0.070	<0.050	<0.057	0.0033	<2.4
106	6	0.070	<0.050	<0.055	0.0034	<2.3
109	6	<0.050	<0.050	<0.050	0	<2.1
116	6	<0.050	<0.050	<0.050	0	<2.1
202	6	0.70	<0.050	<0.33	0.13	<14
204	6	0.11	<0.050	<0.072	0.010	<3.0
206	6	1.0	0.060	0.39	0.17	16
207	6	0.20	<0.050	<0.10	0.031	<4.3
208	6	<0.050	<0.050	<0.050	0	<2.1
209	6	0.15	<0.050	<0.098	0.022	<4.1
210	6	0.060	<0.050	<0.052	0.0017	<2.2
216	6	<0.050	<0.050	<0.050	0	<2.1
217	6	<0.050	<0.050	<0.050	0	<2.1
218	6	<0.050	<0.050	<0.050	0	<2.1
222	6	<0.050	<0.050	<0.050	0	<2.1
223	6	<0.050	<0.050	<0.050	0	<2.1
230	6	<0.050	<0.050	<0.050	0	<2.1
232	6	<0.050	<0.050	<0.050	0	<2.1
233	6	<0.050	<0.050	<0.050	0	<2.1
234	6	<0.050	<0.050	<0.050	0	<2.1
301	6	0.10	0.050	0.062	0.0079	2.6
302	6	0.27	0.050	0.15	0.045	6.3
303	6	0.24	<0.050	<0.10	0.031	<4.2
304	6	3.3	0.38	1.2	0.50	49
305	6	0.10	0.050	0.065	0.0096	2.7
306	6	0.080	<0.050	<0.065	0.0067	<2.7
307	6	<0.050	<0.050	<0.050	0	<2.1
308	6	0.10	<0.050	<0.068	0.0087	<2.8
309	6	0.70	0.090	0.35	0.12	15
310	6	0.060	<0.050	<0.052	0.0017	<2.2
311	6	<0.050	<0.050	<0.050	0	<2.1
312	6	<0.050	<0.050	<0.050	0	<2.1
313	6	<0.050	<0.050	<0.050	0	<2.1
314	6	<0.050	<0.050	<0.050	0	<2.1
7500	6	<0.050	<0.050	<0.050	0	<2.1

Table 2.2.84 (continued)

Station	Number of samples	Concentration (μg/L)				Percentage TWQ[b]
		Max	Min	Av	Std. error	
FLUME	6	0.10	<0.050	<0.075	0.011	<3.1
HDW	6	<0.050	<0.050	<0.050	0	<2.1
LSC	6	0.080	<0.050	<0.055	0.0050	<2.3
WOD	6	<0.050	<0.050	<0.050	0	<2.1
X01	6	<0.050	<0.050	<0.050	0	<2.1
X02	6	0.090	<0.050	<0.065	0.0072	<2.7
X03	3	<0.050	<0.050	<0.050	0	<2.1
X04	6	0.10	<0.050	<0.075	0.011	<3.1
X06	6	0.80	<0.050	<0.43	0.17	<18
X07	6	0.14	<0.050	<0.093	0.019	<3.9
X11	6	0.10	0.050	0.075	0.011	3.1
Stream summary	279	3.3	<0.050	<0.11	0.016	4.7
Overall summary	540	3.7	<0.050	<0.11	0.013	4.4

[a]See Figs. 2.2.9–2.2.11 in Vol. 1.

[b]Percentage of proposed Tennessee Water Quality Standards for the protection of fish and aquatic life.

Table 2.2.85. 1989 NPDES Permit Number TN 0002950
Discharge Point K-1700 at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
1,1,1-Trichloroethane, μg/L	117	39	<5	<5	3.78
1,1,2,2-Tetrachloroethane, μg/L	117	<5	<5	<5	0
1,1,2-Trichloroethane, μg/L	117	<5	<5	<5	0
1,1-Dichloroethane, μg/L	117	6	<5	<5	1.43
1,1-Dichloroethene, μg/L	117	14	<5	<5	1.71
1,2-Dichloroethane, μg/L	117	<5	<5	<5	0
1,2-Dichloropropane, μg/L	117	<5	<5	<5	0
2-Butanone, μg/L	1	<10	<10	<10	0
2-Chloroethylvinyl ether, μg/L	116	<10	<10	<10	0
2-Hexanone, μg/L	1	<10	<10	<10	0
4-Methyl-2-pentatone, μg/L	1	<10	<10	<10	0
Acetone, μg/L	1	<10	<10	<10	0
Aluminum, mg/L	114	9.4	<0.1	<0.660	1.30
Arsenic, mg/L	1	<0.005	<0.005	<0.005	0
Barium, mg/L	1	<0.1	<0.1	<0.1	0
Benzene, μg/L	117	5	<5	<5	0.57
Beryllium, mg/L	115	<0.001	<0.0003	<0.001	0
Boron, mg/L	1	0.072	0.072	0.072	0
Bromodichloromethane, μg/L	117	5	<5	<5	0.77
Bromoform, μg/L	117	<5	<5	<5	0
Bromomethane, μg/L	117	<10	<10	<10	0
Cadmium, mg/L	115	0.003	<0.002	<0.002	0
Calcium, mg/L	1	36	36	36	0
Carbon disulfide, μg/L	1	<5	<5	<5	0
Carbon tetrachloride, μg/L	117	<5	<5	<5	0
Chemical oxygen demand, mg/L	229	159	<4	<7.449	10.57
Chlorobenzene, μg/L	117	5	<5	<5	0.18
Chloroethane, μg/L	117	<10	<10	<10	0
Chloroform, μg/L	117	10	<5	<5	1.72
Chloromethane, μg/L	117	<10	<10	<10	0
Chromium, mg/L	115	0.025	<0.01	<0.010	0
Cis-1,3-dichloropropene, μg/L	117	<5	<5	<5	0
Cobalt, mg/L	1	<0.1	<0.1	<0.1	0
Copper, mg/L	1	0.011	0.011	0.011	0
Dibromochloromethane, μg/L	117	<5	<5	<5	0
Dissolved solids, mg/L	115	996	80	377.339	194.50
Ethyl benzene, μg/L	117	<5	<5	<5	0
Fluoride, mg/L	113	1.7	0.1	0.388	0.34
Iron, mg/L	2	3.2	0.84	2.020	1.67
Lead, mg/L	115	0.4	<0.004	<0.008	0.04
Lithium, mg/L	1	0.0054	0.0054	0.005	0
Magnesium, mg/L	1	5.9	5.9	5.9	0
Manganese, mg/L	1	0.093	0.093	0.093	0
MBAS, mg/L	1	<0.2	<0.2	<0.2	0
Mercury, mg/L	115	<0.00065	<0.0002	<0.001	0
Methylene chloride, μg/L	117	5	<5	<5	1.23
Molybdenum, mg/L	1	<0.01	<0.01	<0.01	0
Nickel, mg/L	1	<0.05	<0.05	<0.05	0
Niobium, mg/L	1	<0.007	<0.007	<0.007	0

Table 2.2.85 (Continued)

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Nitrate nitrogen, mg/L	113	4	0.2	0.476	0.48
Oil and grease, mg/L	117	<2	<2	<2	0
pH, units	388	8.6	2.8	NA[a]	NA
Phosphorus, mg/L	1	<0.2	<0.2	<0.2	0
Potassium, mg/L	1	3.6	3.6	3.6	0
Selenium, mg/L	115	<0.005	<0.004	<0.005	0
Silicon, mg/L	1	6.1	6.1	6.1	0
Silver, mg/L	115	<0.01	<0.006	<0.010	0
Sodium, mg/L	1	8.7	8.7	8.7	0
Strontium, mg/L	1	0.082	0.082	0.082	0
Styrene, μg/L	1	<5	<5	5	0
Suspended solids, mg/L	219	50	<1	<6.995	8.19
Temperature, °C	388	30.3	5	15.854	5.42
Tetrachloroethene, μg/L	117	98	<5	<5	9.81
Thorium, mg/L	1	<0.2	<0.2	<0.2	0
Titanium, mg/L	1	0.057	0.057	0.057	0
Toluene, μg/L	117	5	<5	<5	1.75
Total xylenes, μg/L	1	<5	<5	<5	0
Trans-1,2-dichloroethene, μg/L	116	50	<2	<28.353	12.46
Trans-1,3-dichloropropene, μg/L	117	32	<5	<5.230	2.50
Trichloroethene, μg/L	117	72	<2	<33.752	14.05
Turbidity, NTU	228	1400	1.1	18.843	93.60
Vanadium, mg/L	1	<0.5	<0.5	<0.5	0
Vinyl acetate, μg/L	1	<10	<10	<10	0
Vinyl chloride, μg/L	117	10	<1	<6.598	2.67
Zinc, mg/L	115	0.075	<0.004	<0.022	0.01

[a]NA = not applicable.

Table 2.2.86. 1989 NPDES Permit Number TN 002950
Discharge Point K-1203 at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Ammonia nitrogen, mg/L	166	0.31	<0.2	<0.201	0.01
Biological oxygen demand (BOD), mg/L	171	16	<1.7	<5.105	1.29
Chemical oxygen demand (COD), mg/L	224	300	<5	<13.906	29.87
Chlorine, mg/L	375	0.51	0.02	0.075	0.04
Dissolved oxygen, mg/L	383	18	5	8.955	1.32
Dissolved solids, mg/L	54	268	30	221.814	31.71
Fecal coliform, col/100 mL	167	620	<1	<10.149	54.70
pH, units	383	8.5	7.1	NA[a]	NA
Settleable solids, mg/L	278	0.6	<0.1	<0.116	0.05
Suspended solids, mg/L	168	28	<1	<6.119	4.34
Temperature, °C	383	27.8	4.4	18.650	4.73
Total organic carbon, mg/L	54	24	1	5.518	4.11

[a]NA = not applicable.

Table 2.2.87. 1989 NPDES Permit Number TN 0002950
Discharge Point K-1007-B at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Chemical oxygen demand (COD), mg/L	114	24	<4	<8.210	4.08
Chromium, mg/L	58	<0.01	<0.01	<0.01	0
Dissolved oxygen, mg/L	383	16	5	9.362	2.17
Fluoride, mg/L	58	0.2	<0.1	<0.149	0.05
Oil and grease, mg/L	56	<2	<2	<2.000	0
pH, units	385	9.1	7.1	NA[a]	NA
Suspended solids, mg/L	113	15	<1	<6.106	2.42
Temperature, °C	385	30.8	2.5	17.143	8.05

[a]NA = not applicable.

Table 2.2.88. 1989 NPDES Permit Number TN 0002950
Discharge Point K-901A at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Chemical oxygen demand (COD), mg/L	114	20	<4	<6.903	3.14
Chromium, mg/L	61	0.1	<0.01	<0.015	0.01
Dissolved oxygen, mg/L	372	17	3.8	8.048	2.44
Fluoride, mg/L	58	0.2	<0.1	<0.128	0.04
Oil and grease, mg/L	59	5.3	<2	<2.055	0.43
pH, units	372	8.7	6.5	NA[a]	NA
Suspended solids, mg/L	113	22	1	7.477	4.10
Temperature, °C	372	28.9	1.4	16.294	7.42
Turbidity, NTU	113	26	2.7	11.252	5.24

[a]NA = not applicable.

Table 2.2.89. 1989 NPDES Permit Number TN 0002950
Discharge Point K-1515 at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Aluminum, mg/L	52	0.76	<0.1	<0.385	0.15
Chemical oxygen demand (COD), mg/L	52	19	<4	<6.173	2.46
pH, units	361	9	6.3	NA[a]	NA
Sulfate, mg/L	52	26	7	19.038	4.48
Suspended solids, mg/L	51	10	<1	<4.039	2.13
Temperature, °C	359	30.3	0.5	15.692	7.38
Total residual chlorine, mg/L	64	2.08	<0.01	<0.179	0.43

[a]Not applicable.

Table 2.2.90. 1989 NPDES Permit Number TN 0002950

Discharge Point K-1407-J at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Total toxic organics (TTO), μg/L	11	2123	<5	<145	
1,1,1-Trichloroethane, μg/L	119	140	<0.2	<9.048	16.46
1,1,2,2-Tetrachloroethane, μg/L	119	5	<5	<5	0
1,1,2-Trichloroethane, μg/L	119	<5	<5	<5	0
1,1-Dichloroethane, μg/L	119	36	<5	<5.259	3.48
1,1-Dichloroethene, μg/L	119	100	<5	<5.864	9.07
1,2 4-Trichlorobenzene, μg/L	45	12	<5	<9.022	2.28
1,2-Dichlorobenzene, μg/L	45	<12	<5	<9.088	2.11
1,2-Dichloroethane, μg/L	119	<5	<5	<5	0
1,2-Dichloropropane, μg/L	119	<5	<5	<5	0
1,3-Dichlorobenzene, μg/L	45	<12	<5	<9.088	2.11
1,4-Dichlorobenzene, μg/L	45	<12	<5	<9.088	2.11
2,4,5-Trichlorophenol, μg/L	1	<50	<50	<50	0
2,4,6-Trichlorophenol, μg/L	45	<12	<5	<9.088	2.11
2,4-Dichlorophenol, μg/L	45	<12	<5	<9.088	2.11
2,4-Dimethylphenol, μg/L	45	<12	<5	<9.088	2.11
2,4-Dinitrophenol, μg/L	45	<50	<5	<9.977	6.45
2,4-Dinitrotoluene, μg/L	45	<12	<5	<9.088	2.11
2,6-Dinitrotoluene, μg/L	45	<12	<5	<9.088	2.11
2-Chloroethylvinyl ether, μg/L	119	<10	<10	<10	0
2-Chloronaphthalene, μg/L	45	<12	<5	<9.088	2.11
2-Chlorophenol, μg/L	45	<12	<5	<9.088	2.11
2-Methylnaphthalene, μg/L	1	<10	<10	<10	0
2-Methylphenol, μg/L	1	<10	<10	<10	0
2-Nitroaniline, μg/L	1	<50	<50	<50	0
2-Nitrophenol, μg/L	45	<12	<5	<9.088	2.11
3,3'-Dichlorobenzidine, μg/L	45	<24	<10	<18.222	4.13
3-Nitroaniline, μg/L	1	<50	<50	<50	0
4,6-Dinitro-2-methylphenol, μg/L	45	<61	<25	<45.555	10.48
4-Biomophenyl-phenylether, μg/L	45	<12	<5	<9.088	2.11
4-Chloro-3-methylphenol, μg/L	45	<12	<5	<9.088	2.11
4-Chloroaniline, μg/L	1	<10	<10	<10	0
4-Chlorophenyl-phenylether, μg/L	45	<12	<5	<9.088	2.11
4-Methylphenol, μg/L	1	<10	<10	<10	0
4-Nitroaniline, μg/L	1	<50	<50	<50	0
4-Nitrophenol, μg/L	45	<61	<25	<45.555	10.48
Acenaphthene, μg/L	45	<12	<5	<9.088	2.11
Acenaphthylene, μg/L	45	<12	<5	<9.088	2.11
Aluminum, mg/L	51	15	<0.1	<0.675	2.08
Ammonia nitrogen, mg/L	32	2.79	<0.2	<0.350	0.50
Anthracene, μg/L	45	<12	<5	<9.088	2.11
Antimony, mg/L	50	<0.05	<0.05	<0.050	0
Arsenic, mg/L	47	0.15	<0.005	<0.009	0.02
Barium, mg/L	51	0.14	<0.1	<0.101	0.01
Benzene, μg/L	119	<5	<5	<5	0
Benzidine, μg/L	44	<12	<5	<9.068	2.13
Benzo(a)anthracene, μg/L	45	<12	<5	<9.088	2.11
Benzo(a)pyrene, μg/L	45	<12	<5	<9.088	2.11
Benzo(b)fluoranthene, μg/L	45	<12	<5	<9.088	2.11
Benzo(g,h,i)perylene, μg/L	45	15	<5	<9.311	2.19
Benzo(k)fluoranthene, μg/L	45	<12	<5	<9.088	2.11
Benzoic acid, μg/L	1	<50	<50	<50	0

Table 2.2.90 (continued)

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Benzyl alcohol, μg/L	1	<10	<10	<10	0
Beryllium, mg/L	51	0.0016	<0.001	<0.001	0
Bis(2-chloroethoxy)methane, μg/L	45	<12	<5	<9.088	2.11
Bis(2-chloroethyl)ether, μg/L	45	<12	<5	<9.088	2.11
Bis(2-chloroisopropyl)ether, μg/L	45	<12	<5	<9.088	2.11
Bis(2-ethylhexyl)phthalate, μg/L	45	210	<2	<25.977	43.63
Boron, mg/L	51	1.1	<0.004	<0.217	0.23
Bromide, mg/L	24	<2	<2	<2	0
Bromodichloromethane, μg/L	119	5	<0.5	<4.856	0.77
Bromoform, μg/L	119	<5	<5	<5	0
Bromomethane, μg/L	119	<10	<10	<10	0
Butylbenzylphthalate, μg/L	45	12	<1	<8.844	2.54
Cadmium, mg/L	51	0.0086	<0.002	<0.002	0
Calcium, mg/L	11	190	68	109.090	46.38
Carbon tetrachloride, μg/L	119	5	<1	<4.840	0.71
Chemical oxygen demand (COD), mg/L	84	157	<5	<19.416	20.79
Chloride, mg/L	25	1250	56	396.760	336.50
Chlorobenzene, μg/L	119	5	<2	<4.974	0.28
Chloroethane, μg/L	119	<10	<10	<10	0
Chloroform, μg/L	119	11	<5	<5	1.75
Chloromethane, μg/L	119	<10	<10	<10	0
Chromium, mg/L	51	0.44	<0.01	<0.022	0.06
Chrysene, μg/L	45	<12	<5	<9.088	2.11
Cis-1,3-dichloropropene, μg/L	119	<5	<5	<5	0
Cobalt, mg/L	51	<0.1	<0.1	<0.100	0
Copper, mg/L	51	0.49	<0.004	<0.034	0.07
Cyanide, mg/L	38	0.68	<0.002	<0.088	0.10
Di-n-butylphthalate, μg/L	45	<12	<5	<9.088	2.11
Di-n-octylphthalate, μg/L	45	12	<5	<8.426	3.17
Dibenz(a,h)anthracene, μg/L	45	14	<5	<9.288	2.14
Dibenzofuran, μg/L	1	<10	<10	<10	0
Dibromochloromethane, μg/L	119	<5	<5	<5	0
Diethylphthalate, μg/L	45	12	<5	<8.835	2.54
Dimethylphthalate, μg/L	45	<12	<5	<9.088	2.11
Dissolved solids, mg/L	82	4096	576	1582.487	844.54
Ethylbenzene, μg/L	119	5	<2	<4.974	0.28
Fluoranthene, μg/L	45	12	<0.5	<8.988	2.39
Fluorene, μg/L	45	<12	<5	<9.088	2.11
Fluoride, mg/L	79	95	0.5	9.873	10.97
Hexachlorobenzene, μg/L	45	<12	<5	<9.088	2.11
Hexachlorobutadiene, μg/L	45	<12	<5	<9.088	2.11
Hexachlorocyclopentadiene, μg/L	45	<12	<5	<9.088	2.11
Hexachloroethane, μg/L	45	<12	<5	<9.088	2.11
Indeno(1,2,3-cd)pyrene, μg/L	45	14	<5	<9.355	2.05
Iron, mg/L	51	42	0.17	1.994	5.87
Isophorone, μg/L	45	<12	<5	<9.088	2.11
Kjeldahl nitrogen, mg/L	31	3.6	<0.05	<1.036	0.80
Lead, mg/L	51	0.129	<0.004	<0.011	0.02
Lithium, mg/L	11	0.027	0.0093	0.016	0.01
Magnesium, mg/L	51	30	7.7	16.117	5.54
Manganese, mg/L	51	0.61	0.028	0.161	0.15
MBAS, mg/L	25	<0.2	<0.2	<0.200	0
Mercury, mg/L	51	0.059	<0.0002	<0.001	0.01

Table 2.2.90 (continued)

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Methylene chloride, μg/L	119	8	<0.7	<4.555	1.30
Molybdenum, mg/L	51	0.04	<0.01	<0.012	0.01
N-nitroso-di-N-propylamine, μg/L	45	<12	<5	<9.088	2.11
N-nitrosodimethylamine, μg/L	44	<12	<5	<9.068	2.13
N-nitrosodiphenylamine, μg/L	45	<12	<5	<9.088	2.11
Naphthalene, μg/L	45	<12	<5	<9.088	2.11
Nickel, mg/L	51	2.6	<0.05	<0.240	0.38
Niobium, mg/L	11	0.016	<0.007	<0.008	0
Nitrate nitrogen, mg/L	56	1390	<0.2	<26.057	185.59
Nitrite nitrogen, mg/L	2	1.4	0.9	1.150	0.35
Nitrobenzene, μg/L	45	<12	<5	<9.088	2.11
Oil and grease, mg/L	60	<2	<2	<2	0
PCB (Aroclor-1016), μg/L	36	<0.5	<0.5	<0.5	0
PCB (Aroclor-1221), μg/L	36	<0.5	<0.5	<0.5	0
PCB (Aroclor-1232), μg/L	36	<0.5	<0.5	<0.5	0
PCB (Aroclor-1242), μg/L	36	<0.5	<0.5	<0.5	0
PCB (Aroclor-1248), μg/L	36	<0.5	<0.5	<0.5	0
PCB (Aroclor-1254), μg/L	36	<1	<1	<1	0
PCB (Aroclor-1260), μg/L	36	<1	<1	<1	0
Pentachlorophenol, μg/L	45	<61	<25	<45.555	10.48
pH	215	9.3	6.2	<7.969	0.48
Phenanthrene, μg/L	45	12	<1	<8.688	2.69
Phenol, μg/L	45	<12	<5	<9.088	2.11
Phenols, mg/L	37	0.1	<0.001	<0.019	0.02
Phosphate (total)	5	13	2.4	5.720	4.28
Phosphorus, mg/L	46	9.3	<0.2	<1.025	1.75
Potassium, mg/l	11	23	5.6	10.436	5.54
Pyrene, μg/L	45	12	<0.4	<8.986	2.40
Selenium, mg/L	50	<0.005	<0.005	<0.005	0
Silicon, mg/L	11	12	0.79	4.471	3.23
Silver, mg/L	49	0.01	<0.01	<0.010	0
Sodium, mg/L	11	910	59	376.272	235.48
Strontium, mg/L	11	0.29	0.1	0.162	0.06
Sulfate, mg/L	23	1500	267	548.869	324.61
Sulfide, mg/L	28	<2	<1	<1.821	0.29
Sulfite, mg/L	24	<2	<2	<2	0
Suspended solids, mg/L	83	359	2	19.084	42.15
Temperature, °C	212	31.9	1.8	14.886	7.09
Tetrachloroethene, μg/L	119	240	<5	<13.737	25.08
Thallium, mg/L	47	<0.01	<0.01	<0.010	0
Thorium, mg/L	10	<0.2	<0.2	<0.2	0
Tin, mg/L	56	0.8	<0.01	<0.092	0.21
Titanium, mg/L	51	0.22	<0.003	<0.015	0.03
Toluene, μg/L	119	5	<0.4	<3.788	1.93
Total organic carbon (TOC), mg/L	49	20	2	8.346	3.98
Total phosphate, mg/L	28	8.2	0.6	2.264	1.80
Total residual chlorine, mg/L	29	0.4	<0.01	<0.056	0.10
Trans-1 2-dichloroethene, μg/L	119	200	<5	<13.030	23.50
Trans-1 3-dichloropropene, μg/L	119	<5	<5	<5	0
Trichloroethene, μg/L	119	1400	<5	<47.866	145.84
Uranium, mg/L	47	2.93	0.035	0.549	0.55
Vanadium, mg/L	14	11	<0.5	<0.5	0
Vinyl chloride, μg/L	119	12	<2	<9.823	1.18
Zinc, mg/L	51	0.36	<0.02	<0.055	0.05
Zirconium, mg/L	11	<0.005	<0.005	<0.005	0

Table 2.2.91. 1989 NPDES Permit Number TN 0002950
Discharge Point K-1407-E/F at ORGDP

Parameter	No. samples	Concentration			Std. error
		Max	Min	Av	
Aluminum, mg/L	3	0.55	<0.1	<0.250	0.26
Arsenic, mg/L	47	<0.005	<0.005	<0.005	0
Barium, mg/L	3	<0.1	<0.1	<0.1	0
Beryllium, mg/L	3	<0.001	<0.001	<0.001	0
Boron, mg/L	3	0.13	0.0068	0.064	0.06
Cadmium, mg/L	50	0.003	<0.002	<0.002	0
Calcium, mg/L	3	220	670	129.0	80.52
Chromium, mg/L	50	0.1	<0.01	<0.011	0.01
Cobalt, mg/L	3	<0.1	<0.1	<0.1	0
Copper, mg/L	50	0.064	<0.004	<0.018	0.01
Iron, mg/L	53	4.7	<0.05	<0.705	0.73
Lead, mg/L	50	0.05	<0.004	<0.007	0.01
Lithium, mg/L	3	0.014	0.011	0.012	0
Magnesium, mg/L	3	24	12	16.0	6.93
Manganese, mg/L	50	0.14	<0.03	<0.080	0.03
Molybdenum, mg/L	3	<0.01	<0.01	<0.01	0
Nickel, mg/L	50	6.3	<0.05	<0.240	0.90
Niobium, mg/L	3	<0.007	<0.007	<0.007	0
Oil and grease, mg/L	49	2.7	<2	<2.014	0.10
PCB (aroclor-1016), μg/L	49	<0.5	<0.5	<0.5	0
PCB (aroclor-1221), μg/L	49	<0.5	<0.5	<0.5	0
PCB (aroclor-1232), μg/L	49	<0.5	<0.5	<0.5	0
PCB (aroclor-1242), μg/L	49	<0.5	<0.5	<0.5	0
PCB (aroclor-1248), μg/L	49	<0.5	<0.5	<0.5	0
PCB (aroclor-1254), μg/L	49	<1	<1	<1	0
PCB (aroclor-1260), μg/L	49	<1	<1	<1	0
pH, units	636	11.5	4.6	NA[a]	NA
Phosphorus, mg/L	3	18	<0.2	<6.133	10.28
Potassium, mg/L	3	8.1	4.7	6.066	1.80
Selenium, mg/L	41	<0.005	<0.005	<0.005	0
Silicon, mg/L	3	3.6	2.4	3.066	0.61
Silver, mg/L	50	0.1	<0.01	<0.011	0.01
Sodium, mg/L	3	370	26	155.666	186.98
Strontium, mg/L	3	0.2	0.098	0.132	0.06
Sulfate, mg/L	19	1710	22	606.631	352.27
Suspended solids, mg/L	51	65	<1	<11.039	12.54
Temperature, °C	657	33.3	0.5	17.922	6.96
Thorium, mg/L	3	<0.2	<0.2	<0.2	0
Titanium, mg/L	3	0.018	<0.003	<0.008	0.01
Turbidity, NTU	2	3.3	1.6	2.450	1.20
Vanadium, mg/L	3	<0.5	<0.5	<0.5	0
Zinc, mg/L	50	0.32	<0.02	<0.032	0.05
Zirconium, mg/L	3	<0.005	<0.005	<0.005	0

[a]NA = not applicable.

Table 2.2.92. ORGDP K-1407-J pond toxicity endpoints during 1989

Month	Fathead minnows		*Ceriodaphnia*	
	Survival NOEC[a] (%)	Growth NOEC (%)	Survival NOEC (%)	Reproduction NOEC (%)
February	100	100	12	12
March	≥60[b]	≥60[b]	≥60[b]	≥60[b]
April	100	100	50	50
June	100	100	12	12
August	50	50	25	12
October	100	100	6	6
November	100	100	<6[c]	<6[c]

[a]NOEC = no observed effect concentration.
[b]60% was highest concentration tested.
[c]6% was lowest concentration tested.

Table 2.2.93. ORGDP K-1407-E and K-1407-F pond toxicity endpoints during 1989

Month	Fathead minnows		*Ceriodaphnia*	
	Survival NOEC[a] (%)	Growth NOEC (%)	Survival NOEC (%)	Reproduction NOEC (%)
February	100	100	50	50
April	100	100	<25[b]	<25[b]
June	100	100	100	100
August	100	100	25	25
October	100	100	12	12
November	100	100	<6[c]	<b[c]

[a]NOEC = no observed effect concentration.
[a]25% was lowest concentration tested.
[b]6% was lowest concentration tested.

