Volume 2

Oak Ridge RESERVATION

ENVIRONMENTAL REPORT FOR 1992

OAK RIDGE RESERVATION ENVIRONMENTAL REPORT FOR 1992

VOLUME 2: DATA PRESENTATION

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Acronyms and Abbreviations

AA	atomic absorption
ACD	Analytical Chemistry Division
ACL	alternate concentration limit
ACN	acetonitrile
ADB	Ash Disposal Basin
ADI	acceptable daily intake
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AESG	Analytical Environmental Support Group
AGL	above ground level
AGM	average geometric mean
AGS	Above Grade Storage Facility
AIHA	American Industrial Hygiene Association
ALARA	as low as reasonably achievable
AMAD	activity median aerodynamic diameter
ANAP	Abandoned Nitric Acid Pipeline
ANSI	American National Standards Institute, Inc.
ARAR	applicable or relevant and appropriate requirement
ARSS	Aerial Remote Sensing Surveys
ASTM	American Society for Testing and Materials
ATDL	Atmospheric Turbulence and Diffusion Laboratory
ATLC	Atomic Trades and Labor Council
AVLIS	atomic vapor laser isotopic separation
BAT	best available technology
BC	Beaver Creek
BCBG	Bear Creek Burial Grounds
BCHR	Beaver Creek Hydrogeologic Regime
BCK	Bear Creek kilometer
BCV	Bear Creek Valley
BCVWDA	Bear Creek Valley Waste Disposal Area
BF	Brushy Fork
BMAP	Biological Monitoring and Abatement Programs
BMP	best management practices
BOD	biochemical oxygen demand
BRC	below regulatory concern
BSCP	Background Soil Characterization Project
BTM	breakthrough monitors
CAA	Clean Air Act
CAP	Correction Action Plan
CAPCA	Closure and Post Closure Activities

CARL	Comparative Animal Research Laboratory
CAS	Chemical Abstracts Service
CC	Copper Creek
CDI	calculated daily intake
CEI	Compliance Evaluation Inspection
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFMT	cross-functional management team
CFR	Code of Federal Regulations
CH	contact-handled
CLP	Contract Laboratory Program
CNF	Central Neutralization Facility
CNR	Chestnut Ridge
COD	chemical oxygen demand
CPCF	Central Pollution Control Facility
CRDL	contract-required detection limit
CRHR	Chestnut Ridge Hydrogeologic Regime
CRK	Clinch River kilometer
CRM	Clinch River mile
CRRI	Clinch River Remedial Investigation
CRSDB	Chestnut Ridge Sediment Disposal Basin
CRSP	Chestnut Ridge Security Pits
CWA	Clean Water Act
CX	categorical exclusion
CY	calendar year
CYRTF	Coal Yard Runoff Treatment Facility
D&D	decontamination and decommissioning
DAC	derived air concentration
DCF	dose conversion factor
DCG	derived concentration guide
DMR	discharge monitoring report
DNA	deoxyribonucleic acid
DNAPL	dense nonaqueous phase liquid
DNFSB	Defense Nuclear Facility Safety Board
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy Headquarters
DOE-ORO	U.S. Department of Energy Oak Ridge Operations Office
DOT	U.S. Department of Transportation
DWL	drinking water limits
EA	environmental assessment
EAP	environmental assessment plan
EC	environmental compliance
ECRWP	East Chestnut Ridge Waste Pile
EDE	effective dose equivalent
EFK	East Fork Poplar Creek kilometer
EFPC	East Fork Poplar Creek
EIS	environmental impact statement
EMD	Environmental Management Division
EML	Environmental Measurements Laboratory
EMP	Environmental Monitoring Plan
EMSL-LV	Environmental Monitoring System Laboratory at Las Vegas
Energy Systems	Martin Marietta Energy Systems, Inc.
EP	extraction procedure

EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act
EPIP	Environmental Protection Implementation Plan
ERD	Environmental Restoration Division
ERDS	Environmental Review and Documentation Section
ERP	Environmental Restoration Program
E&SA	Environmental and Safety Activities
ESAMS	Energy Systems Action Management System
ESD	Environmental Sciences Division
ESP	Environmental Surveillance and Protection
ET&I	Equipment Testing and Inspection Division
FAC	free available chlorine
FDA	Food and Drug Administration
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Agreement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FS	feasibility study
FTIR	Fourier Transform infrared
FWPCA	Federal Water Pollution Control Act
FY	fiscal year
GQM	groundwater quality monitoring
GUT	garage underground tank
GW	groundwater
GWPP	Groundwater Protection Program
GWPS	Groundwater Protection Standard
GWQAP	groundwater quality assessment plan
GWQAR	groundwater quality assessment report
HAP	hazardous air pollutant
HAZWDDD	Hazardous Waste Development, Demonstration, and Disposal
HAZWRAP	Hazardous Waste Remedial Actions Program
HCK	Hinds Creek kilometer
HEPA	high-efficiency particulate air
HFIR	High Flux Isotope Reactor
HRE	Homogenous Reactor Experiment
HSWA	Hazardous and Solid Waste Amendments
HWDU	hazardous waste disposal unit
IAG	interagency agreement
IBI	Index of Biotic Integrity
ICP	inductively coupled plasma
ICRP	International Commission on Radiological Protection
IRIS	Integrated Risk Information System
IROD	interim record of decision
ISV	in situ vitrification
IWC	in-stream waste concentration
IWMF	Interim Waste Management Facility
K-25 Site	Oak Ridge K-25 Site
KHQ	Kerr Hollow Quarry

LC_{50}	lethal concentration for 50% of organisms
LCR	lowest concentration reported
LDR	land disposal restrictions
LLLW	liquid low-level waste
LLW	low-level waste
LLWDDD	low-level waste disposal development and demonstration
LLWDF	Low-Level Waste Disposal Facilities
LLLWEF	Liquid Low-Level Waste Evaporation Facility
LSF	Liquid Storage Facility
MAA	material access area
MACT	Maximum Achievable Control Technology
MB	Melton Branch
MCL	maximum contaminant level
MDA	minimum detectable activity
MDL	method detection limits
MHD	Melton Hill Dam
MSDS	material safety data sheet
MSRE	Molten Salt Reactor Experiment
MT	meteorological tower
MVLLWIF	Melton Valley Low-Level Waste Immobilization Facility
NAS	National Academy of Sciences
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
ND	not detected
NDB	Numeric Data Base
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFA	no further action
NHP	New Hope Pond
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NOEC	no-observed-effect concentration
NOEL	no-observed-effect limit
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
NRWTF	Nonradiological Wastewater Treatment Facility
NWT	Northwest Tributary
O&G	oil and grease
OECD	Office of Environmental Compliance and Documentation
OLF	Oil Landfarm Area
ORAU	Oak Ridge Associated Universities
ORGDP	Oak Ridge Gaseous Diffusion Plant
ORIGEN	Oak Ridge Isotopic Generation and Depletion Code
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
ORS	Occurrence Reporting System
OSHA	Occupational Safety and Health Administration

PA	preliminary assessment
PA/SI	preliminary assessment/site investigation
PAM	perimeter air monitoring
PAT	proficiency analytical testing
PC	Pond Closure
PCB	polychlorinated biphenyl
PCK	Poplar Creek kilometer
PCP	pentachlorophenol
PE	performance evaluation
PET	Proficiency Environmental Testing
PGDP	Paducah Gaseous Diffusion Plant
PIDAS	Perimeter Intrusion Detection and Alarm System
PIP	Performance Improvement Process
PM10	particulate matter less than 10 microns in diameter
PRTF	Plating Rinsewater Treatment Facility
PUFF	polyurethane foam filter
PVC	polyvinyl chloride
PWA	Process Waste Assessment
PWMP	Pond Waste Management Project
PWTF	Process Waste Treatment Facility
PWTP	Process Waste Treatment Plant
QA	quality assurance
QC	quality control
RAM	remote air monitoring
RAP	Remedial Action Program
RCRA	Resource Conservation and Recovery Act
RCW	recirculating cooling water
R&D	research and development
REDC	Radiochemical Engineering Development Center
RFA	RCRA Facility Assessment
RfD	reference dose
RFI	RCRA facility investigation
RH	remote-handled
RI/FS	remedial investigation /feasibility study
RMA	Rocky Mountain Arsenal
RMP	radiological monitoring plan
RMPE	Reduction of Mercury in Plant Effluent
ROD	Record of Decision
RQ	reportable quantity
S-3	S-3 Site
S&A	sampling and analysis
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SE	standard error of the mean
SERAM	Stack Emission Reduction and Monitoring Project
SF	slope factor
SIE	specific ion electrode
SIP	State Implementation Plan
SLF	sanitary landfill
SMCL	secondary maximum contaminant level
SOP	standard operating procedure

SPAD	Steam Plant Ash Disposal
SPCC	Spill Prevention, Control, and Countermeasures
SPWTF	Steam Plant Wastewater Treatment Facility
SSF	solid storage facility
STP	Sewage Treatment Plant
SWDF	solid waste disposal facility
SWMU	solid waste management unit
SWSA	solid waste storage area
TCL	Target Compound List
TCLP	toxicity characteristic leaching procedure
TCMP	toxicity control and monitoring program
TDEC	Tennessee Department of Environment and Conservation
TDS	total dissolved solids
TOC	total organic carbon
TOX	total organic halogens
TRC	total residual chlorine
TRE	Toxicity Reduction Evaluation
TRK	Tennessee River kilometer
TRM	Tennessee River mile
TRU	transuranic
TRV	thermal relief valve
TSCA	Toxic Substances Control Act
TSF	Tower Shielding Facility
TSP	total suspended particulates
TSS	total suspended solids
TSWMA	Tennessee Solid Waste Management Act
TURF	Thorium-Uranium Process Facility
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
UE	uranium enrichment
UEFPC	Upper East Fork Poplar Creek
UEFPCHR	Upper East Fork Poplar Creek Hydrogeologic Regime
UF	uranium hexafluoride
UNC	United Nuclear Corporation
USGS	United States Geological Survey
UST	underground storage tank
VC7002	Vehicle Cleaning Facility
VOA	volatile organic aromatics
VOC	volatile organic compound
WAC	waste acceptance criteria
WAG	waste area grouping
WCK	White Oak Creek kilometer
WCPA	Waste Coolant Processing Area
WCPF	Waste Coolant Processing Facility
WETF	West End Treatment Facility
WIPP	Waste Isolation Pilot Plant
WMA	Waste Management Area
WMCBF	Waste Machine Coolant Biodegradation Facility
WMCO	Waste Management Coordination Office
WMP	Waste Management Plan

WMP	Work Management Plan
WOC	White Oak Creek
WOCE	White Oak Creek Embayment
WOD	White Oak Dam
WOL	White Oak Lake
WOM	White Oak Mountain
WTF	Waste Treatment Facility
Y-12 Plant	Oak Ridge Y-12 Plant

Units

mCi	microcurie
mg	microgram
Bq	Becquerel
Btu	British thermal unit
cfm	cubic feet per minute
Ci	curie
cm	centimeter
cm^2	square centimeter
cm^3	cubic centimeter
d	day
ft	foot
ft^2	square foot
ft^3	cubic foot
g	gram
gal	gallon
gpd	gallons per day
gpm	gallons per minute
h	hour
ha	hectare
in.	inch
kg	kilogram
km	kilometer
km^2	square kilometer
L	liter
lb	pound
m	meter
M	million
m^2	square meter
m^3	cubic meter
mCi	millicurie
mg	milligram
Mgd	million gallons per day
mil	1/1000 in.
$mile^2$	square mile
min	minute
mL	milliliter
mm	millimeter
mrad	millirad
mrem	millirem
mSv	millisievert
NTU	nephelometric turbidity unit
pCi	picocurie
ppb	parts per billion
ppm	parts per million
ppt	parts per trillion
psi	pounds per square inch
R	roentgen
s	second
SU	standard unit
ÉC	degrees celsius
ÉF	degrees Fahrenheit
yd^3	cubic yard

CONVERSION TABLE

Multiply	By	To obtain	Multiply	By	To obtain
acre	0.405	ha	ha	2.47	acres
in.	2.54	cm	cm	0.394	in.
ft	0.305	m	m	3.28	ft
mile	1.61	km	km	0.621	mile
lb	0.4536	kg	kg	2.205	lb
liq qt-U.S.	0.946	L	L	1.057	liq qt-U.S.
ft^2	0.093	m^2	m^2	10.764	ft^2
$mile^2$	2.59	km^2	km^2	0.386	$mile^2$
ft^3	0.028	m^3	m^3	35.31	ft^3
Bq	27	pCi	pCi	0.037	Bq
nCi	1×10^3	pCi	pCi	1×10^{-3}	nCi
dpm/L	0.45×10^{-9}	$\mu Ci/cm^3$	$\mu Ci/cm^3$	2.22×10^9	dpm/L
pCi/L (water)	10^{-9}	$\mu Ci/mL$ (water)	$\mu Ci/mL$ (water)	10^9	pCi/L (water)
pCi/m^3 (air)	10^{-12}	$\mu Ci/cm^3$ (air)	$\mu Ci/cm^3$	10^{12}	pCi/m^3 (air)
mCi/km^2	1	nCi/m^2	nCi/m^2	1	mCi/km^2
sievert (Sv)	100	rem	rem	0.01	sievert (Sv)

1. RESERVATION DESCRIPTION AND SETTING

1. Reservation Description and Setting

The two volumes of this report present data and supporting narratives regarding the impact of the U.S. Department of Energy's (DOE's) Oak Ridge Reservation (ORR) on its environs and the public during 1992. Volume 1 includes all narrative descriptions, summaries, and conclusions and is intended to be a "stand-alone" report for the reader who does not want to review in detail all of the 1992 data for the ORR. Volume 2 includes the detailed data in formats that ensure all the environmental data are represented. Narratives are not included in Vol. 2. The information in Vol. 2 is addressed and analyzed in Vol. 1. For this reason, Vol. 2 cannot be considered a stand-alone report but is intended to be used with Vol. 1.

The Oak Ridge Reservation encompasses all of the contiguous land owned by DOE in the Oak Ridge area. The reservation is divided into "administrative units" according to which organization manages each unit, either central Energy Systems, one of the three major installations, or Oak Ridge Associated Universities.

In September 1992 DOE sold a parcel of the reservation (Parcel A2) to the city of Oak Ridge. Parcel A2, which contains about 215 ha (532 acres) of land, is located immediately west of Melton Hill Drive and north of Edgemoor Road (State Route 170). The data shown in Table 1.1 reflect this property transfer.

Table 1.1. Administrative units on the ORR in 1992

Description	Area	
	Hectares	Acres
Oak Ridge Reservation less areas shown below	12,447	30,758
Oak Ridge Y-12 Plant	328	811
Oak Ridge National Laboratory	445	1,100
Oak Ridge K-25 Site	688	1,700
Oak Ridge Institute for Science and Education	137	340
Total	14,045	34,709

Table 1.2. Populations of towns within 80 km of ORR[a]

Town/city	Population
Anderson County	
Clinton	8,972
Lake City	2,166
Norris	1,303
Oak Ridge	27,310
Oliver Springs	3,433
Blount County	
Friendsville	792
Alcoa	6,400
Maryville	19,208
Knox County	
Knoxville	165,121
Loudon County	
Greenback	611
Lenoir City	6,147
Loudon	4,026
Morgan County	
Wartburg	932
Roane County	
Harriman	7,119
Kingston	4,552
Rockwood	5,348
Sevier County	
Sevierville	7,178
Union County	
Luttrell	812
Maynardville	1,298
Campbell County	
Caryville	1,751
Jellico	2,447
Jacksboro	1,568
LaFollette	7,192

[a]*Source: 1990 Census of Population and Housing Public Law 94–171 Data*, U.S. Department of Commerce, Bureau of the Census, Washington, D.C., April 1991.

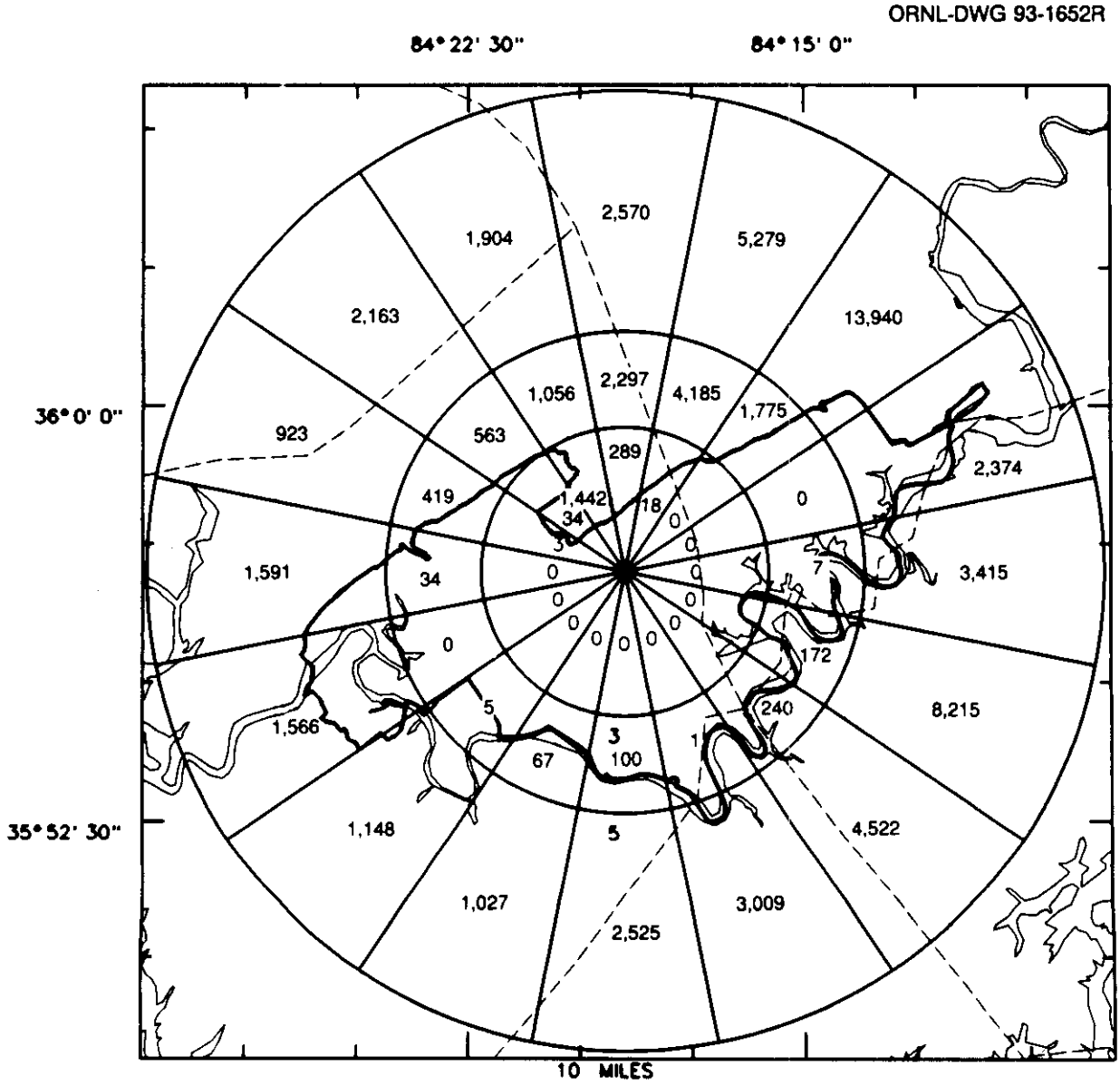

Fig. 1.1. Projected 1992 population levels within 16 km (10 miles) of the center of the Oak Ridge Reservation, by sectors and annuli, based on 1990 census data (U.S. Department of Commerce 1991, Vol. 1). Dashed lines indicate county boundaries.