Table 2.2.94. ORR 1989 concentration of PCB in sediment

Location[a]	Analysis	Number of samples	Concentration (μg/kg)			
			Max	Min	Av	Std. error[b]
WOC 06	Aroclor-1016	3	<250	<200	<230	14
	Aroclor-1221	3	<250	<200	<230	14
	Aroclor-1232	3	<250	<200	<230	14
	Aroclor-1242	3	<250	<200	<230	14
	Aroclor-1248	3	<250	<200	<230	14
	Aroclor-1254	3	3400	~68	~1300	1068
	Aroclor-1260	3	1900	<400	<930	503
WOC 10	Aroclor-1016	3	<1500	<140	<600	429
	Aroclor-1221	3	<1500	<140	<600	429
	Aroclor-1232	3	<1500	<140	<600	429
	Aroclor-1242	3	<1500	<140	<600	429
	Aroclor-1248	3	<1500	<140	<600	429
	Aroclor-1254	3	500	<34	<320	144
	Aroclor-1260	3	<2900	340	<1200	849
WOC 14	Aroclor-1016	3	<2600	<180	<1000	816
	Aroclor-1221	3	<2600	<180	<1000	816
	Aroclor-1232	3	<2600	<180	<1000	816
	Aroclor-1242	3	<2600	<180	<1000	816
	Aroclor-1248	3	<2600	<180	<1000	816
	Aroclor-1254	3	<400	~28	~270	119
	Aroclor-1260	3	<5300	<370	<2000	1632
WOD 13	Aroclor-1016	3	<1200	<130	<510	349
	Aroclor-1221	3	<1200	<130	<510	349
	Aroclor-1232	3	<1200	<130	<510	349
	Aroclor-1242	3	<1200	<130	<510	349
	Aroclor-1248	3	<1200	<130	<510	349
	Aroclor-1254	3	<400	~190	~280	62
	Aroclor-1260	3	<400	~94	~250	88
MB 07	Aroclor-1016	3	<200	<110	<150	26
	Aroclor-1221	3	<200	<110	<150	26
	Aroclor-1232	3	<200	<110	<150	26
	Aroclor-1242	3	<200	<110	<150	26
	Aroclor-1248	3	<200	<110	<150	26
	Aroclor-1254	3	<400	~13	~220	113
	Aroclor-1260	3	<400	<220	<290	53
CR 08	Aroclor-1016	3	<1500	<160	<610	429
	Aroclor-1221	3	<1500	<160	<610	429
	Aroclor-1232	3	<1500	<160	<610	429
	Aroclor-1242	3	<1500	<160	<610	429
	Aroclor-1248	3	<1500	<160	<610	429
	Aroclor-1254	3	<2900	<310	<1200	859
	Aroclor-1260	3	<2900	<310	<1200	859
CR 09	Aroclor-1016	3	<200	<130	<160	22
	Aroclor-1221	3	<200	<130	<160	22
	Aroclor-1232	3	<200	<130	<160	22
	Aroclor-1242	3	<200	<130	<160	22
	Aroclor-1248	3	<200	<130	<160	22
	Aroclor-1254	3	<400	~24	~240	110
	Aroclor-1260	3	<400	<250	<310	44

Table 2.2.94 (continued)

Location[a]	Analysis	Number of samples	Concentration (μg/kg)			
			Max	Min	Av	Std. error[b]
CR 11	Aroclor-1016	3	<200	<81	<120	37
	Aroclor-1221	3	<200	<81	<120	37
	Aroclor-1232	3	<200	<81	<120	37
	Aroclor-1242	3	<200	<81	<120	37
	Aroclor-1248	3	<200	<81	<120	37
	Aroclor-1254	3	<400	<160	<250	75
	Aroclor-1260	3	<400	<160	<250	75
CR 12	Aroclor-1016	3	<1200	<200	<870	333
	Aroclor-1221	3	<1200	<200	<870	333
	Aroclor-1232	3	<1200	<200	<870	333
	Aroclor-1242	3	<1200	<200	<870	333
	Aroclor-1248	3	<1200	<200	<870	333
	Aroclor-1254	3	~460	~68	~310	122
	Aroclor-1260	3	<2400	<400	<1700	667

[a]See Fig. 2.2.9 in Vol. 1.
[b]Standard error about the average.

2.3 GROUNDWATER

REFERENCES

The following references are referred to in Tables 2.3.1–2.3.11.

1. RCRA 40 CFR Pt. 265 Appendix 3.
2. Safe Drinking Water Act—National Primary Drinking Water Regulations, 40 CFR Pt. 141, as amended.
3. Safe Drinking Water Act—National Secondary Drinking Water Regulations, 40 CFR Pt. 143, as amended.
4. State of Tennessee Hazardous Waste Regulations TN 1200-1-11-05, Appendix 05/B.
5. DOE Order 5400.5. Derived Concentration Guides (DCGs) for Air and Water.
6. National Primary Drinking Water Regulations; Synthetic Organic Chemicals, US EPA, Federal Register, July 8, 1987, pp. 25690–25717.

Table 2.3.1. Primary drinking water parameters monitored in groundwater during 1989

Parameter	Reference[a]	Applicable standards[b] (mg/L)
As	1, 2, 4	0.05
Ba	1, 2, 4	1.0
Cd	1, 2, 4	0.010
Cr	1, 2, 4	0.05
F	1, 2, 3, 4	4.0, 2.0[c], 1.4–2.4[d]
Pb	1, 2, 4	0.05
Nitrate	1, 2, 4	10
Hg	1, 2, 4	0.002
Se	1, 2, 4	0.01
Ag	1, 2, 4	0.05
Endrin	1, 2, 4	0.0002
Lindane	1, 2, 4	0.004
Methoxychlor	1, 2, 4	0.1
Toxaphene	1, 2, 4	0.005
2,4-D	1, 2, 4	0.1
2,4,5-TP Silvex	1, 2, 4	0.01
^{226}Ra and ^{228}Ra (pCi/L)	1, 2, 4	5
Gross alpha (pCi/L)	1, 2, 4	15
Gross beta (mrem/year)	1, 2, 4	4
Coliform bacteria (col./100 mL)	1, 2, 4	1[b]

[a]References for applicable standards precede this table.
[b]Maximum contaminant level.
[c]Secondary maximum contaminant level.
[d]RCRA 40 CFR Pt. 265 Appendix B and State of Tennessee Hazardous Waste Regulations.

Table 2.3.2. Parameters establishing groundwater quality monitored during 1989

Parameter	Reference	Applicable[a] standards (mg/L)
Chloride	3	250
Fe	3	0.3
Mn	3	0.05
Phenols		None
Na		None
Sulfate	3	250

[a]Secondary maximum contaminant level.

Table 2.3.3. Indicator parameters monitored in groundwater semiannually in 1989

Parameter	Reference	Applicable standards
Total organic carbon (mg/L)		None
Total organic halogen (mg/L)		None
Specific conductance (mS/cm)		None
pH	3	6.5–8.5[a]

[a]Secondary maximum contaminant level.

Table 2.3.4. Typical inductively coupled argon plasma (ICAP) metals scan of groundwater (results used for metals analysis and site characterization studies)

Parameter	Reference	Applicable standards (mg/L)
Al		None
Sb		None
Ba	1, 2, 4	1.0[a]
Be		None
B		None
Cd	1, 2, 4	0.01[a]
Ca		None
Cr	1, 2, 4	0.05[a]
Co		None
Cu	3	1.0[b]
Pb	3	0.3[b]
Li		None
Mg		None
Mn	3	0.05[b]
Mo		None
Ni		None
Nb		None
P		None
K		None
Si		None
Ag	1, 2, 4	0.05[a]
Na		None
Sr		None
Th		None
Ti		None
V		None
Zn	3	5.0[b]
Zr		None

[a]Maximum contaminant level.
[b]Secondary maximum contaminant level.

Table 2.3.5. Typical metals sought in groundwater by atomic absorption (AA) spectroscopy (results used to fulfill required monitoring and in characterization studies)

Parameter	Reference	Applicable[a] standards (mg/L)
Sb		None
As	1, 2, 4,	0.05
Ba	1, 2, 4	1.00
Be		None
Cd	1, 2, 4	0.010
Cr	1, 2, 4	0.05
Cu	3	1
Pb	1, 2, 4	0.05
Hg	1, 2, 4	0.002
Ni		None
Se	1, 2, 4	0.01
Ag	1, 2, 4	0.05
Tl		None
Zn	3	5.0[b]

[a]Maximum contaminant level.
[b]Secondary maximum contaminant level.

Table 2.3.6. Typical anions sought in groundwater

Results used for required monitoring and in characterization studies

Parameter	Reference	Applicable standards (mg/L)
Chloride	3	250[a]
Fluoride	2, 3	4.0[a], 2.0[b], 1.4–2.4[c]
Nitrate	1, 2, 4	10[b]
Nitrite		1[d]
Phosphate		None
Sulfate	3	250[b]

[a]Maximum contaminant level.
[b]Secondary maximum contaminant level.
[c]State of Tennessee Hazardous Waste Regulations, TN 1200-1-11.05, Appendix 0.05/B.
[d]Proposed by Y-12 Environmental Management Department for required monitoring and compliance limit.

Table 2.3.7. Volatile organics (hazardous substance list) sought in groundwater

Parameter	Reference	Chemical Abstracts Service No.	Applicable[a] standards (mg/L)
Chloromethane		74-87-3	None
Bromomethane		74-83-9	None
Vinyl chloride	6	75-01-4	0.002
Chloroethane		75-00-3	None
Methylene chloride		75-09-2	None
Acetone		67-64-1	None
Carbon disulfide		75-15-0	None
1,1-dichloroethene	6	75-35-4	0.007
1,1-dichloroethane		75-35-3	None
1,2-dichloroethene (total)		540-59-0	None
Chloroform		67-66-3	None
1,2-dichloroethane	6	107-06-2	0.005
2-butanone		78-93-3	None
1,1,1-trichloroethane	6	71-55-6	0.20
Carbon tetrachloride	6	56-23-5	0.005
Vinyl acetate		108-05-4	None
Bromodichloromethane		75-27-4	None
1,1,2,2-tetrachloroethane		79-34-5	None
1,2-dichloropropane		78-87-5	None
Cis-1,3,-dichloropropene		10061-01-5	None
Trichloroethene	6	79-01-6	0.005
Dibromochloromethane		124-48-1	None
1,1,2-trichloroethane		79-00-5	None
Benzene	6	71-43-2	0.005
trans-1,3-dichloropropene		10061-02-6	None
Bromoform		75-25-2	None
2-hexanone		591-78-6	None
4-methyl-2-pentanone		108-10-1	None
Tetrachloroethene		127-18-4	None
Toluene		108-88-3	None
Chlorobenzene		108-90-7	None
Ethyl benzene		100-41-4	None
Styrene		100-42-5	None
Xylenes (total)		133-02-7	None

[a]Maximum contaminant level effective 7/8/87.

Table 2.3.8. Pesticides and polychlorinated biphenyls (hazardous substance list) sought in groundwater

Parameter	Reference	Chemical Abstracts Service No.	Applicable standards (μg/L)
Alpha-BHC		319-84-6	None
Beta-BHC		319-85-7	None
Delta-BHC		319-86-8	None
Gamma-BHC (Lindane)		58-89-9	None
Heptachlor		76-44-8	None
Aldrin		309-00-2	None
Heptachlor epoxide		1024-57-3	None
Endrin		72-20-8	None
Dieldrin		60-57-1	None
4,4'-DDE		72-55-9	None
Endosulfan I		959-98-8	0.0002
Endosulfan II		33213-65-9	None
4,4'-DDD		72-54-8	None
Endosulfan sulfate		1031-07-8	None
4,4'-DDT		50-29-3	None
Endrin ketone		53494-70-5	None
Methoxychlor		72-43-5	0.1
Alpha-chlordane		5103-71-9	None
Gamma-chlordane		5103-74-2	None
Toxaphene		8001-35-2	0.005
Aroclor-1016		12674-11-2	None
Aroclor-1221		11104-28-2	None
Aroclor-1232		11141-16-5	None
Aroclor-1242		53469-21-9	None
Aroclor-1248		12672-29-6	None
Aroclor-1254		11097-69-1	None
Aroclor-1260		11096-82-5	None

Table 2.3.9. Base/neutral/acid extractable organics (hazardous substance list) sought in groundwater

Parameter	Reference	Chemical Abstracts Service No.	Applicable[a] standards (mg/L)
Phenol		108-95-2	None
bis(2-chloroethyl) ether		111-44-4	None
2-chlorophenol		95-57-8	None
1,3-dichlorobenzene		541-73-1	None
1,4-dichlorobenzene	6	106-46-7	0.075
Benzyl alcohol		100-51-6	None
1,2-dichlorobenzene		95-50-1	None
2-methylphenol		95-48-7	None
bis(2-chloroisopropyl)ether		39638-32-9	None
4-methylphenol		106-44-5	None
N-Nitroso-di-n-propylamine		621-64-7	None
Hexachloroethane		67-72-1	None
Nitrobenzene		98-95-3	None
Isophorone		78-59-1	None
2-nitrophenol		88-75-5	None
2,4-dimethylphenol		105-67-9	None
Benzoic acid		65-85-0	None
bis(2-chloroethoxy) methane		111-91-1	None
2,4-dichlorophenol		120-83-2	None
1,2,4-trichlorobenzene		120-82-1	None
Naphthalene		91-20-3	None
4-chloroaniline		106-47-8	None
Hexachlorobutadiene		87-68-3	None
4-chloro-3-methylphenol (para-chloro-meta-cresol)		59-50-7	None
2-methylnaphthalene		91-57-6	None
Hexachlorocyclopentadiene		77-47-4	None
2,4,6-trichlorophenol		88-06-2	None
2,4,5-trichlorophenol		95-95-4	None
2-chloronaphthalene		91-58-7	None
2-nitroaniline		88-74-4	None
Dimethyl phthalate		131-11-3	None
Acenaphthylene		208-96-8	None
2,6-dinitrotoluene		606-20-2	None
3-nitroaniline		99-09-2	None
Acenaphthene		83-32-9	None
2,4-dinitrophenol		51-28-5	None
4-nitrophenol		100-02-7	None
Dibenzofuran		132-64-9	None
2,4-dinitrotoluene		121-14-2	None
Diethylphthalate		84-66-2	None
4-chlorophenyl phenyl ether		7005-72-3	None
Fluorene		86-73-7	None
4-nitroaniline		100-01-6	None
4,6-dinitro-2-methylphenol		534-52-1	None
N-nitrosodiphenylamine		86-30-6	None
4-bromophenyl phenyl ether		101-55-3	None
Hexachlorobenzene		118-74-1	None
Pentachlorophenol		87-86-5	None
Phenanthrene		85-01-8	None
Anthracene		120-12-7	None
Di-*n*-butylphthalate		84-74-2	None
Fluoranthene		206-44-0	None
Pyrene		129-00-0	None

Table 2.3.9 (continued)

Parameter	Reference	Chemical Abstracts Service No.	Applicable[a] standards (mg/L)
Butyl benzyl phthalate		85-68-7	None
3,3'-dichlorobenzidine		91-94-1	None
Benzo[*a*]anthracene		56-55-3	None
Chrysene		218-01-9	None
bis(2-ethylhexyl)phthalate		117-81-7	None
Di-n-octyl phthalate		117-84-0	None
Benzo[*b*]fluoranthene		205-99-2	None
Benzo[*k*]fluoranthene		207-08-9	None
Benzo[*a*]pyrene		50-32-8	None
Indeno(1,2,3-cd)pyrene		193-39-5	None
Dibenz[*a,h*]anthracene		53-70-3	None
Benzo[*g,h,i*]perylene		191-24-2	None

[a]Maximum contaminant level effective 7/8/87.

Table 2.3.10. Radionuclides and radioactive metals sought in groundwater

Parameter	Reference	Applicable standards[a] (pCi/L)
Gross alpha radiation	1, 2, 4	15
Gross beta radiation (mrem/yr)	1, 2, 4	4[b]
Gross gamma radiation		None
^{226}Ra and ^{228}Ra	1, 2, 4	5
^{137}Cs	5	3,000
^{90}Sr	5, 2	1,000; 8.0
^{60}Co	5	10,000
Tritium	5, 2	2,000,000; 20,000
^{99}Tc	5	100,000
^{239}Pu	5	30
^{235}U	5	600
Total uranium (mg/L)		None

[a]Maximum contaminant level.

[b]Maximum contaminant level in the absence of ^{90}Sr and alpha emitters = 1,000 pCi/L.

Table 2.3.11. Other typical parameters that may be included in groundwater studies

Parameter	Reference	Applicable standards (mg/L)
Alkalinity (CO_3)		None
Alkalinity (HCO_3)		None
Total phosphorus		None
Solids:		
Total		None
Suspended		None
Dissolved	3	500
Turbidity (JTU)	2	5
Total Kjeldahl nitrogen		None
Ammonia (N)		None
Chemical oxygen demand		None
MBAS		None

Table 2.3.12. Constituents in groundwater at the Y-12 Plant site, 1989

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
Beta-4 Security Pit							
Dissolved solids, mg/L	NA[a]	13	540	146	321	500	2
Iron, total, mg/L	6	6	44	0.14	24	0.3	5
Manganese, total, mg/L	6	6	3.9	0.048	2.1	0.05	5
pH	NA	52	7.8	5.8	NA	6.5/8.5	16
Selenium, total, mg/L	2	6	0.065	<0.05	0.06	0.01	2
Turbidity, NTU	NA	13	2,600	2.6	590	5	12
Burial Grounds							
Acetone, μg/L	16	119	130	<10	30	NR[b]	NA
Barium, total, mg/L	21	27	6.8	<0.1	0.60	1	1
Benzene, μg/L	4	119	69	<5	42	5	4
Bromoform, μg/L	1	119	11	<5	11	NR	NA
Cadmium, total, mg/L	18	117	0.02	<0.002	0.0054	0.01	1
Chloride, mg/L	118	119	3,300	<1	190	250	12
Chloroform, μg/L	4	119	54	<5	26	NR	NA
Chromium, total, mg/L	15	119	0.16	<0.01	0.062	0.05	7
Dissolved solids, mg/L	NA	119	4,790	38	566	500	21
Gross alpha, pCi/L	NA	119	180	−5	4.1	15	5
Gross beta, pCi/L	NA	119	450	−100	33	50	14
Lead, total, mg/L	64	119	1.5	<0.004	0.047	0.05	4
Methylene chloride, μg/L	4	119	52	<5	21	NR	NA
Nitrate-N, mg/L	25	119	32	<20	3	10	1
pH	NA	476	11	5.1	NA	6.5/8.5	268
Strontium, pCi/L	NA	8	77	−42	8.1	8	2
Tetrachloroethene, μg/L	21	119	1,500	<5	570	NR	NA
Toluene, μg/L	2	119	12	<5	9	NR	NA
Trichloroethene, μg/L	15	119	660	<5	164	5	14
Turbidity, NTU	NA	118	3,000	0.2	102	5	71
Vinyl chloride, μg/L	7	119	510	<10	170	2	7
Xylenes, μg/L	5	119	20	<5	13.8	NR	NA
1,1-Dichloroethane, μg/L	13	119	720	<5	101	NR	NA
1,1-Dichloroethene, μg/L	4	119	100	<5	68.8	7	4
1,1,1-Trichloroethane, μg/L	4	119	540	<5	260	200	2
1,2-Dichloroethane, μg/L	1	119	7	<5	7	5	1
1,2-Dichloroethene, total, μg/L	10	119	2,000	<5	430	NR	NA
2-Butanone, μg/L	3	119	20	<10	17.7	NR	NA
228 Radium, pCi/L	NA	7	27	−1.6	7.49	5	4
4-Methyl-2-pentanone, μg/L	1	119	22	<10	22	NR	NA
Burial Grounds—LLWDDD Lysimeter Demonstration Site							
Barium, Total mg/L	9	9	1.6	0.18	0.56	1	1
Bis(2-ethylhexyl)phthalate, μg/L	1	6	12	<10	12	NR	NA
Chromium, total, mg/L	2	9	0.071	<0.01	0.049	0.05	1
Dissolved solids, mg/L	NA	9	3,770	176	850	500	3
Gross alpha, pCi/L	NA	9	43	−2.8	6.4	15	1
Gross beta, pCi/L	NA	9	79	−5.5	12	50	1
Iron, total, mg/L	9	9	73	0.0082	18	0.3	8
Lead, total, mg/L	3	9	0.09	<0.004	0.038	0.05	1
Manganese, total, mg/L	9	9	6.5	0.0038	1.3	0.05	6
Nitrate-N, mg/L	2	9	790	<0.2	390	10	1
pH	NA	36	7.8	5.8	NA	6.5/8.5	8
Radium, pCi/L	NA	9	38	0.11	7.0	5	2
Turbidity, NTU	NA	9	900	1.4	140	5	8

Table 2.3.12 (continued)

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
Burial Grounds—LLWDDD Packaging							
Chromium, total, mg/L	3	15	0.51	<0.01	0.18	0.05	1
Coliform, col./100 mL	1	15	8	0	8	1	1
Dissolved solids, mg/L	NA	15	606	102	266	500	3
Fluoride, mg/L	11	15	4	<0.1	1	4	2
Gross alpha, pCi/L	NA	15	41	−2	2.8	15	1
Iron, total, mg/L	15	15	33	0.049	4.2	0.3	10
Lead, total, mg/L	7	15	0.058	<0.004	0.019	0.05	1
Manganese, total, mg/L	15	15	2.1	0.0035	0.38	0.05	8
pH	NA	60	9.1	5.4	NA	6.5/8.5	28
Tetrachloroethene, μg/L	8	15	2100	<5	730	NR	NA
Trichloroethene, μg/L	3	15	29	<5	26	5	3
Turbidity, NTU	NA	15	100	1.3	18	5	5
Chestnut Ridge Security Pit							
Acetone, μg/L	3	41	20	<10	14	NR	NA
Chromium, total, mg/L	6	41	0.22	<0.01	0.079	0.05	2
Freon, μg/L	5	7	230	<10	74	NR	NA
Gross beta, pCi/L	NA	41	140	−24	20	50	6
Lead, total, mg/L	25	41	0.31	<0.004	0.028	0.05	2
pH	NA	164	8.5	6.1	NA	6.5/8.5	25
Tetrachloroethene, μg/L	25	41	140	<5	35	NR	NA
Trichlorofluoromethane, μg/L	8	11	220	<10	51	NR	NA
Turbidity, NTU	NA	31	130	0.41	11	5	10
1,1-Dichloroethane, μg/L	21	41	200	<5	37	NR	NA
1,1-Dichloroethene, μg/L	10	41	98	<5	52	7	9
1,1,1-Trichloroethane, μg/L	25	41	630	<5	160	200	6
1,2-Dichloroethane, μg/L	1	41	9	<5	9	5	1
1,2-Dichloroethene, total, μg/L	3	41	15	<5	13	NR	NA
Chestnut Ridge Sediment Disposal Basin							
Acetone, μg/L	1	26	23	<10	23	NR	NA
Chromium, total, mg/L	5	26	0.071	<0.01	0.03	0.05	1
Gross alpha, pCi/L	NA	26	120	−2	12	15	3
Gross beta, pCi/L	NA	26	94	−4.3	19.0	50	2
Iron, total, mg/L	25	25	120	0.045	8.1	0.3	18
Lead, total, mg/L	14	26	0.15	<0.004	0.023	0.05	1
Manganese, total, mg/L	23	25	4.2	<0.001	0.29	0.05	10
pH	NA	104	8.5	5.6	NA	6.5/8.5	35
Tetrachloroethene, μg/L	1	26	6	<5	6	NR	NA
Toluene, μg/L	1	26	6	<5	6	NR	NA
Turbidity, NTU	NA	18	1100	0.7	89	5	12
Xylenes, μg/L	1	26	7	<5	7	NR	NA
East Chestnut Ridge Waste Pile							
Arsenic, total, mg/L	1	8	0.089	<0.5	0.089	0.05	1
Iron, total, mg/L	5	8	1.3	<0.04	0.46	0.3	2
Lead, total, mg/L	4	8	0.83	<0.5	0.59	0.05	4
pH	NA	32	7.9	6.4	NA	6.5/8.5	1
Silver, total, mg/L	3	8	0.094	<0.06	0.074	0.05	3
Turbidity, NTU	NA	8	17	0.5	3.2	5	2

Table 2.3.12 (continued)

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
Fly Ash Pond							
Bis(2-ethylhexyl)phthalate, μg/L	4	11	370	<10	200	NR	NA
Coliform, col./100 mL	2	16	13	0	8	1	2
Iron, total, mg/L	16	16	1.3	0.0043	0.24	0.3	3
PCB-(Aroclor)-1254, μg/L	1	16	33	<1	33	NR	NA
pH	NA	64	8	5.7	NA	6.5/8.5	31
Turbidity, NTU	NA	16	26	1.4	5.3	5	4
2-Butanone, μg/L	2	12	11	<10	11	NR	NA
Industrial Landfill III							
Acetone, μg/L	1	21	11	<10	11	NR	NA
Coliform, col./100 mL	6	28	136	0	30	1	5
Fluoride, mg/L	6	28	7	<0.1	1	4	1
Iron, total, mg/L	28	28	60	0.0072	5.3	0.3	17
Lead, total, mg/L	15	28	0.11	<0.004	0.027	0.05	2
Manganese, total, mg/L	25	28	0.79	<0.001	0.11	0.05	9
pH	NA	112	8.1	6	NA	6.5/8.5	38
Radium, pCi/L	NA	28	7.3	−0.35	1.1	5	1
Turbidity, NTU	NA	28	1300	0.4	140	5	15
Industrial Landfill IV							
Coliform, col./100 mL	2	13	15	0	10	1	2
Iron, total, mg/L	13	13	45	0.021	5.06	0.3	5
Lead, total, mg/L	5	13	0.063	<0.004	0.025	0.05	1
Manganese, total, mg/L	10	13	0.53	<0.001	0.09	0.05	2
pH	NA	52	8.2	6	NA	6.5/8.5	8
Radium, pCi/L	NA	13	5.1	−0.32	1.0	5	1
Turbidity, NTU	NA	13	450	1.9	57	5	8
Kerr Hollow Quarry							
Arsenic, total, mg/L	3	7	0.11	<0.05	0.073	0.05	3
Dissolved solids, mg/L	NA	21	2,220	132	311	500	1
Iron, total, mg/L	6	7	17	<0.004	4.9	0.3	3
Manganese, total, mg/L	5	7	0.088	<0.001	0.041	0.05	2
pH	NA	84	7.4	6.3	NA	6.5/8.5	8
Turbidity, NTU	NA	14	160	0.3	29	5	9
New Hope Pond							
Acetone, μg/L	1	59	23	<10	23	NR	NA
Carbon disulfide, μg/L	1	59	190	<5	190	NR	NA
Carbon tetrachloride, μg/L	35	59	10,000	<5	1,600	5	35
Chloride, mg/L	59	59	430	2	45	250	2
Chloroform, μg/L	26	59	1,000	<5	160	NR	NA
Chromium, total, mg/L	7	59	0.18	<0.01	0.066	0.05	2
Dissolved solids, mg/L	NA	59	780	168	369	500	9
Gross alpha, pCi/L	NA	59	790	−2	30	15	6
Gross beta, pCi/L	NA	59	1,100	−3	43	50	5
Lead, total, mg/L	29	59	0.24	<0.004	0.023	0.05	2
Methylene chloride, μg/L	1	59	7	<5	7	NR	NA
pH	NA	236	9.1	6.1	NA	6.5/8.5	51
Tetrachloroethene, μg/L	24	59	710	<5	160	NR	NA

Table 2.3.12 (continued)

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
Trichloroethene, μg/L	14	59	150	<5	64	5	14
Turbidity, NTU	NA	43	280	0.5	17	5	24
1,2-Dichloroethene, total, μg/L	10	59	110	<5	52	NR	NA
Oil Landfarm							
Acetone, μg/L	8	90	51	<10	23	NR	NA
Barium, total, mg/L	24	25	1.1	<0.1	0.31	1	1
Benzene, μg/L	5	90	41	<5	18	5	5
Cadmium, total, mg/L	7	25	0.019	<0.002	0.0064	0.01	2
Carbon tetrachloride, μg/L	8	90	9	<5	6	5	4
Chlorobenzene, μg/L	2	90	6	<5	6	NR	NA
Chloroform, μg/L	5	90	33	<5	16	NR	NA
Chromium, total, mg/L	21	90	0.11	<0.01	0.034	0.05	4
Dissolved solids, mg/L	NA	90	1,210	98	444	500	33
Gross alpha, pCi/L	NA	90	69	−26	4.8	15	6
Gross beta, pCi/L	NA	90	970	−35	39	50	11
Lead, total, mg/L	47	90	0.64	<0.004	0.035	0.05	6
Nitrate-N, mg/L	60	90	210	<0.2	21	10	22
pH	NA	360	12.1	5.1	NA	6.5/8.5	103
Strontium, pCi/L	NA	18	98	−61	5.7	8	6
Tetrachloroethene, μg/L	11	90	360	<5	78	NR	NA
Trichloroethene, μg/L	55	90	400	<5	81	5	55
Turbidity, NTU	NA	68	950	0.35	64	5	42
Vinyl chloride, μg/L	4	90	35	<10	23	2	4
1,1-Dichloroethane, μg/L	23	90	14	<5	8	NR	NA
1,1-Dichloroethene, μg/L	13	90	25	<5	11	7	4
1,2-Dichloroethane, μg/L	2	90	11	<5	9	5	2
1,2-Dichloroethene, total, μg/L	44	90	190	<5	30	NR	NA
228 Radium, pCi/L	NA	19	51	−5.4	5.7	5	5
Roger's Quarry							
Coliform, col./100 mL	2	4	17	0	10	1	2
Dissolved solids, mg/L	NA	4	584	260	472	500	3
Iron, total, mg/L	4	4	4	0.058	1.3	0.3	2
Manganese, total, mg/L	4	4	0.46	0.0013	0.15	0.05	2
Nitrate-N, mg/L	1	4	37	<0.1	37	10	1
Turbidity, NTU	NA	4	24	7.6	13	5	4
Rust Spoil Area							
Acetone, μg/L	5	18	40	<10	22	NR	NA
Cadmium, total, mg/L	2	18	0.016	<0.002	0.011	0.01	1
Chloroform, μg/L	3	18	6	<5	6	NR	NA
Coliform, col./100 mL	6	18	30	0	7	1	4
Dissolved solids, mg/L	NA	18	768	194	543	500	11
Gross alpha, pCi/L	NA	18	18	−1	3.6	15	1
Gross beta, pCi/L	NA	18	57	−1	30	50	1
Iron, total, mg/L	17	18	20	<0.004	3.5	0.3	10
Lead, total, mg/L	9	18	0.11	<0.004	0.024	0.05	1
Manganese, total, mg/L	18	18	2.9	0.0021	0.59	0.05	10
Nitrate-N, mg/L	18	18	24	0.4	12	10	12
pH	NA	72	12.7	6.2	NA	6.5/8.5	32
Trichloroethene, μg/L	18	18	120	21	49	5	18
Turbidity, NTU	NA	18	170	0.5	28	5	9
1,2-Dichloroethene, total, μg/L	12	18	200	<5	40	NR	NA

Table 2.3.12 (continued)