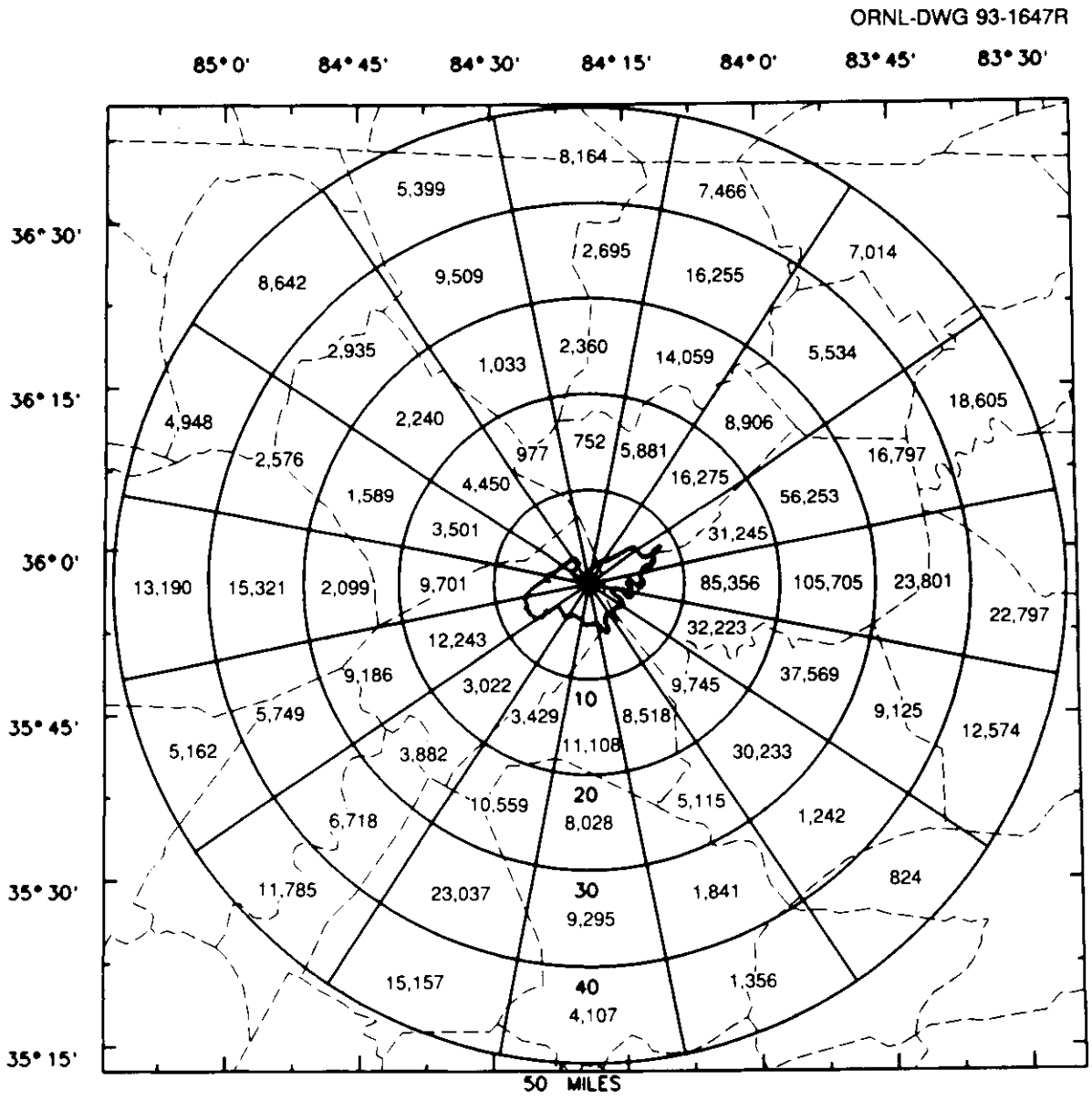

Fig. 1.2. Projected 1992 population levels within 80 km (50 miles) of the center of the Oak Ridge Reservation, by sectors and annuli, based on 1990 census data (U.S. Department of Commerce 1991, Vol. 1). Details of the center annulus are given in Fig. 1.1, Vol. 2. Dashed lines indicate county boundaries.

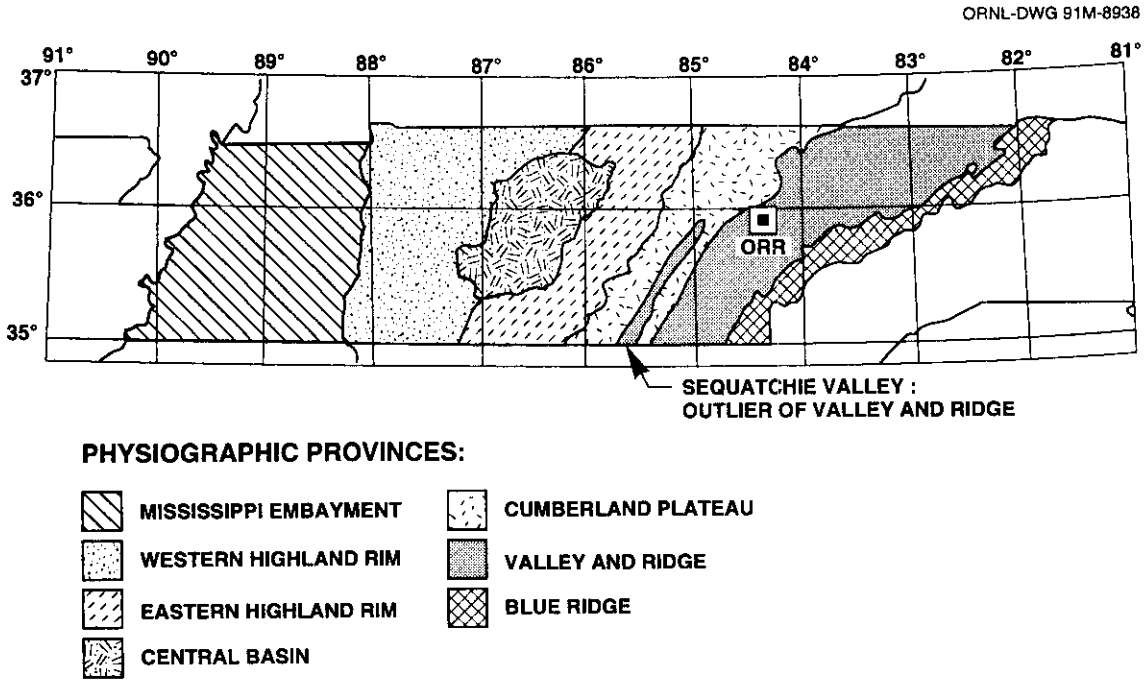

Fig. 1.3. Physiographic map of Tennessee.

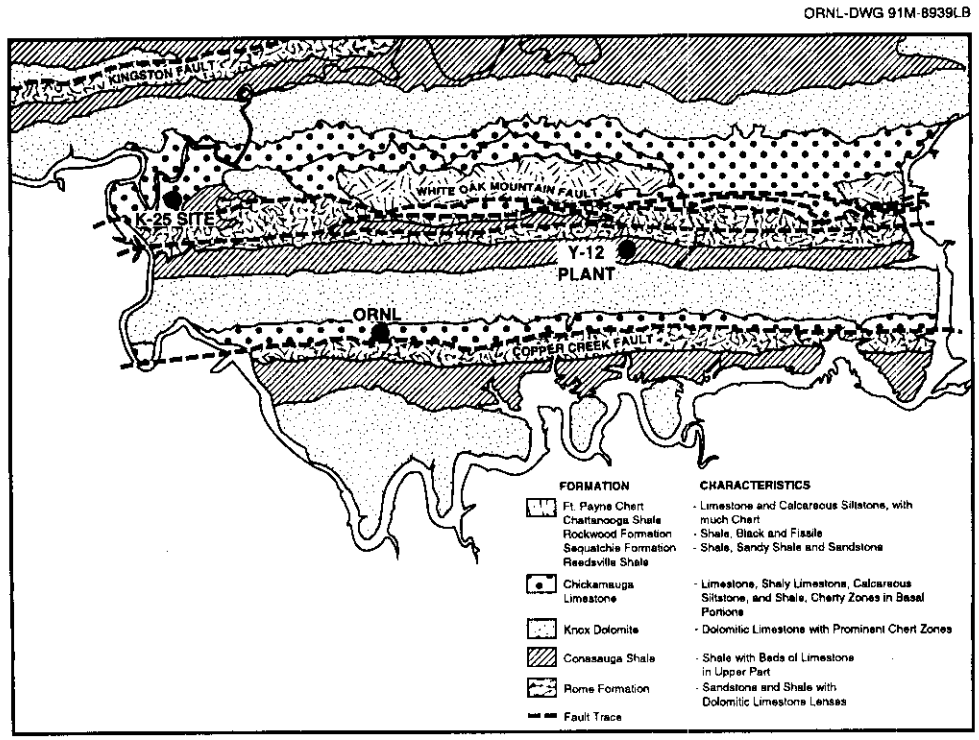

Fig. 1.4. Geologic map of the Oak Ridge Reservation.

Table 1.3. 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:* "Use Classifications for Surface Waters," Chapter 1200-4-4 in *State of Tennessee Water Quality Standards*, Tennessee Department of Environment and Conservation, Bureau of Environment, Division of Water Pollution Control, December 1991.

[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. POTENTIAL RADIATION AND CHEMICAL DOSE TO THE PUBLIC

Table 2.1. Airborne activities (Ci),[a] solubilities, and particle sizes (AMAD, μm) of radionuclides released from ORNL during 1992

Nuclide	Solubility class	Source												
		AMAD	X2026	X3020	X3039	X7830	X7877	X7911	X2000	X3018	X3074	X3544	X7025	X7512	Total
^{3}H	G		7.14E-03		1.95E+03	5.19E-05		5.44E+01	6.56E+01				6.56E+01		2.14E+03
^{7}Be	Y	1			8.74E-06	1.73E-07		1.88E-08			4.23E-11				8.91E-06
^{60}Co	Y	1	3.83E-07		1.99E-05	5.07E-08				2.02E-08	2.28E-13	9.30E-06			2.97E-05
^{82}Br	D	1	1.02E-05												1.02E-05
^{83m}Kr	G							7.32E+01							7.32E+01
^{85m}Kr	G							1.73E+02							1.73E+02
^{87}Kr	G							3.50E+02							3.50E+02
^{88}Kr	G							4.94E+02							4.94E+02
^{89}Kr	G							6.27E+02							6.27E+02
^{90}Sr	D	1	3.86E-05	3.11E-06	5.97E-05	1.76E-06		9.56E-06		4.05E-09	2.94E-11	6.16E-06			1.19E-04
^{129}I	D	1				8.13E-05		1.89E-04							2.70E-04
^{131}I	D	1	3.81E-04	1.60E-07	3.22E-05			1.25E-01							1.25E-01
^{132}I	D	1						1.36E+00							1.36E+00
^{133}I	D	1	9.32E-05	1.58E-05	8.72E-05	1.89E-07		6.48E-01						3.90E-06	6.48E-01
^{134}I	D	1						2.05E-02							2.05E-02
^{135}I	D	1	3.69E-05	2.76E-04	7.62E-04	1.37E-06		1.22E+00							1.22E+00
^{133}Xe	G							8.81E+02							8.81E+02
^{133m}Xe	G							2.74E+01							2.74E+01
^{135}Xe	G							2.82E+01							2.82E+01
^{135m}Xe	G							1.55E+02							1.55E+02
^{138}Xe	G							8.50E+02							8.50E+02
^{134}Cs	D	1	5.55E-07			4.78E-08									6.03E-07
^{137}Cs	D	1	2.80E-04	3.73E-06	9.72E-05	7.58E-06		2.92E-06		1.57E-07	3.44E-11	2.51E-05		1.96E-04	6.13E-04
^{140}Ba	D	1						1.00E-04							1.00E-04
^{137m}Ba	D	1	2.80E-04	3.73E-06	9.72E-05	7.58E-06		2.92E-06		1.57E-07	3.44E-11	2.51E-05		1.96E-04	6.13E-04
^{140}La	W	1						1.39E-06							1.39E-06
^{152}Eu	W	1									1.86E-12				1.86E-12
^{154}Eu	W	1	1.66E-06		4.21E-06						1.02E-12				5.87E-06
^{155}Eu	W	1	3.01E-06			5.44E-09									3.02E-06
^{191}Os	Y	1	9.59E-03		1.31E-02	8.24E-09									2.27E-02
^{212}Pb	D	1	1.81E-01	2.26E-01	9.58E-01	6.85E-03		1.84E-01							1.56E+00
^{228}Th	Y	1	8.99E-06	1.90E-08	5.04E-07	2.27E-09	1.01E-10	6.70E-09			1.14E-13				9.52E-06
^{230}Th	Y	1	1.92E-07	1.14E-07	3.18E-07	1.25E-09	5.26E-11	2.32E-08			1.06E-13				6.49E-07
^{232}Th	Y	1	3.99E-09	4.36E-09	7.87E-09	8.20E-11		2.39E-09		3.07E-12	1.10E-13			1.67E-07	1.86E-07
^{234}U	Y	1	2.09E-05	2.37E-07	8.65E-07	2.39E-08	9.02E-10	1.20E-07	3.25E-09		1.01E-12			2.09E-07	2.24E-05
^{235}U	Y	1	3.80E-07	2.02E-08	6.33E-08	2.16E-09		1.31E-08			7.21E-14				4.79E-07
^{238}U	Y	1	3.55E-07	3.07E-08	8.05E-08	9.74E-09		2.84E-08	1.67E-09	2.01E-10	4.10E-13			2.51E-07	7.57E-07
^{238}Pu	Y	1	6.79E-06	2.68E-07	3.11E-07	6.76E-09		2.04E-08			7.15E-14				7.40E-06
^{239}Pu	Y	1	1.88E-05	1.90E-07	1.50E-06	2.37E-08		6.83E-08		1.32E-08	5.90E-14				2.06E-05
^{241}Am	W	1	1.26E-05	3.54E-07	5.42E-07	1.07E-08	8.27E-11	3.08E-08		9.19E-10	1.72E-13	1.19E-07			1.37E-05
^{244}Cm	W	1	1.97E-04	1.01E-06	4.23E-06	1.13E-07	1.32E-10	5.33E-07		1.04E-10	7.30E-12	1.63E-06			2.05E-04
Total (Ci/year)			1.99E-01	2.26E-01	1.95E+03	7.00E-03	1.27E-09	3.72E+03	6.56E+01	3.53E-07	1.53E-10	6.74E-05	6.56E+01	3.97E-04	5.80E+03

[a]To convert Ci to Bq, multiply by 3.7E + 10.

Table 2.2. Airborne activities (Ci),[a] solubilities, and particle sizes (AMADs, μm) of radionuclides emitted from the K-25 Site during 1992

Nuclide	Solubility class	AMAD	Source				Total
			K-1435 (TSCA)	K-1015 (Laundry)	K-1417 (PWMP)	K-1420 (Valve Dis)	
^{99}Tc	W	1		2.93E–06			2.93E–06
^{106}Ru	Y	1	4.36E–04				4.36E–04
^{137}Cs	D	1		1.01E–07	6.08E–05		6.09E–05
^{137m}Ba	D	1		1.01E–07	6.08E–05		6.09E–05
^{228}Th	Y	0.3	1.54E–03	5.75E–08			1.54E–03
^{230}Th	Y	0.3	6.84E–05	1.27E–07	6.27E–04		6.95E–04
^{232}Th	Y	0.3	2.96E–05	7.26E–09			2.96E–05
^{234}Th	Y	0.3		4.00E–06			4.00E–06
^{234m}Pa	Y	1	3.84E–01	1.80E–05	2.30E–02		4.07E–01
^{234}U	Y	0.3	2.28E–02	4.42E–07	1.54E–04	5.50E–09	2.30E–02
^{235}U	Y	1	9.19E–04	2.30E–08	7.80E–05	2.52E–10	9.97E–04
^{238}U	Y	0.3	3.62E–02	3.25E–08		5.24E–09	3.62E–02
^{237}Np	W	1	1.10E–04	9.39E–07		2.21E–11	1.11E–04
^{238}Pu	W	1	8.54E–06	9.08E–08	5.90E–04		5.99E–04
^{239}Pu	W	1	6.06E–06	1.02E–07	1.05E–04		1.11E–04
^{40}K	D	1	1.01E–03				1.01E–03
^{144}Ce	Y	1	1.23E–06				1.23E–06
Total (Ci/year)			4.47E–01	2.70E–05	2.47E–02	1.10E–08	4.72E–01

[a]To convert Ci to Bq, multiply by 3.7E+10.

Table 2.3. Airborne activities (Ci),[a] solubilities, and particle sizes (AMADs, μm) of radionuclides emitted from the Y-12 Plant during 1992

Nuclide	Solubility class	AMAD	Source		Total
			Monitored stacks	Room exhausts	
^{234}U	Y	1	2.30E–02	5.60E–03	2.86E–02
^{234}U	W	1	4.80E–03	1.00E–03	5.80E–03
^{234}U	D	1	7.80E–03	4.80E–03	1.26E–02
^{235}U	Y	1	7.30E–04	1.90E–04	9.20E–04
^{235}U	W	1	1.50E–04	3.20E–05	1.82E–04
^{235}U	D	1	2.40E–04	1.50E–04	3.90E–04
^{236}U	Y	1	9.10E–05	1.90E–05	1.10E–04
^{236}U	W	1	2.00E–05	4.30E–06	2.43E–05
^{236}U	D	1	3.20E–05	2.00E–05	5.20E–05
^{238}U	Y	1	2.30E–03	1.80E–03	4.10E–03
^{238}U	W	1	1.30E–06	2.90E–07	1.59E–06
^{238}U	D	1	2.20E–06	1.30E–06	3.50E–06
Total (Ci/year)			3.92E–02	1.36E–02	5.28E–02

[a]To convert Ci to Bq, multiply by 3.7E+10.

Table 2.4. Radionuclide discharges to surface water from White Oak Dam (ORNL) during 1992

Radionuclide	Discharge (Ci)[a]
^{3}H	2000
^{60}Co	0.050
Total Sr[b]	2.2
^{137}Cs	0.69

[a]To convert from Ci to Bq, multiply by 3.7E+10.
[b]Taken to be ^{90}Sr.

Table 2.5. Radionuclide discharges to surface water from the Y-12 Plant during 1992

Radionuclide	Discharge (Ci)[a]	
	East Fork Poplar Creek	Bear Creek
Total Sr[b]	0.0092	0.0064
^{99}Tc	0.030	0.084
^{226}Ra	0.0068	0.0035
^{228}Ra	0.0021	0.0018
^{234}U	0.039	0.020
^{235}U	0.0019	0.0012
^{238}U	0.046	0.038
^{228}Th	0.0043	0.0052
^{230}Th	0.0016	0.0011
^{232}Th	0.0029	0.00059
^{234}Th	0.045	0.038
^{237}Np	0.00031	0.00062
^{241}Am		0.00040
^{238}Pu	0.00028	
^{239}Pu	0.000080	
^{240}Pu	0.000080	

[a]To convert Ci to Bq, multiply by 3.7E+10.
[b]Assumed to be ^{90}Sr.

Table 2.6. Radionuclide discharges to surface water from the K-25 Site during 1992

Radionuclide	Discharge (Ci)[a]
^{99}Tc	1.56
^{137}Cs	0.0058
^{234}U	0.026
^{235}U	0.00078
^{236}U	0.00035
^{238}U	0.014
^{237}Np	0.0030
^{238}Pu	0.0062
^{239}Pu	0.00093

[a]To convert Ci to Bq, multiply by 3.7E+10.

Table 2.7. 1992 total dose rate for aquatic organisms (rad/day)[a], ORNL

Location	Fish		Crawdad		Muskrat	
	(Average)	(Maximum)	(Average)	(Maximum)	(Average)	(Maximum)
Melton Branch (weir X-13)	1.6E–3	2.2E–3	4.7E–4	6.8E–4	5.5E–3	7.1E–3
White Oak Creek (weir X-14)	9.6E–4	2.1E–3	1.8E–4	4.0E–4	1.8E–3	3.2E–3
White Oak Dam (weir X-15)	1.2E–3	2.7E–3	3.2E–4	8.5E–4	3.0E–3	4.8E–3
First Creek	1.1E–3	2.7E–3	1.8E–4	1.0E–3	3.9E–3	7.2E–3
Fifth Creek	1.3E–4	9.0E–4	2.1E–5	7.5E–4	4.6E–4	9.2E–4
7500 Bridge	9.7E–4	1.9E–3	1.7E–4	3.4E–4	1.3E–3	2.4E–3
Melton Branch 2	1.5E–5	3.5E–4	5.0E–6	6.8E–5	4.9E–5	2.2E–4
Northwest Tributary	1.8E–4	7.1E–4	3.0E–5	1.3E–4	6.6E–4	1.1E–3
Raccoon Creek	7.7E–5	4.7E–4	1.3E–5	6.0E–4	2.8E–4	6.3E–4

[a]Total dose rate includes the contribution of internally deposited radionuclides, sediment exposure (derived from water concentrations), and water immersion.

Table 2.8. 1992 total dose rate for aquatic organisms (rad/day), Y-12 and K-25

Location	Fish (average)	Crustacea (average)	Muskrat (average)
	Y-12 Plant		
Bear Creek (Outfall 304)	14E–4	6.5E–4	*a*
East Fork Poplar Creek (Station 17)	1.3E–3	4.7E–4	*a*
Roger's Quarry (Outfall 302)	8.3E–5	4.6E–4	*a*
	K-25 Site		
Poplar Creek (Outfall 010)	5.1E–6	1.3E–4	1.0E–5
Poplar Creek (Outfall 057)	5.1E–6	1.2E–4	5.1E–6
Clinch River (Holding Pond Outfall 034)	4.5E–9	1.2E–7	5.3E–9

[a]There were no available plant bioaccumulation factors for certain radionuclides in the Y-12 inventory.

3. AIRBORNE DISCHARGES, AMBIENT AIR MONITORING, METEOROLOGICAL MONITORING, AND EXTERNAL GAMMA RADIATION

Table 3.1. Air permits at the Y-12 Plant

Y-12 Plant source number	Emission source reference number	Permit number	Source
		Part I. Operating permits at the Y-12 Plant	
Fugitive emission source	01-1020-89	034295P	Fugitive air emission at Y-12 Plant
Y-12-Plant-[A]-(00)	01-0020-08	035025P	Plantwide permit for flourescent light crusher
Y-9201-1-A(01)	01-0020-15	730303P	Welding booths
Y-9201-1-A(02)	01-0020-15	730303P	Welding shop
Y-9201-1-A(04)	01-0020-15	730303P	Metal fabrication shop
Y-9201-1-A(05)	01-0020-15	730303P	Welding shop
Y-9201-1-A(15)	01-0020-15	730303P	Metal fabrication shop
Y-9201-1-B(16)	01-0020-59	730310P	Tool grinding machines
Y-9201-1-B(18)	01-0020-59	730310P	Sandblaster exhaust
Y-9201-1-C(3)	01-0020-17	730304P	Graphitic carbon machining
Y-9201-1-C(4)	01-0020-17	730304P	Graphitic carbon machining
Y-9201-1-D(09)	01-0020-59	730310P	Fabrication shop
Y-9201-1-D(10)	01-0020-59	730310P	Fabrication shop
Y-9201-1-D(11)	01-0020-59	730310P	Fabrication shop
Y-9201-1-D(13)	01-0020-59	730310P	Metal grinders and milling machines
Y-9201-1-[E]-(00)	01-1020-92	031880P	Lead machining operations
Y-9201-2-B(02)	01-0020-43	012887P	Acid wash station
Y-9201-3-A(01)	01-0020-55	013002F	Diesel generator
Y-9201-4-[A]-(264)	01-1020-96	032956P	Mercury flasking hood
Y-9201-5-B(01)	01-0020-21	730305P	Machining operations L5N hood exhaust
Y-9201-5-B(02)	01-0020-21	730305P	Vacuum inlets L5E machining shop
Y-9201-5-B(03)	01-0020-21	730305P	Rubber-gel potting hood exhaust
Y-9201-5-B(04)	01-0020-21	730305P	Palarite shop, machine exhaust
Y-9201-5-B(05)	01-0020-21	730305P	Tool grinding machines hood exhaust
Y-9201-5-B(06)	01-0020-21	730305P	Cleaning hood, equipment service
Y-9201-5-B(07)	01-0020-21	730305P	Electrochemical machine, stainless steel
Y-9201-5-D(01)	01-1020-44	025902P	Hood
Y-9201-5-D(02)	01-1020-44	025902P	Film dryer exhaust fume hood
Y-9201-5-E(01)	01-1020-70	025983P	BeO hot press
Y-9201-5-E(02)	01-1020-70	025983P	A53 hot press house vacuum
Y-9201-5-E(08)	01-1020-70	025983P	Room exaust
Y-9201-5-G(01)	01-0020-44	730308P	Arc melt
Y-9201-5-G(02)	01-0020-44	730308P	DeVilbiss hood
Y-9201-5-G(03)	01-0020-44	730308P	Nitric acid dip tanks
Y-9201-5-G(04)	01-0020-44	730308P	Acid pickling tanks
Y-9201-5-G(05)	01-0020-44	730308P	Abrasive saws
Y-9201-5-G(06)	01-0020-44	730308P	Scrap metal recycle
Y-9201-5-G(07)	01-0020-44	730308P	Vapor degreaser
Y-9201-5-H(01)	01-0020-16	026019P	Mixing process material
Y-9201-5-H(02)	01-0020-16	026019P	Setup and sample area
Y-9201-5-H(03)	01-0020-16	026019P	Vapor blaster
Y-9201-5-H(04)	01-0020-16	026019P	Nickel plating tank exhaust
Y-9201-5-H(05)	01-0020-16	026019P	Material handling
Y-9201-5-H(06)	01-0020-16	026019P	Material handling
Y-9201-5-H(07)	01-0020-16	026019P	Glove box and blending station
Y-9201-5-H(08)	01-0020-16	026019P	Inspection house vacuum
Y-9201-5N-[A]-(67)	01-1020-18	730314P	Machine shop exhaust
Y-9201-5N-[B]-(239)	01-0020-30	030484P	Plating tanks and hoods
Y-9201-5N-[B]-(240)	01-0020-30	030484P	Plating tanks and hoods
Y-9201-5N-[B]-(241)	01-0020-30	030484P	Plating tanks and hoods
Y-9201-5N-[B]-(242)	01-0020-30	030484P	Incinerator
Y-9201-5N-[B]-(243)	01-0020-30	030484P	Grit blaster
Y-9201-5N-[B]-(244)	01-0020-30	030484P	Grit blaster and area exhaust
Y-9202-A-(20)	01-0020-06	031696P	Laboratory beryllium
Y-9202-A-(21)	01-0020-06	031696P	Laboratory

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9204-2-A(01)	01-0020-46	026107P	Storage tank
Y-9204-2-A(02)	01-0020-46	026107P	Storage tank
Y-9204-2-A(03)	01-0020-46	026107P	Storage tank
Y-9204-2-A(04)	01-0020-46	026107P	Storage tank
Y-9204-2-A(05)	01-0020-46	026107P	Storage tank
Y-9204-2-A(06)	01-0020-46	026107P	Storage tank
Y-9204-2-A(07)	01-0020-46	026107P	Storage tank
Y-9204-2-A(08)	01-0020-46	026107P	Storage tank
Y-9204-2-A(09)	01-0020-46	026107P	Storage tank
Y-9204-2-A(10)	01-0020-46	026107P	Storage tank
Y-9204-2-A(11)	01-0020-46	026107P	Storage tank
Y-9204-2-A(12)	01-0020-46	026107P	Storage tank
Y-9204-2-A(13)	01-0020-46	026107P	Storage tank
Y-9204-2-B	01-0020-45	012889P	Storage tank
Y-9204-2-B(14)	01-0020-71	025954P	Reduction cell
Y-9204-2-B(15)	01-0020-71	025954P	Reduction cell
Y-9204-2-B(16)	01-0020-71	025954P	Reduction cell
Y-9204-2-B(17)	01-0020-71	025954P	Reduction cell
Y-9204-2-B(18)	01-0020-71	025954P	Caustic scrubber exhaust
Y-9204-2-B(19)	01-0020-71	025954P	Caustic scrubber exhaust
Y-9204-2-B(20)	01-0020-71	025954P	Storage area
Y-9204-2-B(21)	01-0020-71	025954P	Reduction cell
Y-9204-2-B(22)	01-0020-71	025954P	Reduction cell
Y-9204-2-B(23)	01-0020-71	025954P	Caustic scrubber exhaust
Y-9204-2-B(24)	01-0020-71	025954P	Caustic scrubber exhaust
Y-9204-2-B(25)	01-0020-71	025954P	Lithium metal wash station
Y-9204-2-B(26)	01-0020-71	025954P	Cleaning station
Y-9204-2-B(27)	01-0020-71	025954P	Lithium remelt oven
Y-9204-2-B(28)	01-0020-71	025954P	Reduction cell
Y-9204-2-C(29)	01-1020-19	025900P	Classified
Y-9204-2-C(30)	01-1020-19	025900P	Classified
Y-9204-2-C(31)	01-1020-19	025900P	Classified
Y-9204-2-C(32)	01-1020-19	025900P	Classified
Y-9204-2-C(33)	01-1020-19	025900P	Classified
Y-9204-2-C(34)	01-1020-19	025900P	Classified
Y-9204-2-C(35)	01-1020-19	025900P	Classified
Y-9204-2-C(36)	01-1020-19	025900P	Classified
Y-9204-2-C(37)	01-1020-19	025900P	Classified
Y-9204-2-C(38)	01-1020-19	025900P	Classified
Y-9204-2-C(39)	01-1020-19	025900P	Classified
Y-9204-2-C(40)	01-1020-19	025900P	Classified
Y-9204-2-C(41)	01-1020-19	025900P	Classified
Y-9204-2-C(42)	01-1020-19	025900P	Classified
Y-9204-2-C(43)	01-1020-19	025900P	Classified
Y-9204-2-C(44)	01-1020-19	025900P	Classified
Y-9204-2-C(45)	01-1020-19	025900P	Classified
Y-9204-2-C(46)	01-1020-19	025900P	Classified
Y-9204-2-C(47)	01-1020-19	025900P	Classified
Y-9204-2-C(48)	01-1020-19	025900P	Classified
Y-9204-2-C(49)	01-1020-19	025900P	Classified
Y-9204-2-C(50)	01-1020-19	025900P	Classified
Y-9204-2-C(51)	01-1020-19	025900P	Classified
Y-9204-2-D(52)	01-1020-57	025967P	Storage tanks
Y-9204-2-D(53)	01-1020-57	025967P	Station
Y-9204-2-D(54)	01-1020-57	025967P	Salvage vats
Y-9204-2-D(55)	01-1020-57	025967P	Storage tank
Y-9204-2-D(56)	01-1020-57	025967P	Lithium chloride crystallizer
Y-9204-2-D(57)	01-1020-57	025967P	Lithium chloride crystallizer
Y-9204-2-D(58)	01-1020-57	025967P	Neutralizer

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9204-2-D(59)	01-1020-57	025967P	Three lab hoods
Y-9204-2-D(60)	01-1020-57	025967P	Process tank
Y-9204-2-D(61)	01-1020-57	025967P	Lithium chloride crystallizer
Y-9204-2-D(62)	01-1020-57	025967P	Lithium hydroxide neutralizer
Y-9204-2-D(63)	01-1020-57	025967P	HCL head tanks
Y-9204-2-D(64)	01-1020-57	025967P	Process tanks
Y-9204-2-D(65)	01-1020-57	025967P	Process tank
Y-9204-2-D(66)	01-1020-57	025967P	Neutralizer
Y-9204-2-D(67)	01-1020-57	025967P	Neutralizer
Y-9204-2-E(68)	01-1020-55	730328P	Oven
Y-9204-2-E(69)	01-1020-55	730328P	Oven
Y-9204-2-E(70)	01-1020-55	730328P	Tungsten screener
Y-9204-2-E(71)	01-1020-55	730328P	Dry box vent
Y-9204-2-E(72)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(73)	01-1020-55	730328P	Material handling
Y-9204-2-E(74)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(75)	01-1020-55	730328P	Outgassing/annealing ovens
Y-9204-2-E(76)	01-1020-55	730328P	Material handling
Y-9204-2-E(77)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(78)	01-1020-55	730328P	Reactor unloading station
Y-9204-2-E(79)	01-1020-55	730328P	Reactor unloading station
Y-9204-2-E(80)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(81)	01-1020-55	730328P	Vacuum pump
Y-9204-2-F	01-0020-32	012874P	Storage tank
Y-9204-2-F(082)	01-0020-51	025897P	Classified
Y-9204-2-F(083)	01-0020-51	025897P	Classified
Y-9204-2-F(084)	01-0020-51	025897P	Classified
Y-9204-2-F(085)	01-0020-51	025897P	Classified
Y-9204-2-F(086)	01-0020-51	025897P	Classified
Y-9204-2-F(087)	01-0020-51	025897P	Classified
Y-9204-2-G(088)	S01-1020-79	028350P	Inspection operation
Y-9204-2-G(089)	S01-1020-79	028350P	Metal working machine shop hood, B-2
Y-9204-2-G(090)	S01-1020-79	028350P	Metal working machine shop hood, B-2
Y-9204-2-H(492)	S01-1020-42	025952P	Etching vats
Y-9204-2-H(493)	S01-1020-42	025952P	Glue mixing
Y-9204-2E-A(436)	01-0020-68	730312P	Oven
Y-9204-2E-A(439)	01-0020-68	730312P	Hood exhaust
Y-9204-2E-A(441)	01-0020-68	730312P	Hood
Y-9204-2E-A(442)	01-0020-68	730312P	Hood
Y-9204-2E-A(443)	01-0020-68	730312P	Degreaser
Y-9204-2E-A(444)	01-0020-68	730312P	Electropolishers
Y-9204-2E-A(445)	01-0020-68	730312P	Surface coating
Y-9204-2E-A(448)	01-0020-68	730312P	Glove box
Y-9204-2E-B(12)	01-1020-41	025953P	X-ray testing
Y-9204-2E-B(14)	01-1020-41	025953P	Hoods
Y-9204-2E-B(15)	01-1020-41	025953P	Hoods
Y-9204-2E-C(12)	01-1020-55	730328P	Machine shop hood exhaust, B2E
Y-9204-2E-C(13)	01-1020-55	730328P	Machine shop hood exhaust, specimen shop
Y-9204-2E-[A]-(202)	01-1020-91	730938P	Positive Ion Accelerator
Y-9204-3-AJ-106	01-0020-89	018208P	Roof exhaust stack
Y-9204-4-A(02)	01-1020-56	032416P	Wash tank
Y-9204-4-A(03)	01-1020-56	032416P	Quench tanks
Y-9204-4-A(04)	01-1020-56	032416P	1,000-ton press
Y-9204-4-A(05)	01-1020-56	032416P	7,500-ton press
Y-9204-4-A(06)	01-1020-56	032416P	Exhaust from press pit area
Y-9204-4-A(07)	01-1020-56	032416P	Plasma torch cutting machine
Y-9204-4-A(08)	01-1020-56	032416P	Vacuum quench furnace
Y-9204-4-A(09)	01-1020-56	032416P	Ingot cooler
Y-9204-4-A(10)	01-1020-56	032416P	Exhaust from lathe