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
S-2 Pond Site							
Cadmium, total, mg/L	5	5	5.1	0.23	1.2	0.01	5
Carbon tetrachloride, μg/L	5	5	39	19	26	5	5
Chloroform, μg/L	5	5	42	9	16	NR	NA
Copper, total, mg/L	2	2	120	1.5	61	1	2
Dissolved solids, mg/L	NA	5	2,880	728	1,210	500	5
Gross alpha, pCi/L	NA	5	32	0.03	11	15	1
Iron, total, mg/L	2	2	4.5	0.33	2.4	0.3	2
Lead, total, mg/L	3	5	0.099	<0.004	0.038	0.05	1
Manganese, total, mg/L	2	2	45	9.1	27	0.05	2
Mercury, total, mg/L	3	5	0.017	<0.0002	0.0058	0.002	1
Nitrate-N, mg/L	5	5	510	91	180	10	5
pH	NA	20	6.2	5.2	NA	6.5/8.5	20
Radium, pCi/L	NA	2	30	4.3	17	5	1
Strontium, pCi/L	NA	2	8.0	5.6	6.8	8	1
Tetrachloroethene, μg/L	5	5	760	200	440	NR	NA
Trichloroethene, μg/L	5	5	470	130	220	5	5
Turbidity, NTU	NA	5	36	7.1	20	5	5
Zinc, total, mg/L	2	2	6.9	0.25	3.6	5	1
1,2-Dichloroethene, total, μg/L	3	5	60	<5	25	NR	NA
S-3 Ponds Site							
Acetone, μg/L	18	124	390	<10	131	NR	NA
Barium, total, mg/L	116	124	170	<0.1	20	1	62
Bromoform, μg/L	2	124	9	<5	9	NR	NA
Cadmium, total, mg/L	47	124	4.9	<0.002	0.57	0.01	34
Chloride, mg/L	109	124	460	<100	74	250	8
Chloroform, μg/L	22	124	30	<5	18	NR	NA
Chloromethane, μg/L	1	124	10	<10	10	NR	NA
Chromium, total, mg/L	22	124	0.42	<0.02	0.067	0.05	6
Dissolved solids, mg/L	NA	124	79,400	18	11,000	500	85
Fluoride, mg/L	52	123	36	<0.1	5	4	18
Gross alpha, pCi/L	NA	124	14,000	−170	250	15	40
Gross beta, pCi/L	NA	124	38,000	−710	2,000	50	60
Lead, total, mg/L	55	124	0.15	<0.01	0.015	0.05	2
Mercury, total, mg/L	22	124	0.16	<0.0002	0.025	0.002	12
Methylene chloride, μg/L	24	124	87	<5	29	NR	NA
Nitrate-N, mg/L	101	124	18,000	<2	2,600	10	80
pH	NA	492	10	3.4	NA	6.5/8.5	320
Radium, pCi/L	NA	47	81	−0.38	12	5	20
Strontium, pCi/L	NA	43	302	−37	40	8	23
Sulfate, mg/L	83	124	760	<100	78	250	6
Tetrachloroethene, μg/L	25	124	2,300	<5	230	NR	NA
Toluene, μg/L	2	124	14	<5	14	NR	NA
Trichloroethene, μg/L	10	124	11	<5	8	5	9
Turbidity, NTU	NA	90	170	0.3	17	5	44
Xylenes, μg/L	4	124	16	<5	12	NR	NA
1,1-Dichloroethane, μg/L	1	124	5	<5	5	NR	NA
1,2-Dichloroethene, total, μg/L	2	124	9	<5	8	NR	NA
2-Butanone, μg/L	5	124	66	<10	33	NR	NA
Radium-228, pCi/L	NA	40	120	−4.9	36	5	27
4-Methyl-2-pentanone, μg/L	2	124	12	<10	12	NR	NA

Table 2.3.12 (continued)

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
S-3 Ponds Site Salvage Yard/OSDS							
Acetone, μg/L	3	28	22	<10	18	NR	NA
Arsenic, total, mg/L	2	28	0.063	<0.05	0.06	0.05	2
Dissolved soids, mg/L	NA	28	704	70	257	500	4
Ethylbenzene, μg/L	1	28	5	<5	5	NR	NA
Iron, total, mg/L	27	28	17	<0.004	1.9	0.3	20
Lead, total, mg/L	10	28	0.4	<0.004	0.049	0.05	1
Manganese, total, mg/L	28	28	0.99	0.0092	0.15	0.05	14
Nitrate-N, mg/L	13	28	1,600	<0.2	240	10	2
pH	NA	112	7.8	5.1	NA	6.5/8.5	76
Sulfate, mg/L	28	28	1,300	5	79	250	1
Tetrachloroethene, μg/L	8	28	280	<5	110	NR	NA
Trichloroethene, μg/L	5	28	27	<5	20	5	5
Turbidity, NTU	NA	28	190	0.8	20	5	21
1,1-Dichloroethene, μg/L	4	28	31	<5	25	7	4
1,2-Dichloroethene, total, μg/L	4	28	18	<5	14	NR	NA
2-Butanone, μg/L	1	28	10	<10	10	NR	NA
Sanitary Landfill II							
Acetone, μg/L	1	10	26	<10	26	NR	NA
Arsenic, total, mg/L	4	12	0.12	<0.040	0.080	0.05	3
Cadmium, total, mg/L	4	6	0.023	<0.00050	0.0064	0.01	1
Carbon tetrachloride, μg/L	1	10	16	<10	16	5	1
Chromium, total, mg/L	3	6	0.082	<0.025	0.048	0.05	2
Gross alpha, pCi/L	NA	5	74	6.5	29	15	2
Gross beta, pCi/L	NA	5	84	−1.7	26	50	1
Iron, total, mg/L	5	6	19	<0.15	4.7	0.3	3
Lead, total, mg/L	6	6	0.16	0.0010	0.033	0.05	1
Manganese, total, mg/L	5	6	0.92	<0.010	0.30	0.05	3
Mercury, total, mg/L	2	6	0.0022	<0.00020	0.0015	0.002	1
Tetrachloroethene, μg/L	2	10	13	<10	10	NR	NA
1,1-Dichloroethane, μg/L	3	10	49	<10	37	NR	NA
226 Radium, pCi/L	1	6	9.2	<1.0	9.2	5	1
United Nuclear Site							
Arsenic, total, mg/L	3	15	0.2	<0.05	0.11	0.05	3
Cadmium, total, mg/L	3	20	0.02	<0.003	0.01	0.01	1
Chromium, total, mg/L	3	20	0.2	<0.01	0.076	0.05	1
Gross beta, pCi/L	NA	15	190	0.2	27	50	2
Iron, total, mg/L	19	20	370	<0.004	21	0.3	6
Lead, total, mg/L	1	15	0.99	<0.05	0.99	0.05	1
Manganese, total, mg/L	15	20	14	<0.001	0.98	0.05	3
pH	NA	80	8.1	6.3	NA	6.5/8.5	17
Radium, pCi/L	NA	20	19	−0.27	1.7	5	1
Selenium, total, mg/L	1	15	0.2	<0.05	0.2	0.01	1
Turbidity, NTU	NA	15	1,900	0.5	140	5	6

Table 2.3.12 (continued)

Parameter	Number detected	Number of samples	Values above detection limit			Reference value	Number of values exceeding reference
			Max	Min	Av		
Waste Coolant Facility							
Acetone, μg/L	9	24	560	<10	260	NR	NA
Bis(2-ethylhexyl)phthalate, μg/L	5	24	770	<10	190	NR	NA
Cadmium, total, mg/L	1	24	0.049	<0.002	0.049	0.01	1
Chloroform, μg/L	1	24	5	<5	5	NR	NA
Coliform, col./100 mL	5	23	13	0	4	1	2
Iron, total, mg/L	24	24	9.2	0.039	2.3	0.3	18
Manganese, total, mg/L	24	24	2.2	0.004	0.3	0.05	19
Methylene chloride, μg/L	1	24	6	<5	6	NR	NA
Naphthalene, μg/L	1	24	12	<10	12	NR	NA
pH	NA	96	7.3	5.4	NA	6.5/8.5	62
Tetrachloroethene, μg/L	18	24	2,100	<5	690	NR	NA
Trichloroethene, μg/L	18	24	2,000	<5	620	5	18
Turbidity, NTU	NA	24	110	0.49	33	5	21
Vinyl chloride, μg/L	11	24	440	<10	190	2	11
1,1-Dichloroethane, μg/L	12	24	160	<5	70	NR	NA
1,1-Dichloroethene, μg/L	12	24	420	<5	230	7	12
1,1,1-Trichloroethane, μg/L	12	24	550	<5	190	200	3
1,2-Dichloroethene, total, μg/L	16	24	15,000	<5	3,700	NR	NA
2-Butanone, μg/L	3	24	580	<10	370	NR	NA
4-Methyl-2-pentanone, μg/L	3	24	140	<10	82	NR	NA
9754-2 Fuel Facility							
Bis(2-ethylhexyl)phthalate, μg/L	1	15	15	<10	15	NR	NA
Cadmium, total, mg/L	6	15	0.042	<0.002	0.015	0.01	2
Chloride, mg/L	15	15	310	3.0	71	250	2
Chromium, total, mg/L	14	15	5.4	<0.01	0.84	0.05	8
Coliform, col./100 mL	4	15	19	0	8	1	4
Di-n-octylphthalate, μg/L	1	15	29	<10	29	NR	NA
Dissolved solids, mg/L	NA	15	1,180	68	423	500	5
Gross alpha, pCi/L	NA	15	24	−2	3.6	15	1
Gross beta, pCi/L	NA	15	130	−6.1	13	50	1
Iron, total, mg/Ll	15	15	84	0.45	12	0.3	15
Lead, total, mg/L	9	15	0.064	<0.004	0.018	0.05	1
Manganese, total, mg/L	15	15	3.1	0.2	1.3	0.05	15
Mercury, total, mg/L	5	15	0.0034	<0.0002	0.0016	0.002	2
Methylene chloride, μg/L	1	15	59	<5	59	NR	NA
pH	NA	60	7.2	5.9	NA	6.5/8.5	21
Turbidity, NTU	NA	15	1400	9.6	240	5	15

[a]NA = not applicable.
[b]NR = no reference.

Table 2.3.13. Constituents in the WAG 1 groundwater at ORNL,[a] January–December 1989

Parameter	No. detected/ No. of samples	Concentration[b]		Average of values above the detection limit	Reference value[c]	No. of values exceeding reference
		Max	Min			
		Perimeter wells				
Anions, mg/L						
Fluoride, total	18/55	4.3	1.0 U	1.7	1.4	6
Field data						
pH, standard units	371/371	9.3	6.2	7.2	*d*	*e*
Conductivity, mS/cm	371/371	1.4	0.040	0.55	*d*	*e*
Temperature, °C	371/371	40	12	18	*d*	*e*
Metals, mg/L						
Aluminum, dissolved	26/38	2.0 U	0.050 U	0.32	*d*	*e*
Aluminum, total	37/55	2.0 U	0.050 U	0.58	*d*	*e*
Antimony, dissolved	5/38	0.11	0.040 U	0.065	*d*	*e*
Barium, total	38/55	2.3	0.0049	0.18	1.0	1
Beryllium, dissolved	5/38	0.030	0.00040 U	0.029	*d*	*e*
Beryllium, total	12/55	0.030	0.00030 U	0.029	*d*	*e*
Boron, dissolved	8/38	0.91	0.080 U	0.63	*d*	*e*
Boron, total	12/55	0.99	0.080 U	0.60	*d*	*e*
Cadmium, dissolved	6/38	0.011	0.0020 U	0.0091	0.010	1
Cadmium, total	13/55	0.045	0.0020 U	0.012	0.010	2
Calcium, dissolved	38/38	190	0.96	89	*d*	*e*
Calcium, total	55/55	170	0.54	85	*d*	*e*
Chromium, total	27/55	0.11	0.0030 U	0.021	0.050	1
Cobalt, dissolved	12/38	0.0074	0.0030 U	0.0045	*d*	*e*
Cobalt, total	12/55	0.014	0.0030 U	0.0054	*d*	*e*
Copper, dissolved	4/38	0.010 U	0.0080 U	0.0089	*d*	*e*
Iron, dissolved	24/38	14	0.010 U	2.9	0.30	12
Iron, total	49/55	16	0.010 U	2.4	0.30	34
Lithium, total	2/53	15 U	0.20 U	0.28	*d*	*e*
Magnesium, dissolved	38/38	31	0.44	14	*d*	*e*
Magnesium, total	55/55	27	0.43	12	*d*	*e*
Manganese, dissolved	29/38	8.6	0.0020 U	1.9	0.050	20
Manganese, total	52/55	7.8	0.0020 U	1.3	0.050	29
Nickel, dissolved	4/38	0.036	0.0060 U	0.023	*d*	*e*
Nickel, total	18/55	0.052	0.0050 U	0.016	*d*	*e*
Phosphorus, dissolved	1/38	0.65	0.30 U	0.65	*d*	*e*
Silicon, dissolved	38/38	8.8	2.9	5.0	*d*	*e*
Silicon, total	55/55	7.7	2.3	4.8	*d*	*e*
Sodium, dissolved	35/38	310	2.0 U	56	*d*	*e*
Sodium, total	52/55	340	2.0 U	53	*d*	*e*
Strontium, dissolved	38/38	2.6	0.075	0.57	*d*	*e*
Strontium, total	38/38	2.7	0.068	0.56	*d*	*e*
Titanium, total	17/55	0.033	0.020 U	0.022	*d*	*e*
Vanadium, dissolved	4/38	0.0040 U	0.0030 U	0.0036	*d*	*e*
Vanadium, total	22/55	0.014	0.0030 U	0.0095	*d*	*e*
Zinc, dissolved	5/38	0.014	0.0050 U	0.011	*d*	*e*
Other						
Fecal coliform, col./100 mL	1/17	100	1.0 U	100	1.0	1
Turbidity, NTU	17/17	50	0.28	9.0	1.0	10
Radionuclides, pCi/L						
Gross alpha	55/55	180	−0.81	9.2	15	4
Gross beta	55/55	11000	−22	608	50	
Radioactive strontium, total	55/55	6200	−3.0	284	8.1	12
Tritium	55/55	38000	−780	4231	20000	3

Table 2.3.13 (continued)

Parameter	No. detected/ No. of samples	Concentration[b]		Average of values above the detection limit	Reference value[c]	No. of values exceeding reference
		Max	Min			
Semivolatiles, mg/L						
Di-n-octylphthalate	1/38	0.014	0.010 U	0.014	*d*	*e*
Organic carbon, total	64/68	3.5	0.50 U	1.3	*d*	*e*
Organic halides, total	31/68	0.090	0.0050 U	0.030	*d*	*e*
Volatile organics, mg/L						
Chloroform	2/38	0.011	0.0030 J	0.0090	*d*	*e*
Methylene chloride	6/38	0.0050 B	0.0010 J	0.0050	*d*	*e*
Trichloroethene	2/38	0.011	0.0030 J	0.0080	0.0050	1
Vinyl chloride	1/38	0.028	0.0060 J	0.028	0.0020	38
1,2-Dichloroethene	2/38	0.011	0.0050 U	0.010	*d*	*e*
		Upgradient wells				
Cyanide, total	2/12	0.0030	0.0020 U	0.0025	*d*	*e*
Field data						
pH, standard units	126/126	12	6.7	7.4	*d*	*e*
Conductivity, mS/cm	126/126	0.66	0.17	0.39	*d*	*e*
Temperature, °C	126/126	21	13	16	*d*	*e*
Metals, mg/L						
Aluminum, dissolved	8/12	2.0 U	0.050 U	0.36	*d*	*e*
Aluminum, total	13/18	12	0.050 U	1.8	*d*	*e*
Antimony, total	1/18	0.17	0.030 U	0.17	*d*	*e*
Beryllium, dissolved	1/12	0.030	0.00040 U	0.030	*d*	*e*
Beryllium, total	4/18	0.031	0.00030 U	0.017	*d*	*e*
Boron, dissolved	6/12	0.36	0.080 U	0.20	*d*	*e*
Boron, total	6/18	0.33	0.080 U	0.20	*d*	*e*
Cadmium, total	3/18	0.011	0.0020 U	0.00993333333	0.010	1
Calcium, dissolved	12/12	140	42	84	*d*	*e*
Calcium, total	18/18	130	41	85	*d*	*e*
Cobalt, dissolved	4/12	0.0084	0.0030 U	0.0058	*d*	*e*
Cobalt, total	5/18	0.0073	0.0030 U	0.0051	*d*	*e*
Copper, dissolved	2/12	0.021	0.0080 U	0.014	*d*	*e*
Iron, total	18/18	6.2	0.011	0.83	0.30	9
Magnesium, dissolved	12/12	32	9.9	23	*d*	*e*
Magnesium, total	18/18	30	6.2	18	*d*	*e*
Manganese, total	18/18	0.16	0.0029	0.038	0.050	4
Nickel, dissolved	1/12	0.0073	0.0060 U	0.0073	*d*	*e*
Nickel, total	7/18	0.028	0.0050 U	0.011	*d*	*e*
Silicon, dissolved	12/12	7.3	2.2	4.6	*d*	*e*
Silicon, total	18/18	8.6	0.99	5.4	*d*	*e*
Sodium, dissolved	9/12	28	2.0 U	14	*d*	*e*
Sodium, total	14/18	29	2.0 U	13	*d*	*e*
Strontium, dissolved	12/12	1.8	0.15	0.62	*d*	*e*
Strontium, total	12/12	1.7	0.17	0.60	*d*	*e*
Titanium, total	6/18	0.086	0.020 U	0.041	*d*	*e*
Vanadium, total	7/18	0.014	0.0030 U	0.0092	*d*	*e*
Zinc, dissolved	4/12	0.023	0.0050 U	0.017	*d*	*e*
Other						
Fecal coliform, col./100 mL	1/6	20	1.0 U	20	1.0	1
Turbidity, NTU	6/6	43	0.090	8.9	1.0	2
Radionuclides, pCi/L						
Gross beta	18/18	6.5	−8.1	2.2	50	

Table 2.3.13 (continued)

Parameter	No. detected/ No. of samples	Concentration[b]		Average of values above the detection limit	Reference value[c]	No. of values exceeding reference
		Max	Min			
Semivolatiles, mg/L						
Organic carbon, total	16/24	1.0	0.50 U	0.85	*d*	*e*
Organic halides, total	3/24	0.058	0.0050 U	0.030	*d*	*e*
Volatile organics, mg/L						
Chloroform	1/12	0.014	0.0050 U	0.014	*d*	*e*
Methylene chloride	1/12	0.0050 B	0.0010 J	0.0050	*d*	*e*

[a]See Fig. 2.3.6 in Vol. 1.

[b]Data qualifiers (organics): U = Undetected; B = Present in blank; J = Below detection limit, but estimated; E = Concentration exceeds the calibration range of the instrument; (inorganics): U = Undetected; B = Value < Contract required detection limit > Instrument detection limit; E = Value is estimated because of the presence of interference.

[c]See Table 2.3.1 in Volume 2 for more information.

[d]No reference.

[e]Not applicable.

Table 2.3.14. Constituents in the WAG 6 groundwater at ORNL,[a] January–December 1989

Parameter	No. detected/ No. of samples	Concentration[b]		Average of values above the detection limit	Reference value[c]	No. of values exceeding reference
		Max	Min			
		Site characterization wells				
Field data						
pH, standard units	56/56	7.1	6.1	*e*	*d*	*e*
Conductivity, mS/cm	56/56	0.88	0.26	0.53	*d*	*e*
Temperature, °C	56/56	16	12	14	*d*	*e*
Metals, mg/L						
Aluminum, total	8/8	0.94	0.52	0.73	*d*	*e*
Barium, dissolved	2/8	2.7	1.0 U	1.9	1.0	2
Barium, total	2/8	2.6	1.0 U	1.8	1.0	2
Calcium, total	8/8	140	51	97	*d*	*e*
Cobalt, total	1/8	0.013	0.0030 U	0.013	*d*	*e*
Iron, dissolved	5/8	39	0.050 U	8.6	0.30	4
Iron, total	8/8	40	0.25	6.1	0.30	7
Magnesium, total	8/8	8.8	8.1	8.5	*d*	*e*
Manganese, dissolved	8/8	12	0.010	1.8	0.050	7
Manganese, total	8/8	13	0.020	1.8	0.050	7
Nickel, total	8/8	0.028	0.0059	0.014	*d*	*e*
Silicon, total	8/8	13	5.4	9.6	*d*	*e*
Sodium, dissolved	8/8	13	5.9	8.1	*d*	*e*
Sodium, total	8/8	13	5.6	8.0	*d*	*e*
Titanium, total	8/8	0.031	0.024	0.028	*d*	*e*
Vanadium, total	8/8	0.014	0.0082	0.010	*d*	*e*
Other						
Alkalinity, as $CaCO_3$	8/8	610	150	342	*d*	*e*
Turbidity, NTU	8/8	62	0.53	9.7	1.0	6
Radionuclides, pCi/L						
Gross alpha	8/8	0.78	−0.27	0.43	15	0
Gross beta	8/8	30	0.81	5.9	50	
Tritium	8/8	2,000,000	3,000	417,939	20,000	7
Semivolatiles, mg/L						
Naphthalene	1/8	0.45 E	0.011 U	0.45	*d*	*e*
Organic carbon, total	32/32	10	0.60	3.4	*d*	*e*
Organic halides, total	13/32	2.1	0.0050 U	0.60	*d*	*e*
Recoverable phenolics, total	1/8	0.029	0.0010 U	0.029	*d*	*e*
2-Methylphenol	1/8	0.022	0.011 U	0.022	*d*	*e*
Volatile organics, mg/L						
Acetone	1/8	0.024 B	0.0020 J	0.024	*d*	*e*
Benzene	3/8	0.096	0.0050 U	0.041	0.0050	3
Ethylbenzene	1/8	0.70 E	0.0050 U	0.70	*d*	*e*
Toluene	1/8	1.9 E	0.0050 U	1.9	*d*	*e*
Trichloroethene	1/8	1.1 E	0.0050 U	1.1	0.0050	1
Vinyl chloride	1/8	0.063	0.010 U	0.063	0.0020	8
Xylene, total	2/8	3.8 E	0.0050 U	1.9	*d*	*e*
1,1-Dichloroethane	2/8	0.017	0.0050 U	0.016	*d*	*e*
1,2-Dichloroethene	3/8	0.26 E	0.0050 U	0.093	*d*	*e*
		Perimeter wells				
Anions, mg/L						
Phosphate	1/30	5.0	5.0 U	5.0	*d*	*e*
Field data						
pH, standard units	210/210	7.8	4.3	*e*	*d*	*e*
Conductivity, mS/cm	210/210	0.82	0.010	0.30	*d*	*e*
Temperature, °C	210/210	17	9.5	14	*d*	*e*

Table 2.3.14 (continued)

Parameter	No. detected/ No. of samples	Concentration[b]		Average of values above the detection limit	Reference value[c]	No. of values exceeding reference
		Max	Min			
Metals, mg/L						
Aluminum, total	24/30	0.89	0.050 U	0.48	*d*	*e*
Beryllium, total	5/30	0.025	0.00030 U	0.025	*d*	*e*
Calcium, total	29/30	180	0.10 U	65	*d*	*e*
Cobalt, total	5/30	0.0048	0.0030 U	0.0041	*d*	*e*
Iron, total	28/30	4.8	0.050 U	0.96	0.30	25
Magnesium, total	29/30	29	0.010 U	8.6	*d*	*e*
Manganese, dissolved	21/30	0.10	0.010 U	0.028	0.050	3
Manganese, total	25/30	0.11	0.010 U	0.052	0.050	11
Nickel, total	20/30	0.028	0.0050 U	0.010	*d*	*e*
Silicon, total	29/30	14	0.20 U	8.0	*d*	*e*
Sodium, dissolved	30/30	46	1.1	9.7	*d*	*e*
Sodium, total	30/30	49	1.0	9.5	*d*	*e*
Strontium, total	12/15	1.2	0.0050 U	0.41	*d*	*e*
Titanium, total	15/30	0.033	0.020 U	0.027	*d*	*e*
Vanadium, total	15/30	0.012	0.0040 U	0.010	*d*	*e*
Other						
Alkalinity, as $CaCO_3$	30/30	440	4.0	195	*d*	*e*
Fecal coliform, col./100 mL	1/30	50	1.0 U	50	1.0	1
Turbidity, NTU	30/30	54	0.055	6.2	1.0	19
Radionuclides, pCi/L						
Gross alpha	30/30	2.5	−0.027	3.9	15	0
Gross beta	30/30	180	−0.054	15	50	
Tritium	30/30	1,200,000	−1,400	128,063	20,000	14
Semivolatiles, mg/L						
Di-n-butylphthalate	1/17	0.019	0.011 U	0.019	*d*	*e*
Diethyl phthalate	1/17	0.048	0.0030 J	0.048	*d*	*e*
Organic carbon, total	64/120	4.7	0.50 U	1.2	*d*	*e*
Organic halides, total	32/120	0.59	0.0050 U	0.12	*d*	*e*
Recoverable phenolics, total	1/30	0.0010	0.0010 U	0.0010	*d*	*e*
Volatile organics, mg/L						
Carbon tetrachloride	2/30	0.086	0.00050J	0.084	0.0050	2
Chloroform	3/30	0.097	0.0020 J	0.055	*d*	*e*
Chloromethane	1/30	0.015	0.0040 J	0.015	*d*	*e*
Toluene	1/30	0.0070 B	0.0020 J	0.0070	*d*	*e*
Trichloroethene	3/30	0.49	0.0010 J	0.28	0.0050	3
Xylene, total	1/30	0.011	0.0050 U	0.011	*d*	*e*
1,1-Dichloroethane	1/30	0.0090	0.0030 J	0.0090	*d*	*e*
1,2-Dichloroethane	2/30	0.044	0.0050 U	0.031	0.0050	2
1,2-Dichloroethene	3/30	0.019	0.0050 U	0.012	*d*	*e*
		Upgradient wells				
Anions, mg/L						
Sulfate, as SO_4	10/14	330	5.0 U	93	250	2
Field data						
pH, standard units	98/98	8.5	4.7	*e*	*d*	*e*
Conductivity, mS/cm	98/98	0.97	0.020	0.37	*d*	*e*
Temperature, °C	98/98	18	12	14	*d*	*e*

Table 2.3.14 (continued)

Parameter	No. detected/ No. of samples	Concentration[b]		Average of values above the detection limit	Reference value[c]	No. of values exceeding reference
		Max	Min			
Metals, mg/L						
Aluminum, total	13/14	0.66	0.050 U	0.38	*d*	*e*
Beryllium, total	10/14	0.025	0.00030 U	0.015	*d*	*e*
Calcium, total	12/14	170	0.10 U	91	*d*	*e*
Cobalt, total	1/14	0.0031	0.0030 U	0.0031	*d*	*e*
Iron, dissolved	3/14	0.63	0.050 U	0.38	0.30	2
Iron, total	12/14	1.7	0.050 U	0.62	0.30	7
Magnesium, total	14/14	54	0.99	12	*d*	*e*
Manganese, dissolved	9/14	0.060	0.010 U	0.023	0.050	2
Manganese, total	10/14	0.13	0.010 U	0.034	0.050	1
Nickel, total	6/14	0.020	0.0050 U	0.013	*d*	*e*
Silicon, total	14/14	14	4.2	8.0	*d*	*e*
Sodium, dissolved	14/14	18	0.68	7.4	*d*	*e*
Sodium, total	14/14	19	0.69	7.3	*d*	*e*
Strontium, total	11/12	0.40	0.0050 U	0.19	*d*	*e*
Titanium, total	2/14	0.027	0.020 U	0.025	*d*	*e*
Vanadium, total	2/9	0.011	0.0040 U	0.010	*d*	*e*
Other						
Alkalinity, as $CaCO_3$	14/14	430	7.0	198	*d*	*e*
Turbidity, NTU	14/14	120	0.075	11	1.0	7
Radionuclides, pCi/L						
Gross alpha	14/14	2.4	−0.15	0.46	15	0
Gross beta	14/14	8.4	0.78	2.3	50	
Semivolatiles, mg/L						
Organic carbon, total	32/56	1.2	0.40	0.85	*d*	*e*
Organic halides, total	2/56	0.0080	0.0050 U	0.0075	*d*	*e*
Volatile organics, mg/L						
Acetone	2/14	0.093 B	0.0030 J	0.053	*d*	*e*

[a]See Fig. 2.3.6 in Vol. 1.

[b]Data qualifiers (organics): U = Undetected; B = Present in blank; J = Below detection limit, but estimated; E = Concentration exceeds the calibration range of the instrument; (inorganics): U = Undetected; B = Value < Contract required detection limit > Instrument detection limit; E = Value is estimated because of the presence of interference.

[c]See Table 2.3.1 in Volume 2 for more information.

[d]No reference.

[e]Not applicable.