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9204-4-A(11)	01-1020-56	032416P	Grinding facility
Y-9204-4-A(12)	01-1020-56	032416P	Dye penetrant
Y-9204-4-A(13)	01-1020-56	032416P	Salt baths
Y-9204-4-A(14)	01-1020-56	032416P	Quench tanks
Y-9204-4-A(15)	01-1020-56	032416P	Preheat furnace exhaust
Y-9204-4-A(17)	01-1020-56	032416P	Oven exhaust
Y-9204-4-A(18)	01-1020-56	032416P	Vacuum furnace quench chamber
Y-9204-4-A(19)	01-1020-56	032416P	7,500-ton press and 1,500-ton press
Y-9204-4-B(481)	01-0020-72	730313P	Exhaust from machining operation
Y-9204-4-B(482)	01-0020-72	730313P	Exhuast from hood, reclamation area
Y-9204-4-B(484)	01-0020-72	730313P	Rolling mill, first floor assembly
Y-9204-4-B(485)	01-0020-72	730313P	Exhaust from paint hood
Y-9204-4-B(486)	01-0020-72	730313P	Filtering exhaust from paint booths
Y-9204-4-B(488)	01-0020-72	730313P	Laboratory hoods, first floor
Y-9204-4-B(489)	01-0020-72	730313P	Laboratory hoods, reclamation area
Y-9204-4-B(490)	01-0020-72	730313P	Assembly process, first floor
Y-9204-4-B(491)	01-0020-72	730313P	Assembly process, first floor
Y-9204-4-D(1)	01-1020-35	032584P	Product certification cleaning
Y-9204-4-E(01)	01-0020-33	030819P	Plating equipment
Y-9204-4-E(02)	S01-0020-33	025002P	Plating equipment
Y-9204-4-E(03)	S01-0020-33	025002P	Plating equipment
Y-9204-4-E(04)	S01-0020-33	025002P	Plating equipment
Y-9204-4-[A]-(88)	01-1020-56	032416P	Grit Blast System
Y-9206-A(01)	01-0020-48	012892P	8,500-gal storage tank, tank farm
Y-9206-A(02)	01-0020-48	012892P	12,800-gal storage tank, tank farm
Y-9206-A(03)	01-0020-48	012892P	10,000-gal storage tank, tank farm
Y-9206-C(01)	01-1020-24	730316P	Classified
Y-9206-C(02)	01-1020-24	730316P	Classified
Y-9206-E (NEW)	01-1020-24	730316P	Classified
Y-9206-[B]-(013)	01-0020-03	731689P	South stack, incinerator
Y-9206-[B]-(015)	01-0020-03	731689P	West stack
Y-9206-[B]-(016)	01-0020-03	731689P	Dissolving hood
Y-9206-[B]-(017)	01-0020-03	731689P	Steam cleaning hoods
Y-9206-[B]-(115)	01-0020-03	731689P	Reduction fluid bed
Y-9206-[B]-(135)	01-0020-03	731689P	Air emission control scrubber stack
Y-9206-[B]-(136)	01-0020-03	731689P	Air emission control consolidated stack
Y-9206-[B]-(208)	01-0020-03	731689P	Conversion fluid bed
Y-9206-[B]-(209)	01-0020-03	731689P	HF purge vent
Y-9206-[B]-(210)	01-0020-03	731689P	Chemical make-up area
Y-9206-[B]-(211)	01-0020-03	731689P	Hood 29 and 30
Y-9206-[B]-(212)	01-0020-03	731689P	Dry vacuum system
Y-9212-B(01)	01-0020-02	730301P	U metal drying and briquetting process
Y-9212-B(02)	01-0020-02	730301P	Exhaust from chip washing and drying
Y-9212-B(03)	01-0020-02	730301P	E-wing machine shop
Y-9212-B(04)	01-0020-02	730301P	U metal and U metal alloy casting
Y-9212-C(01)	01-0020-05	025984P	Drum receiving/samplng hood and glove box
Y-9212-C(02)	01-0020-05	025984P	Tube furnace/gas purge vents
Y-9212-C(03)	01-0020-05	025984P	Sampling hoods and safe bottles/Rm 1022
Y-9212-C(04)	01-0020-05	025984P	Dry hoods/Rm 1021
Y-9212-C(05)	01-0020-05	025984P	Dissolver tray hoods/Rm 1021
Y-9212-C(06)	01-0020-05	025984P	Dissolver hood
Y-9212-C(07)	01-0020-05	025984P	Dissolver trays/scrubber
Y-9212-C(08)	01-0020-05	025984P	Shear and saw hood/Rm 1021
Y-9212-C(09)	01-0020-05	025984P	Precipitation process
Y-9212-F(01)	01-1020-49	730321P	Two deburr benches, hood exhaust, A-wing
Y-9212-F(02)	01-1020-49	730321P	Two deburr benches, hood exhaust, A-wing
Y-9212-F(03)	01-1020-49	730321P	Machining, hood exhaust, A-wing
Y-9212-F(04)	01-1020-49	730321P	Machining, hood exhaust, A-wing
Y-9212-F(05)	01-1020-49	730321P	Machining, hood exhaust, A-wing

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9212-G(01)	01-1020-47	028435P	Seal-peel pot
Y-9212-[A]-(019)	01-1020-72	033581P	Filter exhaust, denitrator, fluid bed, etc.
Y-9212-[A]-(021)	01-1020-72	033581P	Centrifuges, liquid pour-up station, etc.
Y-9212-[A]-(022)	01-1020-72	033581P	Reduction salvage, crusher and hopper
Y-9212-[A]-(024)	01-1020-72	033581P	Calciner and dry vacuum system enclosure
Y-9212-[A]-(025)	01-1020-72	033581P	Denitrator area and fluid bed room enclosure
Y-9212-[A]-(027)	01-1020-72	033581P	D-wing, Rm 1010 hoods, Rms 26 and 29
Y-9212-[A]-(028)	01-1020-72	033581P	Reduction, shear, and Rm 1010, enriched uranium conversion facility
Y-9212-[A]-(033)	01-1020-72	033581P	Headhous equipment and incinerator
Y-9212-[A]-(036)	01-1020-72	033581P	East scrubber (C-1 wing) exhaust
Y-9212-[A]-(040)	01-1020-72	033581P	B-1 sampling lab hoods
Y-9212-[A]-(042)	01-1020-72	033581P	Chloride removal system/C-1 wing process exhaust
Y-9212-[A]-(050)	01-1020-72	033581P	C-1 chip burner, enclosures, load hoods
Y-9212-[A]-(111)	01-1020-72	033581P	Reduction fluid beds
Y-9212-[A]-(112)	01-1020-72	033581P	Conversion fluid beds
Y-9212-[A]-(132)	01-1020-72	033581P	Decontamination facility
Y-9212-[A]-(430)	01-1020-72	033581P	HF dock cylinder/vaporizer purge vent
Y-9212-[A]-(431)	01-1020-72	033581P	N204 cylinder purge vent
Y-9212-[A]-(432)	01-1020-72	033581P	Muffle furnaces (2) vent, Rm 29
Y-9212-[A]-(500)	01-1020-72	033581P	Primary extraction vent
Y-9212-[A]-(501)	01-1020-72	033581P	Secondary extraction vent
Y-9215-A(01)	01-0020-37	731839P	Machine shop hood exhaust, M-wing
Y-9215-B(02)	01-0020-38	012880P	Turco pretreat spray hood
Y-9215-C(02)	01-1020-52	025948P	Hydroform exhaust
Y-9215-C(03)	01-1020-52	730323P	Vapor blaster/metal cleaner
Y-9215-C(10)	01-1020-52	730323P	Nickel plating, metal working exhaust
Y-9215-C(11)	01-1020-52	730323P	Exhaust
Y-9215-C(17)	01-1020-52	730323P	Rolling mill
Y-9215-C(19)	01-1020-52	730323P	Electric annealing oven
Y-9215-D(12)	01-1020-53	025966P	Rolling mill exhaust
Y-9215-D(13)	01-1020-53	025966P	Hood exhaust
Y-9215-D(14)	01-1020-53	025966P	Exhaust from rolling mill
Y-9215-D(15)	01-1020-53	025966P	Turret lathe and shear exhaust
Y-9215-E(6)	01-1020-54	025972P	Lab hood
Y-9215-E(7)	01-1020-54	025972P	Lab hoods
Y-9215-E(8)	01-1020-54	025972P	Lab hoods
Y-9215-[B]-(1)	01-1020-51	732125P	O-wing metal working operations
Y-9215-[B]-(2)	01-1020-51	732125P	O-wing metal working operations
Y-9215-[B]-(4)	01-1020-51	732125P	O-wing metal working operations
Y-9215-[B]-(6)	01-1020-51	732125P	O-wing metal working operations
Y-9401-2-[A]-(205)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(220)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(221)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(222)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(223)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(224)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(225)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(226)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(227)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(228)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(229)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(230)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(231)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(232)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(233)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(234)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(235)	01-0020-88	730286P	Plating equipment
Y-9401-3-A	01-1020-31	029322F	Coal-fired boiler

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9401-3-B(170)	01-1020-31	029322F	Coal-fired boiler
Y-9401-3-C	01-1020-31	029322F	Coal fired boiler
Y-9401-3-D(171)	01-1020-31	029322F	Coal fired boiler
Y-9401-3-H(01) [9616-10]	01-1020-62	029280P	20,000-gal sulfuric acid storage tank
Y-9401-5-A(01)	01-0020-92	026108P	Uranium chip oxidizer
Y-9404-11-A(1)	01-1020-81	028426P	Purification plant
Y-9404-11-A(2)	01-1020-81	028426P	Purification plant
Y-9404-11-A(3)	01-1020-81	028426P	Purification plant
Y-9404-11-A(4)	01-1020-81	028426P	Purification plant
Y-9404-5-B(02)	01-0020-25	012866P	Spray room exhaust
Y-9404-5-B(03)	01-0020-25	012866P	Spray booth
Y-9404-7-FUG-[A]-(00)	01-1020-89	034295P	PCB drum storage facility
Y-9404-9-C(03)	01-0020-40	012882P	PVC curing ovens
Y-9404-9-D(04)	01-0020-40	012882P	PVC curing ovens
Y-9404-9-E(05)	01-0020-40	012882P	PVC curing ovens
Y-9616-7-A(01)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(02)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(03)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(04)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(05)	01-1020-74	033498P	West end treatment vent, reactor vessel
Y-9616-7-A(06)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(07)	01-1020-74	033498P	West end treatment vent, degasifier unit
Y-9616-7-A(08)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(09)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(10)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-A(11)	01-1020-74	033498P	West end treatment vent, lime silo
Y-9616-7-A(12)	01-1020-74	033498P	West end treatment storage tank
Y-9616-7-WST-[A]-(1)	01-1020-80	031254P	Vent from air stripper
Y-9616-7-[B]-(650)	01-1020-74	033498P	Biological treatment tanks
Y-9616-7-[B]-(651)	01-1020-74	033498P	Biological treatment tanks
Y-9616-7-[B]-(653)	01-1020-74	033498P	Biological treatment tanks
Y-9616-7-[B]-(654)	01-1020-74	033498P	Biological treatment tanks
Y-9616-7-[B]-(655)	01-1020-74	033498P	Biological treatment tanks
Y-9616-7-[B]-(655)	01-1020-74	033498P	Biological treatment tanks
Y-9616-7-[B]-(656)	01-1020-74	033498P	Solids storage tanks
Y-9616-7-[B]-(657)	01-1020-74	033498P	Solids storage tanks
Y-9616-7-[B]-(658)	01-1020-74	033498P	Solids storage tanks
Y-9616-7-[B]-(659)	01-1020-74	033498P	Solids storage tanks
Y-9616-7-[B]-(660)	01-1020-74	033498P	Solids storage tanks
Y-9616-7-[B]-(661)	01-1020-74	033498P	Solids storage tanks
Y-9616-7-[B]-(662)	01-1020-74	033498P	Solids storage tanks
Y-9620-2A	01-0020-50	012894P	Storage tank
Y-9623-A(01)	01-1020-25	025970P	Vent from reactor vessel
Y-9623-A(02)	01-1020-25	025970P	Vent from eight tanks
Y-9623-A(03)	01-1020-25	025970P	Lab hood
Y-9623-A(04)	01-1020-25	025970P	Lime silo
Y-9623-A(05)	01-1020-25	025970P	Storage tank
Y-9623-A(06)	01-1020-25	025970P	Storage tank
Y-9720-12-FUG-[A]-(00)	01-1020-89	034295P	Nonspecial nuclear material warehouse
Y-9720-19-A(01)	01-0020-41	012885P	Curing oven
Y-9720-19-C(01)	01-0020-23	012864P	Teflon sintering oven
Y-9720-19-D(03)	01-0020-27	012869P	Plastics spray booth
Y-9720-20-A(01)	01-1020-39	025971P	Small maintenance shop, fabric filter
Y-9720-25-FUG-[A]-(00)	01-1020-89	034295P	Classified waste storage facility
Y-9720-28-FUG-[A]-(00)	01-1020-89	034295P	Drum storage warehouse
Y-9720-31-FUG-[A]-(00)	01-1020-89	034295P	RCRA and mixed waste storage and staging facility
Y-9720-32-SAS-[A]-201	01-0020-42	032547P	Classified waste shredder
Y-9720-44-FUG-[A]-(00)	01-1020-89	034295P	Low-level waste storage pad
Y-9720-5-ASM-[A]-(130)	01-1020-75	031958P	Hood at 9720-5 east end

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9720-58-FUG-[A]-(00)	01-1020-89	034295P	PCB and RCRA staging and storage facility
Y-9720-6-A(1)	01-0020-26	012867P	Paint spray booth
Y-9720-6-A(2)	01-0020-26	012867P	Paint spray booth
Y-9720-6-B(01)	01-0020-75	015154P	Woodworking operation
Y-9720-6-B(03)	01-0020-26	012867P	Drying oven
Y-9720-6-E(01)	01-0020-83	016548P	Clean room laboratory
Y-9720-60-FUG-[A]-(00)	01-1020-89	034295P	DARA solids storage unit
Y-9720-9-FUG-[A]-(00)	01-1020-89	034295P	PCB and RCRA hazardous waste drum storage facility
Y-9737-A(01)	01-0020-22	012863P	Oven
Y-9738-A(01)	01-0020-14	025975P	Sandblaster
Y-9738-A(02)	01-0020-14	025975P	Hood with fan
Y-9738-A(03)	01-0020-14	025975P	Sand blaster
Y-9738-A(04)	01-0020-14	025975P	Hood with fan
Y-9738-A(05)	01-0020-14	025975P	Hood with fan
Y-9739-A(01)	01-1020-78	028105P	Printfold diazo blueprint copier/Rm 160
Y-9739-B(02)	01-1020-78	028105P	Printfold diazo blueprint copier/Rm 174
Y-9767-4-A(01)	01-0020-35	012877P	Chilled water circulating system
Y-9808-A	01-0020-77	015156P	Carpenter shop
Y-9808-A(01)	01-1020-22	026109P	Spray booth
Y-9809-A(01)	01-0020-93	025899P	Oxide storage vaults
Y-9811-1-FUG-[B]-(00)	01-1020-89	034295P	Waste oil/solvent drum storage facility(OD-8)
Y-9811-1-[A]-(1)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(2)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(3)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(4)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(5)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(6)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(7)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-6-A(1)	01-1020-82	029415P	Dry ash handling system
Y-9811-8-[A]-(01)	01-1020-63	032988P	Waste oil/solvent storage facility(OD-9)
Y-9811-8-[A]-(02)	01-1020-63	032988P	Waste oil/solvent storage facility(OD-9)
Y-9811-8-[A]-(03)	01-1020-63	032988P	Waste oil/solvent storage facility(OD-9)
Y-9811-8-[A]-(04)	01-1020-63	032988P	Waste oil/solvent storage facility(OD-9)
Y-9811-8-[A]-(05)	01-1020-63	032988P	Waste oil/solvent storage facility(OD-9)
Y-9811-B(02)	01-1020-45	025903P	Incinerator
Y-9812-[A]-(287)	01-1020-29	033051P	12,115-gal storage tank
Y-9812-[A]-(288)	01-1020-29	033051P	12,133-gal storage tank
Y-9812-[A]-(289)	01-1020-29	033051P	4,876.gal storage tank
Y-9815-A(03)	01-0020-11	025895P	Vent from reactors
Y-9815-A(04)	01-0020-11	025895P	12,000-gal storage tank
Y-9815-A(05)	01-0020-11	025895P	4,500-gal storage tank
Y-9815-A(06)	01-0020-11	025895P	4,400-gal storage tank
Y-9815-A(07)	01-0020-11	025895P	1,800-gal storage tank
Y-9815-A(08)	01-0020-11	025895P	Two 2,200-gal storage tanks
Y-9818-A(01)	01-0020-12	025965P	Hot well seal tank
Y-9818-A(02)	01-0020-12	025965P	11 storage tanks, nitric acid recovery
Y-9818-A(03)	01-0020-12	025965P	Two bioreactor tanks/ozonation tanks
Y-9818-A(04)	01-0020-12	025965P	Basement exhaust
Y-9818-A(05)	01-0020-12	025965P	Nitric acid supply line vent
Y-9818-A(06)	01-0020-12	025965P	Ozone generator/area exhaust
Y-9818-A(07)	01-0020-12	025965P	10,000-gal storage tank
Y-9818-A(08)	01-0020-12	025965P	10,000-gal denitrification feed tank
Y-9818-A(09)	01-0020-12	025965P	4,000-gal nitrate receiving tank
Y-9818-A(10)	01-0020-12	025965P	10,000-gal nitric acid waste tank
Y-9818-A(11)	01-0020-12	025965P	10,000-gal nitric acid waste tank
Y-9818-A(12)	01-0020-12	025965P	10,000-gal nitric acid waste tank
Y-9828-6-FUG-[A]-(00)	01-1020-89	034295P	Trash monitoring station
Y-9929-F(01)	M01-0020-39	012881P	Open yard coal storage
Y-9983-74-FUG-[A]-(00)	01-1020-89	034295P	Old salvage yard