Table 2.3.15. ORGDP groundwater monitoring for 1989

Parameter	Number of samples	Samples above detection limit		Min[b]	Max[b]	Reference value	No. of samples > reference
		No.	Av[a]				
			K-27/29				
Benzene, mg/L	25	1	0.006	<0.005	<0.01	0.005	1
Cadmium, mg/L	50	10	0.0055	<0.003	<0.013	0.01	1
Carbon tetrachloride, mg/L	25	8	0.0044	<0.0006	<0.011	0.005	2
Chromium (total), mg/L	50	35	0.072	<0.01	0.46	0.05	8
Iron, mg/L	50	39	4.89	<0.004	31	0.3	21
Lead, mg/L	100	22	0.014	<0.004	<0.055	0.05	1
Manganese, mg/L	50	48	1.34	<0.001	12.0	0.05	24
Total coliform bacteria (COL)	11	2	21	<1.0	<22	1	2
Trichloroethene, mg/L	25	22	0.1	<0.005	<0.41	0.005	22
Turbidity, NTU	25	25	112	0.7	800	5	21
Vinyl chloride, mg/L	25	2	0.011	<0.002	<0.02	0.002	1
			K-31				
Iron, mg/L	19	9	2.59	<0.004	16.0	0.3	6
Manganese, mg/L	19	18	0.16	<0.001	0.43	0.05	12
Total coliform bacteria (COL)	4	2	259	<1.0	<262	1	2
Turbidity, NTU	9	9	37	0.78	200	5	7
			K-33				
Iron, mg/L	20	16	3.91	<0.004	9.1	0.3	12
Manganese, mg/L	20	18	4.76	<0.001	9.9	0.05	14
Total coliform bacteria (COL)	1	1	8.0	8.0	8.0	1	1
Trichloroethene, mg/L	10	2	0.05	<0.005	<0.052	0.005	2
Turbidity, NTU	10	10	260	1.3	1600	5	8
			K-720				
Iron, mg/L	12	12	28	0.055	56	0.3	11
Lead, mg/L	24	7	0.046	<0.004	<0.13	0.05	2
Manganese, mg/L	12	12	50	0.21	100	0.05	12
Nitrate, mg/L	6	2	32	<0.2	64	10	1
Sulfate, mg/L	6	6	1039	4.0	1820	250	5
Turbidity, NTU	6	6	150	33	400	5	6
			K-770				
Iron, mg/L	27	19	1.95	<0.004	4.6	0.3	16
Manganese, mg/L	27	27	0.61	0.031	1.5	0.05	25
Turbidity, NTU	11	11	20	3.5	80	5	8
			K-802-B and H				
Carbon tetrachloride, mg/L	10	2	0.005	<0.004	<0.006	0.005	1
Iron, mg/L	21	15	0.62	<0.004	7.8	0.3	3
Lead, mg/L	42	3	0.023	<0.004	<0.058	0.05	1
Manganese, mg/L	21	19	0.02	<0.001	0.13	0.05	2
Total coliform bacteria (COL)	4	2	32	<1.0	34	1	2
Trichloroethene, mg/L	10	2	0.016	<0.005	<0.018	0.005	2
Turbidity, NTU	10	10	355	0.7	2800	5	3

Table 2.3.15 (Continued)

Parameter	Number of samples	Samples above detection limit		Min[b]	Max[b]	Reference value	No. of samples > reference
		No.	Av[a]				
			K-832-H				
Cadmium, mg/L	16	5	0.01	<0.003	0.027	0.01	1
Iron, mg/L	16	12	0.88	<0.004	5.5	0.3	4
Lead, mg/L	32	6	0.037	<0.004	<0.089	0.05	3
Manganese, mg/L	16	16	2.61	0.006	15.0	0.05	14
Trichloroethene, mg/L	8	2	0.0075	<0.002	<0.013	0.005	1
Turbidity, NTU	8	8	347	2.6	2500	5	6
			K-862-E				
Cadmium, mg/L	32	10	0.0069	<0.003	<0.019	0.01	2
Chromium (total), mg/L	32	26	0.21	<0.01	0.71	0.05	15
Iron, mg/L	32	19	7.51	<0.004	76	0.3	9
Lead, mg/L	64	11	0.045	<0.004	<0.28	0.05	3
Manganese, mg/L	32	30	0.17	<0.001	2.7	0.05	13
Sulfate, mg/L	16	16	229	37	559	250	6
Total coliform bacteria (COL)	6	1	9.0	<1.0	<9.0	1	1
Trichloroethene, mg/L	16	9	0.0048	0.002	<0.01	0.005	3
Turbidity, NTU	16	16	66	0.4	550	5	10
			K-892-G and H				
Chromium (total), mg/L	23	19	0.16	<0.01	0.37	0.05	16
Iron, mg/L	23	8	0.48	<0.004	2.2	0.3	3
Lead, mg/L	46	2	0.057	<0.004	<0.059	0.05	2
Manganese, mg/L	23	18	0.1	<0.001	0.76	0.05	5
Sulfate, mg/L	11	11	229	26	435	250	5
Total coliform bacteria (COL)	4	1	3.0	<1.0	<3.0	1	1
Turbidity, NTU	11	11	27	0.54	260	5	3
			K-892-J				
Alpha activity, pCi/L	9	9	9.53	0.3	68	15	1
Chromium (total), mg/L	20	9	0.095	<0.01	0.31	0.05	3
Iron, mg/L	20	15	43	<0.004	300	0.3	9
Lead, mg/L	39	8	0.12	<0.004	0.22	0.05	7
Manganese, mg/L	20	19	0.71	<0.001	5.9	0.05	8
Trichloroethene, mg/L	9	1	0.016	<0.005	<0.016	0.005	1
Turbidity, NTU	9	9	1546	30	6000	5	9
			K-901-A				
Barium, mg/L	46	46	0.1	0.018	1.2	1	1
Chromium (total), mg/L	46	7	0.19	<0.01	<1.2	0.05	1
Iron, mg/L	46	30	6.9	<0.004	<13	0.3	10
Lead, mg/L	92	16	0.032	<0.004	<0.19	0.05	2
Manganese, mg/L	46	45	0.4	<0.001	10.0	0.05	31
Total coliform bacteria (COL)	7	3	22	<1.0	27	1	3
Trichloroethene, mg/L	26	14	0.0094	<0.001	0.036	0.005	8
Turbidity, NTU	23	23	312	0.65	1800	5	11
Zinc, mg/L	46	31	0.27	<0.001	<7.1	5	1

Table 2.3.15 (Continued)

Parameter	Number of samples	Samples above detection limit		Min[b]	Max[b]	Reference value	No. of samples > reference
		No.	Av[a]				
			K-1004 (includes K-1006)				
Chromium (total), mg/L	49	2	0.33	<0.01	0.65	0.05	1
Iron, mg/L	49	36	0.39	<0.004	6.3	0.3	9
Lead, mg/L	97	7	0.024	<0.004	<0.081	0.05	1
Manganese, mg/L	49	43	0.5	<0.001	2.5	0.05	29
Total coliform bacteria (COL)	5	2	2.5	<1.0	4.0	1	1
Trichloroethene, mg/L	26	21	0.063	0.001	<0.24	0.005	14
Turbidity, NTU	23	23	79	0.45	1100	5	11
			K-1007				
Chromium (total), mg/L	14	5	0.023	<0.01	0.061	0.05	1
Iron, mg/L	14	10	3.62	<0.004	13.0	0.3	5
Lead, mg/L	28	6	0.04	<0.004	<0.21	0.05	1
Manganese, mg/L	14	14	0.29	0.037	1.2	0.05	13
Turbidity, NTU	7	7	77	1.6	26	5	5
			K-1064-G				
1,1-Dichloroethene, mg/L	14	7	0.005	0.002	<0.009	0.007	2
Alpha activity, pCi/L	10	10	17.4	−1.0	50	15	4
Arsenic, mg/L	31	9	0.099	<0.005	<0.32	0.05	4
Cadmium, mg/L	33	12	0.0051	<0.003	<0.011	0.01	1
Iron, mg/L	31	15	0.46	<0.004	5.0	0.3	3
Lead, mg/L	64	10	0.047	<0.004	<0.12	0.05	6
Manganese, mg/L	31	25	0.046	<0.001	0.19	0.05	8
Silver, mg/L	33	9	0.026	<0.006	<0.15	0.05	1
Trichloroethene, mg/L	14	3	0.011	<0.005	<0.013	0.005	3
Turbidity, NTU	10	10	78	0.6	750	5	4
			K-1070-A				
1,1,1-Trichloroethane, mg/L	16	1	3.4	<0.005	<3.4	0.2	1
1,1-Dichloroethene, mg/L	16	1	1.5	<0.005	<1.5	0.007	1
Cadmium, mg/L	37	10	0.0054	<0.003	0.011	0.01	1
Iron, mg/L	37	15	2.15	<0.004	<20.0	0.3	4
Lead, mg/L	72	10	0.062	<0.004	<0.12	0.05	6
Manganese, mg/L	37	27	0.05	<0.001	0.44	0.05	3
Trichloroethene, mg/L	16	8	0.36	<0.001	2.5	0.005	6
Turbidity, NTU	8	8	140	1.0	750	5	6
			K-1070-C/D (includes K-1414)				
1,1-Dichloroethene, mg/L	40	4	0.05	<0.002	<0.12	0.007	2
Alpha activity, pCi/L	28	28	2.05	−1.0	17.0	15	1
Barium, mg/L	59	59	0.17	0.001	1.1	1	1
Cadmium, mg/L	59	15	0.0061	<0.003	<0.011	0.01	2
Chromium (total), mg/L	59	9	0.063	<0.01	<0.17	0.05	4
Iron, mg/L	59	42	9.5	<0.004	120	0.3	25
Lead, mg/L	116	19	0.031	<0.004	<0.19	0.05	3
Manganese, mg/L	59	50	1.82	<0.001	<10.	0.05	34
Trichloroethene, mg/L	40	9	0.34	<0.002	<1.7	0.005	7
Turbidity, NTU	28	28	99	0.8	650	5	24
Vinyl chloride, mg/L	40	1	0.003	<0.003	<0.1	0.002	1

Table 2.3.15 (Continued)

Parameter	Number of samples	Samples above detection limit		Min[b]	Max[b]	Reference value	No. of samples > reference
		No.	Av[a]				
			K-1070-F				
Cadmium, mg/L	13	3	0.0073	<0.003	<0.011	0.01	1
Iron, mg/L	13	9	0.67	<0.004	2.3	0.3	5
Lead, mg/L	25	3	0.085	<0.004	<0.24	0.05	1
Manganese, mg/L	13	13	0.033	0.002	0.14	0.05	2
Trichloroethene, mg/L	3	1	0.031	<0.005	0.031	0.005	1
Turbidity, NTU	6	6	24	5.1	80	5	6
			K-1085				
Chromium (total), mg/L	21	4	0.11	<0.01	0.22	0.05	2
Iron, mg/L	21	14	4.77	<0.004	47	0.3	8
Lead, mg/L	41	12	0.053	<0.004	0.19	0.05	3
Manganese, mg/L	21	20	0.37	<0.001	2.6	0.05	12
Turbidity, NTU	8	8	62	2.1	260	5	7
			K-1099				
Alpha activity, pCi/L	4	4	14.7	12.1	17.2	15	1
Turbidity, NTU	4	4	42	21	85	5	4
			K-1232				
Carbon tetrachloride, mg/L	10	3	0.0053	<0.001	<0.01	0.005	1
Chromium (total), mg/L	22	8	0.035	<0.01	<0.1	0.05	1
Iron, mg/L	22	19	9.41	<0.004	82	0.3	8
Lead, mg/L	44	14	0.033	<0.004	<0.1	0.05	3
Manganese, mg/L	22	20	0.65	<0.001	4.90	0.05	12
Trichloroethene, mg/L	10	10	0.22	0.001	1.50	0.005	6
Turbidity, NTU	10	10	360	1.6	1250	5	6
			K-1401				
Cadmium, mg/L	26	3	0.015	<0.003	0.037	0.01	1
Chloride, mg/L	11	11	74	4.0	327	250	2
Iron, mg/L	26	14	7.98	<0.004	30	0.3	11
Manganese, mg/L	26	23	4.6	<0.001	14.0	0.05	21
Total coliform bacteria (COL)	1	1	50	50	50	1	1
Trichloroethene, mg/L	13	11	1.94	0.002	9.3	0.005	10
Turbidity, NTU	12	12	152	6.4	850	5	12
Vinyl chloride, mg/L	13	4	0.06	0.004	<0.5	0.002	4
			K-1407-B				
1,1,1-Trichloroethane, mg/L	41	15	0.11	<0.003	<0.37	0.2	3
1,1-Dichloroethene, mg/L	41	23	0.17	<0.003	<1.1	0.007	12
1,2-Dichloroethane, mg/L	41	8	0.011	<0.003	<1.3	0.005	5
Alpha activity, pCi/L	38	38	2.22	−24	33	15	3
Cadmium, mg/L	76	15	0.0054	<0.003	<0.03	0.01	2
Chloride, mg/L	27	27	194	39	618	250	9
Chromium (total), mg/L	76	6	0.051	<0.01	<0.2	0.05	1
Iron, mg/L	76	59	6.72	<0.004	100	0.3	38

Table 2.3.15 (Continued)

Parameter	Number of samples	Samples above detection limit		Min[b]	Max[b]	Reference value	No. of samples > reference
		No.	Av[a]				
			K-1407-B (Continued)				
Lead, mg/L	153	27	0.041	<0.004	<0.5	0.05	6
Manganese, mg/L	76	76	5.94	0.0039	24	0.05	71
Sulfate, mg/L	35	35	140	6.0	1400	250	7
Trichloroethene, mg/L	41	36	1.65	<0.003	36	0.005	35
Turbidity, NTU	35	35	116	0.43	2300	5	23
Vinyl chloride, mg/L	41	30	0.12	<0.003	0.54	0.002	30
			K-1407-C				
Chromium (total), mg/L	37	8	0.026	<0.01	<0.052	0.05	1
Iron, mg/L	37	32	7.96	<0.004	88	0.3	20
Lead, mg/L	73	19	0.029	<0.004	<0.15	0.05	5
Manganese, mg/L	37	37	4.97	0.0071	32	0.05	25
Sulfate, mg/L	18	18	60	4.0	298	250	2
Trichloroethene, mg/L	20	7	0.0071	<0.001	<0.019	0.005	3
Turbidity, NTU	18	18	46	2.0	260	5	15
Vinyl chloride, mg/L	20	4	0.0047	<0.003	<0.01	0.002	4
			K-1407-C Upgradient				
Alpha activity, pCi/L	6	6	2.17	−11	17.0	15	1
Chromium (total), mg/L	12	3	0.24	<0.01	<0.31	0.05	3
Iron, mg/L	12	9	13.7	<0.004	50	0.3	7
Lead, mg/L	24	6	0.13	<0.004	<0.5	0.05	3
Manganese, mg/L	12	12	0.97	0.015	2.0	0.05	9
Turbidity, NTU	6	6	174	20	800	5	6
			K-1407-WAG (includes K-1070-B and K-1407-A)				
1,1-Dichloroethene, mg/L	25	11	0.2	<0.002	<0.83	0.007	6
Alpha activity, pCi/L	21	21	10.0	0.45	47	15	5
Chromium (total), mg/L	47	10	0.057	<0.01	0.14	0.05	4
Iron, mg/L	47	32	10.2	<0.004	71	0.3	21
Lead, mg/L	92	13	0.025	<0.004	<0.058	0.05	1
Manganese, mg/L	47	46	2.43	<0.001	14.0	0.05	36
Trichloroethene, mg/L	25	18	5.04	<0.001	34	0.005	17
Turbidity, NTU	21	21	181	0.7	1700	5	17
Vinyl chloride, mg/L	25	15	0.16	<0.005	<2.5	0.002	15
			K-1410				
Iron, mg/L	2	1	36	<0.004	36	0.3	1
Manganese, mg/L	2	2	0.47	0.033	0.9	0.05	1
Trichloroethene, mg/L	1	1	0.064	0.064	0.064	0.005	1
Turbidity, NTU	1	1	1300	1300	1300	5	1

Table 2.3.15 (Continued)

Parameter	Number of samples	Samples above detection limit		Min[b]	Max[b]	Reference value	No. of samples > reference
		No.	Av[a]				
			K-1413				
Cadmium, mg/L	49	21	0.0073	<0.003	<0.033	0.01	2
Chromium (total), mg/L	49	16	0.05	<0.01	0.29	0.05	3
Iron, mg/L	49	32	10.5	<0.004	56	0.3	19
Lead, mg/L	96	28	0.031	<0.004	<0.11	0.05	6
Manganese, mg/L	49	49	0.47	0.0023	2.3	0.05	35
Total coliform bacteria (COL)	2	1	4.0	<1.0	4.0	1	1
Trichloroethene, mg/L	25	23	0.7	0.001	3.8	0.005	16
Turbidity, NTU	23	23	434	1.9	2200	5	21
Vinyl chloride, mg/L	25	5	0.0094	<0.003	<0.2	0.002	5
			K-1420				
1,1-Dichloroethene, mg/L	13	1	0.023	<0.005	<0.1	0.007	1
Alpha activity, pCi/L	12	12	9.13	−1.0	49	15	2
Chromium (total), mg/L	27	4	0.064	<0.01	<0.18	0.05	1
Iron, mg/L	27	25	4.98	<0.004	110	0.3	8
Lead, mg/L	53	10	0.017	<0.004	<0.091	0.05	1
Manganese, mg/L	27	27	0.81	0.0025	8.1	0.05	13
Trichloroethene, mg/L	13	6	1.17	<0.002	3.4	0.005	5
Turbidity, NTU	12	12	34	1.8	170	5	8
Vinyl chloride, mg/L	13	3	0.11	0.009	<0.25	0.002	3
			K-1503				
Chromium (total), mg/L	13	4	0.048	<0.01	0.14	0.05	1
Iron, mg/L	13	13	7.5	0.01	76	0.3	6
Manganese, mg/L	13	12	0.82	<0.001	3.8	0.05	9
Trichloroethene, mg/L	7	4	0.012	<0.001	<0.018	0.005	3
Turbidity, NTU	6	6	202	18	950	5	6

[a]Average of samples above detection.
[b]Maximum and minimum of all the samples.

2.4 BIOLOGICAL SAMPLING

Table 2.4.1. 1989 Concentrations of ^{131}I in milk[a]

Station[b]	No. of samples	Concentration (pCi/L)				Dose (μSv)[c]
		Max	Min	Av	Std. error	
		Immediate environs				
1	15	2.4	−1.1	0.65	0.26	3.2
2	17	1.4	−1.1	0.27	0.17	1.4
3	16	1.4	−0.54	0.31	0.15	1.6
4	17	1.6	−2.4	0.032	0.23	0.16
Network summary	65	2.4	−2.4	0.31	0.10	1.5
		Remote environs				
51	1	1.4	1.4	1.4		6.7
53	1	0.27	0.27	0.27		1.3
Network summary	2	1.4	0.27	0.81	0.54	4.0

[a]Raw milk samples; Station 2 is a dairy.
[b]See Fig. 2.4.1 in Vol. 1.
[c]Potential 50-year committed effective dose equivalents from drinking 365 L of milk per year using average radionuclide concentrations at each location.

Table 2.4.2. 1989 Concentrations of total radioactive Sr in milk[a]

Station[b]	No. of samples	Concentration (pCi/L)				Dose (μSv)[c]
		Max	Min	Av	Std. error	
		Immediate environs				
1	15	10	0.86	3.3	0.74	42
2	17	7.3	0.81	1.9	0.48	25
3	16	4.9	0.32	2.4	0.30	31
4	17	12	−1.6	4.0	0.82	52
Network summary	65	12	−1.6	2.9	0.32	37
		Remote environs				
51	1	1.8	1.8	1.8		24
53	1	0.30	0.30	0.30		3.8
Network summary	2	1.8	0.30	1.1	0.77	14

[a]Raw milk samples; Station 2 is a dairy.
[b]See Fig. 2.4.1 in Vol. 1.
[c]Potential 50-year committed effective dose equivalents from drinking 365 L of milk per year using average radionuclide concentrations at each location.

Table 2.4.3. 1989 Mercury concentrations in Clinch River bluegill

Location[a]	No. of fish sampled	Concentration (μg/g wet wt)				Percentage of action level[b]
		Max	Min	Av	Std. error	
CRK 8.0	12	0.35	0.061	0.14	0.023	14
CRK 33.3	12	0.13	0.027	0.054	0.0090	5.4
CRK 40.0	12	0.10	0.016	0.041	0.0072	4.1

[a]See Fig. 2.4.2 in Vol. 1.

[b]Percent of Food and Drug Administration action level of mercury in fish (1.0 μg/g) for the average concentration.

Table 2.4.4. 1989 PCB Concentrations in Clinch River bluegill

Location[a]	PCB type	No. of fish sampled	Concentration (μg/g wet wt)				Percentage of tolerance[b]
			Max	Min	Av	Std. error	
CRK 8.0	1254	12	0.03	<0.01	<0.018	0.0027	0.92
CRK 8.0	1260	12	0.07	<0.01	<0.016	0.0050	0.79
CRK 33.3	1254	12	0.10	<0.01	<0.019	0.0074	0.96
CRK 33.3	1260	12	0.10	<0.01	<0.025	0.0080	1.3
CRK 40.0	1254	12	0.01	<0.01	<0.010	0	0.50
CRK 40.0	1260	12	0.04	<0.01	<0.018	0.0035	0.88

[a]See Fig. 2.4.2 in Vol. 1.

[b]Percent of Food and Drug Administration action level of PCBs in fish (2.0 μg/g) for the average concentration.

Table 2.4.5. 1989 Radionuclide concentrations in Clinch River bluegill

Location[a]	Radionuclide	No. of samples[b]	Max	Min	Av	Std. error
		Concentration (pCi/g ash wt)				
CRK 8.0	^{60}Co	6	0.51	−0.057	0.22	0.087
CRK 8.0	^{137}Cs	6	12	3.8	7.6	1.6
CRK 8.0	Total Sr[c]	6	0.68	0.027	0.32	0.086
CRK 33.3	^{60}Co	6	0.38	−0.032	0.21	0.067
CRK 33.3	^{137}Cs	6	16	3.5	11	1.8
CRK 33.3	Total Sr[c]	6	1.9	0.51	1.5	0.22
CRK 40.0	^{60}Co	6	0.16	−0.14	0.013	0.043
CRK 40.0	^{137}Cs	6	1.9	0.26	0.83	0.26
CRK 40.0	Total Sr[c]	6	1.7	−0.27	0.50	0.27
		Concentration (pCi/g wet wt)				
CRK 8.0	^{60}Co	6	0.0063	−0.00084	0.0027	0.0011
CRK 8.0	^{137}Cs	6	0.15	0.045	0.10	0.022
CRK 8.0	Total Sr[c]	6	0.0091	0.00032	0.0042	0.0012
CRK 33.3	^{60}Co	6	0.0045	−0.00041	0.0025	0.00078
CRK 33.3	^{137}Cs	6	0.18	0.041	0.13	0.021
CRK 33.3	Total Sr[c]	6	0.022	0.0060	0.017	0.0026
CRK 40.0	^{60}Co	6	0.0020	−0.0018	0.00019	0.00056
CRK 40.0	^{137}Cs	6	0.032	0.0032	0.012	0.0044
CRK 40.0	Total Sr[c]	6	0.020	−0.0045	0.0064	0.0035

[a]See Fig. 2.4.2 in Vol. 1.
[b]A sample is a composite of 6 to 10 fish.
[c]Total radioactive Sr (^{89}Sr and ^{90}Sr).

Table 2.4.6. 1989 grass sampling and pine needle data at ORGDP[a]

Station	F^- concentration (μg/g dry wt)			U (total) concentration						^{99}Tc concentration (pCi/g dry wt)		
				μg/g dry wt			pCi/g dry wt					
	Apr	Aug	Av	Apr	Aug	Av	Apr	Aug	Av	Apr	Aug	Av
						Grass sampling data						
V1	<3	35	<19	1.5	<0.5	<1.0	1.2	<0.39	<0.8	0.5	0.6	0.6
V2	<3	44	<23	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	0.3	0.1	0.2
V3	<3	40	<22	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	0.3	0.7	0.5
V4	3.2	6	4.6	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	0.1	0.3	0.2
V5	<3	6	<5	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	0.2	<0.1	<0.2
V6	<3	55	<29	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	0.9	1.1	1.0
V7	<3	24	<14	0.5	0.8	<0.7	0.39	0.6	<0.55	0.5	1.6	1.1
V8	3.4	8	6	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	<0.1	<0.1	<0.1
V9	<3	8	<6	<0.5	5.0	<2.7	<0.39	3.9	<2.1	<0.1	0.2	<0.2
V10	<3	5	<4	<0.5	<0.5	<0.5	<0.39	<0.39	<0.39	0.3	0.8	0.6
V11	<3	6	<5	<0.5	1.0	<0.8	<0.39	<0.8	<0.6	18.0	23.7	20.9
V12	<3	15	<9	1.0	<0.5	<0.8	<0.8	<0.39	<0.6	1.4	2.6	2.0
V13	<3	11	<7	1.7	<0.5	<1.1	1.3	<0.39	<0.9	<0.1	0.3	<0.2
V14		7			<0.5	<0.5					2.4	
V15		14			<0.5	<0.5					4.2	
V16		3			<0.5	<0.5					22.2	
						Pine needle sampling data						
PN1		16			<0.5			<0.39				
PN2		10			<0.5			<0.39				
PN3		10			<0.5			<0.39				
PN4		10			<0.5			<0.39				
PN5		10			<0.5			<0.39				
PN6		14			0.5			0.39				

[a]See Fig. 2.4.3 (grass and pine needle sampling locations) in Vol. 1.

2.5 SOIL AND SEDIMENT MONITORING

Table 2.5.1. ^{60}Co concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.054	−0.035	0.019	0.027
07	3	0.019	−0.022	−0.0054	0.012
09	3	0.057	−0.035	0.0045	0.027
20	3	−0.0081	−0.030	−0.018	0.0063
21	3	0.057	−0.0054	0.021	0.019
Network summary	15	0.057	−0.035	0.0041	0.0086
Oak Ridge Reservation Stations					
40	3	0.032	−0.0027	0.014	0.010
45	3	0.030	0.0081	0.022	0.0068
46	3	0.030	0.0054	0.015	0.0074
Network summary	9	0.032	−0.0027	0.017	0.0043

[a]Standard error about the average.

Table 2.5.2. ^{137}Cs concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.92	0.70	0.80	0.063
07	3	1.5	0.30	0.84	0.36
09	3	1.5	0.11	0.69	0.42
20	3	0.27	0.19	0.23	0.024
21	3	0.12	0.051	0.081	0.021
Network summary	15	1.5	0.051	0.53	0.13
Oak Ridge Reservation Stations					
40	3	0.19	0.049	0.13	0.042
45	3	0.46	0.0081	0.19	0.14
46	3	0.35	0.26	0.30	0.025
Network summary	9	0.46	0.0081	0.21	0.049

[a]Standard error about the average.

Table 2.5.3. ^{238}Pu concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.0012	−0.00027	0.00064	0.00046
07	3	0.0035	−0.00027	0.0011	0.0012
09	3	0.0011	−0.00046	0.00023	0.00045
20	3	0.00027	−0.00065	−0.00011	0.00028
21	3	−0.00024	−0.00070	−0.00047	0.00013
Network summary	15	0.0035	−0.00070	0.00028	0.00028
Oak Ridge Reservation Stations					
40	3	0.00057	0.00019	0.00042	0.00012
45	3	0.0012	−0.0010	0.00014	0.00063
46	3	0.00097	−0.0014	0.000009	0.00070
Network summary	9	0.0012	−0.0014	0.00019	0.00028

[a]Standard error about the average.

Table 2.5.4. ^{239}Pu concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.038	0.030	0.034	0.0024
07	3	0.022	0.0032	0.013	0.0053
09	3	0.049	0.0054	0.022	0.014
20	3	0.0032	0.0022	0.0027	0.00031
21	3	0.0013	−0.000027	0.00072	0.00039
Network summary	15	0.049	−0.000027	0.014	0.0042
Oak Ridge Reservation Stations					
40	3	0.0038	−0.00073	0.0020	0.0014
45	3	0.0049	−0.0025	0.0018	0.0022
46	3	0.0065	0.0035	0.0052	0.00089
Network summary	9	0.0065	−0.0025	0.0030	0.00097

[a]Standard error about the average.

Table 2.5.5. Total radioactive Sr concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.78	0.24	0.43	0.18
07	3	0.70	0.35	0.50	0.11
09	3	0.21	0.15	0.19	0.019
20	3	0.21	0.014	0.085	0.062
21	3	0.11	0.027	0.067	0.023
Network summary	15	0.78	0.014	0.25	0.060
Oak Ridge Reservation Stations					
40	3	0.19	0.011	0.076	0.058
45	3	0.24	−0.030	0.079	0.082
46	3	0.23	0.092	0.15	0.040
Network summary	9	0.24	−0.030	0.10	0.034

[a]Standard error about the average.

Table 2.5.6. ^{234}U concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.30	0.20	0.24	0.029
07	3	0.35	0.27	0.32	0.027
09	3	0.41	0.24	0.31	0.049
20	3	0.30	0.25	0.27	0.014
21	3	0.97	0.59	0.77	0.11
Network summary	15	0.97	0.20	0.38	0.057
Oak Ridge Reservation Stations					
40	3	3.2	2.4	2.8	0.25
45	3	1.1	0.49	0.79	0.19
46	3	0.76	0.43	0.60	0.094
Network summary	9	3.2	0.43	1.4	0.36

[a]Standard error about the average.

Table 2.5.7. ^{235}U concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.013	0.0065	0.0086	0.0021
07	3	0.014	0.011	0.012	0.00087
09	3	0.016	0.011	0.014	0.0014
20	3	0.020	0.0057	0.012	0.0042
21	3	0.041	0.022	0.032	0.0056
Network summary	15	0.041	0.0057	0.016	0.0026
Oak Ridge Reservation Stations					
40	3	0.30	0.14	0.21	0.048
45	3	0.14	0.035	0.073	0.033
46	3	0.030	0.012	0.022	0.0052
Network summary	9	0.30	0.012	0.10	0.032

[a]Standard error about the average.

Table 2.5.8. ^{238}U concentrations in soil, 1989

Location	Number of samples	Concentration (pCi/g dry wt)			
		Max	Min	Av	Std. error[a]
ORNL Perimeter Stations					
03	3	0.21	0.14	0.17	0.021
07	3	0.27	0.21	0.25	0.020
09	3	0.35	0.14	0.24	0.061
20	3	0.23	0.17	0.19	0.019
21	3	0.62	0.41	0.50	0.063
Network summary	15	0.62	0.14	0.27	0.036
Oak Ridge Reservation Stations					
40	3	4.3	1.4	2.5	0.93
45	3	1.2	0.30	0.83	0.27
46	3	0.38	0.25	0.32	0.036
Network summary	9	4.3	0.25	1.2	0.43

[a]Standard error about the average.

Table 2.5.9. 1989 fluoride and uranium in soil from ORGDP perimeter[a]

New station ID	No. of samples	Concentration (μg/g dry wt)						U (pCi/g dry wt)		
		F			U (total)					
		April	Aug	Av	April	Aug	Av	April	Aug	Av
S18	2	250	443	347	4	3	4	3.1	2.4	3.1
S19	2	650	436	543	3	2	3	2.4	1.6	2.4
S20	2	250	252	251	6	5	6	4.7	3.9	4.7
S21	2	300	395	348	5	3	4	3.9	2.4	3.1
S22	2	850	693	772	4	2	3	3.1	1.6	2.4
S23	2	150	251	201	3	3	3	2.4	2.4	2.4
S24	2	50	236	143	2	2	2	1.6	1.6	1.6
S25	2	250	466	358	4	5	5	3.1	3.9	3.9
S26	2	<50	246	<148	5	4	5	3.9	3.1	3.9
S27	2	450	441	446	2	2	2	1.6	1.6	1.6
S28	2	250	417	334	42	32	37	32.9	25.1	29.0
S29	2	550	1442	996	10	4	7	7.8	3.1	5.5
S30	2	50	355	203	7	2	5	5.5	1.6	3.7
S31	2	—	444	444	—	7	7	—	5.5	5.5

[a]See Fig. 2.5.1 in Vol. 1.