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9998-A(01)	01-0020-13	025957P	Swaging machines
Y-9998-A(02)	01-0020-13	025957P	Swaging machines
Y-9998-A(03)	01-0020-13	025957P	Furnaces
Y-9998-A(04)	01-0020-13	025957P	Nitric acid pickling tanks
Y-9998-A(05)	01-0020-13	025957P	Hood
Y-9998-A(06)	01-0020-13	025957P	Foundry operations
Y-9998-B(1)	01-1020-40	026110P	Machine shop
Y-BCB-FUG-A-(00)	01-1020-89	034295P	Bear creek burial grounds
Y-BCBG-NAK	01-00020-00	010002000	Open burn for NaK
Y-CSL-II-FUG-[A]-(00)	01-1020-89	034295P	Y-12 centralized sanitary landfill II
Y-CWSF-FUG-[A]-(00)	01-1020-89	034295P	Containerized waste storage facility
Y-IDY-FUG-[A]-(00)	01-1020-89	034295P	Interim drum yard
Y-IWF-FUG-[A]-(00)	01-1020-89	034295P	Industrial waste landfill IV
	Part II. Construction permits at the Y-12 Plant		
Y-9201-1-A(01)	01-0020-15	730303P	Welding booths
Y-9201-1-A(02)	01-0020-15	730303P	Welding shop
Y-9201-1-A(04)	01-0020-15	730303P	Metal fabrication shop
Y-9201-1-A(05)	01-0020-15	730303P	Welding shop
Y-9201-1-A(15)	01-0020-15	730303P	Metal fabrication shop
Y-9201-1-B(16)	01-0020-59	730310P	Tool grinding machines
Y-9201-1-B(18)	01-0020-59	730310P	Sandblaster exhaust
Y-9201-1-C(3)	01-0020-17	730304P	Graphitic carbon machining
Y-9201-1-C(4)	01-0020-17	730304P	Graphitic carbon machining
Y-9201-1-D(09)	01-0020-59	730310P	Fabrication shop
Y-9201-1-D(10)	01-0020-59	730310P	Fabrication shop
Y-9201-1-D(11)	01-0020-59	730310P	Fabrication shop
Y-9201-1-D(13)	01-0020-59	730310P	Metal grinders and milling machines
Y-9201-5-B(01)	01-0020-21	730305P	Machining operations L5N hood exhaust
Y-9201-5-B(02)	01-0020-21	730305P	Vacuum inlets L5E machining shop
Y-9201-5-B(03)	01-0020-21	730305P	Rubber-gel potting hood exhaust
Y-9201-5-B(04)	01-0020-21	730305P	Palarite shop, machine exhaust
Y-9201-5-B(05)	01-0020-21	730305P	Tool grinding machines hood exhaust
Y-9201-5-B(06)	01-0020-21	730305P	Cleaning hood, equipment service
Y-9201-5-B(07)	01-0020-21	730305P	Electrochemical machine, stainless steel
Y-9201-5-G(01)	01-0020-44	921689P	ARC melt
Y-9201-5-G(02)	01-0020-44	921689P	DeVilbiss hood
Y-9201-5-G(03)	01-0020-44	921689P	Nitric acid dip tanks
Y-9201-5-G(04)	01-0020-44	921689P	Acid pickling tanks
Y-9201-5-G(05)	01-0020-44	921689P	Abrasive saws
Y-9201-5-G(06)	01-0020-44	921689P	Scrap metal recycle
Y-9201-5-G(07)	01-0020-44	921689P	Vapor degreaser
Y-9201-5N-[A]-(67)	01-1020-18	730314P	Machine shop exhaust
Y-9202-[A]-(162)	01-1020-94	931742P	Electrolytic deposition of uranium
Y-9203-[B]-(108)	01-1020-93	931697P	Microanalytical lab
Y-9203-[B]-(131)	01-1020-93	931697P	Microanalytical lab
Y-9203-[B]-(137)	01-1020-93	931697P	Microanalytical lab
Y-9204-2-E(68)	01-1020-55	730328P	Oven
Y-9204-2-E(69)	01-1020-55	730328P	Oven
Y-9204-2-E(70)	01-1020-55	730328P	Tungsten screener
Y-9204-2-E(71)	01-1020-55	730328P	Dry box vent
Y-9204-2-E(72)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(73)	01-1020-55	730328P	Material handling
Y-9204-2-E(74)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(75)	01-1020-55	730328P	Outgassing/annealing ovens
Y-9204-2-E(76)	01-1020-55	730328P	Material handling
Y-9204-2-E(77)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(78)	01-1020-55	730328P	Reactor unloading station

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9204-2-E(79)	01-1020-55	730328P	Reactor unloading station
Y-9204-2-E(80)	01-1020-55	730328P	Glove boxes
Y-9204-2-E(81)	01-1020-55	730328P	Vacuum pump
Y-9204-2E-A(436)	01-0020-68	730312P	Oven
Y-9204-2E-A(439)	01-0020-68	730312P	Hood exhaust
Y-9204-2E-A(441)	01-0020-68	730312P	Hood
Y-9204-2E-A(442)	01-0020-68	730312P	Hood
Y-9204-2E-A(443)	01-0020-68	730312P	Degreaser
Y-9204-2E-A(444)	01-0020-68	730312P	Elecropolishers
Y-9204-2E-A(445)	01-0020-68	730312P	Surface coating
Y-9204-2E-A(448)	01-0020-68	730312P	Glovebox
Y-9204-2E-C(12)	01-1020-55	730328P	Machine shop hood exhaust, B2E
Y-9204-2E-C(13)	01-1020-55	730328P	Machine shop hood exhaust, specimen shop
Y-9204-2E-[A]-(202)	01-1020-91	730938P	Positive ion accelerator
Y-9204-4-A(02)	01-1020-56	931629P	Wash tank
Y-9204-4-A(03)	01-1020-56	931629P	Quench tanks
Y-9204-4-A(04)	01-1020-56	931629P	1,000-ton press
Y-9204-4-A(05)	01-1020-56	931629P	7,500-ton press
Y-9204-4-A(06)	01-1020-56	931629P	Exhaust from press pit area
Y-9204-4-A(07)	01-1020-56	931629P	Plasma torch cutting machine
Y-9204-4-A(08)	01-1020-56	931629P	Vacuum quench furnace
Y-9204-4-A(09)	01-1020-56	931629P	Ingot cooler
Y-9204-4-A(10)	01-1020-56	931629P	Exhaust from lathe
Y-9204-4-A(11)	01-1020-56	931629P	Grinding facility
Y-9204-4-A(12)	01-1020-56	931629P	Dye penetrant
Y-9204-4-A(13)	01-1020-56	931629P	Salt baths
Y-9204-4-A(14)	01-1020-56	931629P	Quench tanks
Y-9204-4-A(15)	01-1020-56	931629P	Preheat furnace exhaust
Y-9204-4-A(17)	01-1020-56	931629P	Oven exhaust
Y-9204-4-A(18)	01-1020-56	931629P	Vacuum furnace quench chamber
Y-9204-4-A(19)	01-1020-56	931629P	7,500-ton press and 1,500-ton press
Y-9204-4-B(481)	01-0020-72	730313P	Exhaust from machining operation
Y-9204-4-B(482)	01-0020-72	730313P	Exhuast from hood, reclamation area
Y-9204-4-B(484)	01-0020-72	730313P	Rolling mill, first floor assembly
Y-9204-4-B(485)	01-0020-72	730313P	Exhaust from paint hood
Y-9204-4-B(486)	01-0020-72	730313P	Filtering exhaust from paint booths
Y-9204-4-B(488)	01-0020-72	730313P	Laboratory hoods, first floor
Y-9204-4-B(489)	01-0020-72	730313P	Laboratory hoods, reclamation area
Y-9204-4-B(490)	01-0020-72	730313P	Assembly process, first floor
Y-9204-4-B(491)	01-0020-72	730313P	Assembly process, first floor
Y-9204-4-[A]-(88)	01-1020-56	931629P	Grit blast system
Y-9206-C(01)	01-1020-24	730316P	Classified
Y-9206-C(02)	01-1020-24	730316P	Classified
Y-9206-E (NEW)	01-1020-24	730316P	Classified
Y-9206-[B]-(013)	01-0020-03	731689P	South stack, incinerator
Y-9206-[B]-(015)	01-0020-03	731689P	West stack
Y-9206-[B]-(016)	01-0020-03	731689P	Dissolving hood
Y-9206-[B]-(017)	01-0020-03	731689P	Steam cleaning hoods
Y-9206-[B]-(115)	01-0020-03	731689P	Reduction fluid bed
Y-9206-[B]-(135)	01-0020-03	731689P	Air emission control scrubber stack
Y-9206-[B]-(136)	01-0020-03	731689P	Air emission control consolidated stack
Y-9206-[B]-(208)	01-0020-03	731689P	Conversion fluid bed
Y-9206-[B]-(209)	01-0020-03	731689P	HF purge vent
Y-9206-[B]-(210)	01-0020-03	731689P	Chemical make-up area
Y-9206-[B]-(211)	01-0020-03	731689P	Hood 29 and 30
Y-9206-[B]-(212)	01-0020-03	731689P	Dry vacuum system
Y-9212-B(01)	01-0020-02	730301P	U metal drying and briquetting process
Y-9212-B(02)	01-0020-02	730301P	Exhaust from chip washing and drying
Y-9212-B(03)	01-0020-02	730301P	E-wing machine shop

Table 3.1 (continued)

Y-12 Plant source number	Emission source reference number	Permit number	Source
Y-9212-B(04)	01-0020-02	730301P	U metal and U metal alloy casting
Y-9212-F(01)	01-1020-49	730321P	Two deburr benches, hood exhaust, A-wing
Y-9212-F(02)	01-1020-49	730321P	Two deburr benches, hood exhaust, A-wing
Y-9212-F(03)	01-1020-49	730321P	Machining, hood exhaust, A-wing
Y-9212-F(04)	01-1020-49	730321P	Machining, hood exhaust, A-wing
Y-9212-F(05)	01-1020-49	730321P	Machining, hood exhaust, A-wing
Y-9215-A(01)	01-0020-37	731839P	Machine shop hood exhaust, M-wing
Y-9215-C(03)	01-1020-52	730323P	Vapor blaster/metal cleaner
Y-9215-C(10)	01-1020-52	730323P	Nickel plating, metal working exhaust
Y-9215-C(11)	01-1020-52	730323P	Exhaust
Y-9215-C(17)	01-1020-52	730323P	Rolling mill
Y-9215-C(19)	01-1020-52	730323P	Electric annealing oven
Y-9215-[B]-(1)	01-1020-51	732125P	O-wing metal working operations
Y-9215-[B]-(2)	01-1020-51	732125P	O-wing metal working operations
Y-9215-[B]-(4)	01-1020-51	732125P	O-wing metal working operations
Y-9215-[B]-(6)	01-1020-51	732125P	O-wing metal working operations
Y-9401-2-[A]-(205)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(220)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(221)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(222)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(223)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(224)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(225)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(226)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(227)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(228)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(229)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(230)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(231)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(232)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(233)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(234)	01-0020-88	730286P	Plating equipment
Y-9401-2-[A]-(235)	01-0020-88	730286P	Plating equipment
Y-9720-32-[A]-(435)	01-1020-99	933282I	Classified paper incinerator
Y-9811-1-[A]-(1)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(2)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(3)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(4)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(5)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(6)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)
Y-9811-1-[A]-(7)	01-1020-95	731997P	Waste oil/storage bulk storage facility(OD-7)

Table 3.2. Air permits at ORNL

ORNL source number	Emission source reference number	Permit number	Source	Permit type[a]
X-2000-09	73-0112-32	024135P	Laser with wet scrubber	O
X-2000-SV2	73-0112-75	024473P	Furnace, ovens, hoods, pumps	O
X-2018-03	73-0112-44	024117P	Dip tank and baking oven	O
X-2026-06	73-0112-77	024759P	Rad laboratory	O
X-2519-1/5	73-0112-03,33,34	030284P	5 boilers and ash system	O
X-2522-T1A	73-0112-10	024114P	No. 2 fuel oil storage tank	O
X-2525-01	73-0112-14	030835P	Degreaser (perchloroethyene)	O
X-2525-6	73-0112-95	027257P	Machine shop	O
X-2525-SV11	73-0112-49	024151P	Electroplating shop	O
X-2525-SV4	73-0112-38	031062P	Six wet and three dry grinders	O
X-2525-SV8	73-0112-62	024949P	Spray booth and oven	O
X-2547-01	73-0112-27	028439P	Spray booth	O
X-3003-SV6	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-3003-SV8	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-3012-SV1	73-0112-74	024449P	Furnace	O
X-3039-01	73-0112-93	026525P	Off gas and hot cell ventilation	O
X-3044-01	73-0112-96	029051P	Special materials machine shop	O
X-3104-SV3	73-0112-81	024511P	Carpenter shop	O
X-3500-SV12	73-0112-73	024450P	Electric belt furnace	O
X-3502-01	73-0112-05,06,07	030881P	Spray booths Nos. 1, 2, and 3	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	036052P	Cyclone and carpentry shop	O
X-3504-SV1	73-0112-80	024451P	Oven	O
X-3544-SV1	73-0112-70	730468P	PWTP	O
X-3587-SV1	73-0112-56	029830P	Printed circuit board facility	O
X-3608-01	73-0112-37	730489P	NRWTP air stripper column	O
X-4500S3-50	73-0112-31	024088P	Mercury purification system	O
X-4508-SV8	73-0112-61	732645P	Acid etching process	O
X-4508-SV9	73-0112-55	024306P	Sand blaster	O
X-5500	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-6005-00	73-0112-29	023760P	Tank, sulfur hexafluoride	O
X-6010-00	73-0112-85	025282P	ORELA	O
X-7002-05	73-0112-08	030980P	Spray booth	O
X-7003-SV1	73-0112-79	024452P	Furnace	O
X-7005-00	73-0112-45	024118P	Machining tools	O
X-7007-1/2	73-0112-09	030824P	Spray booth and cleaning booth	O
X-7007-1/2/3	73-0112-09		Spray booth and cleaning booth	A
X-7021-00	73-0112-58	024307P	Grinding shop	O
X-7025-00	73-0112-92	026070P	TTFF	O
X-7057-SV1	73-0112-76	030101P	Sand blaster	O
X-7069-T1	73-0112-60 NSPS	730836P	Gasoline storage tank	O
X-7503-00	73-0112-83	025254P	Molten salt reactor	O
X-7600-01	73-0112-20	017930P	Nuclear fuel reprocessing	O
X-7602-01	73-0112-24	027090P	Boiler, hot water	O
X-7603-01	73-0112-25	035134F	Steam boiler	O
X-7667-0	73-0112-0067-5	73-0112-0067-5	Chemical detonation facility	OB[b]
X-7822-00	73-0112-86	025340P	Solid waste shredder	O

Table 3.2 (continued)

ORNL source number	Emission source reference number	Permit number	Source	Permit type[a]
X-7830-SV1	73-0112-71	731010P	LWSP	O
X-7831-00	73-0112-84	025281P	Baler and box compactor	O
X-7911-00	73-0112-82	025249P	HFIR, TPP, AND TURF	O
X-7934-SV2	73-0112-53	024912P	Silver recovery system	O
X-7935-SV1	73-0112-78	027393P	Equipment cleaning facility	O
X-FE	73-0112-97	029660P	Fugitive emission source	O
X-FLC	73-0112-99	034960P	Fluorescent lamp disposers	O

[a]O = operating permit; A = application
[b]OB = open burning.

Table 3.3. Air permits at the K-25 Site

K-25 source number	Emission source reference number	Permit number	Source	Permit type[a]
K1004L	73-0106-35	012503P	Main Vent of Development Facility	O
K1004LOVEN	73-0106-95	024299P	Sintering Oven	O
K1004TCENTBHOOD	73-1106-04	024756P	Hood for fumes from mixing resins	O
K1004THOOD	73-1106-04	024498P	Hood for fumes from mixing resins	O
K1004THOODMETH	73-1106-15	025493P	Ultrasonic Cleaner Using Methylene Chlor	O
K1004TSOUTHOVEN	73-1106-01	024304P	Fiber and Polymer Composites Curing Oven	O
K1004TWESTNOVEN	73-0106-96	024301P	Fiber and Polymer Composites Curing Oven	O
K1004TWIND1	73-1106-28	029901P	Fiber Winding Spools With Epoxy Dip	O
K1004TWIND2	73-1106-28	029901P	Fiber Winding Spools With Epoxy Dip	O
K1004TWIND3	73-1106-28	029901P	Fiber Winding Spools With Epoxy Dip	O
K1004TWIND4	73-1106-28	029901P	Fiber Winding Spools With Epoxy Dip	O
K1024FT1	73-0106-18	025655P	Filter Test Facility	O
K1037AVLISEXLAB	73-0106-68	031404P	Electron Beam One (EB-1)	O
K1037AVLISEXLAB	73-0106-68	031404P	Vacuum System Vents	O
K1037AVLISEXLAB	73-0106-68	031404P	Materials Test Unit (MTU)	O
K1037AVLISEXLAB	73-0106-68	031404P	Materials Handling Development Module	O
K1037AVLISFURN	73-0106-81	034647P	Huppert Furnace	O
K1037AVLISGOVEN	73-0106-80	023118P	Grieve Oven TB-500 Electric	O
K1037AVLISLAB	73-1106-35	932953P	AVLIS Lab	PTC
K1037AVLISLCDEV	73-0106-69	029897P	Expansion Lab C Spray Coating	O
K1037AVLISLGB	73-0106-77	032345P	Grit Blast Facility with Baghouse	O
K1037AVLISOOVEN	73-0106-73	029900P	Electric Oxidation Oven	O
K1037AVLISPRODCON	73-1106-36	933170P	Products Conversion Demonstration	PTC
K1037AVLISQOVEN	73-0106-79	023120P	Quincy Oven	O
K1037AVLISSSB	73-0106-85	023663P	Small Sand Blaster	O
K1037MLBH	73-0106-84	023662P	Mechanical Lab	O
K1047HF210LIME	73-1106-18	025443P	CNF Lime Storage Silo	O
K1095PS1234	73-0106-14	734461P	Paint Spray Operation	O
K1098FSB1	73-0106-13	034231P	Sand Blast Facility with Baghouse	O
K1131MS	73-0106-29	015099P	Fluorine Plant	O
K1200A123	73-0106-56	019608P	Purge Evacuation, Feed and Withdrawal	O
K1200CENTERBAY	73-0106-87	732346P	Mixing, Coating, and Winding Operations	O
K1200CPL	73-0106-54	017055P	Ultrasonic cleaner, solvent degreaser	O
K1200CPL1	73-0106-58	017051P	Ultrasonic cleaner, solvent degreaser	O
K1200CVTF	73-0106-62	017339P	Centrifuge Verification Test Facility	O
K1200FAE1	73-0106-86	029192P	Isotope Separating Process	O
K1200NBAYOVEN	73-0106-92	024272P	North Bay Curing Oven	O
K1200SITF	73-0106-61	017338P	System Interface Test Facility	O
K1202ST1	73-1106-20	033203P	Waste Storage Tank	O
K1202ST2	73-1106-41	034392P	Waste Storage Tank	O
K1220B	73-0106-48	015101P	Machine Repair Stands	O
K1231AP216	73-0106-53	015704P	HF Transfer Line Vent Scrubber	O
K1232LSS	73-1106-26	024456P	Lime Storage Silo	O
K12331	73-0106-51	015702P	Classified Material Process	O
K1401 121659	73-0106-09	016306P	1,1,1 Trichloroethane Degreaser	O
K1401 275029PL	73-0106-38	012506P	Plastic Shop Curing Oven	O
K1401CARPENTERSHOP	73-1106-40	032930P	Wood and acrylic working operations	O
K1401COMPOSMACH	73-0106-88	025514P	Composite Machining Process	O
K1401FOAMPACK	73-1106-12	025490P	Exhaust Hood From Foam Packing Operation	O
K1401HCLE	73-0106-28	024500P	Hydrochloric Acid Tank	O
K1401JIGANDFIXT	73-0106-71	029898P	Vacuum Exhaust for Parts Fabrication	O

Table 3.3 (continued)

K-25 source number	Emission source reference number	Permit number	Source	Permit type[a]
K1401LHGLOVB123	73-1106-03	026679P	Testing and Machining of LIH Parts	O
K1401MACHINESHOP	73-1106-09	025585P	Vent From Machine Shop Exhaust System	O
K1401MB01	73-0106-45	017336P	Reclaiming Service Oven	O
K1401MSMC1	73-0106-32	017337P	Motor Curing Oven	O
K1401MSMC3	73-0106-66	018526P	Electric Bake Oven in Motor Shop	O
K1401OOOOVENNE2	73-0106-89	028424P	Electric Oven for Metal Parts	O
K1401PLS1,4,6	73-0106-72	029899P	Curing Ovens 1,4,6 for Plastic Parts	O
K1401SLOPE	73-1106-29	026164P	Slope Testing Stand	O
K1401T104	73-1106-32	025658P	T-104 Acid Cleaning Tank	O
K1401TRICH	73-1106-10	024947P	1,1,1-Trichloroethane Storage Tank	O
K1407ALIME	73-1106-25	024455P	Lime Storage Silo	O
K1413MS	73-0106-52	015703P	Development Facility Vent with Scrubber	O
K1413PROPANELBD	73-0106-28	024500P	Propane Storage Tank	O
K1414RG	73-0106-28	016312P	Gasoline Storage Tank	O
K1414UG	73-0106-28	024500P	Methanol, unleaded gasoline storage tank	O
K1414UNLGAS	73-1106-39	035063P	Unleaded Gasoline Storage Tank	O
K1419-20	73-0106-83	025250P	Floor Pan and Cylinder Cleaning Process	O
K1420 237306VAPO	73-0106-49	023797P	Detrex Vapor Degreaser Perchloroethylene	O
K1420A	73-0106-55	017846P	Area Ventilation for A Area Plating	O
K1420A1	73-0106-82	034619P	Flammable Materials Storage Tank	O
K1420DISASSEMBL	73-0106-74	032344P	Disassembly Stand for Dismantling Parts	O
K1420PHILLIPSVA	73-0106-70	023798P	Phillips Vapor Degreaser	O
K1420WODF	73-0106-67	018527P	Waste Oil Centrifuge Extraction Facility	O
K1425WOS A	73-0106-11	029895P	Waste Oil and Solvent Storage Tanks	O
K1425WOS B	73-0106-11	029895P	Waste Oil and Solvent Storage Tanks	O
K1425WOS C	73-0106-11	029895P	Waste Oil and Solvent Storage Tanks	O
K1425WOS D	73-0106-11	029895P	Waste Oil and Solvent Storage Tanks	O
K1435CTANKFARM	73-0106-75	024105P	Tank Farm for Hazardous Liquid Wastes	O
K1435TSCAINCIN	73-0106-78	032449I	TSCA Incinerator	O
K1501BOILER4	73-0106-04	029902F	Natural Gas Boiler	O
K1501BOILER7	73-0106-07	029902F	Gas/Oil Boiler	O
K1501BOILER8	73-0106-12	933069F	Gas/Oil Boiler	PTC
K1501BOILER9	73-0106-12	933069F	Gas/Oil Boiler	PTC
K1501SULFACID	73-0106-28	024500P	Sulfuric Acid Storage Tank	O
K1515SALUMTANK	73-0106-28	024500P	South Alum Tank	O
K151NALUMTANK	73-0106-28	024500P	North Alum Tank	O
K1600TTFL	73-0106-59	017053P	Development Lab	O
K1652FECS	73-1106-42	733774P	Fire extinquisher charging station	O
K25A-E	73-0106-33	012478P	Drying Tracks	O
K25BULBCRUSHER	73-1106-43	934193	Flourescent Lamp Disposers	PTC
K25VAO	73-0106-15	012488P	Vacuum Systems	O
K291	73-0106-63	015097P	Wet Air Evacuation System	O
K4028 16990COOL	73-0106-28	024500P	Coolant Tank	O
K4029 16989COOL	73-0106-28	024500P	Coolant Tank	O
K4029PC	73-0106-42	012660P	Gaseous Diffusion Purge Cascade	O
K5022 327298	73-0106-28	024500P	Freon Storage Tank	O
K5022 327300	73-0106-28	024500P	Freon Storage Tank	O
K6021 2543LO	73-0106-23	016310P	Lube Oil Tank	O
K6022 2540LO	73-0106-23	016310P	Lube Oil Tank	O
K6022 325172	73-0106-28	024500P	Freon Storage Tank	O
K6023 2542LO	73-0106-23	016310P	Lube Oil Tank	O

Table 3.3 (continued)

K-25 source number	Emission source reference number	Permit number	Source	Permit type[a]
K6024 2541LO	73-0106-23	016310P	Lube Oil Tank	O
K6024 325285	73-0106-28	024500P	Freon Storage Tank	O
K6025 2545LO	73-0106-23	016310P	Lube Oil Tank	O
K6026 2544LO	73-0106-23	016310P	Lube Oil Tank	O
K602WAP	73-0106-93	024297P	Evacuation Wet Air Pumps or Air Jets	O
K704 316MO	73-0106-24	034218P	Mineral Oil Tank	O
K732 2140MO	73-0106-24	034218P	Mineral Oil Tank	O
K762 2427MO	73-0106-24	034218P	Mineral Oil Tank	O
K762 2428MO	73-0106-24	034218P	Mineral Oil Tank	O
K792 2423MO	73-0106-24	034218P	Mineral Oil Tank	O
K792 2431MO	73-0106-24	034218P	Mineral Oil Tank	O
K832CHROM	73-1106-10	024947P	Chromate Storage Tank	O
K892CHROM	73-1106-10	024947P	Chromate Storage Tank	O
K892LIMESILO	73-1106-08	025120P	Lime Silo	O
K892NSAT	73-0106-28	024500P	North Sulfuric Acid Tank	O
K893SSAT	73-0106-28	024500P	South Sulfuric Acid Tank	O
K894SULFACID	73-0106-28	024500P	Sulfuric Acid Storage Tank	O
K896SODASILO	73-1106-24	024758P	Soda Silo	O
K9021 2310LO	73-0106-23	016310P	Lube Oil Tank	O
K9021 2318LO	73-0106-23	016310P	Lube Oil Tank	O
K9022 2311LO	73-0106-23	016310P	Lube Oil Tank	O
K9022 2319LO	73-0106-23	016310P	Lube Oil Tank	O
K9022 2320LO	73-0106-23	016310P	Lube Oil Tank	O
K9022 2321LO	73-0106-23	016310P	Lube Oil Tank	O
K9023 2312LO	73-0106-23	016310P	Lube Oil Tank	O
K9023 2322LO	73-0106-23	016310P	Lube Oil Tank	O
K9023 2323LO	73-0106-23	016310P	Lube Oil Tank	O
K9023 324383	73-0106-28	024500P	Freon Storage Tank	O
K9023 324469FREON	73-0106-28	024500P	Freon R-114 Storage Tank	O
K9023 324470FREON	73-0106-28	024500P	Freon R-114 Storage Tank	O
K9024 2313LO	73-0106-23	016310P	Lube Oil Tank	O
K9024 2324LO	73-0106-23	016310P	Lube Oil Tank	O
K9024 2325LO	73-0106-23	016310P	Lube Oil Tank	O
K9025 2314LO	73-0106-23	016310P	Lube Oil Tank	O
K9025 2378LO	73-0106-23	016310P	Lube Oil Tank	O
K9025 2379LO	73-0106-23	016310P	Lube Oil Tank	O
K9025PCB1	73-1106-10	024947P	PCB Oil Storage Tank	O
K9025PCB2	73-1106-10	024947P	PCB Oil Storage Tank	O
K9025PCB3	73-1106-10	024947P	PCB Oil Storage Tank	O
K9025PCB4	73-1106-10	024947P	PCB Oil Storage Tank	O
K9026 2315LO	73-0106-23	016310P	Lube Oil Tank	O
K9026 2380LO	73-0106-23	016310P	Lube Oil Tank	O
K9026 2381LO	73-0106-23	016310P	Lube Oil Tank	O
K9026PCB1	73-1106-10	024947P	PCB Oil Storage Tank	O
K9026PCB2	73-1106-10	024947P	PCB Oil Storage Tank	O
K9026PCB3	73-1106-10	024947P	PCB Oil Storage Tank	O
K9027 2316LO	73-0106-23	016310P	Lube Oil Tank	O
K9027 2382LO	73-0106-23	016310P	Lube Oil Tank	O
K9027 2383LO	73-0106-23	016310P	Lube Oil Tank	O
K9028 2317LO	73-0106-23	016310P	Lube Oil Tank	O
K9028 2384LO	73-0106-23	016310P	Lube Oil Tank	O

Table 3.3 (continued)

K-25 source number	Emission source reference number	Permit number	Source	Permit type[a]
K9028 2385LO	73-0106-23	016310P	Lube Oil Tank	O
K9028PCB	73-1106-10	024947P	PCB Oil Storage Tank	O
K902JET	73-0106-93	024298P	Exhaust Jet	O
K902WAP	73-0106-93	024298P	Evacuation Wet Air Pumps	O
K-25-B-1	73-0106-19	016309P	Heat Exchange Medium Freon for Plant	O
K-732 2135MO	73-0106-24	034218P	Mineral Oil Tank	O

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

Table 3.4. 1992 gross alpha and beta in ambient air at the Y-12 Plant

Station Number	Concentration (10^{-15} µCi/cm^3)			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		Gross alpha		
1	0.271±0.036	0.165±0.124	–0.026±-0.112	0.324±0.130
2	0.513±0.056	–0.289±-0.124	0.051±0.112	0.230±0.110
3	0.416±0.047	0.423±0.149	0.149±0.130	0.285±0.124
4	0.475±0.052	–0.307±-0.266	–0.730±–0.304	0.521æ0.311
5	0.569±0.052	0.756±0.150	0.053±0.117	0.705±0.143
6	0.275±0.047	0.262±0.215	0.020±0.169	0.454±0.144
7	0.234±0.036	0.211±0.148	0.032±0.138	0.109±0.124
8	0.352±0.043	0.033±0.138	–0.114±-0.153	0.481±0.131
9	0.492±0.049	0.115±0.126	0.068±0.121	0.137±0.122
10	0.448±0.048	–0.092±-0.123	0.118±0.133	0.408±0.126
11	0.231±0.033	0.234±0.128	0.134±0.123	0.125±0.112
12	0.463±0.047	0.212±0.130	0.068±0.121	0.112±0.112
		Gross beta		
1	4.078±0.140	3.357±0.248	5.193±0.264	6.280±0.299
2	6.382±0.198	0.137±0.229	5.014±0.255	6.537±0.275
3	6.351±0.183	5.379±0.301	6.259±0.296	6.448±0.295
4	4.730±0.163	2.241±0.502	4.105±0.605	5.328±0.577
5	4.972±0.154	4.191±0.256	4.999±0.262	6.350±0.288
6	2.270±0.135	2.422±0.368	4.244±0.335	7.174±0.326
7	4.412±0.156	3.566±0.286	5.092±0.299	5.994±0.306
8	4.363±0.152	3.347±0.283	4.246±0.326	6.227±0.285
9	5.207±0.161	4.240±0.271	5.285±0.271	7.242±0.320
10	5.429±0.168	4.250±0.286	5.666±0.292	6.581±0.288
11	4.797±0.151	3.784±0.256	5.488±0.272	6.750±0.295
12	5.356±0.160	4.312±0.270	5.243±0.271	6.725±0.296

Table 3.5. 1992 ^{234}U, ^{235}U, ^{236}U, and ^{238}U in ambient air at the Y-12 Plant

Station number	Concentration (10^{-15} µCi/cm^3)			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		^{234}U		
1	0.0472±0.0055	0.0748±0.0271	0.0316±0.00	0.0464±0.0087
2	0.1235±0.0121	0.0199±0.0160	0.0942±0.01	0.0700±0.0128
3	0.2835±0.0216	0.4482±0.1003	0.2617±0.02	0.1683±0.0285
4	0.3203±0.0254	0.2615±0.0901	0.1950±0.02	0.2122±0.0394
5	0.3627±0.0255	1.6897±0.3036	0.3514±0.03	0.1816±0.0315
6	0.0837±0.0100	0.0813±0.0366	0.1011±0.01	0.1440±0.0247
7	0.1309±0.0122	0.2160±0.0610	0.1572±0.01	0.1283±0.0022
8	0.0920±0.0088	0.4340±0.0713	0.0716±0.01	0.0655±0.0122
9	0.0801±0.0086	0.1398±0.0416	0.0642±0.01	0.0575±0.0117
10	0.0548±0.0064	0.0730±0.0297	0.0327±0.00	0.0364±0.0077
11	0.0439±0.0055	0.1019±0.0325	0.0349±0.00	0.0268±0.0060
12	0.0827±0.0087	0.0763±0.0303	0.0446±0.01	0.0476±0.0092
		^{235}U		
1	0.0021±0.0011	0.0019±0.0052	0.0017±0.00	0.0016±0.0011
2	0.0041±0.0018	*a*	0.0050±0.00	0.0030±0.0016
3	0.0130±0.0030	0.0095±0.0110	0.0118±0.00	0.0088±0.0031
4	0.0113±0.0030	0.0073±0.0147	0.0120±0.00	0.0120±0.0058
5	0.0148±0.0029	0.0464±0.0238	0.0113±0.00	0.0063±0.0026
6	0.0030±0.0018	0.0044±0.0088	0.0038±0.00	0.0049±0.0023
7	0.0075±0.0023	0.0139±0.0141	0.0074±0.00	0.0043±0.0022
8	0.0046±0.0017	0.0679±0.0305	0.0026±0.00	0.0028±0.0016
9	0.0037±0.0016	*a*	0.0018±0.00	0.0025±0.0018
10	0.0029±0.0014	0.0030±0.0063	0.0015±0.00	0.0022±0.0014
11	0.0018±0.0011	0.0025±0.0049	0.0018±0.00	0.0033±0.0018
12	0.0035±0.0015	*a*	0.0019±0.00	0.0033±0.0018
		^{236}U		
1	0.0009±0.0006	*a*	0.0012±0.00	0.0005±0.0006
2	0.0016±0.0010	*a*	0.0040±0.00	0.0008±0.0007
3	0.0052±0.0017	*a*	0.0066±0.00	0.0020±0.0013
4	0.0029±0.0013	*a*	0.0037±0.00	0.0036±0.0029
5	0.0072±0.0018	0.0066±0.0077	0.0067±0.00	0.0032±0.0017
6	0.0023±0.0014	0.0036±0.0072	0.0023±0.00	0.0016±0.0011
7	0.0026±0.0013	0.0028±0.0056	0.0019±0.00	0.0025±0.0014
8	0.0019±0.0010	0.0110±0.0110	0.0025±0.00	0.0017±0.0011
9	0.0018±0.0010	*a*	0.0007±0.00	0.0006±0.0008
10	0.0012±0.0008	*a*	0.0002±0.00	0.0004±0.0007
11	0.0010±0.0007	*a*	0.0008±0.00	0.0003±0.0005
12	0.0018±0.0011	0.0025±0.0049	0.0008±0.00	0.0011±0.0009

Table 3.5 (continued)

Station number	Concentration (10^{-15} µCi/cm^3)			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
		^{238}U		
1	0.0095±0.0022	0.0081±0.0082	0.0054±0.00	0.0080±0.0026
2	0.0170±0.0035	0.0081±0.0104	0.0095±0.00	0.0139±0.0037
3	0.0185±0.0033	0.0280±0.0175	0.0172±0.00	0.0847±0.0153
4	0.0190±0.0036	0.0119±0.0169	0.0171±0.01	0.1116±0.0231
5	0.0200±0.0032	0.0221±0.0144	0.0149±0.00	0.0097±0.0031
6	0.0119±0.0027	0.0107±0.0125	0.0101±0.00	0.0091±0.0030
7	0.0198±0.0036	0.0169±0.0140	0.0165±0.00	0.0102±0.0032
8	0.0288±0.0041	0.0456±0.0223	0.0197±0.00	0.0085±0.0028
9	0.0210±0.0037	0.0288±0.0166	0.0149±0.00	0.0102±0.0034
10	0.0160±0.0031	0.0202±0.0146	0.0097±0.00	0.0070±0.0026
11	0.0129±0.0027	0.0118±0.0010	0.0081±0.00	0.0053±0.0021
12	0.0158±0.0031	0.0074±0.0086	0.0107±0.00	0.0063±0.0022

[a]No data available.