Table 2.5.10. 1989 concentrations of various elements in stream sediment samples near ORGDP[a]

Element	Concentration (μg/g dry wt)							
	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8
Aluminum	9700	4300	6900	9800	8800	5400	6100	1800
Cadmium	0.80	0.66	0.35	0.69	0.39	0.47	0.61	<0.26
Chromium	15	16	10	18	15	29	9.6	4.5
Copper	11	11	13	24	18	14	9.6	2.5
Lead	24	15	29	31	31	23	28	5.1
Manganese	460	220	440	200	460	430	630	300
Mercury	<1.0	4.9	4.9	6.2	6.8	4.4	<1.0	<1.0
Nickel	15	24	18	42	13	19	8.6	4.7
Thorium	<16	<13	<17	<16	<16	<17	<19	<18
Uranium	2	1	3	5	4	4	2	<1
Zinc	52	43	59	70	62	43	40	13

[a]See Fig. 2.5.2 in Vol. 1.

Table 2.5.9. 1989 fluoride and uranium in soil from ORGDP perimeter[a]

New station ID	No. of samples	Concentration (μg/g dry wt)						U (pCi/g dry wt)		
		F			U (total)					
		April	Aug	Av	April	Aug	Av	April	Aug	Av
S18	2	250	443	347	4	3	4	3.1	2.4	3.1
S19	2	650	436	543	3	2	3	2.4	1.6	2.4
S20	2	250	252	251	6	5	6	4.7	3.9	4.7
S21	2	300	395	348	5	3	4	3.9	2.4	3.1
S22	2	850	693	772	4	2	3	3.1	1.6	2.4
S23	2	150	251	201	3	3	3	2.4	2.4	2.4
S24	2	50	236	143	2	2	2	1.6	1.6	1.6
S25	2	250	466	358	4	5	5	3.1	3.9	3.9
S26	2	<50	246	<148	5	4	5	3.9	3.1	3.9
S27	2	450	441	446	2	2	2	1.6	1.6	1.6
S28	2	250	417	334	42	32	37	32.9	25.1	29.0
S29	2	550	1442	996	10	4	7	7.8	3.1	5.5
S30	2	50	355	203	7	2	5	5.5	1.6	3.7
S31	2	—	444	444	—	7	7	—	5.5	5.5

[a]See Fig. 2.5.1 in Vol. 1.

Table 2.5.10. 1989 concentrations of various elements in stream sediment samples near ORGDP[a]

Element	Concentration (μg/g dry wt)							
	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8
Aluminum	9700	4300	6900	9800	8800	5400	6100	1800
Cadmium	0.80	0.66	0.35	0.69	0.39	0.47	0.61	<0.26
Chromium	15	16	10	18	15	29	9.6	4.5
Copper	11	11	13	24	18	14	9.6	2.5
Lead	24	15	29	31	31	23	28	5.1
Manganese	460	220	440	200	460	430	630	300
Mercury	<1.0	4.9	4.9	6.2	6.8	4.4	<1.0	<1.0
Nickel	15	24	18	42	13	19	8.6	4.7
Thorium	<16	<13	<17	<16	<16	<17	<19	<18
Uranium	2	1	3	5	4	4	2	<1
Zinc	52	43	59	70	62	43	40	13

[a]See Fig. 2.5.2 in Vol. 1.

2.6 EXTERNAL GAMMA RADIATION

Table 2.6.1. 1989 External gamma radiation measurements

Location	Number of samples	Exposure rate (μR/h)			
		Max	Min	Av	Standard error[a]
ORNL PAM stations					
3	45	7.1	6.6	6.8	0.021
4	9	110	94	110	2.1
7	22	8.9	7	8.0	0.13
20	4	9.4	8.4	8.8	0.21
Network summary	80	110	6.6	18	3.5
Oak Ridge Reservation stations					
8	28	7.4	6.9	7.1	0.029
31	39	11	7.5	7.8	0.082
33	23	8	7.1	7.5	0.052
34	8	9.1	7.8	8.5	0.14
36	28	7.4	6.8	7.1	0.029
40	16	8.2	7.6	7.9	0.039
41	40	6.5	5.8	6.1	0.032
42	8	7.2	6.7	6.9	0.058
43	19	6.9	6.4	6.7	0.033
44	42	7.3	6.4	6.7	0.031
45	3	7.4	7.2	7.3	0.063
Network summary	254	11	5.8	7.1	0.043

[a]Standard deviation of the mean.

3. POTENTIAL RADIATION AND CHEMICAL DOSE TO THE PUBLIC

All data for this section are presented in Vol. 1.

4. REMEDIAL ACTION

All data for this section are presented in Vol. 1.

5. SOLID WASTE MANAGEMENT PROGRAM

Table 5.2.1. Y-12 Plant remedial action waste data for 1989

Waste	Quantity (yd^3)
Nonhazardous	1000
Harzardous and/or mixed	3972[a]

[a]Does not include treated water discharged from Oil Ponds 1 and 2.

Table 5.3.1. Y-12 Plant on-site waste treatment data for FY 1989

Waste	Quantity treated (kg)[a]	Treatment method	Residue type
	Liquids		
Nonhazardous	4,771,700[b]	*c*	Sludge
Hazardous	1,967,000	*d*	Sludge
Low-level aqueous	556,000	*c, e*	Sludge
Mixed	4,195,000	*c*	Sludge
	Solids[f]		
Low-level solids (ft^3)	375,000	Compaction	Solid

[a]Units are kilograms except as noted.

[b]Does not include wastewater treated at the Steam Plant Wastewater Treatment Facility.

[c]Batch reactors, settling, filtration, chrome reduction, hydrated lime treatment, dewatering, effluent polishing, biodenitrification, and biological degradation.

[d]Batch reactors, settling, filtration, chrome reduction, hydrated lime treatment, dewatering, effluent polishing, biodenitrification, biological degradation, pH control, and metal precipitation.

[e]Batch reactors, settling, filtration, chrome reduction, hydrated lime treatment, dewatering, effluent polishing, and biodenitrification.

[f]Total; cannot be broken down.

Table 5.3.2. 1989 ORNL waste treatment data

Type	Quantity (kg)	Treatment	Residue type
Hazardous	394	Detonation	None
Hazardous		Evaporation	This facility is no longer in operation

Table 5.3.3. Y-12 Plant on-site waste disposal during 1989

Waste	Method	Quantity (kg)
Sanitary/industrial	Landfill	6,308,000[a]
Solid/low level	Landfill	406,000
Classified	Landfill	95,000

[a]This category includes construction/demolition spoils from Y-12 Plant.

Table 5.3.4. 1989 ORNL on-site waste disposal

Waste	Disposal method	Quantity (kg)
Hazardous[a]	Release to air	59
Sanitary Nonradiological Radiological	Landfilling	1,400 m^3[b]
Construction debris	Landfilling	930 m^3
Asbestos Radiological	Landfilling	1,300
Scrap metal Radiological	Landfilling	29,000

[a]This is not RCRA regulated hazardous.

[b]The nonradiological sanitary waste (i.e., garbage) is disposed of in the Y-12 Centralized Sanitary Landfill.

Table 5.3.5. ORGDP waste disposal at DOE Oak Ridge Facilities during 1989

Waste	Quantity	Disposal method
Asbestos nonradiological (kg)	33,400	Sent to landfill at Y-12 Plant
Miscellaneous nonradiological (m^3)	45	Buried at ORGDP–classified solids
nonhazardous (m^3)	25,103	Sent to landfill at Y-12 Plant–sanitary demo

Table 5.3.6. Y-12 Plant 1989 off-site waste disposal

Waste	Method	Quantity (kg)
Oil and solvents	Fuels program; incineration; recycle/recovery	141,000
PCB liquid	Incineration	28,700
PCB solids	Incineration	17,900
RCRA	Shipped off-site	64,100
Scrap metal (clean)	Public sale	1,456,000

Table 5.3.7. 1989 ORNL off-site waste disposal

Waste	Quantity (kg)	Disposal method	Location
Hazardous	46,000	Landfilling	Chem Waste, Emelle, AL
Hazardous	5,400	Fuel recycle	Chem Waste, Emelle, AL
Hazardous	44,000	Incineration (ash is landfilled)	Rollins, Baton Rouge, LA
Hazardous	22,000	Metal reclamation	Silver Services, Gallatin, TN
Asbestos nonradiological	7,700	Landfilling	Y-12 Plant Central Sanitary Landfill, Oak Ridge, TN
Miscellaneous nonhazardous	3,500	Landfilling	Y-12 Plant Central Sanitary Landfill, Oak Ridge, TN

Table 5.3.8. ORGDP off-site disposal activities during 1989

Waste description	Quantity (kg)	Ultimate disposal
Scrap metal—nonradiological	129,655	Sold to public
Batteries (solid)	8,575	Sold to public (for recycle)
Film (solid)	136	Sold to public (for recovery)
Chemicals	227	Sold to public
Office furniture, tires, etc.	3,308	Sold to public
Laboratory chemicals, janitorial supplies, etc.	11,762	Commercial disposal facility
Scrap lumber	908	Sold to public
Lead	14,240	Sold to public
Brass	1,430	Sold to public

Table 5.3.9. Waste placed in storage on-site at the Y-12 Plant in 1989

Waste	Quantity (kg)
Low level	2,274,000[a]
Mixed	915,000
PCB	46,600
PCB/uranium	1,100
RCRA	141,000
Scrap metal (contaminated)	639,000

[a]Includes wastes stored at ORGDP.

Table 5.3.10. Y-12 Plant total waste in storage at the end of 1989[a]

Waste	Quantity (kg)
Low-level	3,313,400
Mixed	5,723,300
Hazardous	175,000
PCB	34,000
PCB/uranium	263,000
Noncontaminated oils/ solvents	30,000
Roofing materials	3,109,000
Scrap metal	
Clean	0
Uranium-contaminated	4,224,500
Mercury-contaminated soil	3,436,400
Other[b]	1,209,600

[a]Totals do not include United Nuclear Corporation wastes.
[b]Mercury-contaminated waste materials.

Table 5.3.11. 1989 waste placed in storage at ORNL

Waste	Quantity (kg)	
	Long-term	Short-term
Hazardous		70,000[a]
Mixed	2,600	3,700
PCB[c]		
Nonradiological		33,000
Radiological	660	
Transuranic		
Contact handled	30 m^3	
Remote handled	9 m^3	
Low-level (m^3)[b]	610 m^3	
Asbestos		
Nonradiological		7,700
Radiological		1,800
Scrap metal		
Nonradiological		1,000,000
Radiological		29,000
Miscellaneous		
Radiological (m^3)		0

[a]Almost 38,000 kg will be recycled.
[b]Low-level concentrated sludge.
[c]PCB concentration of ≥ 2 ppm.

Table 5.3.12. Waste remaining in storage at ORNL at year's end for 1989

Waste	Quantity (kg)
Hazardous	61,000
Mixed	111,000
PCB	
Nonradiological	27,000
Radiological	4,100
Transuranic	
Contact handled	110,000
Remote handled	470,000
Low-level (m^3)[a]	21
Scrap metal radiological	890

[a]An additional 275 m^3 of ORNL's low-level concentrate sludge is in storage at ORGDP.

Table 5.3.13. 1989 ORGDP waste placed in on-site storage

Waste description	Quantity	Type storage[a]		Ultimate disposal
		Short-term	Long-term	
Scrap metal (kg)	175,650		X	Under review
PCB liquids (L)	946	X		TSCA incinerator
PCB solids (kg)	22,797	X		TSCA incinerator
Centrifuge sludge (kg)	19,772		X	Under review
Plating solutions (kg)	363		X	Shipped off-site from storage
Solvents (L)	9,654	X		TSCA incinerator
Oils (L)	52,801	X		TSCA incinerator
Sludge from K-1232 treatment of Y-12 Plant wastewaters (kg)	None		X	Under review
Laboratory waste (kg) BMP	31,679	X		Analyses and treatment plan under review
Sludge from close-out of K-1407-B/C ponds ($L \times 10^6$)	7.0		X	Delisting effort under way
Photographic solutions (L)	619	X		ORNL for silver recovery
Paint and aerosol contents (L)	5,808	X		TSCA incinerator
TSCA ash (kg)[b]	16,892		X	Under review
TSCA sludge (kg)	23,380		X	Under review
Gas cylinders (kg)	54		X	Under review
Metallic mercury (kg)	7	X		Off-site recycle
Solvent-contaminated rags (kg)	2,000	X		TSCA incinerator
Laundry sludge (kg)	4,738	X		TSCA incinerator

[a]Short-term storage = <5 years; long-term storage = >5 years.
[b]TSCA and RCRA test burns; includes caustic sludges from scrubbing system.

Table 5.3.14. Waste placed in storage at ORGDP from other DOE facilities during 1989

Waste description	Quantity[a]	Type storage[b]		Ultimate disposal
		Short-term	Long-term	
Trichloroethane	3,812	X		Blended, TSCA incinerated
Tetrachloroethylene	15,925	X		Blended, TSCA incinerated
Metal sludges	199,285 kg			Under review
Trichloroethylene	6,043	X		TSCA incinerated
Waste oils/solvents	14,754	X		TSCA incinerated
Nonhazardous waste	3,600 kg			Under review
Acetonitrile	8,600	X		Blended, TSCA incinerated
Hazardous waste liquid contaminated with lead, mixed	20,414		X	Under review
Waste solvent, mixed	3,180	X		Blended, TSCA incinerated
Hazardous waste radioactive materials, mixed	59,052 kg		X	Under review
Hazardous waste solids contaminated with metals	13,183 kg		X	Under review
Hazardous waste contaminated soils	16,044 kg		X	Under review

[a]Numbers are liters unless otherwise noted.
[b]Short-term storage = <5 years; long-term storage = >5 years.

Table 5.3.15. Total waste in storage at ORGDP—end of 1989

Waste description	Quantity[a]	Ultimate disposal
Waste oils (low-level waste)	12,400	Incineration
K-1420 nitric acid (mixed)	17,500	Under review
K-1420 electroless nickel solution (mixed)	21,163	Under review
Spent solvents, oils, & PCB liquids (mixed)	649,549	Incineration
Paint waste	17,241	Incineration
K-1232 spent carbon filter agent (mixed)	41,600	Under review
Sludges from treatment of wastewaters	161,722	Under review
PCB solids and liquids (PCB radiological)	965 (drums)	Incineration
Decontamination solutions (mixed)	229 (drums)	Under review
Waste oils from WMCO (mixed)	814 (drums)	Incineration
Y-12 metal sludges	280,717 (kg)	Under review
Waste treatment	114,000	Treatment
Portsmouth PCB contaminated soil	909,000 (kg)	Under review
Incineration ash/sludge	137,313 (kg)	Under review
K-1407B/C pond sludge (mixed)	31,958 (drums)	To be fixed in concrete
K-1407B/C pond sludge (mixed)	45,856 (drums)	Stabilized
RMI lead contaminated liquid (mixed)	18,585 (kg)	Under review
WMCO hazardous waste liquid (mixed)	25,263 (kg)	Incineration
WMCO hazardous waste solid (mixed)	9,728 (kg)	Under review

[a]Units are liters except where noted otherwise.

6. SPECIAL STUDIES

All data for this section are presented in Vol. 1.

7. QUALITY ASSURANCE

Table 7.1.1. Example of inorganic QC results for sampling GW-514—Y-12 Plant, 1989

Parameter	GW-514	Field replicate	Field blank
Concentration (mg/L)			
As	<0.005	<0.005	NA[a]
Ba	0.008	0.008	NA
Cd	<0.002	<0.002	NA
Cr	<0.01	<0.01	NA
Pb	<0.004	<0.004	NA
Se	<0.005	<0.005	NA
Ag	<0.01	0.01	NA
Hg	<0.0002	<0.0002	NA
Total organic carbon	<1.0	<1.0	NA
pH (units)	7.1	7.1	NA
Activity (pCi/L)			
Alpha	−1.2	3.0	NA
Beta	3.6	7.0	NA
Suspended solids (mg/L)	2.0	1.0	NA
U (mg/L)	<0.001	<0.001	NA
Conductivity (μmho/cm)	345.0	342.0	NA
Alkalinity (mg/L)			
CO_3	<1.0	<1.0	NA
HCO_3	176.0	176.0	NA

[a]Not applicable.

Table 7.1.2 Example of organic QC data at GW-514—Y-12 Plant, 1989

Parameter	GW-514	Field duplicate	Field blank
Volatile organic compounds (μg/L)			
Chloromethane	10U	10U	10U
Bromomethane	10U	10U	10U
Vinyl chloride	10U	10U	10U
Chloroethane	10U	10U	10U
Methylene chloride	5U	5U	5U
Acetone	10U	10U	10U
Carbon disulfide	5U	5U	5U
1,1-dichloroethene	5U	5U	5U
1,1-dichloroethane	5U	5U	5U
Chloroform	5U	5U	5U
1,2-dichloroethane	5U	5U	5U
2-butanone	10U	10U	10U
1,1,1-trichloroethane	3J	2J	5U
Carbon tetrachloride	5U	5U	5U
Vinyl acetate	10U	10U	10U
Bromodichloromethane	5U	5U	5U
1,1,2,2-tetrachloroethane	5U	5U	5U
1,2-dichloropropane	5U	5U	5U
Trans-1,3-dichloropropene	5U	5U	5U
Trichloroethene	5U	5U	5U
1,1,2-trichloroethane	5U	5U	5U
Benzene	5U	5U	5U
Cis-1,3-dichloropropene	5U	5U	5U
Bromoform	5U	5U	5U
2-hexanone	10U	10U	10U
4-methyl-2-pentanone	10U	10U	10U
Tetrachloroethene	5U	5U	5U
Toluene	5U	5U	5U
Chlorobenzene	5U	5U	5U
Ethylbenzene	5U	5U	5U
Styrene	5U	5U	5U
Xylenes	5U	5U	5U
Surrogate recovery (%)			
Toluene-D8	94	96	103
Bromofluorobenzene	98	99	101
1,2-dichloroethane D-4	98	98	105

U = compound analyzed for but not detected.
J = indicates an estimated value.

Table 7.2.1. Energy Systems environmental analysis procedures for water

Parameter	Energy Systems procedure	EPA method	Lowest concentration reported[a]
Alkalinity, $CaCO_3$ (mg/L)	EC-1005	310.1	5
Gross alpha activity (pCi/L)	EC-1010		1.0
Gross beta activity (pCi/L)	EC-1010		4.0
^{241}Am and ^{244}Cm (pCi/L)			
^{241}Am	EC-1020		3.0 (ORNL) 0.05
^{244}Cm	EC-1020		3.0 (ORNL) 0.05
As and Se, gaseous hydride-AA (mg/L)			
As	EC-1040	206.3	0.002
Se	EC-1040	270.3	0.002
Asbestos (fibers/L)	EC-1050		0.3×10^6
Biochemical oxygen demand, 5-d (mg/L)	EC-1060	405.1	5
Bromide, spectrophotometric (mg/L)	EC-1070	ASTM D 1216-77	0.1
Chemical oxygen demand (low level) titration method (mg/L)	EC-1090	410.2	5
Chloride, titration, $HgNO_3$ (mg/L)	EC-1120	325.3	2
Anions, ion chromatograph[b] (mg/L)			
Chloride	EC-1130	300.0	2
Nitrate (N)	EC-1130	300.0	1
Sulfate	EC-1130	300.0	5
Phosphate (P)	EC-1130	300.0	2
$TRCl_2$, amperometric (mg/L)	EC-1150	330.1	0.05 (PGDP) 0.01
Cr (VI), spectrophotometric (mg/L)	EC-1180	USGS[c]	0.01
Coliform bacteria, fecal (colonies/100 mL)	EC-1190	909C Std Mth[d]	1
Coliform bacteria, total (colonies/100 mL)	EC-1200	909A Std Mth	1
Color (color unit)	EC-1220	110.2	1
Conductance, specific (μmho/cm)	EC-1240	120.1	0.5
Cyanide, total (5-cm cell)	EC-1270	335.2	0.004
Dissolved oxygen, membrane electrode method (mg/L)	EC-1300	360.1	0.1
Fluoride (mg/L)	EC-1330	340.2	0.1
Gamma-ray emitters (pCi/L)	EC-1340		2.5
Herbicides (chlorinated phenoxy acid), GC method (μg/L)			
2,4-D	EC-1370	509B Std Mth	0.1
Silvex	EC-1370	509B Std Mth	0.02
^{131}I (pCi/L)	EC-1380		4.0
Hg, total (mg/L)	EC-1390	245.1	0.0002
Methylene-blue-active substances (mg/L)	EC-1450	425.1	0.05
^{237}Np (pCi/L)	EC-1460		1.0 (ORNL) 4×10^{-2}
N (mg/L)			
Ammonia, spectrophotometric	EC-1470	350.2	0.2
Ammonia, SIE	EC-1480	350.3	0.2
Kjeldahl (total), spectrophotometric	EC-1500	351.3	0.2
Kjeldahl (total), volumetric	EC-1510	351.3	0.2
Kjeldahl (total), SIE	EC-1520	351.4	0.2
Nitrate, brucine method	EC-1530	352.1	0.1
Nitrate-nitrite, Cd-Redn.	EC-1540	353.3	0.1
N-nitrosomorpholine, spectrophotometric (mg/L)	EC-1550		1.0
O&G, gravimetric (mg/L)	EC-1560	413.1	5
O&G, infrared (mg/L)	EC-1570	413.2	2.0
Pentachlorophenol, HPLC (μg/L)	EC-1583		50

Table 7.2.1 (continued)

Parameter	Energy Systems procedure	EPA method	Lowest concentration reported[a]
Pesticides (organochlorine), GC method (μg/L)			
Lindane	EC-1586	608[e]	0.01
Endrin	EC-1586	608	0.05
Toxaphene	EC-1586	608	1.0
Methoxychlor	EC-1586	509A Std Mth	0.2
Phenols (μg/L)			
Without conc.	EC-1590	420.1	50
With conc.	EC-1590	420.1	5
pH, electrometric (units)	EC-1600	150.1	Nearest 0.1
P (all forms), spectrophotometric (mg/L)	EC-1610	365.2	0.1
Pu isotopes (pCi/L)	EC-1615		1.0 (ORNL) 5×10^{-2}
PCBs, each (μg/L)	EC-1620	608	0.5
Priority pollutants, organic (base/neutral/acid), each (μg/L)	EC-1701	625	Mostly 10–50[f]
Priority pollutants, organic (volatile, purgeable), each (μg/L)	EC-1704	624	Mostly 10–30[g]
Solids			
Dissolved (mg/L)	EC-1760	160.1	10
Settleable [mL/(L·h)]	EC-1770	160.5	1.0
Total (mg/L)	EC-1790	160.3	10
Undissolved (mg/L)	EC-1800	160.2	4
Volatile (mg/L)	EC-1820	160.4	5
^{90}Sr (pCi/L)	EC-1840		4.0 (ORNL) 2.0
Sulfate, turbidimetric method (mg/L)	EC-1850	375.4	5
^{99}Tc (pCi/L)	EC-1860		300
Th isotopes (pCi/L)	EC-1870		0.4 (ORNL) 5×10^{-2}
Th, spectrophotometric (mg/L)	EC-1871		2×10^{-3}
Total organic carbon, combustion or oxidation (mg/L)	EC-1873	415.1	1
Tritium (pCi/L)	EC-1879		5000 (ORNL) 1500
Turbidity (NTU)	EC-1880	180.1	0.05
U (total), fluorometric (mg/L)	EC-1910		1×10^{-3}
U isotopes (pCi/L)	EC-1920		1 (ORNL) 5×10^{-2}
U isotopic abundances (wt %)	EC-1960		0.001

[a]The lowest concentration reported (LCR) may vary among specific samples, depending on interferences in the sample matrix. However, these LCRs have been assigned to accommodate most minor interferences. Some of the Energy Systems LCRs are higher than the method detection limits (MDLs) listed by EPA. This is consistent with guidance from EPA. However, any data reported below the MDLs must be supported by sound documentation. The LCRs applied by the Energy Systems laboratories meet the needs of the programs they support.

[b]Approved for drinking water only (reagent water).

[c]*Methods for Analysis of Inorganic Substances in Water and Fluvial Sediment,* U.S. Department of the Interior, U.S. Geological Survey, Open-File Report 78-679; or "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," N. W. Skougstad et al., *Techniques of Water-Resources Investigation,* Book 5, Chapter A1, U.S. Geological Survey, 1979.

[d]All references to *Standard Methods* for the 15th Edition, 1980.

[e]*Federal Register* 49 (209), 43, 261, October 26, 1984.

[f]For 81 compounds.

[g]For 31 compounds.

Table 7.2.2. Energy Systems atomic absorption and ICP environmental analysis procedures for waters

Element	Lowest concentration reported[a] (mg/L)		
	MMES EC-1400 EPA 200 series flame AA	MMES EC-1400 EPA 200 series graphite furnace AA	MMES EC-1410 EPA 200.7 ICP
Ag	0.05	0.01	0.03
Al	0.3	0.01	0.01
As	*b*	0.005	0.1
Ba	0.2	0.01	0.005
Ca	0.05	*b*	0.01
Cd	0.02	0.002	0.01
Cr	0.2	0.01	0.05
Cu	0.05	0.004	0.01
Fe	0.05	*b*	0.01
K	0.2	*b*	2.0
Li	0.01	*b*	0.02
			(ORNL) 0.2
Mg	0.02	*b*	0.002
Mn	0.03	0.01	0.005
Mo	0.2	0.01	0.05
Na	0.05	*b*	0.04
			(ORNL) 0.5
Ni	0.1	0.01	0.05
Pb	0.2	0.004	0.2
Se	*b*	0.005	0.2
Zn	0.02	*b*	0.005

[a]The lowest concentration reported (LCR) may vary among specific samples, depending on interferences in the sample matrix. However, these LCRs have been assigned to accommodate most minor interferences. Some of the Energy Systems LCRs are higher than the method detection limits (MDLs) listed by EPA. This is consistent with guidance from EPA. However, any data reported below the MDLs must be supported by sound documentation. The LCRs applied by Energy Systems laboratories meet the needs of the programs they support.

[b]Element not normally determined using this technique.

Table 7.2.3. Energy Systems environmental analysis procedures for air

Parameter	Energy Systems procedure	NIOSH[a] or EPA method	Lowest concentration reported[b]
Gross alpha, beta, air filters, radiochemistry (pCi/m^3)	EC-2100	APHA 601, 602[c]	
Alpha			0.005
Beta			0.025
Dustfall, gravimetric	EC-2270		*d*
Fluoride, air, SIE (μg/sample)	EC-2360		5
Fluoride, stacks, SIE ($\mu g/m^3$)	EC-2370		30
Gamma-ray spec., air filters	EC-2400		*d*
^{131}I, gamma-ray spec., air filter (pCi/filter)	EC-2420		2.5
Metals in air particulates, emission spec. (μg/sample)	EC-2440		For 48 metals, mostly 1–10
Air filters, radiochemistry (pCi/filter)			
Pu	EC-2500	EPA-680/4-75-001	0.04
^{90}Sr	EC-2580		2
^{99}Tc	EC-2600		300
Th alpha isotopes, radiochemistry (pCi/filter)	EC-2640		0.04
U, air filters, fluorometric (μg/sample)	EC-2850		0.05
U isotopes, air filters, radiochemistry (pCi/filter)	EC-2870	EPA-680/4-75-001	0.04
U, stack gases, spec./fluoro. ($\mu g/m^3$)	EC-2890		1.7
Dichlorotetrafluoroethane, GC method (mg/m^3)	IHA-230	NIOSH S108	3500
Dioctyl phthalate, air, GC method (mg/m^3)	IHA-235	NIOSH S40	2
Formaldehyde, air (mg/m^3)	IHA-237	NIOSH 125	0.1
Isopropanol, air (mg/m^3)	IHA-240	NIOSH S64	180
Oil mist, air, infrared (mg/m^3)	IHA-247		0.5
Organic solvents, air, GC method (mg/sample)	IHA-250	NIOSH 127	18 cpds; 0.01 to 1.0
Pentachlorophenol, air, HPLC (mg/m^3)	IHA-260	NIOSH S297	0.27
PCBs, air, GC ($\mu g/m^3$)	IHA-270	NIOSH 244	10
Quinoline, air	IHA-273		*d*
Toluene disocyanate, air ($\mu g/m^3$)	IHA-239	NIOSH 141	7
Tributyl phos. air, GC method (mg/m^3)	IHA-285	NIOSH S208	2.7
Vinyl chloride, air, GC method ($\mu g/m^3$)	IHA-294	NIOSH 178	8

[a] *NIOSH Manual of Analytical Methods,* 2nd ed., U.S. Dept. of Health, Education, and Welfare, 1977.

[b] The lowest concentration reported (LCR) may vary among specific samples, depending on interferences in the sample matrix. However, these LCRs have been assigned to accommodate most minor interferences. Some of the Energy Systems LCRs are higher than the method detection limit (MDLs) listed by EPA. This is consistent with guidance from EPA. However, any data reported below the MDLs must be supported by sound documentation. The LCRs applied by Energy Systems laboratories meet the needs of the programs they support.

[c] *APHA Methods,* American Public Health Assoc., 1977.

[d] Procedure in preparation.