Table 3.6. 1992 monthly fluoride averages in ambient air at the Y-12 Plant[a]

Station	Average concentrations ($\mu g/m^3$)					
	Jan	Feb	Mar	Apr	May	Jun
1	<0.0077	<0.0076	<0.0075	<0.0088	<0.0072	<0.0078
2	<0.0097	<0.0082	<0.0107	*b*	*b*	*b*
3	<0.0088	<0.0081	<0.0078	<0.0072	<0.0070	<0.0070
4	<0.0103	<0.0088	<0.0110	<0.0070	<0.0070	<0.0070
5	<0.0779	<0.1285	<0.1402	<0.1402	<0.1402	<0.1402
6	<0.0089	<0.0125	<0.0110	<0.0127	<0.0124	<0.0070
7	<0.0091	<0.0081	<0.0068	<0.0064	<0.0070	<0.0070
8	<0.0077	<0.0079	<0.0074	<0.0072	<0.0073	<0.0073
9	<0.0085	<0.0078	<0.0073	<0.0070	<0.0070	<0.0076
10	<0.0077	<0.0070	<0.0065	<0.0069	<0.0073	<0.0070
11	<0.0075	<0.0074	<0.0073	<0.0075	<0.0070	<0.0068
	Jul	Aug	Sept	Oct	Nov	Dec
1	<0.0086	<0.0095	<0.0094	<0.0104	<0.0091	<0.0101
2	<0.0072	<0.0095	<0.0095	<0.0100	<0.0122	<0.0095
3	<0.0079	<0.0086	<0.0138	<0.0076	<0.0092	<0.0081
4	<0.0082	<0.0087	<0.0101	<0.0079	<0.0151	<0.0109
5	<0.1542	<0.2103	<0.1402	*b*	<0.0060	<0.0064
6	<0.0071	<0.0080	<0.0090	<0.0079	<0.0081	<0.0071
7	<0.0076	<0.0075	<0.0094	<0.0082	<0.0097	<0.0081
8	<0.0091	<0.0088	<0.0099	<0.0117	<0.0079	<0.0077
9	<0.0082	<0.0090	<0.0103	<0.0077	<0.0075	<0.0073
10	<0.0076	<0.0078	<0.0099	<0.0077	<0.0076	<0.0073
11	<0.0081	<0.0092	<0.0083	<0.0078	<0.0078	<0.0075

[a]Tennessee standard for 30-d average = 1.2 $\mu g/m^3$.
[b]Invalid sample or no sample (downtime).

Table 3.7. 1992 total suspended particulates in air at the Y-12 Plant

Sample date	Concentration[a] ($\mu g/m^3$)		Sample date	Concentration[a] ($\mu g/m^3$)	
	East	West		East	West
Jan	*b*	*b*			
Feb	*b*	*b*			
March	*b*	*b*			
April	*b*	*b*			
05/01/92	49.36	36.14	09/04/92	20.28	19.03
05/07/92	15.98	24.10	09/10/92	31.88	43.79
05/13/92	34.53	28.09	09/16/92	41.36	*b*
05/19/92	20.61	46.43	09/22/92	16.59	20.58
05/25/92	18.20	13.45	09/28/92	26.34	20.26
05/31/92	35.39	27.06	10/04/82	10.84	*b*
06/06/92	46.22	73.02	10/10/92	18.88	*b*
06/12/92	28.14	15.24	10/16/92	30.23	*b*
06/18/92	44.18	33.55	10/22/92	50.16	*b*
06/24/92	51.73	41.31	10/28/92	34.41	*b*
06/30/92	29.57	31.33	11/03/92	18.26	19.83
07/06/92	15.08	14.24	11/09/92	31.03	*b*
07/12/92	*b*	32.39	11/15/92	12.69	8.68
07/18/92	*b*	3.15	11/21/92	8.83	7.57
07/24/92	*b*	21.95	11/27/92	11.49	9.78
07/30/92	36.15	27.42	12/03/92	21.74	11.93
08/05/92	30.75	59.41	12/09/92	30.65	19.94
08/11/92	40.20	24.31	12/15/92	30.79	16.99
08/17/92	38.50	37.60	12/21/92	11.37	10.94
08/23/92	28.60	21.71	12/27/92	12.89	10.43
08/29/92	16.42	16.44			

[a]Previous Tennessee primary air quality standard = 260 $\mu g/(m^3/24\ h)$. Previous Tennessee secondary air quality standard = 150 $\mu g/(m^3/24\ h)$. TSP is no longer regulated.

[b]Invalid sample or no sample (downtime)

Table 3.8. 1992 PM 10 concentrations in air at the Y-12 Plant

Sample Date	Concentration[a] (μg/m³)			Sample Date	Concentration[a] (μg/m³)		
	West	East	East collocated		West	East	East collocated
Jan	*b*	*b*	*b*				
Feb	*b*	*b*	*b*				
March	*b*	*b*	*b*				
April	*b*	*b*	*b*				
5/1/92	16.26	26.80	23.38	9/4/92	9.17	10.81	*b*
5/7/92	11.50	11.05	10.18	9/10/92	17.45	18.00	*b*
5/13/92	19.42	19.65	20.56	9/16/92	*b*	*b*	*b*
5/19/92	23.47	24.07	28.48	9/22/92	12.03	9.47	*b*
5/25/92	10.76	12.40	11.82	9/28/92	11.38	11.49	*b*
5/31/92	28.36	19.91	20.02	10/4/92	9.18	8.60	*b*
6/6/92	*b*	*b*	*b*	10/10/92	8.43	8.60	*b*
6/12/92	*b*	*b*	*b*	10/16/92	*b*	20.96	*b*
6/18/92	*b*	*b*	*b*	10/22/92	*b*	24.69	*b*
6/24/92	*b*	*b*	*b*	10/28/92	27.76	27.81	*b*
6/30/92	*b*	*b*	*b*	11/3/92	8.74	7.60	2.28
7/6/92	*b*	*b*	*b*	11/9/92	13.47	18.38	*b*
7/12/92	*b*	*b*	*b*	11/15/92	3.29	4.26	*b*
7/18/92	*b*	*b*	*b*	11/21/92	1.44	1.59	*b*
7/24/92	*b*	*b*	*b*	11/27/92	3.87	4.51	0.17
7/30/92	*b*	*b*	*b*	12/3/92	5.38	7.56	3.19
8/5/92	*b*	*b*	*b*	12/9/92	13.67	14.63	5.05
8/11/92	19.95	22.35	*b*	12/15/92	9.08	16.48	6.98
8/17/92	29.14	28.69	*b*	12/21/92	2.35	3.73	*b*
8/23/92	21.46	19.82	*b*	12/27/92	7.94	9.78	*b*
8/29/92	12.12	10.12	*b*				

[a]Tennessee primary air quality standard = 260 μg/m³/24 h. Tennessee secondary air quality standard = 150 μg/m3/24 h.
[b]Invalid sample or no sample (downtime). Calibration instrument in shop for repairs 6/6/92 thru 8/5/92.

Table 3.9. Atmospheric adsorbable gas concentrations at ORNL air monitoring stations during 1992

Station[a]	Number detected/ number of samples	Concentration of detected values (10^{-15} μCi/mL)				
		Max	Min	Mean[b]	Standard error of mean	Percent of DCG[c]
			^{131}I			
1	0/25	*d*	*d*	*d*	*d*	*d*
2	0/25	*d*	*d*	*d*	*d*	*d*
3	0/23	*d*	*d*	*d*	*d*	*d*
7	1/24	5.5	5.5	5.5	*d*	*d*
			^{133}I			
1	2/25	6.9	5.1	6.0*	0.91	<0.01
2	2/25	9.0	8.1	8.6*	0.47	<0.01
3	3/23	25	4.7	11	6.6	*d*
7	2/24	5.8	5.0	5.4*	0.43	<0.01
			^{135}I			
1	2/25	71	28	50	21	*d*
2	1/25	69	69	69	*d*	*d*
3	1/23	35	35	35	*d*	*d*
7	1/24	45	45	45	*d*	*d*
			^{212}Pb			
1	1/25	150	150	150	*d*	*d*
2	0/25	*d*	*d*	*d*	*d*	*d*
3	0/23	*d*	*d*	*d*	*d*	*d*
7	2/24	24	22	23*	0.77	0.029

[a]Locations of ORNL perimeter stations are shown in Figs. 3.17 and 3.18, Vol. 1.

[b]Means marked with an asterisk (*) are statistically determined to be significantly different from zero.

[c]Percent of DCG = Mean/DCG × 100. The derived concentration guide (DCG) for ^{131}I is $400{,}000 \times 10^{-15}$ μCi/mL; for ^{133}I is 2×10^{-9} μCi/mL; for ^{135}I is 1×10^{-8} μCi/mL; and for ^{212}Pb is 8×10^{-11} μCi/mL.

[d]Not applicable.

Table 3.10. Tritium concentration in ambient air on the ORR during 1992

Station[a]	Number detected/ number of samples	Concentration of detected values (10^{-6} pCi/mL)				
		Max	Min	Mean[b]	Standard error of mean	Percent of DCG[c]
3	13/13	64	4.5	19*	4.9	0.019
37	3/3	85	10	38	24	*d*
38	3/3	27	13	18*	4.7	0.018
39	3/3	650	49	280	190	*d*
40	2/3	13	2.4	7.7	5.4	*d*
42	3/3	50	18	30*	9.9	0.030
46	3/3	50	3.1	22	14	*d*
48	10/13	52	2.9	22*	5.1	0.022
51	2/3	9.1	4.4	6.7	2.3	*d*
52	2/3	190	5.4	100	95	*d*
Summary	44/50	650	2.4	42*	15	0.042

[a]Station locations are shown in Figs. 3.17, 3.18, and 3.19, Vol. 1.

[b]Means marked with an asterisk (*) are statistically determined to be significantly different from zero.

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

[d]Not applicable.

Table 3.11. 1992 continuous ambient air monitoring data at ORNL[a]

Analysis	Significant concentrations (10^{-15} µCi/mL)					
	Station 1	Percentage DCG[b]	Station 2	Percentage DCG[b]	Station 3	Percentage DCG[b]
^{244}Cm	c	c	0.021	0.052	c	c
^{60}Co	c	c	c	c	c	c
^{137}Cs	c	c	c	c	0.09	<0.01
^{238}Pu	c	c	c	c	c	c
^{239}Pu	c	c	c	c	0.0028	0.014
^{228}Th	0.041	0.10	0.038	0.095	0.011	0.028
^{230}Th	0.053	0.13	0.036	0.090	0.043	0.11
^{232}Th	0.043	0.61	0.019	0.26	0.024	0.35
Total Sr	c	c	c	c	c	c
^{234}U	0.027	0.030	0.022	0.024	0.04	0.045
^{235}U	0.006	0.0060	c	c	0.0048	0.005
^{238}U	0.016	0.016	0.015	0.015	0.02	0.02

Analysis	Station 7	Percentage DCG[b]
^{244}Cm	0.03	0.076
^{60}Co	c	c
^{137}Cs	0.029	<0.01
^{238}Pu	c	c
^{239}Pu	c	c
^{228}Th	0.028	0.070
^{230}Th	0.038	0.094
^{232}Th	0.023	0.33
Total Sr	0.070	<0.01
^{234}U	0.044	0.049
^{235}U	c	c
^{238}U	0.021	0.021

[a]See Fig. 3.17 in Vol. 1 for monitoring locations.

[b]Percentage of DCG = average/derived concentration guide (DCG) × 100. The DCG for ^{244}Cm is 4×10^{-14} µCi/mL; ^{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} µC/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} µCi/mL. Source for DCG is DOE Order 5400.5, "Radiation Protection of the Public and the Environment," Chap. III.

[c]Not detected.

Table 3.12. 1992 continuous ambient air monitoring data at the ORR[a]

Analysis	Significant concentrations (10^{-15} µCi/mL)					
	Station 35	Percentage DCG[b]	Station 37	Percentage DCG[b]	Station 38	Percentage DCG[b]
^{244}Cm	0.05	0.13	*c*	*c*	*c*	*c*
^{60}Co	0.15	<0.01	*c*	*c*	*c*	*c*
^{137}Cs	*c*	*c*	*c*	*c*	*c*	*c*
^{238}Pu	*c*	*c*	*c*	*c*	*c*	*c*
^{239}Pu	*c*	*c*	*c*	*c*	*c*	*c*
^{228}Th	*c*	*c*	0.0079	0.020	0.0075	0.019
^{230}Th	0.019	0.049	0.012	0.030	0.023	0.056
^{232}Th	0.0083	0.12	0.0066	0.094	0.0071	0.10
Total Sr	*c*	*c*	*c*	*c*	*c*	*c*
^{234}U	0.036	0.040	0.0050	0.0060	0.023	0.025
^{235}U	*c*	*c*	0.0086	0.0090	*c*	*c*
^{238}U	0.0094	0.0090	0.021	0.021	0.0098	0.010
Analysis	Station 39	Percentage DCG[b]	Station 40	Percentage DCG[b]	Station 42	Percentage DCG[b]
^{244}Cm	*c*	*c*	*c*	*c*	*c*	*c*
^{60}Co	0.096	<0.01	*c*	*c*	*c*	*c*
^{137}Cs	*c*	*c*	*c*	*c*	*c*	*c*
^{238}Pu	*c*	*c*	*c*	*c*	*c*	*c*
^{239}Pu	*c*	*c*	*c*	*c*	*c*	*c*
^{228}Th	0.016	0.041	0.0078	0.019	0.0050	0.012
^{230}Th	0.011	0.028	0.015	0.038	0.012	0.030
^{232}Th	0.0063	0.090	0.0073	0.10	0.0052	0.074
Total Sr	*c*	*c*	*c*	*c*	*c*	*c*
^{234}U	0.031	0.034	0.12	0.13	0.050	0.055
^{235}U	0.0047	0.0050	0.0087	0.0090	*c*	*c*
^{238}U	0.019	0.019	0.018	0.018	0.015	0.015
Analysis	Station 46	Percentage DCG[b]	Station 48	Percentage DCG[b]	Station 51	Percentage DCG[b]
^{244}Cm	*c*	*c*	*c*	*c*	*c*	*c*
^{60}Co	0.096	<0.01	0.062	<0.01	*c*	*c*
^{137}Cs	*c*	*c*	*c*	*c*	*c*	*c*
^{238}Pu	*c*	*c*	0.0040	0.013	0.0044	0.015
^{239}Pu	*c*	*c*	*c*	*c*	*c*	*c*
^{228}Th	0.011	0.028	0.0066	0.017	*c*	*c*
^{230}Th	0.022	0.056	0.018	0.045	0.010	0.025
^{232}Th	0.011	0.16	0.0060	0.086	0.0029	0.041
Total Sr	*c*	*c*	0.072	<0.01	0.10	0.0010
^{234}U	0.21	0.24	0.032	0.035	0.034	0.038
^{235}U	0.052	0.052	0.0059	0.0060	0.0029	0.0030
^{238}U	0.032	0.032	0.012	0.012	0.011	0.011

Table 3.12 (continued)

Analysis	Station 52	Percentage DCG[b]
^{244}Cm	*c*	*c*
^{60}Co	*c*	*c*
^{137}Cs	0.048	<0.01
^{238}Pu	*c*	*c*
^{239}Pu	*c*	*c*
^{228}Th	0.0084	0.021
^{230}Th	0.021	0.052
^{232}Th	0.0047	0.068
Total Sr	*c*	*c*
^{234}U	0.027	0.030
^{235}U	0.0050	0.0050
^{238}U	0.0074	0.0070

[a]See Figs. 3.18 and 3.19 in Vol. 1 for monitoring locations.

[b]Percentage of DCG = average/derived concentration guide (DCG) × 100. The DCG for ^{244}Cm is 4×10^{-14} μCi/mL; ^{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} μC/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} μCi/mL. Source for DCG is DOE Order 5400.5, "Radiation Protection of the Public and the Environment," Chap. III.

[c]Not detected.

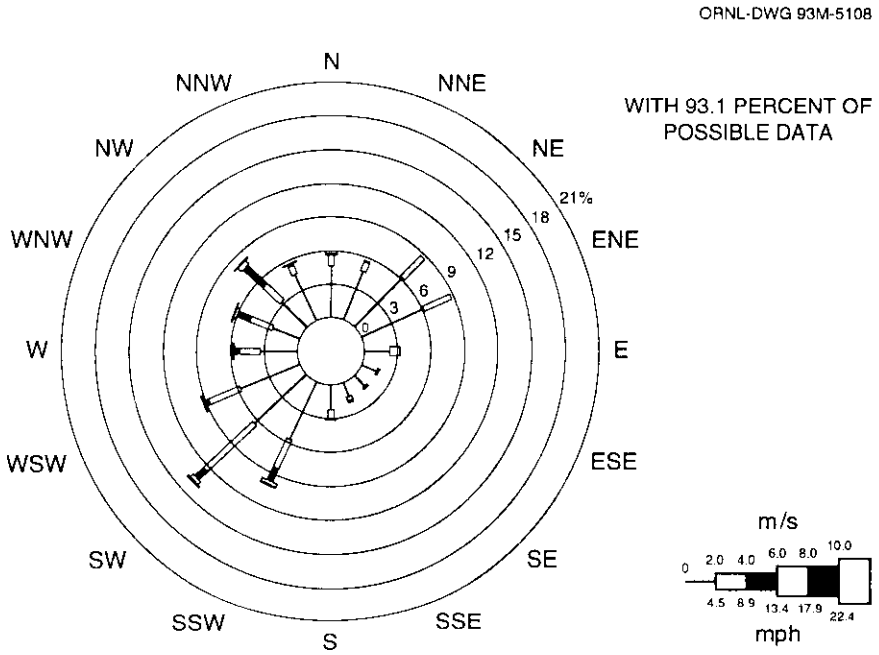

Fig. 3.1. 1992 wind rose for K-25 tower MT1 (10-m level), with 93.1% of possible data.