Table 7.2.4. Energy Systems environmental analysis procedures for soil and sediment

Parameter	Energy Systems procedure	EPA method	Lowest concentration reported[a]
Fluoride	EC-3050		*b*
Gamma-ray spectrum analysis	EC-3070		*b*
Hg (total), flameless atomic absorption (mg/kg)	EC-3100	245.5	0.2
Metals, atomic absorption	EC-3200	200 Series	*c*
Metals, inductively coupled plasma-optical emission spectrometric (ICP-OES)	EC-3250	200.7	*c*
Np, direct gamma spectrum	EC-3300		*b*
^{237}Np, radiochemical (pCi/kg)	EC-3305		20
Pu, radiochemical (pCi/kg)	EC-3360		20
PCBs, gas chromatographic (mg/kg)	EC-3400		0.1
^{90}Sr, radiochemical (pCi/kg)	EC-3500	704 Std Mth[d]	200
^{99}Tc, radiochemical (pCi/kg)	EC-3550		2×10^4
Th, spectrophotometric (mg/kg)	EC-3600		3
Th (alpha-emitting) isotopes, radiochemical (pCi/kg)	EC-3650		4
U (total), fluorometric (mg/kg)	EC-3700		0.5
U (total and isotopic), isotope dilution mass spectrometric (ng)	EC-3740		10
U isotopes, radiochemical (pCi/kg)	EC-3780		4

[a]The lowest concentration reported (LCR) may vary among specific samples, depending on interferences in the sample matrix. However, these LCRs have been assigned to accommodate most minor interferences. Some of the Energy Systems LCRs are higher than the method detection limits (MDLs) listed by EPA. This is consistent with guidance from EPA. However, any data reported below the MDLs must be supported by sound documentaion. The LCRs applied by Energy Systems laboratories meet the needs of the programs they support.

[b]Procedure in preparation.

[c]See Table 7.2.2.

[d]References to Standard Methods are from the 14th Edition, 1975.

Table 7.2.5. Energy Systems environmental analysis procedures for biota

Parameter	Energy Systems procedure	EPA method	Lowest concentration reported[a]
Fluoride in vegetation (mg/kg)	EC-4100		3
Gamma-ray spectrometry of deer muscle	EC-4130		*b*
Gamma-ray spectrometry of fish	EC-4150		*b*
Gamma-ray spectrometry of vegetation	EC-4170		*b*
^{131}I and ^{90}Sr in raw milk (pCi/L)	EC-4180		
^{131}I			1
^{90}Sr			1
Metals in fish, atomic absorption, furnace AA (mg/kg)	EC-4250	600/4-81-055[c]	
Cd			0.01
Cr			0.05
Cu			0.10
Ni			0.50
Pb			0.05
Metals in vegetation, atomic absorption, flame AA (mg/kg)	EC-4300		
Cd			0.5
Cr			3.0
Cu			2.0
Ni			3.5
Zn			0.5
Pu isotopes in fish (pCi/kg)	EC-4360		20 (ORNL) 4
Pu isotopes in vegetation (pCi/kg)	EC-4380		40 (ORNL) 4
PCBs in fish and animal tissue	EC-4400	600/4-81-055[c]	0.1
^{90}Sr in fish (pCi/kg)	EC-4600		1000 (ORNL) 200
^{90}Sr in vegetation (pCi/kg)	EC-4620		1000 (ORNL) 200
^{99}Tc in fish	EC-4630		*b*
^{99}Tc in vegetation	EC-4635		*b*
Th isotopes in vegetation (pCi/kg)	EC-4640		40 (ORNL) 4
U (total) in vegetation (mg/kg)	EC-4700		0.5
U (total and isotopic) in vegetation (ng/sample)	EC-4720		10
U isotopes in animal tissue	EC-4800		*b*
U isotopes in vegetation (pCi/kg)	EC-4840		40 (ORNL) 4

[a]The lowest concentration reported (LCR) may vary among specific samples, depending on interferences in the sample matrix. However, these LCRs have been assigned to accommodate most minor interferences. Some of the Energy Systems LCRs are higher than the method detection limit (MDLs) listed by EPA. This is consistent with guidance from EPA. However, any data reported below the MDLs must be supported by sound documentation. The LCRs applied by Energy Systems laboratories meet the needs of the programs they support.

[b]Procedure in preparation.

[c]*Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue,* EPA, October 1980.

Table 7.2.6. EPA EMSL-LV Intercomparison Radionuclide Control Program—Y-12, 1989

Analysis and sample date	Values		Normalized deviation	Performance evaluation
	EPA	Y-12		
	Water (pCi/L)			
^{239}Pu				
1/89	4.20 ± 0.40	4.33	0.58	Acceptable
8/89	2.80 ± 0.30	20.7	103	Unacceptable
Gross alpha				
1/89	8.00 ± 5	15.6	2.66	Acceptable
4/89	29.00 ± 7	30.3	0.33	Acceptable
5/89	30.00 ± 8	33.7	0.79	Acceptable
10/89	49.00 ± 12	49.3	0.05	Acceptable
Gross beta				
1/89	4.00 ± 5	8.00	1.39	Acceptable
4/89	57.00 ± 5	55.3	0.58	Acceptable
5/89	50.00 ± 5	46.0	1.39	Acceptable
10/89	32.00 ± 5	29.7	0.81	Acceptable
U				
3/89	5.00 ± 6	4.33	0.19	Acceptable
4/89	3.00 ± 6	3.33	0.10	Acceptable
10/89	12.00 ± 6	6.33	1.64	Acceptable
11/89	15.00 ± 6	16.33	0.47	Acceptable
^{134}Cs				
4/89	20.00 ± 5	24.7	1.62	Acceptable
6/89	39.00 ± 5	42.0	1.04	Acceptable
^{137}Cs				
4/89	20.00 ± 5	20.7	0.23	Acceptable
6/89	20.00 ± 5	24.7	1.62	Acceptable
^{133}Ba				
6/89	49.00 ± 5	59.7	3.70	Unacceptable
^{60}Co				
6/89	31.00 ± 5	36.0	1.73	Acceptable
^{65}Zn				
6/89	165.00 ± 17	166.0	0.10	Acceptable
^{106}Ru				
6/89	128.00 ± 13	196.3	9.10	Unacceptable
^{3}H				
6/89	4503 ± 450	4123	1.46	Acceptable
10/89	3496 ± 364	1850	7.83	Unacceptable
^{226}Ra				
7/89	17.70 ± 2.70	24.0	4.04	Unacceptable
^{228}Ra				
7/89	18.30 ± 2.70	39.7	13.7	Unacceptable

Table 7.2.6 (continued)

Analysis and sample date	Values		Normalized deviation	Performance evaluation
	EPA	Y-12		
	Air filter (pCi/filter)			
Gross alpha 3/89	21.00 ± 5	21.7	0.23	Acceptable
Gross beta 3/89	62.00 ± 5	61.0	0.35	Acceptable
^{90}Sr 3/89	20.00 ± 1.50	20.0	0	Acceptable
^{137}Cs 3/89	20.00 ± 5	23.3	1.15	Acceptable

Table 7.2.7. EPA EMSL-LV Intercomparison Radionuclide Control Program ORNL low-level radiochemical laboratory, 1989

Analysis and sample date	Values		Ratio[b] (ORNL/EPA)	Performance evaluation[c]
	EPA[a]	ORNL		
	Water, pCi/L			
Gross Alpha				
1/89	8 ± 5	7.33	0.92	Acceptable
4/89	29 ± 7	29	1.00	Acceptable
5/89	30 ± 8	25	0.83	Acceptable
9/89	4 ± 5	3.67	0.92	Acceptable
Gross Beta				
1/89	4 ± 5	6	1.50	Acceptable
4/89	57 ± 5	62.7	1.10	Acceptable
5/89	50 ± 5	55	1.10	Acceptable
9/89	6 ± 5	7.33	1.22	Acceptable
^{133}Ba				
6/89	49 ± 5	48	0.98	Acceptable
10/89	59 ± 6	54	0.92	Acceptable
^{134}Cs				
2/89	10 ± 5	10.33	1.03	Acceptable
4/89	20 ± 5	13	2.42	Warning
6/89	39 ± 5	36.7	0.94	Acceptable
10/89	29 ± 5	25.33	0.87	Acceptable
^{137}Cs				
2/89	10 ± 5	10.67	1.07	Acceptable
4/89	20 ± 5	15.3	0.77	Acceptable
6/89	20 ± 5	21	1.05	Acceptable
10/89	59 ± 5	58.33	0.99	Acceptable
^{51}Cr				
2/89	235 ± 24	213	0.91	Acceptable
^{60}Co				
2/89	10 ± 5	9.33	0.93	Acceptable
6/89	31 ± 5	31	1.00	Acceptable
10/89	30 ± 5	27.76	0.93	Acceptable
^{3}H				
2/89	2754 ± 356	1933	3.99	Unacceptable
6/89	4491 ± 450	4323	0.96	Acceptable
10/89	3496 ± 364	2527	0.72	Unacceptable[a]
^{239}Pu				
1/89	4.2 ± 0.4	3.9	0.93	Acceptable
8/89	2.83 ± 0.3	2.83	1.00	Acceptable
^{226}Ra				
3/89	4.9 ± 0.4	4.5	0.92	Acceptable
4/89	3.5 ± 0.5	3.5	1.00	Acceptable
7/89	17.7 ± 2.7	19.1	1.08	Acceptable
^{228}Ra				
4/89	3.6 ± 0.5	4.6	1.28	Acceptable
7/89	18.3	17.4	0.95	Acceptable

Table 7.2.7 (continued)

Analysis and sample date	Values		Ratio (ORNL/EPA)	Performance evaluation
	EPA	ORNL		
^{106}Ru				
2/89	178 ± 18	163	0.92	Acceptable
6/89	128	116	0.91	Acceptable
10/89	161 ± 16	136.33	0.85	Acceptable
^{89}Sr				
1/89	40 ± 5	42.33	1.06	Acceptable
4/89	8 ± 5	9.7	1.21	Acceptable
6/89	6 ± 5	6.67	1.11	Acceptable
9/89	14 ± 5	14.33	1.02	Acceptable
^{90}Sr				
1/89	25 ± 2	24	0.96	Acceptable
4/89	8 ± 1.5	6.3	0.79	Acceptable
6/89	6 ± 1.5	5.33	0.89	Acceptable
9/89	10 ± 5	8.67	0.87	Acceptable
U				
3/89	5 ± 6	5.33	1.07	Acceptable
4/89	3 ± 6	2.0	0.67	Acceptable
7/89	41 ± 6	38.30	0.93	Acceptable
^{65}Zn				
2/89	159 ± 16	163	1.03	Acceptable
6/89	165 ± 17	175	1.06	Acceptable
10/89	129 ± 13	121.67	0.94	Acceptable
	Air filters, pCi/filter			
Gross alpha				
3/89	21 ± 5	24.3	1.16	Acceptable
Gross Beta				
3/89	62 ± 5	64.3	1.04	Acceptable
^{137}Cs				
3/89	20 ± 5	18.7	0.93	Acceptable
^{90}Sr				
3/89	20 ± 2	19.7	0.99	Acceptable

[a]Values and uncertainty were provided by the EPA and are published as provided.

[b]Ratio is proved as an indication of performance in comparison to EPA values. Ratio is not used as a measure of acceptability of data and may vary widely in relation to the individual precision associated with a particular radionuclide.

[c]The EPA gives three classes of performance based on the number of standard deviations a result is from the true value; these are acceptable (<2 sigma), warning (2 to 3 sigma), and unacceptable (>3 sigma).

Table 7.2.8. EPA EMSL-LV Intercomparison Radionuclide Control Program—ORGDP, 1989

Analysis and sample date	Values (pCi/unit)[a]		Ratio[b] (EPA/ORGDP)	Performance evaluation
	EPA	ORGDP		
		Water		
^{239}Pu				
1/89	4.20 ± 0.40	3.77 ± 0.15	1.11	Acceptable
8/89	2.80 ± 0.30	2.70 ± 0.10	1.03	Acceptable
U				
3/89	5.00 ± 6.00	5.00 ± 0.00	1.00	Acceptable
4/89	3.00 ± 6.00	3.00 ± 0.00	1.00	Acceptable
7/89	41.00 ± 6.00	39.33 ± 0.58	1.04	Acceptable
10/89	12.00 ± 6.00	6.33 ± 0.58	1.89	Acceptable
11/89	15.00 ± 6.00	14.33 ± 1.15	1.05	Acceptable
Gross alpha				
1/89	8.00 ± 5.00	5.67 ± 0.58	1.41	Acceptable
4/89	29.00 ± 7.00	19.33 ± 2.08	1.500	Acceptable
5/89	30.00 ± 8.0	17.67 ± 0.58	1.70	Acceptable
9/89	4.00 ± 5.00	3.00 ± 1.00	1.33	Acceptable
10/89	49.00 ± 12.00	41.33 ± 1.53	1.18	Acceptable
Gross beta				
1/89	4.00 ± 5.00	5.67 ± 0.58	0.70	Acceptable
4/89	57.00 ± 5.00	34.33 ± 2.89	1.66	Acceptable
5/89	50.00 ± 5.00	57.33 ± 1.15	0.87	Acceptable
9/89	6.00 ± 5.00	3.33 ± 0.58	1.80	Acceptable
10/89	32.00 ± 5.00	28.33 ± 0.58	1.13	Acceptable
^{3}H				
6/89	4503 ± 450	3491 ± 367	1.29	Acceptable
10/89	3496 ± 364	3305 ± 177	1.06	Acceptable
^{134}Cs				
4/89	20.00 ± 5.00	15.00 ± 1.73	1.33	Acceptable
6/89	39.00 ± 5.00	31.33 ± 0.58	1.24	Acceptable
10/89	29.00 ± 5.00	25.00 ± 1.00	1.16	Acceptable
^{137}Cs				
4/89	20.00 ± 5.00	34.33 ± 2.89	0.58	Acceptable
6/89	20.00 ± 5.00	195.33 ± 4.73	0.10	Unacceptable
10/89	59.00 ± 5.00	64.33 ± 3.06	0.92	Acceptable
10/89	5.00 ± 5.00	5.00 ± 0.00	1.00	Acceptable
^{133}Ba				
6/89	49.00 ± 5.00	41.00 ± 2.00	1.20	Acceptable
10/89	59.00 ± 6.00	58.33 ± 3.21	1.01	Acceptable
^{60}Co				
6/89	31.00 ± 5.00	31.33 ± 0.58	0.99	Acceptable
10/89	30.00 ± 5.00	31.67 ± 1.53	0.95	Acceptable
^{65}Zn				
6/89	165.00 ± 17.00	185.00 ± 1.73	0.89	Acceptable
10/89	129.00 ± 13.00	133.67 ± 3.06	0.97	Acceptable
^{106}Ru				
6/89	128.00 ± 13.00	143.00 ± 8.66	0.90	Acceptable
10/89	161.00 ± 16.00	140.33 ± 3.21	1.15	Acceptable

Table 7.2.8 (continued)

Analysis and sample date	Values (pCi/unit)[a]		Ratio[b] (EPA/ORGDP)	Performance evaluation
	EPA	ORGDP		
		Air filters		
Gross alpha				
3/89	21.00 ± 5.00	13.00 ± 1.00	1.62	Acceptable
8/89	6.00 ± 5.00	4.33 ± 0.58	1.38	Acceptable
Gross beta				
3/89	62.00 ± 5.00	63.67 ± 4.04	0.97	Acceptable
^{90}Sr				
3/89	20.00 ± 5.00	22.33 ± 0.58	0.90	Acceptable
^{137}Cs				
3/89	20.00 ± 5.00	20.33 ± 2.31	0.98	Acceptable
8/89	10.00 ± 5.00	13.00 ± 1.00	0.76	Acceptable

[a]Unit for water is "liter." Unit for air is "filter."
[b]Acceptable ratio is 0.50–1.50.

Table 7.2.9. EML Intercomparison study QAP-30 Y-12 Radiochemical Laboratory May 1989

Parameter	EML value	Y-12 value	Y-12 percent error[a]	Ratio Y-12/EML	Performance evaluation
			Soil (pCi/g)		
^{90}Sr	1.09	1.52	10	1.39 ± 0.17	Acceptable
^{137}Cs	20.8	33.1	6	1.59 ± 0.12	Unacceptable
^{239}Pu	0.420	0.166	12	0.40 ± 0.05	Unacceptable
^{241}Am	0.210	0.223	8	1.06 ± 0.11	Acceptable
			Vegetation (pCi/g)		
^{90}Sr	3.75	4.58	6	1.22 ± 0.08	Acceptable
^{137}Cs	1.60	3.73	23	2.33 ± 0.55	Unacceptable
^{239}Pu	0.022	0.016	43	0.73 ± 0.33	Acceptable
^{241}Am	0.015	0.013	53	0.87 ± 0.56	Acceptable
^{238}U	0.012	0.014	0	1.17 ± 0.29	Acceptable
			Water (pCi/mL)		
^{3}H	6.31	5.43	25	0.86 ± 0.23	Acceptable
^{54}Mn	0.300	0.678	16	2.26 ± 0.40	Unacceptable
^{57}Co	0.880	1.84	4	2.09 ± 0.15	Unacceptable
^{60}Co	0.940	1.93	9	2.05 ± 0.23	Unacceptable
^{90}Sr	0.550	0.58	6	1.05 ± 0.08	Acceptable
^{134}Cs	2.73	5.09	2	1.86 ± 0.11	Unacceptable
^{137}Cs	2.55	5.69	3	2.23 ± 0.15	Unacceptable
^{239}Pu	0.0059	0.0041	17	0.69 ± 0.12	Acceptable
^{241}Am	0.0045	0.0046	15	1.02 ± 0.21	Acceptable
^{238}U	0.0044	0.0112	0	2.55 ± 0.17	Unacceptable

[a]Percent error for the laboratory based on three replicate analyses.

Table 7.2.10. EML Intercomparison Study QAP-31 Y-12 Radiochemical Laboratory November 1989

Parameter	EML value	Y-12 value	Y-12 percent error[a]	Ratio Y-12/EML	Performance evaluation
		Air, Bq/filter[b]			
^{90}Sr	0.200	0.220	31	1.10	Acceptable
^{239}Pu	0.018	0.012	41	0.67	Acceptable
^{241}Am	0.018	0.026	30	1.44	Acceptable
U (μg)	0.720	0.800	—	1.11	Acceptable
		Soil, Bq/kg			
^{90}Sr	5.73	6.29	73	1.10	Acceptable
^{137}Cs	17.1	15.9	6	0.93	Acceptable
^{239}Pu	2.22	1.82	5	0.82	Acceptable
U (μg/g)	1.71	1.34	—	0.78	Acceptable
		Vegetation, Bq/kg			
^{90}Sr	1830	1660	5	0.91	Acceptable
^{239}Pu	0.0745	0.103	63	1.38	Acceptable
U (μg/g)	0.047	0.275	—	5.80	Unacceptable
		Water, Bq/L			
^{3}H	395	364	7	0.92	Acceptable
^{90}Sr	31.7	33.9	5	1.07	Acceptable
^{239}Pu	0.350	0.247	10	0.71	Acceptable
^{241}Am	0.333	0.340	8	1.02	Acceptable
U (μg/mL)	13.2	13.0	—	0.98	Acceptable

[a]Percent error for the laboratory based on three replicate analyses.
[b]Bq = becquerel. 1 Bq = 27 pCi.

Table 7.2.11. 1989 EML intercomparison study ORNL low-level radiochemical laboratory April 1989

Parameter	EML value	ORNL value	ORNL % error[a]	Ratio (ORNL/EML)	Performance evaluation
			Air, pCi/filter		
^{7}Be	1950	1700	5	0.87	Acceptable
^{54}Mn	3.74	3.30	63	0.88	Acceptable
^{60}Co	126	125	8	0.99	Acceptable
^{90}Sr	2.39	3.64	57	1.52	Acceptable
^{90}Sr	2.39	2.40	41	1.00	Acceptable
^{125}Sb	96.8	82.0	8	0.85	Acceptable
^{137}Cs	189	190	5	1.01	Acceptable
^{144}Ce	327	305	3	0.93	Acceptable
^{239}Pu	0.270	0.210	47	0.78	Acceptable
^{239}Pu	0.270	0.150	66	0.56	Acceptable
^{241}Am	0.225	0.240	33	1.07	Acceptable
^{241}Am	0.225	0.250	40	1.11	Acceptable
^{238}U	0.090	0.180	27	2.00	Unacceptable
^{238}U	0.090	0.170	58	1.89	Acceptable
			Soil, pCi/g		
^{40}K	24.1	25.0	4	1.04	Acceptable
^{90}Sr	1.09	1.10	9	1.01	Acceptable
^{90}Sr	1.09	1.60	6	1.47	Acceptable
^{137}Cs	20.8	20.0	5	0.96	Acceptable
^{239}Pu	0.420	0.400	7	0.95	Acceptable
^{241}Am	0.210	0.190	15	0.90	Acceptable
			Vegetation, pCi/g		
^{40}K	26.1	28.0	3	1.07	Acceptable
^{90}Sr	3.75	3.80	7	1.01	Acceptable
^{137}Cs	1.60	1.65	6	1.03	Acceptable
^{239}Pu	0.022	0.028	35	1.27	Acceptable
^{241}Am	0.015	0.018	22	1.20	Acceptable
^{238}U	0.012	0.013	46	1.08	Acceptable
			Water, pCi/mL		
^{3}H	6.31	5.70	26	0.90	Acceptable
^{54}Mn	0.300	0.310	6	1.03	Acceptable
^{57}Co	0.880	0.840	2	0.95	Acceptable
^{60}Co	0.940	0.880	2	0.93	Acceptable
^{90}Sr	0.550	0.570	5	1.04	Acceptable
^{137}Cs	2.55	2.40	4	0.94	Acceptable
^{144}Ce	1.89	1.85	5	0.98	Acceptable
^{239}Pu	0.00590	0.00620	16	1.05	Acceptable
^{241}Am	0.00450	0.00420	23	0.93	Acceptable
^{238}U	0.00440	0.00450	22	1.02	Acceptable

[a]Counting error, 2 σ.

Table 7.2.12. 1989 EML intercomparison study ORNL low-level radiochemical laboratory September 1989

Parameter	EML value	ORNL value	ORNL % error[a]	Ratio (ORNL/EML)	Performance evaluation
			Air, pCi/filter		
^{7}Be	123	120	8	0.98	Acceptable
^{54}Mn	4.17	4.40	4	1.06	Acceptable
^{60}Co	8.17	8.60	2	1.05	Acceptable
^{90}Sr	0.200	0.230	34	1.15	Acceptable
^{134}Cs	9.33	8.30	2	0.89	Acceptable
^{137}Cs	3.58	3.80	5	1.06	Acceptable
^{144}Ce	7.08	7.40	6	1.05	Acceptable
^{239}Pu	0.018	0.018	222	1.00	Acceptable
^{241}Am	0.018	0.021	19	1.17	Acceptable
^{238}U	0.090	0.015	20	0.17	Unacceptable
			Soil, pCi/g		
^{40}K	561	600	8	1.07	Acceptable
^{90}Sr	5.73	7.70	55	1.34	Acceptable
^{137}Cs	642	735	6	1.14	Acceptable
^{239}Pu	17.1	13.0	7	0.76	Acceptable
^{241}Am	2.22	2.40	16	1.08	Acceptable
^{238}U	43.4	27.0	7	0.62	Acceptable
			Vegetation, pCi/g		
^{40}K	1290	1550	6	1.20	Acceptable
^{90}Sr	1830	1450	6	0.79	Acceptable
^{137}Cs	47.9	52.0	9	1.09	Acceptable
^{241}Am	0.060	0.087	229	1.45	Acceptable
^{238}U	0.60	0.54	55	0.90	Acceptable
			Water, pCi/mL		
^{3}H	395	336.00	11	0.85	Acceptable
^{54}Mn	65.0	67.0	1	1.03	Acceptable
^{57}Co	135	140	7	1.04	Acceptable
^{60}Co	155	155	6	1.00	Acceptable
^{90}Sr	31.7	35	5	1.10	Acceptable
^{134}Cs	68.3	64	1	0.94	Acceptable
^{137}Cs	68.3	73	1	1.07	Acceptable
^{144}Ce	132	135	7	1.02	Acceptable
^{239}Pu	0.350	0.260	15	0.74	Acceptable
^{241}Am	0.333	0.340	14	1.02	Acceptable
^{238}U	0.167	0.160	18	0.96	Acceptable

[a]Counting error, 2 σ.

Table 7.2.13. 1989 EML intercomparison study results for ORGDP in May 1989

Parameter	EML value	ORGDP value	Error, ORGDP (%)	Ratio (ORGDP/EML)	Performance evaluation[a]
		Water (pCi/mL)			
^{3}H	0.631×10^{1}	0.371×10^{1}	61	0.59 ± 0.37	Acceptable
^{54}Mn	0.300×10^{0}	0.316×10^{0}	4	1.05 ± 0.08	Acceptable
^{57}Co	0.880×10^{0}	0.893×10^{0}	1	1.01 ± 0.06	Acceptable
^{60}Co	0.940×10^{0}	0.921×10^{0}	1	0.98 ± 0.05	Acceptable
^{90}Sr	0.550×10^{0}	0.601×10^{0}	2	1.09 ± 0.05	Acceptable
^{134}Cs	0.273×10^{1}	0.251×10^{1}	0	0.92 ± 0.05	Acceptable
^{137}Cs	0.255×10^{1}	0.261×10^{1}	1	1.02 ± 0.06	Acceptable
^{239}Pu	0.590×10^{-2}	0.652×10^{-2}	12	1.11 ± 0.15	Acceptable
^{241}Am	0.450×10^{-2}	0.357×10^{-2}	17	0.79 ± 0.18	Acceptable
^{238}U μg	0.440×10^{-2}	0.429×10^{-2}	14	0.98 ± 0.16	Acceptable
		Air (pCi/filter)			
^{60}Co	0.126×10^{3}	0.129×10^{3}	4	1.02 ± 0.07	Acceptable
^{134}Cs	0.158×10^{3}	0.146×10^{3}	3	0.92 ± 0.06	Acceptable
^{137}Cs	0.189×10^{3}	0.201×10^{3}	4	1.06 ± 0.07	Acceptable
^{144}Ce	0.327×10^{3}	0.348×10^{3}	8	1.06 ± 0.11	Acceptable
^{239}Pu	0.270×10^{0}	0.222×10^{0}	60	0.82 ± 0.50	Acceptable
^{241}Am	0.225×10^{0}	0.232×10^{0}	46	1.03 ± 0.49	Acceptable
		Soil (pCi/g)			
^{90}Sr	0.109×10^{1}	0.156×10^{1}	24	1.43 ± 0.36	Acceptable
^{137}Cs	0.208×10^{2}	0.216×10^{2}	2	1.04 ± 0.04	Acceptable
^{239}Pu	0.420×10^{0}	0.431×10^{0}	8	1.03 ± 0.10	Acceptable
^{241}Am	0.210×10^{0}	0.158×10^{0}	14	0.75 ± 0.11	Acceptable

[a]Acceptable ratio is 0.5 to 1.5.

Table 7.2.14. 1989 EML intercomparison study results for ORGDP in September 1989

Parameter	EML value	ORGDP value	Error, ORGDP (%)	Ratio (ORGDP/EML)	Performance evaluation[a]
		Water (pCi/mL)			
^{3}H	0.395×10^{3}	0.362×10^{1}	12	0.92 ± 0.12	Acceptable
^{54}Mn	0.650×10^{2}	0.703×10^{1}	1	1.08 ± 0.09	Acceptable
^{57}Co	0.135×10^{3}	0.147×10^{1}	0	1.09 ± 0.09	Acceptable
^{60}Co	0.155×10^{3}	0.162×10^{1}	0	1.05 ± 0.09	Acceptable
^{90}Sr	0.317×10^{2}	0.360×10^{1}	6	1.14 ± 0.08	Acceptable
^{134}Cs	0.683×10^{2}	0.670×10^{1}	0	0.98 ± 0.08	Acceptable
^{137}Cs	0.683×10^{2}	0.762×10^{1}	1	1.12 ± 0.08	Acceptable
^{144}Ce	0.132×10^{3}	0.150×10^{1}	1	1.14 ± 0.10	Acceptable
^{239}Pu	0.350×10^{0}	0.238×10^{1}	10	0.68 ± 0.07	Acceptable
^{241}Am	0.333×10^{0}	0.281×10^{1}	11	0.84 ± 0.14	Acceptable
^{238}U, pCi	0.167×10^{0}	0.153×10^{1}	12	0.92 ± 0.12	Acceptable
		Air (pCi/filter)			
^{54}Mn	0.417×10^{1}	0.463×10^{1}	8	1.11 ± 0.11	Acceptable
^{60}Co	0.817×10^{1}	0.881×10^{1}	5	1.08 ± 0.07	Acceptable
^{134}Cs	0.933×10^{1}	0.920×10^{1}	4	0.99 ± 0.05	Acceptable
^{137}Cs	0.358×10^{1}	0.395×10^{1}	9	1.10 ± 0.11	Acceptable
^{144}Ce	0.708×10^{1}	0.760×10^{1}	18	1.07 ± 0.22	Acceptable
^{239}Pu	0.180×10^{-1}	0.102×10^{-1}	50	0.57 ± 0.29	Acceptable
^{241}Am	0.180×10^{-1}	0.163×10^{-1}	31	0.91 ± 0.31	Acceptable
^{238}U, pCi	0.900×10^{-2}	0.121×10^{-1}	41	1.34 ± 0.56	Acceptable
		Soil (pCi/g)			
^{137}Cs	0.642×10^{3}	0.660×10^{1}	3	1.03 ± 0.05	Acceptable
^{239}Pu	0.171×10^{2}	0.140×10^{1}	8	0.82 ± 0.21	Acceptable
^{241}Am	0.222×10^{1}	0.162×10^{1}	28	0.73 ± 0.23	Acceptable
U, Bq	0.434×10^{2}	0.281×10^{1}	5	0.65 ± 0.10	Acceptable

[a]Acceptable ratio is 0.5 to 1.5.

Table 7.2.15. Proficiency Environmental Testing Control Program at the Y-12 Plant Environmental Laboratory in 1989—Level 1 concentrations

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Biochemical oxygen demand	95.68	0.403	10	0	0
Chemical oxygen demand	88.74	0.973	11	0	1
Total organic carbon	106.34	0.806	11	1	0
Ammonia nitrogen	92.71	1.389	10	1	1
Nitrate nitrogen	101.89	0.400	12	0	0
Phosphate-P	102.76	0.198	12	0	0
Kjeldahl nitrogen	108.48	0.609	12	0	0
Total phosphorus	108.87	0.556	12	0	0
Total suspended solids	87.09	0.516	12	0	0
Total dissolved solids	92.78	0.757	11	1	0
Oil and grease	86.57	0.448	12	0	0
Alkalinity	101.69	0.388	11	1	0
Calcium	102.30	0.316	11	0	0
Chloride	100.35	0.318	12	0	0
Conductivity	95.81	1.200	10	0	2
Magnesium	100.01	0.303	11	0	0
Potassium	101.89	1.001	9	2	0
Sodium	103.51	0.691	11	0	0
Sulfate	101.69	0.595	12	0	0
Total hardness	100.98	0.390	11	0	0
pH	104.01	0.591	12	0	0
Aluminum	119.53	0.600	9	1	1
Arsenic	89.92	0.910	8	1	0
Barium	105.99	0.755	11	0	0
Beryllium	100.37	0.411	11	0	0
Cadmium	99.52	0.545	11	0	0
Chromium	101.86	0.246	11	0	0
Copper	101.15	0.442	11	0	0
Iron	138.06	1.924	10	0	1
Lead	99.81	0.525	11	0	0
Manganese	103.37	0.740	11	0	0
Mercury	96.26	0.508	12	0	0
Nickel	97.70	0.340	11	0	0
Selenium	95.06	0.953	12	0	0
Silver	93.03	0.460	11	0	0
Thallium	98.49	0.654	11	0	0
Zinc	103.48	0.811	10	1	0
Phenol	103.47	1.123	11	0	1
Cyanide	84.81	0.615	9	1	0
Residual chlorine	92.70	0.323	12	0	0
Fluoride	95.07	0.447	12	0	0
Organic halide	98.24	0.815	7	0	0
Cr^{6+}	106.48	1.000	10	0	0
Uranium	95.93	0.888	12	0	0
Vanadium	100.76	0.270	9	0	0

[a]Average of all results for the Y-12 laboratory. All parameters were not measured every month.

[b]The average number of standard deviations from the mean of all participants. The number of participant laboratories varied depending on the parameter and the month.

[c]The adopted limits place the warning (marginal) level at 1.96 standard deviations and the acceptance level at 2.58 deviations from the mean.

Table 7.2.16. Proficiency Environmental Testing Control Program at the Y-12 Plant Environmental Laboratory in 1989—Level 2 concentrations

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Biochemical oxygen demand	94.06	0.510	10	0	0
Chemical oxygen demand	84.75	0.520	12	0	0
Total organic carbon	106.03	0.674	12	0	0
Ammonia nitrogen	92.44	0.883	11	0	0
Nitrate nitrogen	103.25	0.446	12	0	0
Phosphate-P	104.22	0.328	12	0	0
Kjeldahl nitrogen	103.09	0.403	12	0	0
Total phosphorus	103.84	0.612	12	0	0
Total suspended solids	93.70	0.502	12	0	0
Total dissolved solids	97.51	0.579	12	0	0
Oil and grease	91.29	0.390	12	0	0
Alkalinity	101.76	0.394	12	0	0
Calcium	102.16	0.340	11	0	0
Chloride	98.75	0.284	12	0	0
Conductivity	91.38	1.522	10	0	2
Magnesium	99.40	0.434	11	0	0
Potassium	105.50	1.402	8	1	2
Sodium	102.23	0.647	11	0	0
Sulfate	103.52	0.635	10	2	0
Total hardness	100.24	0.312	11	0	0
pH	104.43	0.731	12	0	0
Aluminum	100.07	0.474	11	0	0
Arsenic	89.12	0.654	11	1	0
Barium	105.41	0.633	11	0	0
Beryllium	101.05	0.293	11	0	0
Cadmium	98.69	0.685	11	0	0
Chromium	100.89	0.222	11	0	0
Copper	99.88	0.710	10	0	1
Iron	103.79	0.624	11	0	0
Lead	98.74	0.907	11	0	0
Manganese	102.88	0.896	11	0	0
Mercury	95.54	0.374	12	0	0
Nickel	97.71	0.638	11	0	0
Selenium	95.48	1.525	11	0	1
Silver	94.76	0.944	10	0	1
Thallium	101.64	0.532	11	0	0
Zinc	95.84	0.643	11	0	0
Phenol	99.37	0.629	12	0	0
Cyanide	94.88	0.335	10	0	0
Residual chlorine	94.68	0.277	12	0	0
Fluoride	97.02	0.559	12	0	0
Organic halides	93.98	0.615	7	0	0
Cr^{6+}	106.66	0.892	9	0	1
Uranium	96.46	0.815	12	0	0
Vanadium	100.73	0.404	8	1	0

[a]Average of all results for the Y-12 laboratory. All parameters were not measured every month.

[b]The average number of standard deviations from the mean of all participants. The number of participant laboratories varied depending on the parameter and the month.

[c]The adopted limits place the warning (marginal) level at 1.96 standard deviations and the acceptance level at 2.58 deviations from the mean.

Table 7.2.17. Proficiency Environmental Testing Control Program at ORNL in 1989—Level 1 concentration

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance		
			Acceptable[c]	Marginal[c]	Unacceptable[c]
Biochemical O demand	97	0.45	12	0	0
TOC	99	0.27	12	0	0
Ammonia N	111	0.34	19	0	1
Nitrate N	101	0.10	10	0	0
Orthophosphate as P	104	0.12	3	0	0
Total P	90	0.59	2	0	0
Suspended solids	88	0.79	11	1	0
Dissolved solids	103	0.57	12	0	0
O & G	83	0.45	11	0	0
Alkalinity	101	0.42	11	0	0
Ca	99	0.20	9	0	0
Chloride	99	0.32	12	0	0
Conductivity	95	0.54	12	0	0
Mg	96	0.33	8	0	0
K	100	0.47	8	0	0
Na	99	0.36	10	0	0
Sulfate	101	0.45	12	0	0
Total hardness (as $CaCO_3$)	100	0.38	12	0	0
pH	102	0.55	12	0	0
As	98	0.42	6	0	1
Ba	99	0.33	6	0	0
Cd	79	1.54	4	1	1
Cr	90	0.81	4	1	0
Cu	100	0.32	6	0	0
Fe	107	0.14	3	0	0
Pb	87	0.96	3	0	0
Mn	105	2.23	4	0	1
Hg	97	0.33	12	0	0
Ni	97	0.31	4	0	0
Se	120	0.99	2	1	0
Ag	88	0.86	5	0	0
Zn	100	0.31	5	0	0
Phenol	113	0.58	11	1	0
Cyanide	105	0.42	12	0	0
Total residual Cl	101	0.53	12	0	0
Al	170[d]	0.76	3	0	0
V	98	0.36	6	0	0
Be	97	0.35	5	0	0
Total organic halides	142	0.27	3	0	0
Cr^{6+}	106	0.40	1	0	0

[a]Average of 12 months results at ORNL. All parameters were not analyzed each month.

[b]The average number of standard deviations from the mean of all participants. The number of participant laboratories varied depending on the parameters and the month.

[c]For EPA, the warning level is 1.96 standard deviations, and the acceptance level is 2.58 standard deviations from the mean.

[d]Would be 99% and 0.44 if outlier is removed.

Table 7.2.18. Proficiency Environmental Testing Control Program at ORNL in 1989—Level 2 concentrations

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance		
			Acceptable[c]	Marginal[c]	Unacceptable[c]
Biochemical O demand	95	0.32	12	0	0
TOC	101	0.24	12	0	0
Ammonia N	104	0.58	18	2	0
Nitrate N	101	0.18	10	0	0
Orthophosphate as P	102	0.13	3	0	0
Total P	96	0.37	4	0	0
Suspended solids	94	0.58	12	0	0
Dissolved solids	99	0.64	12	0	0
O & G	87	0.30	10	0	0
Alkalinity	95	0.53	11	0	0
Ca	99	0.28	9	0	0
Chloride	99	0.28	12	0	0
Conductivity	93	0.49	12	0	0
Mg	95	0.30	8	0	0
K	101	0.13	8	0	0
Na	99	0.27	10	0	0
Sulfate	102	0.41	12	0	0
Total hardness (as $CaCO_3$)	99	0.33	12	0	0
pH	102	0.44	12	0	0
As	98	0.35	11	0	0
Ba	98	0.48	6	0	0
Cd	96	0.60	6	0	0
Cr	98	0.45	6	0	0
Cu	100	0.45	6	0	0
Fe	97	0.62	5	0	0
Pb	92	0.94	5	0	0
Mn	96	0.59	6	0	0
Hg	97	0.25	12	0	0
Ni	98	0.46	6	0	0
Se	96	0.99	4	1	0
Ag	101	0.42	6	0	0
Zn	101	0.39	6	0	0
Phenol	105	1.04	11	0	1
Cyanide	108	0.40	12	0	0
Total residual Cl	100	0.44	12	0	0
Al	96	1.07	5	1	0
V	98	0.39	6	0	0
Be	97	0.45	6	0	0
Total organic halides	94	0.71	6	0	0
Cr^{6+}	104	0.12	1	0	0

[a]Average of 10 months results at ORNL. All parameters were not analyzed each month.

[b]The average number of standard deviations from the mean of all participants. The number of participant laboratories varied depending on the parameters and the month.

[c]For EPA, the warning level is 1.96 standard deviations, and the acceptance level is 2.58 standard deviations from the mean.

Table 7.2.19. Proficiency Environmental Testing Control Program at ORGDP in 1989—Level 1 concentrations

Parameter[a]	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Marginal	Unacceptable
Alkalinity	93.693	−0.67	10	0	1
Al	142.546	1.27	9	0	3
Ammonia nitrogen	119.254	0.28	10	1	0
As	92.741	−0.35	12	0	0
Ba	96.313	−0.49	12	0	0
Be	98.019	−0.03	12	0	0
Biochemical oxygen demand	94.634	0.02	10	0	0
Cd	95.811	−0.49	12	0	0
Ca	96.546	−0.52	11	0	0
Chemical oxygen demand	98.382	0.23	9	1	0
Chloride	106.984	0.75	9	0	2
Cr	99.191	−0.27	12	0	0
Conductivity	90.444	−0.22	10	1	0
Cu	93.405	−0.80	10	1	1
Cyanide	80.701	−0.68	10	0	1
Fl	99.795	0.14	11	0	0
Cr^{6+}	84.525	−0.35	11	0	0
Fe	90.541	−0.53	12	0	0
Pb	97.522	−0.16	12	0	0
Mg	96.649	−0.16	11	0	0
Mn	97.524	−0.16	12	0	0
Hg	100.042	−0.01	12	0	0
Ni	93.357	−0.24	12	0	0
Nitrate-N	107.355	0.35	11	0	0
Oil and grease	89.399	0.16	11	0	0
Orthophosphate as P	96.159	−0.39	11	0	0
pH	99.338	−0.29	11	0	0
Phenol	94.561	−0.18	11	0	0
K	104.293	0.16	10	0	1
Se	104.796	−0.13	12	0	0
Ag	89.889	−0.59	10	2	0
Na	99.674	−0.30	11	0	0
Sulfate	98.631	0.06	11	0	0
Tl	100.461	0.11	12	0	0
Total dissolved solids	111.681	0.22	11	0	0
Total hardness, as $CaCO_3$	101.579	0.10	11	0	0
Total Kjeldahl N	171.708	0.88	8	0	2
Total organic carbon	105.735	0.50	9	1	0
Total organic halides, TO_X	101.870	−0.32	10	1	0
Total phosphorus as P	110.551	0.20	11	0	0
Total residual chlorine	112.753	0.70	9	1	1
Total suspended solids	90.965	−0.16	11	0	0
U	100.653	−0.02	11	0	0
V	97.291	−0.36	9	0	0
Zn	137.821	2.42	10	0	2

[a]Average of all results for ORGDP. All parameters were not measured every month.

[b]The average number of standard deviations from the mean of all participants. The number of participant laboratories varied depending on the parameters and the month.

[c]For the EPA, the warning (marginal) level is 1.96 standard deviations and the acceptance level is 2.58 standard deviations from the mean.

Table 7.2.20. Proficiency Environmental Testing Control Program at ORGDP in 1989—Level 2 concentrations

Parameter[a]	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Marginal	Unacceptable
Alkalinity	92.949	−0.54	9	2	0
Al	98.054	−0.32	11	1	0
Ammonia nitrogen	113.765	1.02	8	3	0
As	95.702	−0.12	12	0	0
Ba	96.242	−0.66	12	0	0
Be	98.268	−0.25	12	0	0
Biochemical oxygen demand	98.395	0.04	9	1	0
Cd	96.293	−0.64	12	0	0
Ca	97.658	−0.59	11	0	0
Chemical oxygen demand	108.447	0.68	9	1	0
Chloride	98.520	−0.22	11	0	0
Cr	99.345	−0.24	12	0	0
Conductivity	89.486	0.11	10	1	0
Cu	97.860	−0.46	12	0	0
Cyanide	89.719	−0.45	10	0	1
Cr^{6+}	92.090	−0.37	11	0	0
Fluoride	100.765	0.17	11	0	0
Fe	97.670	−0.56	12	0	0
Pb	99.601	0.01	11	1	0
Mg	96.676	−0.14	11	0	0
Mn	97.680	−0.02	12	0	0
Hg	97.774	−0.06	12	0	0
Ni	96.697	−0.57	12	0	0
Nitrate-N	101.385	0.09	11	0	0
Oil and grease	90.477	0.04	11	0	0
Orthophosphate as P	98.425	−0.08	11	0	0
pH	100.250	−0.17	11	0	0
Phenol	93.615	−0.40	11	0	0
K	101.866	−0.12	11	0	0
Se	97.542	−0.01	12	0	0
Ag	88.330	−1.38	10	1	1
Na	99.897	−0.17	11	0	0
Sulfate	98.758	0.16	11	0	0
Tl	101.145	0.30	12	0	0
Total dissolved solids	106.324	0.35	11	0	0
Total hardness, as $CaCO_3$	98.276	−0.01	11	0	0
Total Kjeldahl-N	107.090	0.37	9	1	0
Total organic carbon	114.115	1.04	9	0	1
Total organic halides, TO_x	87.426	−0.42	10	0	0
Total phosphorus as P	98.400	−0.06	11	0	0
Total residual chlorine	103.451	0.38	10	0	1
Total suspended solids	92.541	0.00	11	0	0
U	101.776	0.19	11	0	0
V	97.168	−0.54	9	0	0
Zn	99.775	−0.46	12	0	0

[a]Average of all results for ORGDP. All parameters were not measured every month.

[b]The average number of standard deviations from the mean of all participants. The number of participant laboratories varied depending on the parameters and the month.

[c]For the EPA, the warning (marginal) level is 1.96 standard deviations and the acceptance level is 2.58 standard deviations from the mean.

Table 7.2.21. EPA performance evaluation DMR-QA study number 009—Y-12 Plant, 1989

Analytes	Values		Limits		Performance evaluation
	Reported	True	Acceptance	Warning	
			Trace metals (μg/L)		
Al	1230	1150	931–1340	982–1290	Acceptable
As	148	226	171–272	184–259	Unacceptable
Be	78.9	80.1	68.4–91.2	71.3–88.3	Acceptable
Cd	327	320	277–375	289–363	Acceptable
Cr	161	150	118–179	125–171	Acceptable
Co	953	900	787–1010	816–983	Acceptable
Cu	77	76.2	65.4–86.0	67.9–83.4	Acceptable
Fe	744	749	652–859	678–833	Acceptable
Pb	100	91.9	71.5–115	77.0–110	Acceptable
Mn	1010	970	886–1050	906–1030	Acceptable
Hg	0.9	0.853	0.457–1.23	0.554–1.13	Acceptable
Ni	635	622	547–691	565–673	Acceptable
Se	12.5	12.0	6.24–16.7	7.56–15.4	Acceptable
V	498	479	420–553	437–536	Acceptable
Zn	205	210	181–237	188–230	Acceptable
			Miscellaneous analytes (mg/L)		
pH (units)	7.78	7.80	7.55–7.97	7.60–7.92	Acceptable
Total suspended solids	41.8	41.9	33.3–46.6	34.9–45.0	Acceptable
O&G	19.6	19.8	10.7–24.8	12.5–23.0	Acceptable
			Nutrients (mg/L)		
Ammonia-nitrogen	12.4	13.0	10.2–15.5	10.9–14.9	Acceptable
Nitrate-nitrogen	8.7	8.50	6.94–10.1	7.32–9.72	Acceptable
Kjeldahl-nitrogen	15.0	15.0	11.4–18.2	12.2–17.4	Acceptable
Total P	7.08	7.01	5.60–8.38	5.93–8.05	Acceptable
Orthophosphate	3.85	4.80	3.25–4.36	3.39–4.23	Acceptable
			Demands (mg/L)		
COD	92	91.7	74.4–109	78.8–105	Acceptable
TOC	37.7	37.0	30.6–43.2	32.3–41.6	Acceptable
5-day BOD	60	59.7	41.7–85.7	47.2–80.3	Acceptable
			Additional miscellaneous analytes (mg/L)		
Total cyanide	0.054	0.070	0.0300–0.0998	0.0388–0.0910	Acceptable
Total phenolics	0.54	0.646	0.307–1.01	0.395–0.920	Acceptable
Total residual chlorine	1.91	2.00	1.35–2.53	1.51–2.38	Acceptable

Table 7.2.22. EPA performance evaluation DMR-QA study number 009—ORNL, 1989

Analytes	Values		Limits		Performance evaluation
	Reported	True[a]	Acceptable	Warning	
			Trace metals, μg/L		
Al	393	350	269–439	290–418	Acceptable
As	60	45.1	35.6–55.5	38.0–53.0	Unusable data
Be	429	400	347–449	360–436	Acceptable
Cd	24.1	85.1	74.1–100	77.4–97.0	Not acceptable
Cr	627	600	485–703	512–676	Acceptable
Co	222	200	171–229	179–222	Acceptable
Cu	845	820	753–893	770–876	Acceptable
Fe	1920	1827	1650–2030	1690–1980	Acceptable
Pb	404	415	361–479	376–464	Acceptable
Mn	287	292	263–318	270–311	Acceptable
Hg	8.86	8.69	6.40–11.1	6.99–10.5	Acceptable
Ni	403	370	319–419	331–407	Acceptable
Se	48.2	48.0	33.0–58.5	36.2–55.3	Acceptable
V	1610	1497	1270–1710	1330–1650	Acceptable
Zn	398	401	347–446	359–434	Acceptable
			Miscellaneous analytes, mg/L[b]		
pH, units	5.81	5.80	5.66–5.91	5.69–5.88	Acceptable
Total suspended solids	26.0	29.7	24.2–33.3	25.3–32.2	Acceptable
Oil and grease	12.0	12.0	6.32–16.4	7.57–15.1	Acceptable
			Nutrients, mg/L		
Ammonia as N	2.97	3.00	2.31–3.66	2.47–3.50	Acceptable
Nitrate as N	1.04	0.950	0.745–1.16	0.794–1.11	Acceptable
Total phosphorous	2.30	2.50	2.03–3.01	2.15–2.89	Acceptable
			Demands, mg/L		
TOC	11.6	11.5	9.45–16.0	10.3–15.2	Acceptable
5-d BOD	22.0	18.6	13.1–30.9	15.3–28.7	Acceptable
			Additional miscellaneous analytes, mg/L		
Total cyanide	0.976	0.890	0.562–1.14	0.635–1.07	Acceptable
Total phenolics	0.268	0.268	0.127–0.409	0.162–0.374	Acceptable
Total residual chlorine	0.710	0.700	0.440–0.925	0.504–0.861	Acceptable

[a]Based on theoretical calculations or a reference value when necessary.
[b]Units are mg/L except for pH, which is reported in pH units.

Table 7.2.23. Water supply performance evaluation study number WS-024—Y-12 Plant, 1989

Analytes	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
		Trace metals (μg/L)			
Sb	3	5.25	9.00	6.27–12.3	Unacceptable
	4	36	42.0	34.3–53.1	Acceptable
As	1	11	10.2	7.88–11.6	Acceptable
	2	82	80.7	67.1–92.4	Acceptable
Ba	1	896	853	729–944	Acceptable
	2	43.2	41.0	31.7–49.7	Acceptable
Be	3	0.622	0.600	0.467–0.771	Acceptable
	4	0.956	1.00	0.832–1.19	Acceptable
Cd	1	15.9	15.4	13.5–17.5	Acceptable
	2	11.0	10.4	8.40–11.8	Acceptable
Cr	1	130	127	111–144	Acceptable
	2	28.1	25.5	21.4–29.8	Acceptable
Pb	1	12	15.0	11.7–18.6	Acceptable
	2	6.25	3.20	1.45–5.37	Unacceptable
Hg	1	5.59	5.76	4.65–6.75	Acceptable
	2	2.06	2.16	1.42–2.69	Acceptable
Ni	3	3.00	2.00	0.977–3.03	Acceptable
	4	12.7	14.0	11.6–16.3	Acceptable
Se	1	48.5	48.0	37.2–57.1	Acceptable
	2	11	12.0	8.79–14.4	Acceptable
Ag	1	108	103	88.4–117	Acceptable
	2	5.68	6.45	5.22–8.04	Acceptable
Tl	3	1.33	2.00	1.20–2.85	Acceptable
	4	14.6	18.0	14.3–21.6	Acceptable
		Nitrate/nitrite/fluoride (mg/L)			
Nitrate as N	1	0.81	0.600	0.433–0.820	Acceptable
	2	9.33	8.50	7.21–10.0	Acceptable
Nitrite as N	1	0.16	0.150	0.123–0.177	Acceptable
	2	0.91	0.900	0.779–1.02	Acceptable
Fluoride	1	1.26	1.30	1.17–1.43	Acceptable
	2	1.69	1.72	1.55–1.89	Acceptable
		Trihalomethanes (μg/L)			
Bromodichloromethane	1	24.5	22.5	18.0–27.0	Acceptable
	2	57.9	57.8	46.2–69.4	Acceptable
Bromoform	1	13.3	12.3	9.84–14.8	Acceptable
	2	77.6	66.9	53.5–80.3	Acceptable
Chlorodibromomethane	1	7.78	7.66	6.13–9.19	Acceptable
	2	79.4	80.5	64.4–96.6	Acceptable
Chloroform	1	12.6	10.6	8.48–12.7	Acceptable
	2	59.1	63.8	51.0–76.6	Acceptable
Total Trihalomethanes	1	58.18	53.1	42.5–63.7	Acceptable
	2	274.0	269	215–323	Acceptable

Table 7.2.23 (continued)

Analytes	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
		Insecticides (μg/L)			
Endrin	1	5.05	4.29	2.91–5.38	Acceptable
	2	0.351	0.293	0.182–0.414	Acceptable
Lindane	1	4.46	3.16	2.15–4.15	Unacceptable
	2	0.520	0.474	0.267–0.623	Acceptable
Methoxychlor	1	61.5	73.2	38.5–87.2	Acceptable
	2	5.06	5.37	3.28–6.22	Acceptable
Toxaphene	3	7.90	7.58	4.57–9.85	Acceptable
	4	2.25	2.33	1.50–3.33	Acceptable
		Herbicides (μg/L)			
2,4-D	1	3.24	5.70	2.11–8.09	Acceptable
	2	43.1	68.3	26.0–93.0	Acceptable
2,4,5-TP (silvex)	1	1.76	4.30	1.56–5.76	Acceptable
	2	30.7	73.1	23.7–100	Acceptable
		Volatile organic compounds (μg/L)			
Benzene	1	4.17	4.32	2.59–6.05	Acceptable
Carbon tetrachloride	1	8.20	4.56	2.74–6.38	Unacceptable
1,4-Dichlorobenzene	1	2.88	2.50	1.50–3.50	Acceptable
1,2-Dichloroethane	1	13.6	13.2	10.6–15.8	Acceptable
1,1-Dichloroethylene	1	5.18	5.36	3.22–7.50	Acceptable
1,1,1-Trichloroethane	1	5.65	3.21	1.93–4.49	Unacceptable
Trichloroethylene	1	7.88	7.36	4.42–10.3	Acceptable
Vinyl chloride	1	5.29	4.35	2.61–6.09	Acceptable
Bromobenzene	2	5.54	5.78	3.47–8.09	Acceptable
4-Chlorotoluene	2	7.06	6.59	3.95–9.23	Acceptable
1,3-Dichlorobenzene	2	8.53	8.09	4.85–11.3	Acceptable
C 1,2 Dichloroethylene	2	7.16	7.24	4.34–10.1	Acceptable
1,3-Dichloropropane	2	10.5	10.8	8.64–13.0	Acceptable
1,1-Dichloropropene	2	9.04	8.88	5.33–12.4	Acceptable
1,1,1,2-Tetrachloroethane	2	5.44	5.90	3.54–8.26	Acceptable
Total xylenes	2	8.76	14.0	11.2–16.8	Unacceptable

Table 7.2.23 (continued)

Analytes	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
		Miscellaneous analytes			
Residual free Cl (mg/L)	1	0.63	0.616	0.363–0.861	Acceptable
	2	1.14	1.16	0.840–1.44	Acceptable
Turbidity (NTUs)	1	3.70	3.40	2.85–3.83	Acceptable
	2	1.15	1.00	0.735–1.13	Unacceptable
Calcium (as $CaCO_3$) (mg/L)	1	155	120	109–128	Unacceptable
pH (units)	1	9.15	9.12	8.84–9.34	Acceptable
Alkalinity (as $CaCO_3$) (mg/L)	1	37	34.8	32.0–40.5	Acceptable
Sodium (mg/L)	1	17.6	16.0	14.6–18.0	Acceptable
Sulfate (mg/L)	1	6.25	5.30	3.01–7.48	Acceptable
	2	59.6	51.0	43.5–56.2	Unacceptable
Total cyanide (mg/L)	1	0.272	0.310	0.222–0.364	Acceptable
	2	0.412	0.430	0.311–0.533	Acceptable

Table 7.2.24. Water supply performance evaluation study WP-023—ORNL, 1989

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Trace metals, μg/L			
Al	1	1580	1560	1260–1820	Acceptable
	2	51.5	51.9	20.2–107	Acceptable
As	1	134	152	118–181	Acceptable
	2	6.74	7.20	4.06–10.1	Acceptable
Be	1	504	500	434–553	Acceptable
	2	13.5	13.9	8.15–20.0	Acceptable
Cd	1	125	133	112–149	Acceptable
	2	5.42	3.55	1.42–5.43	Check for error
Co	1	7.93	8.48	2.73–14.9	Acceptable
	2	142	150	121–175	Acceptable
Cr	1	814	834	696–974	Acceptable
	2	5.55	6.65	2.17–10.5	Acceptable
Cu	1	545	578	497–633	Acceptable
	2	13.7	16.0	11.6–20.5	Acceptable
Fe	1	1680	1704	1500–1890	Acceptable
	2	10.2	14.0	2.76–25.8	Acceptable
Hg	1	26.7	30.0	21.5–39.8	Acceptable
	2	3.3	3.59	2.56–4.66	Acceptable
Mn	1	702	700	630–752	Acceptable
	2	13.5	16.3	9.00–22.2	Acceptable
Ni	1	593	606	532–675	Acceptable
	2	10.2	12.4	3.83–21.5	Acceptable
Pb	1	1110	1108	942–1270	Acceptable
	2	15.9	16.3	10.6–23.7	Acceptable
Se	1	144	140	99.4–160	Acceptable
	2	12.3	11.1	5.81–15.2	Acceptable
V	1	21.8	22.4	13.6–31.0	Acceptable
	2	1390	1459	1270–1650	Acceptable
Zn	1	1260	1267	1110–1420	Acceptable
	2	13.1	12.6	7.71–16.8	Acceptable
Sb	3	123	135	83.5–169	Acceptable
	4	13.2	15.0	7.57–20.4	Acceptable
Ag	3	0.470	0.560	0.250–0.827	Acceptable
	4	7.20	8.12	6.16–10.0	Acceptable
Tl	3	14.5	13.8	9.25–19.5	Acceptable
	4	39.9	40.0	30.1–51.7	Acceptable
Mo	3	25.0	28.2	15.5–38.4	Acceptable
Sr	3	5.10	5.14	2.40–7.83	Acceptable
	4	29.1	30.4	22.7–37.8	Acceptable
Ti	3	180	175	136–215	Acceptable
	4	45.4	45.7	30.7–60.5	Acceptable
		Minerals, mg/L (except as noted)			
pH, units	3	7.94	7.9	7.62–8.12	Acceptable
	4	4.20	4.2	4.12–4.28	Acceptable
Specific conductivity	1	249	234	214–257	Acceptable
μmhos/cm at 25°C	2	1030	1030	922–1140	Acceptable
TDS at 180°C	1	134	133	90.2–179	Acceptable
	2	656	647	380–967	Acceptable
Total hardness,	1	51.4	50.6	43.4–58.0	Acceptable
as $CaCO_3$	2	350	342	312–368	Acceptable
Calcium, as $CaCO_3$	1	20.8	19.0	16.5–22.2	Acceptable
	2	101	93.3	80.9–108	Acceptable

Table 7.2.24 (continued)

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
Magnesium	1	0.775	0.771	0.599–0.934	Acceptable
	2	27.6	26.5	22.5–30.5	Acceptable
Sodium	1	15.3	14.9	12.9–16.9	Acceptable
	2	36.0	35.2	31.3–39.2	Acceptable
Potassium	1	14.0	14.0	11.7–15.8	Acceptable
	2	36.0	36.6	30.9–41.7	Acceptable
Total alkalinity, as $CaCO_3$	1	24.0	23.4	20.4–27.9	Acceptable
	2	71.0	69.0	63.4–77.1	Acceptable
		Minerals, mg/L (except as noted)			
Chloride	1	40.1	38.6	33.5–44.6	Acceptable
	2	250	244	220–267	Acceptable
Fluoride	1	3.32	3.40	2.92–3.91	Acceptable
	2	0.406	0.219	0.149–0.304	Not acceptable
Sulfate	1	13.8	13.6	9.94–16.5	Acceptable
	2	50.5	50.0	40.7–57.7	Acceptable
		Nutrients, mg/L			
Ammonia as N	1	0.700	0.692	0.446–0.975	Acceptable
	2	3.49	3.50	2.65–4.33	Acceptable
Nitrate as N	1	0.45	0.451	0.320–0.573	Acceptable
	2	2.30	2.41	1.83–2.92	Acceptable
Orthophosphate	1	0.30	0.299	0.244–0.356	Acceptable
	2	1.10	1.11	0.932–1.28	Acceptable
Kjeldahl-nitrogen	3	3.40	0.451	D.L.[b]–1.05	Not acceptable
	4	0.460	3.50	2.35–4.60	Not acceptable
Total phosphorous	3	2.90	0.351	0.273–0.455	Not acceptable
	4	0.350	2.75	2.23–3.41	Not acceptable
		Demands, mg/L			
TOC	1	38.2	79.6	65.7–91.0	Not acceptable
	2	5.34	10.4	8.24–13.3	Not acceptable
		Miscellaneous parameters, mg/L			
Total cyanide	1	0.291	0.270	0.164–0.347	Acceptable
	2	0.892	0.800	0.561–1.01	Acceptable
Nonfilterable residue	1	91.6	90.7	83.1–95.6	Acceptable
	2	27.1	29.2	24.0–32.4	Acceptable
Oil and grease	1	44.1	43.9	20.9–54.5	Acceptable
	2	15.7	16.0	6.97–21.5	Acceptable
		Miscellaneous parameters, mg/L			
Total phenolics	1	0.404	0.406	0.206–0.607	Acceptable
	2	1.91	1.99	1.07–2.91	Acceptable
Total residue Cl	1	0.650	0.602	0.374–0.788	Acceptable
	2	1.38	1.41	0.832–1.82	Acceptable

[a]Based upon theoretical calculations, or a reference value when necessary.
[b]D.L. = Detection Limit.

Table 7.2.25. Water supply performance evaluation study number WP-022—ORGDP, 1989

Parameter	Sample No.	Values		Limits		Performance evaluation
		Reported[a]	True[b]	Acceptance	Warning	
			Minerals (mg/L)			
pH	3	5.83	5.80	5.66–5.91	5.69–5.88	Acceptable
	4	7.80	7.80	7.55–7.97	7.60–7.92	Acceptable
Special conditions, μmhos/cm at 25°C	1	239	191	164–208	169–203	Unacceptable
	2	757	755	665–824	684–804	Acceptable
TDS at 180°C	1	99.0	100	73.1–136	80.9–128	Acceptable
	2	424	401	298–522	326–494	Acceptable
Total hardness, as $CaCO_3$	1	19.0	18.1	15.3–22.0	16.1–21.2	Acceptable
	2	167	170	154–183	158–179	Acceptable
Total alkalinity, as $CaCO_3$	1	8.00	8.59	5.73–12.7	6.59–11.8	Acceptable
	2	45.0	52.9	47.3–57.4	48.6–56.1	Unacceptable
Chloride	1	14.0	14.9	12.4–17.3	13.0–16.7	Acceptable
	2	202	191	177–207	180–203	Acceptable
Fluoride	1	1.62	1.60	1.39–1.78	1.44–1.73	Acceptable
	2	0.160	0.160	0.0837–0.235	0.103–0.216	Acceptable
Sulfate	1	37.0	38.0	30.6–44.3	32.3–42.6	Acceptable
	2	6.00	6.10	2.92–8.80	3.65–8.07	Acceptable
			Nutrients (mg/L)			
Ammonia-N	1	3.22	3.00	2.31–3.66	2.47–3.50	Acceptable
	2	14.6	13.0	10.2–15.5	10.9–14.9	Acceptable
Nitrate-N	1	0.980	0.950	0.745–1.16	0.794–1.11	Acceptable
	2	8.78	8.50	6.94–10.1	7.32–9.72	Acceptable
Orthophosphate	1	0.910	0.940	0.789–1.09	0.825–1.05	Acceptable
	2	2.84	3.80	3.25–4.36	3.39–4.23	Unacceptable
Kjeldahl-N	3	7.78	8.00	5.88–9.90	6.36–9.42	Acceptable
	4	15.7	15.0	11.4–18.2	12.2–17.4	Acceptable
Total phosphorus	3	1.57	2.50	2.03–3.01	2.15–2.89	Unacceptable
	4	6.85	7.01	5.60–8.38	5.93–8.05	Acceptable
			Demands (mg/L)			
COD	1	37.0	28.5	19.7–44.0	22.7–40.9	Acceptable
	2	93.0	91.7	74.4–109	78.8–105	Acceptable
TOC	1	13.0	11.5	9.45–16.0	10.3–15.2	Acceptable
	2	42.0	37.0	30.6–43.2	32.3–41.6	Check for error
5-d BOD	1	22.0	18.6	13.1–30.9	15.3–28.7	Acceptable
	2	69	59.7	41.7–85.7	47.2–80.3	Acceptable
			Miscellaneous parameters (mg/L)			
Total cyanide	1	0.960	0.890	0.562–1.14	0.635–1.07	Acceptable
	2	0.070	0.070	0.0300–0.0998	0.0388–0.0910	Acceptable
Nonfilterable residue	1	28.0	29.7	24.2–33.3	25.3–32.2	Acceptable
	2	41.0	41.9	33.3–46.6	34.9–45.0	Acceptable

Table 7.2.25 (continued)

Parameter	Sample No.	Values		Limits		Performance evaluation
		Reported[a]	True[b]	Acceptance	Warning	
Oil and grease	1	10.6	12.0	6.32–16.4	7.57–15.1	Acceptable
	2	18.1	19.8	10.7–24.8	12.5–23.0	Acceptable
Total phenolics	1	20.5	0.268	0.127–0.409	0.162–0.374	Unacceptable
	2	0.500	0.646	0.307–1.01	0.395–0.920	Acceptable
Total residual chlorine	1	2.06	1.40	0.906–1.72	1.01–1.61	Unacceptable
	2	4.12	4.00	2.76–5.01	3.05–4.71	Acceptable

[a]Based on theoretical calculations or a reference value when necessary.

Table 7.2.26. Water supply performance evaluation study number WP-023—ORGDP, 1989

Parameter	Sample No.	Values		Limits		Performance evaluation
		Reported[a]	True[b]	Acceptance	Warning	
			Minerals (mg/L)			
pH	3	7.91	7.9	7.62–8.12	7.68–8.06	Acceptable
	4	4.22	4.2	4.12–4.28	4.14–4.26	Acceptable
Special conditions,	1	238	234	214–257	220–252	Acceptable
μmhos/cm at 25°C	2	1040	1030	922–1140	949–1110	Acceptable
TDS at 180°C	1	109	133	90.2–179	101–168	Acceptable
	2	659	647	380–967	453–894	Acceptable
Total hardness,	1	50.8	50.6	43.4–58.8	45.2–56.2	Acceptable
as $CaCO_3$	2	337	342	312–368	319–361	Acceptable
Total alkalinity,	1	24	23.4	20.4–27.9	21.3–27.0	Acceptable
as $CaCO_3$	2	70.0	69.0	63.4–77.1	65.1–75.4	Acceptable
Chloride	1	39.3	38.6	33.5–44.5	34.9–43.3	Acceptable
	2	238	244	220–267	226–261	Acceptable
Fluoride	1	3.60	3.40	2.92–3.91	3.04–3.79	Acceptable
	2	0.24	0.219	0.149–0.304	0.168–0.285	Acceptable
Sulfate	1	13.0	13.6	9.94–16.5	10.8–15.7	Acceptable
	2	50.5	50.0	40.7–57.7	42.8–55.6	Acceptable
			Nutrients (mg/L)			
Ammonia-N	1	0.76	0.692	0.446–0.975	0.510–0.911	Acceptable
	2	3.64	3.50	2.65–4.33	2.85–4.13	Acceptable
Nitrate-N	1	0.473	0.451	0.320–0.573	0.350–0.542	Acceptable
	2	2.71	2.41	1.83–2.92	1.96–2.79	Acceptable
Orthophosphate	1	0.28	0.299	0.244–0.356	0.257–0.342	Acceptable
	2	1.04	1.11	0.932–1.28	0.973–1.24	Acceptable
Kjeldahl-N	3	0.336	0.451	DL[b]–1.05	0.121–0.927	Acceptable
	4	3.76	3.50	2.35–4.60	2.62–4.33	Acceptable
Total phosphorus	3	0.388	0.351	0.273–0.455	0.294–0.433	Acceptable
	4	3.00	2.75	2.23–3.41	2.37–3.27	Acceptable
			Demands (mg/L)			
COD	1	206	201	161–221	168–213	Acceptable
	2	28	26.3	15.3–33.5	17.5–31.5	Acceptable
TOC	1	76.7	79.6	65.7–91.0	69.0–87.6	Acceptable
	2	10.6	10.4	8.24–13.3	8.90–12.6	Acceptable
5-d BOD	1	96.2	127	78.9–176	91.0–164	Acceptable
	2	12.9	18.0	9.42–26.5	11.5–24.4	Acceptable
			Miscellaneous parameters (mg/L)			
Total cyanide	1	0.30	0.270	0.164–0.347	0.187–0.324	Acceptable
	2	0.78	0.800	0.561–1.01	0.618–0.955	Acceptable
Nonfilterable residue	1	89.5	90.7	83.1–95.6	84.7–94.1	Acceptable
	2	27.0	29.2	24.0–32.4	25.1–31.4	Acceptable

Table 7.2.26 (continued)

Parameter	Sample No.	Values		Limits		Performance evaluation
		Reported[a]	True[b]	Acceptance	Warning	
Oil and grease	1	41.9	43.9	20.9–54.5	25.1–50.3	Acceptable
	2	14.2	16.0	6.97–21.5	8.79–19.7	Acceptable
Total phenolics	1	0.39	0.406	0.206–0.607	0.257–0.556	Acceptable
	2	2.00	1.99	1.07–2.91	1.30–2.68	Acceptable
Total residual chlorine	1	0.51	0.602	0.374–0.788	0.429–0.733	Acceptable
	2	1.26	1.41	0.832–1.82	0.961–1.69	Acceptable

[a]Based on theoretical calculations or a reference value when necessary.
[b]Detection limit (DL) = acceptance limit.

Table 7.2.27. Water supply performance evaluation study number WS-023—ORGDP, 1989

Parameter	Sample No.	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Trace metals (μg/L)			
As	1	59.8	60.5	49.7–68.7	Acceptable
	2	3.95	3.56	2.29–4.41	Acceptable
Ba	1	117	120	98.4–137	Acceptable
	2	53.8	53.3	39.9–64.2	Acceptable
Cd	1	5.82	6.05	4.78–6.98	Acceptable
	2	35.2	33.6	26.0–39.4	Acceptable
Cr	1	20.9	19.7	15.9–24.6	Acceptable
	2	54.4	53.2	45.9–60.5	Acceptable
Cu	1	42.5	44.0	37.5–48.8	Acceptable
	2	674[b]	660	598–696	Acceptable
Pb	1	8.30	8.80	6.25–11.9	Acceptable
	2	60.8	51.0	45.3–59.4	Not acceptable
Hg	1	3.32[b]	2.80	1.98–3.28	Not acceptable
	2	4.62	4.00	2.98–4.84	Acceptable
Se	1	18.8	19.0	14.0–22.9	Acceptable
	2	60.7	57.0	44.6–67.3	Acceptable
Ag	1	30.1	26.0	22.7–30.5	Acceptable
	2	4.00	3.42	2.48–4.88	Acceptable
		Nitrate/nitrite/fluoride (mg/L)			
Nitrate, as N	1	0.49	0.492	0.296–0.766	Acceptable
	2	4.30	4.00	3.00–5.27	Acceptable
Nitrite, as N	1	0.30	0.197	0.165–0.230	Not acceptable
	2	0.76	0.800	0.691–0.910	Acceptable
Fluoride	1	0.22	0.196	0.163–0.235	Acceptable
	2	1.24	1.30	1.17–1.43	Acceptable
		Insecticides (μg/L)			
Chlordane	5	5.96[b]	8.83	2.22–12.1	Acceptable
	6	1.64[b]	2.21	0.796–3.01	Acceptable
Endrin	1	0.24	0.195	0.101–0.281	Acceptable
	2	2.19	2.34	1.55–2.99	Acceptable
Heptachlor	7	0.50[b]	0.836	0.334–0.977	Acceptable
	8	0.14[b]	0.183	0.0728–0.245	Acceptable
Heptachlor epoxide	7	0.89	1.03	0.611–1.32	Acceptable
	8	0.27	0.275	0.144–0.365	Acceptable
Lindane	1	0.25	0.237	0.0909–0.388	Acceptable
	2	1.64	1.74	0.936–2.64	Acceptable
Methoxychlor	1	3.29[b]	4.39	2.61–5.40	Acceptable
	2	19.8[b]	26.9	15.9–31.1	Acceptable
Toxaphene	3	4.53	3.20	1.67–4.30	Not acceptable
	4	8.83	10.2	6.35–13.7	Acceptable

Table 7.2.27 (continued)

Parameter	Sample No.	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Herbicides (μg/L)			
2,4-D	1	83.4	84.2	30.3–121	Acceptable
	2	1.85	1.79	0.320–3.14	Acceptable
2,4,5-TP, Silvex	1	249	57.1	7.16–91.8	Not acceptable
	2	11.0[b]	2.30	0.881–3.02	Not acceptable

[a]Based on theoretical calculations or a reference value when necessary.
[b]Significant general method bias is anticipated for this result.

Table 7.2.28. Water supply performance evaluation study number WS-024—ORGDP, 1989

Parameter	Sample No.	Values		Acceptance limits	Performance evaluation
		Reported	True		
		Trace metals (μg/L)			
Sb	3	6.10	9.00	6.27–12.3	Unacceptable
	4	34.9	42.0	34.3–53.1	Acceptable
As	1	9.40	10.2	7.88–11.6	Acceptable
	2	75.5	80.7	67.1–92.4	Acceptable
Ba	1	798	853	729–944	Acceptable
	2	33.2	41.0	31.7–49.7	Acceptable
Be	3	0.580	0.600	0.467–0.771	Acceptable
	4	0.970	1.00	0.832–1.19	Acceptable
Cd	1	14.4	15.4	13.5–17.5	Acceptable
	2	10.9	10.4	8.40–11.8	Acceptable
Cr	1	121	127	111–144	Acceptable
	2	30.5	25.5	21.4–29.8	Acceptable
Cu	1	309	330	292–364	Acceptable
	2	23.8	33.0	27.7–37.6	Unacceptable
Pb	1	16.5	15.0	11.7–18.6	Acceptable
	2	4.10	3.20	1.45–5.37	Acceptable
Hg	1	5.47	5.76	4.65–6.75	Acceptable
	2	1.98	2.16	1.42–2.69	Acceptable
Ni	3	4.67	2.00	0.977–3.03	Unacceptable
	4	18.3	14.0	11.6–16.3	Unacceptable
Se	1	40.7	48.0	37.2–57.1	Acceptable
	2	10.4	12.0	8.79–14.4	Acceptable
Ag	1	118	103	88.4–117	Unacceptable
	2	6.40	6.45	5.22–8.04	Acceptable
Tl	3	<10.0	2.00	1.20–2.85	Unusable data
	4	13.5	18.0	14.3–21.6	Unacceptable
		Nitrate/nitrite/fluoride (mg/L)			
Nitrate, as N	1	0.620	0.600	0.433–0.820	Acceptable
	2	8.48	8.50	7.21–10.0	Acceptable
Nitrite, as N	1	0.155	0.150	0.123–0.177	Acceptable
	2	0.907	0.900	0.779–1.02	Acceptable
Fluoride	1	1.27	1.30	1.17–1.43	Acceptable
	2	1.68	1.72	1.55–1.89	Acceptable
		Insecticides (μg/L)			
Chlordane	5	1.38[b]	1.32	0.611–1.75	Acceptable
	6	4.84[b]	4.86	2.06–6.31	Acceptable
Endrin	1	4.20	4.29	2.91–5.38	Acceptable
	2	0.25	0.293	0.182–0.414	Acceptable
Heptachlor	7	0.23[b]	0.263	0.107–0.350	Acceptable
	8	2.25[b]	3.15	1.32–4.14	Acceptable
Heptachlor epoxide	7	0.16	0.161	0.0913–0.206	Acceptable
	8	1.40	1.61	0.992–2.09	Acceptable

Table 7.2.28 (continued)

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
Lindane	1	3.74	3.16	2.15–4.15	Acceptable
	2	0.56	0.474	0.267–0.623	Acceptable
Methoxychlor	1	51.8[b]	73.2	38.5–87.2	Acceptable
	2	4.60[b]	5.37	3.28–6.22	Acceptable
Toxaphene	3	7.36	7.58	4.57–9.85	Acceptable
	4	2.26	2.33	1.50–3.33	Acceptable
		Herbicides (μg/L)			
2,4-D	1	4.88	5.70	2.11–8.09	Acceptable
	2	6.2[b]	68.3	26.0–93.0	Acceptable
2,4,5-TP, silvex)1	3.62[b]	4.30	1.56–5.76	Acceptable	
	2	58.7[b]	73.1	23.7–100	Acceptable
		Polychlorinated biphenyls (μg/L)			
PCB-Aroclor 1016/1242	1	<0.50	0.100	0.290–0.209	Unacceptable
PCB-Aroclor 1254	1	<1.00	0.113	0.0518–0.172	Unusable data
		Trihalomethanes (μg/L)			
Bromodichloromethane	1	21.5	22.5	18.0–27.0	Acceptable
	2	57.6	57.8	46.2–69.4	Acceptable
Bromoform	1	11.7	12.3	9.84–14.8	Acceptable
	2	73.3	66.9	53.5–80.3	Acceptable
Chlorodibromomethane	1	6.98	7.66	6.13–9.19	Acceptable
	2	81.3	80.5	64.4–96.6	Acceptable
Chloroform	1	11.1	10.6	8.48–12.7	Acceptable
	2	66.8	63.8	51.0–76.6	Acceptable
Total trihalomethane	1	51.28	53.1	42.5–63.7	Acceptable
	2	279.0	269	215–323	Acceptable
		Volatile organic compounds (μg/L)			
Benzene	1	3.90	4.32	2.59–6.05	Acceptable
Carbon tetrachloride	1	4.19	4.56	2.74–6.38	Acceptable
1,4-Dichlorobenzene	1	2.37	2.50	1.50–3.50	Acceptable
1,2-Dichloroethane	1	13.5	13.2	10.6–15.8	Acceptable
1,1-Dichloroethylene	1	4.78	5.36	3.22–7.50	Acceptable
1,1,1-Trichloroethane	1	2.82	3.21	1.93–4.49	Unacceptable
Trichloroethylene	1	6.22	7.36	4.42–10.3	Acceptable
Vinyl chloride	1	5.29	4.35	2.61–6.09	Acceptable
Bromobenzene	2	5.25	5.78	3.47–8.09	Acceptable
4-Chlorotoluene	2	5.53	6.59	3.95–9.23	Acceptable
1,2-Dibromochloropropanes	3	<5.00	0.804	0.482–1.13	Unusable data

Table 7.2.28 (continued)

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
1,3-Dichlorobenzene	2	6.80	8.09	4.85–11.3	Acceptable
C 1,2-Dichloroethylene	2	6.35	7.24	4.34–10.1	Acceptable
1,3-Dichloropropane	2	10.3	10.8	8.64–13.0	Acceptable
1,1-Dichloropropene	2	<5.00	8.88	5.33–12.4	Acceptable
1,3-Dichloropropene	2	6.88		DL[c]–DL[c]	Unacceptable
Ethylene dibromide, EDB	3	<5.00	0.480	0.288–0.672	Unusable data
1,1,1,2-Tetrachloroethane	2	5.00	5.90	3.54–8.26	Acceptable
Total xylenes	2	12.2	14.0	11.2–16.8	Unacceptable
Miscellaneous parameters					
Residual free Cl, mg/L	1	0.560	0.616	0.363–0.861	Acceptable
	2	0.950	1.16	0.840–1.44	Acceptable
Turbidity, NTUs	1	3.35	3.40	2.85–3.83	Acceptable
	2	1.40[b]	1.00	0.735–1.13	Unacceptable
Sulfate, mg/L	1	4.75	5.30	3.01–7.48	Acceptable
	2	47.2	51.0	43.5–56.2	Unacceptable
Total cyanide, mg/L	1	0.180	0.310	0.222–0.364	Unacceptable
	2	0.260	0.430	0.311–0.533	Unacceptable

[a]Based on theoretical calculations or a reference value when necessary.
[b]Significant general method bias is anticipated for this result.
[c]Detection limit (DL) = acceptance limit.

Table 7.2.29. Water supply performance evaluation study number WS-025—ORGDP, 1989

Parameter	Sample No.	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Trace metals (μg/L)			
Sb	3	20.3	21.0	14.8–29.6	Acceptable
	4	5.80	6.00	3.16–9.09	Acceptable
As	1	52.3[b]	51.0	41.1–56.5	Acceptable
	2	8.00	8.50	6.16–10.1	Acceptable
Ba	1	105	115	96.9–128	Acceptable
	2	365	369	318–402	Acceptable
Be	3	2.01	2.00	1.81–2.23	Acceptable
	4	0.412	0.400	0.252–0.529	Acceptable
Cd	1	2.69	2.30	1.79–2.92	Acceptable
	2	31.0	27.6	21.8–33.0	Acceptable
Cr	1	15.4	15.0	12.0–18.1	Acceptable
	2	61.2	60.0	52.2–68.7	Acceptable
Cu	1	55.2	59.4	51.2–67.2	Acceptable
	2	996	990	895–1060	Acceptable
Pb	1	7.10	6.26	4.47–8.51	Acceptable
	2	22.1	20.0	16.2–23.0	Acceptable
Hg	1	0.713	0.720	0.287–1.06	Acceptable
	2	4.27	4.32	3.12–5.50	Acceptable
Ni	3	6.77	7.00	5.33–8.19	Acceptable
	4	3.56	7.00	1.20–4.68	Acceptable
Se	1	13.4[b]	14.4	10.4–16.7	Acceptable
	2	64.5	72.0	56.6–86.1	Acceptable
Ag	1	4.72	4.30	3.37–5.57	Acceptable
	2	43.3	43.0	35.8–51.0	Acceptable
		Trace metals			
Tl	3	34.5	36.0	29.0–42.7	Acceptable
	4	3.40	3.00	1.75–4.25	Acceptable
		Miscellaneous analytes			
Residual free chlorine, mg/L	1	0.49	0.505	0.292–0.727	Acceptable
	2	1.76	1.40	1.11–1.66	Not acceptable
Turbidity, NTU	1	0.95	0.450	0.265–0.660	Not acceptable
	2	0.95	0.600	0.415–0.755	Not acceptable
Sulfate, mg/L	1	9.64	9.70	6.92–12.2	Acceptable
	2	34.1	34.0	28.5–38.1	Acceptable
Total cyanide, mg/L	1	0.46	0.500	0.348–0.608	Acceptable
	2	0.19	0.220	0.150–0.269	Acceptable

[a]Based on theoretical calculations or a reference value when necessary.
[b]Significant general method bias is anticipated for this result.

Table 7.2.30. CLP performance evaluation results—inorganics (ORNL, 1989)

Scoring classification	Points deducted			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Duplicate precision[a]	0	0	0	1.0
Matrix spikes[b]	0.5	0	0	2.0
Water sample				
Identification	0	0	0	0
Quantitation	4.3	0	0	9.9
False positives and unmet CRDLs[c]	0	0	0	0
Soil sample				
Identification	0	0	0	0
Quantitation	8.5	0	0	3.3
False positives and unmet CRDLs[c]	0	0	0	0
Total points deducted	13.3	0	0	16.2
Laboratory score[d]	86.7	0	0	83.8

[a]Maximum of 10 points deducted based on number of duplicate results that are outside of the control limits.

[b]Maximum of 10 points deducted based on number of matrix spike results that are outside of the control limits.

[c]Points deducted for false positive values and for not meeting the contract-required detection limits (CRDLs).

[d]The maximum number of possible points is 100.

Table 7.2.31. CLP performance evaluation results—organics (ORNL, 1989)

Scoring classification	Points deducted			
	1st quarter	2nd quarter	3rd quarter	4th quarter
No. of TCL compounds not identified	8.1	0	0	7.9
No. of TCL compounds misquantified	20.3	6.0	0	7.9
No. of TCL contaminants	0	0	0	0
No. of non-TCL compounds not identified	5.5	0	0	0
No. of non-TCL contaminants	5.5	0	0	0
Total points deducted	39.4	6.0	0	15.8
Laboratory score[a]	60.6	94.0	0	84.2

[a]The maximum number of possible points is 100.

Table 7.2.32. CLP performance evaluation results—inorganics (ORGDP, FY 1989)

Scoring classification	Points deducted			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Duplicate precision[a]	0	0	0	0
Matrix spikes[b]	2	2	3	1
Water sample				
Identification	0	0	0	0
Quantitation	0	3	0	0
False positives and unmet CRDLs[c]	0	0	0	0
Soil sample				
Identification	0	0	0	0
Quantitation	0	1	0	0
False positives and unmet CRDLs[c]	0	0	0	0
Total points deducted	5.7	16.1	1.5	1.5
Laboratory score[d]	94.3	83.9	98.5	98.5

[a]Maximum of 10 points deducted based on number of duplicate results that are outside of the control limits.

[b]Maximum of 10 points deducted based on number of matrix spike results that are outside of the control limits.

[c]Points deducted for false positive values and for not meeting the contract-required detection limits (CRDLs).

[d]The maximum number of possible points is 100.

Table 7.2.33. CLP performance evaluation results—organics (ORGDP, FY 1989)

Scoring classification	Points deducted			
	1st quarter	2d quarter	3rd quarter[b]	4th quarter
No. of TCL compounds not identified	3	0		0
No. of TCL compounds misquantified	7	5		3
No. of TCL contaminants	0	0		0
No. of non-TCL compounds not identified	0	0		1
No. of non-TCL contaminants	0	0		2
Total points deducted	52.7	15.0		18.4
Laboratory score[a]	47.3	85.0		81.6

[a]The maximum number of possible points is 100.

[b]EPA did not evaluate any data.

Table 7.3.1. Environmental audits and reviews at the Y-12 Plant during 1989

Date	Audit	Reviewer	Subject	Findings
January	Interim oversight	National Academy of Sciences	Health, Safety, and Environment	No report.
January 1	Resource Conservation and Recovery Act (RCRA) follow-up inspection	Tennessee Department of Health and Environment (TDHE)	RCRA	No findings.
January 25	Compliance Evaluation Inspection (CEI)	TDHE	Groundwater monitoring	4 findings, all complete.
January 31	Quality assurance (QA) audit of ambient sulfur dioxide monitoring stations	TDHE	Ambient sulfur dioxide monitoring stations	No findings.
March 2	CAPCA inspection	TDHE	RCRA	No findings.
March 7	Compliance monitoring evaluation	Environmental Protection Agency (EPA)	Groundwater monitoring	No findings.
March 31	Erosion control inspection	TDHE	West Borrow Area	No findings.
April 17	Performance audit inspection	EPA	National Pollutant Discharge Elimination System (NPDES) Permit.	8 findings, 7 complete.
April 27	Aquatic Resources Alteration Permit (ARAP) inspection	TDHE	ARAP	No findings.
May 5	RCRA generator and interim status facility inspection	TDHE	RCRA	No findings.
June 5	Erosion control inspection	TDHE	Spoil Area 1 and Sanitary Landfill 2	No findings.

Table 7.3.1 (Continued)

Date	Audit	Reviewer	Subject	Findings
June 5	Environment, Safety, and Health and Quality Assurance (ESH & QA) Appraisal	DOE-ORO	ESH & QA	38 findings, 22 complete.
June 16	Inspection of leaking underground gasoline tank	TDHE	Underground gasoline tank	No findings.
June 21	QA audit of ambient sulfur dioxide monitoring stations	TDHE	Ambient sulphur dioxide monitoring stations	No findings.
July 13	ARAP inspections	TDHE	ARAP	No findings.
July 26	Air permitting inspection	TDHE	Air permitting.	No report.
August 17	ARAP inspection	TDHE	ARAP	No findings.
September 7	QA audit of ambient sulfur dioxide monitoring stations	TDHE	Ambient sulphur dioxide monitoring stations	No findings.
September 25	Compliance assessment	DOE-HQ Tiger Team	ESH & QA	61 findings, 21 complete.

Table 7.3.2. Environmental audits and reviews at ORNL during 1989

Date	Audit/review	Reviewer/ auditor	Subject	Findings/outcome
February 5	RCRA tour	DOE-HQ	Hazardous waste management facilities.	Information tour only.
March 1	RCRA tour of Cell 4 at Building 3019	TDHE	Cell 4	Information tour to support dropping of unit from RCRA regulations.
April 12	NPDES Compliance Sampling Inspection (CSI)	EPA	Inspection of NPDES records/reports, operations, self-monitoring program.	Two deficiencies were noted in sampling methods. These have been corrected.
July 19–22	RCRA inspection	EPA/TDHE	Review of RCRA TSD facilities, satellite accumulation areas, and records.	No deficiencies or noncompliances were found.
August 8	RCRA tour	TDHE	Hazardous waste management units.	No deficiencies or noncompliances reported.
September 19	Groundwater Monitoring Compliance Evaluation Inspection	TDHE	To ascertain ORNL compliance with applicable interim status groundwater monitoring requirements for SWSA 6.	No noncompliances were found.
October 23	RCRA tour	DOE-ORO	Land-ban regulated waste storage areas.	Information tour only.

Table 7.3.3. Environmental audits and reviews at ORGDP during 1989

Date	Audit/review	Reviewer/auditor	Inspection type	Findings
March 14	Groundwater compliance	EPA	Review of groundwater program	Several findings and recommendations were made. All are being addressed.
March 27	Waste management	Energy Systems	Review of waste management activities	Several findings and recommendations were made. All are being addressed.
April	NPDES compliance sampling inspection	EPA	Inspection of NPDES sampling activities	No findings reported.
April	Clean air compliance	TDHE	Review of air program	No findings issued.
May 22	Environmental protection appraisal	DOE	Review of environmental programs	Several recommendations were made and an action plan has been prepared to address all items.
May 23	RCRA inspection	TDHE	Inspection of RCRA facilities	An NOV was issued, which has been corrected.
May 29	Asbestos	DOE	Review of asbestos program	No findings issued.
August 28	Compliance evaluation inspection	EPA	Review of RCRA facilities	Several findings and recommendations were made. All items have been corrected.
Sept. 19	Groundwater compliance	TDHE	Review of groundwater program	No findings issued; favorable evaluation.