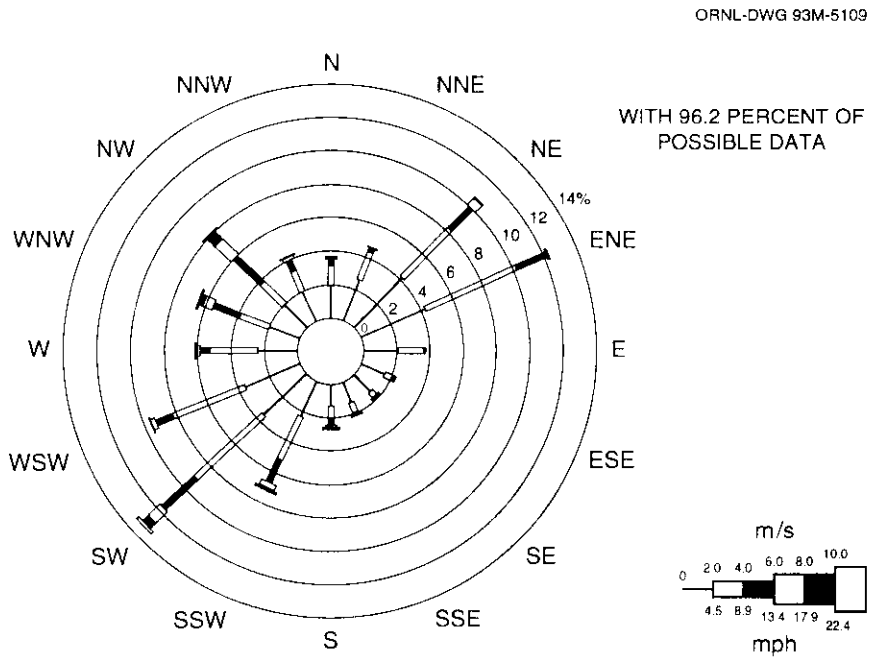

Fig. 3.2. 1992 wind rose for K-25 tower MT1 (60-m level), with 96.2% of possible data.

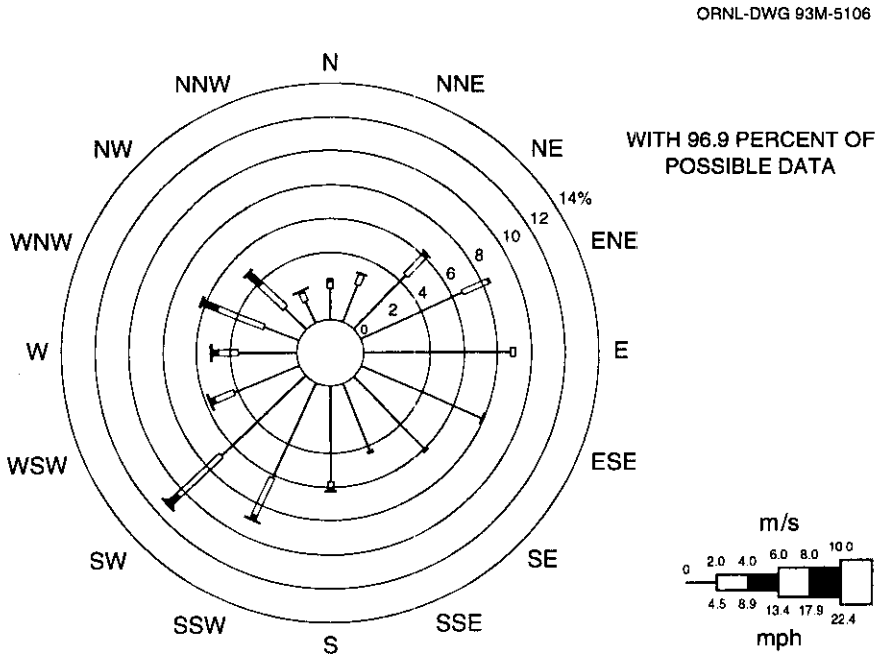

Fig. 3.3. 1992 wind rose for K-25 tower MT7 (10-m level), with 96.9% of possible data.

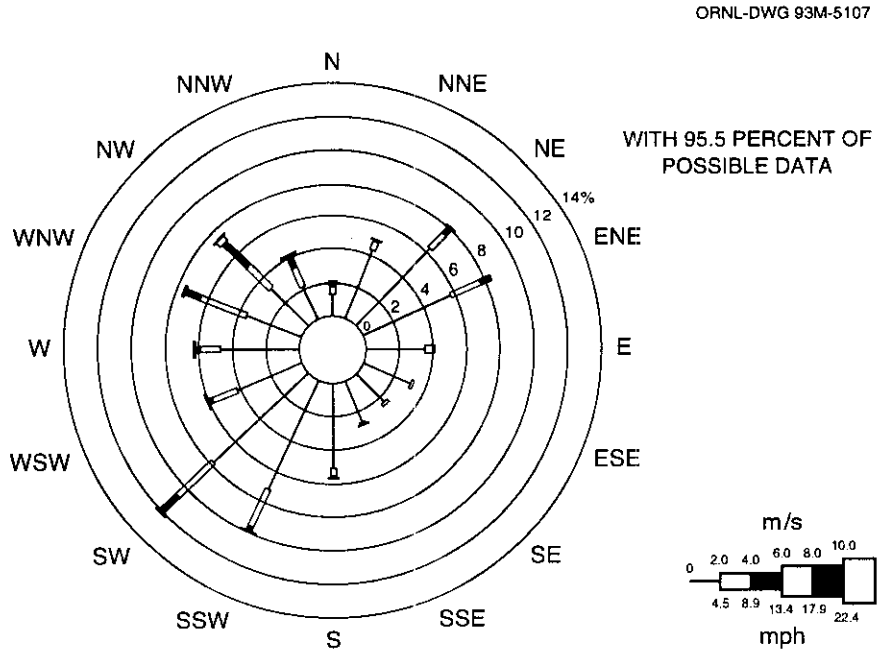

Fig. 3.4. 1992 wind rose for K-25 tower MT7 (30-m level), with 95.5% of possible data.

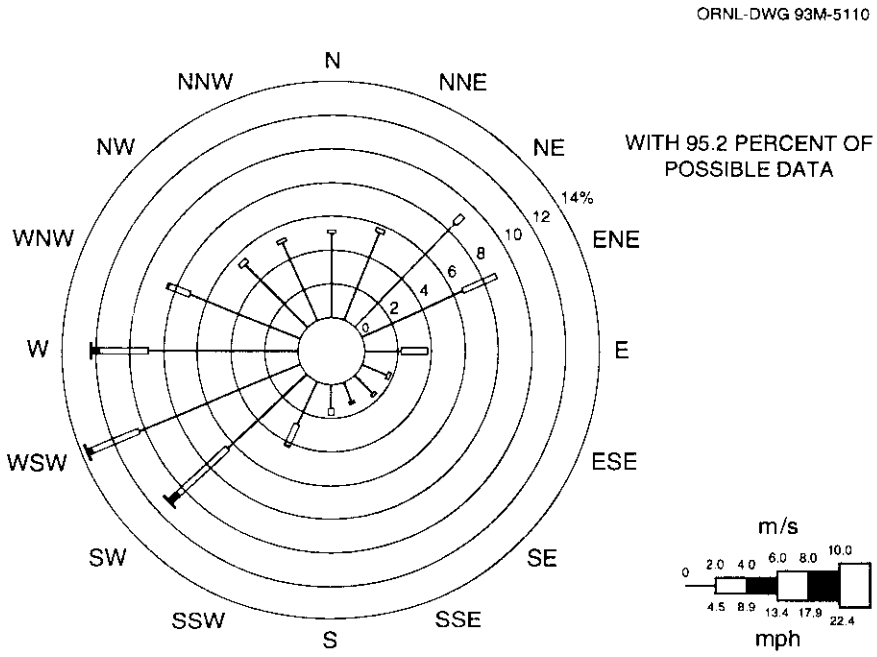

Fig. 3.5. 1992 wind rose for ORNL tower MT2 (10-m level), with 95.2% of possible data.

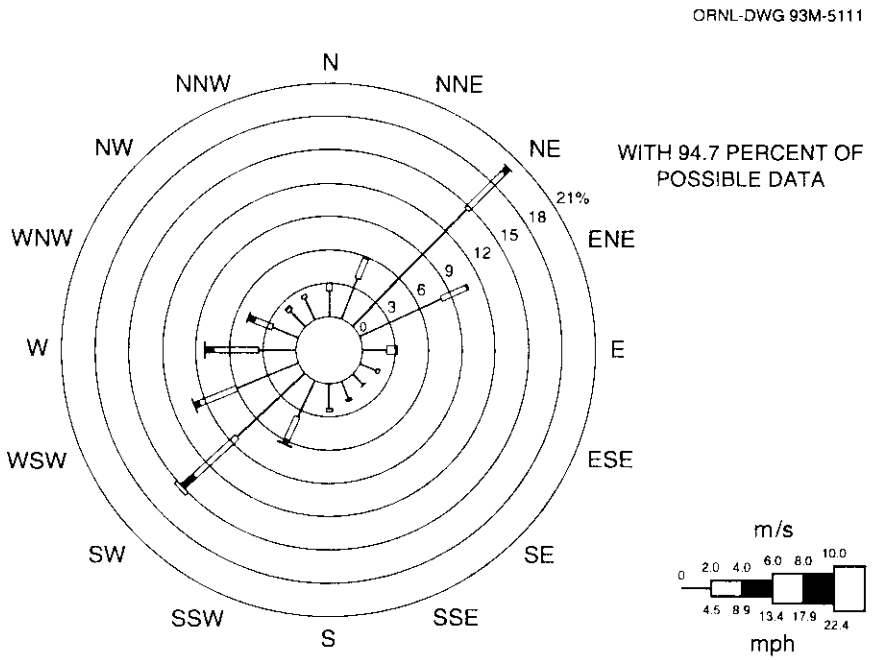

Fig. 3.6. 1992 wind rose for ORNL tower MT2 (30-m level), with 94.7% of possible data.

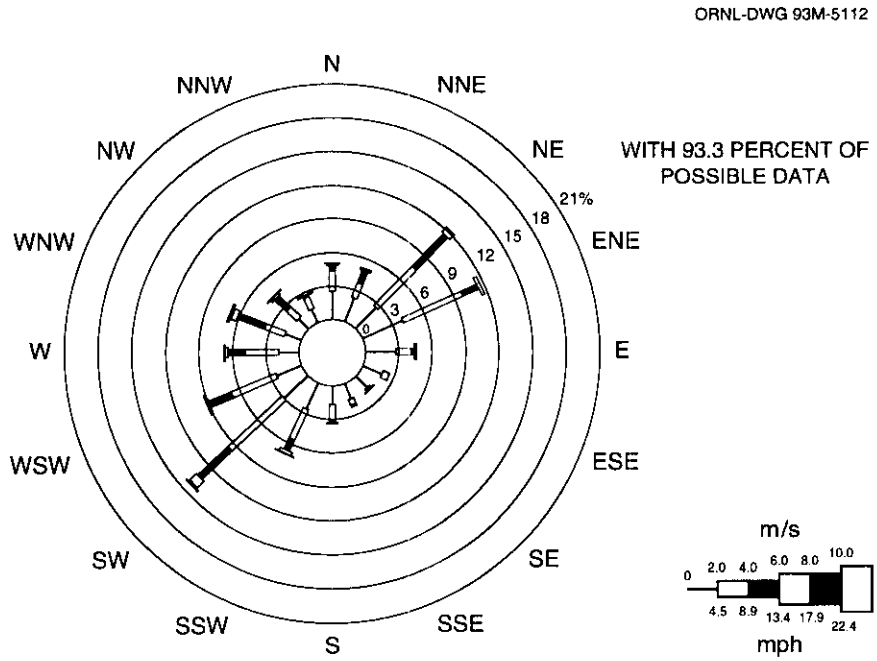

Fig. 3.7. 1992 wind rose for ORNL tower MT2 (100-m level), with 93.3% of possible data.

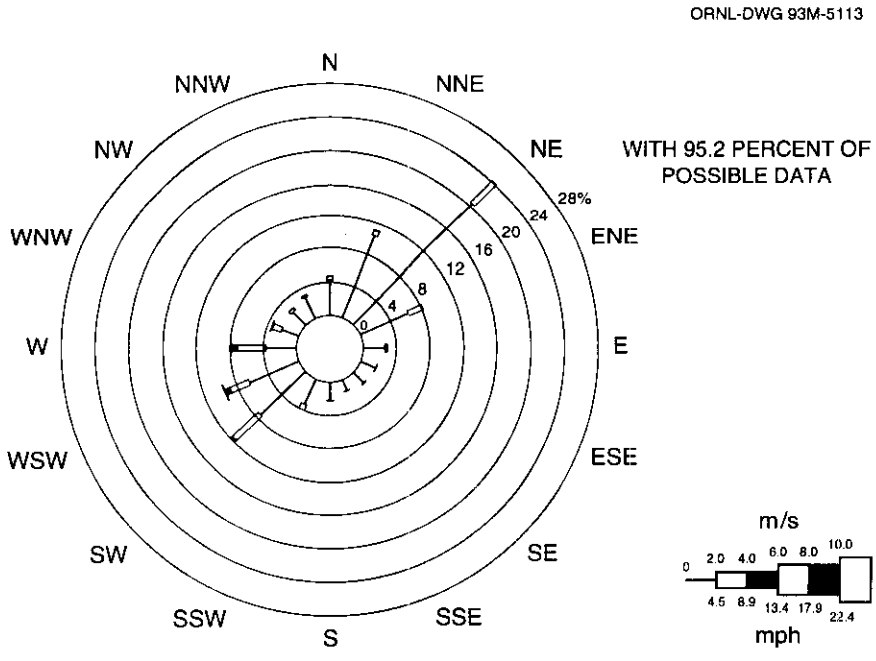

Fig. 3.8. 1992 wind rose for ORNL tower MT3 (10-m level), with 95.2% of possible data.

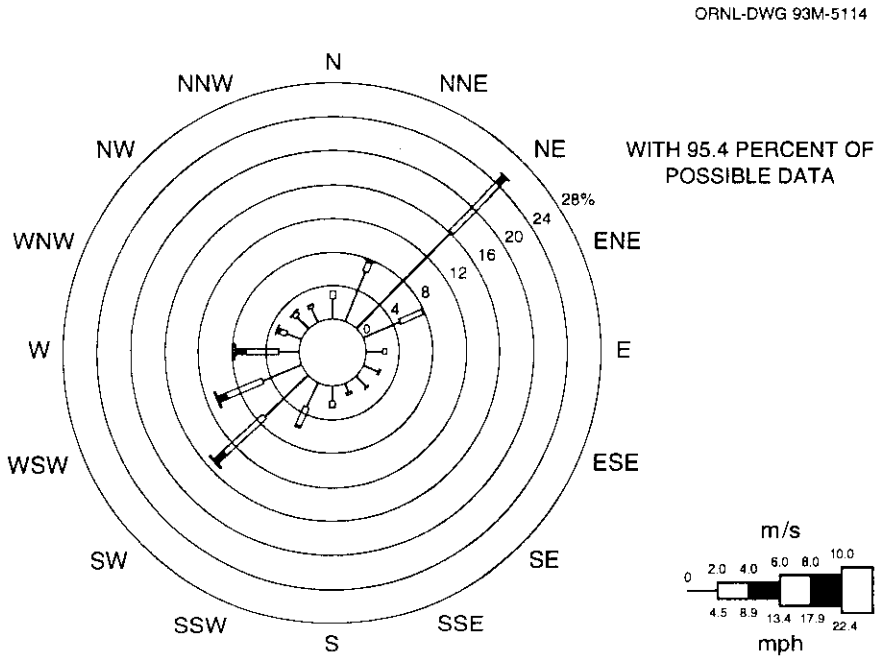

Fig. 3.9. 1992 wind rose for ORNL tower MT3 (30-m level), with 95.4% of possible data.

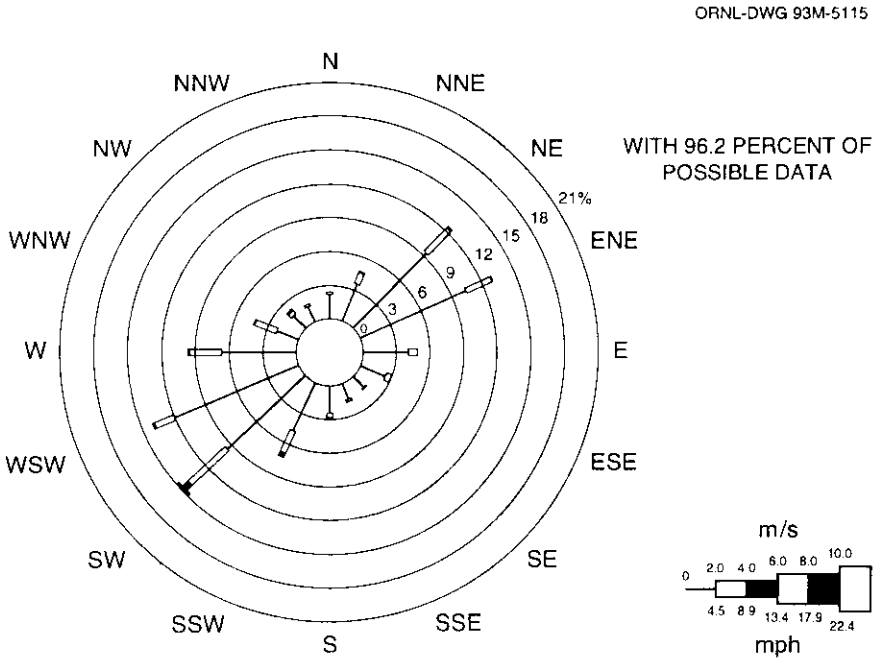

Fig. 3.10. 1992 wind rose for ORNL tower MT4 (10-m level), with 96.2% of possible data.

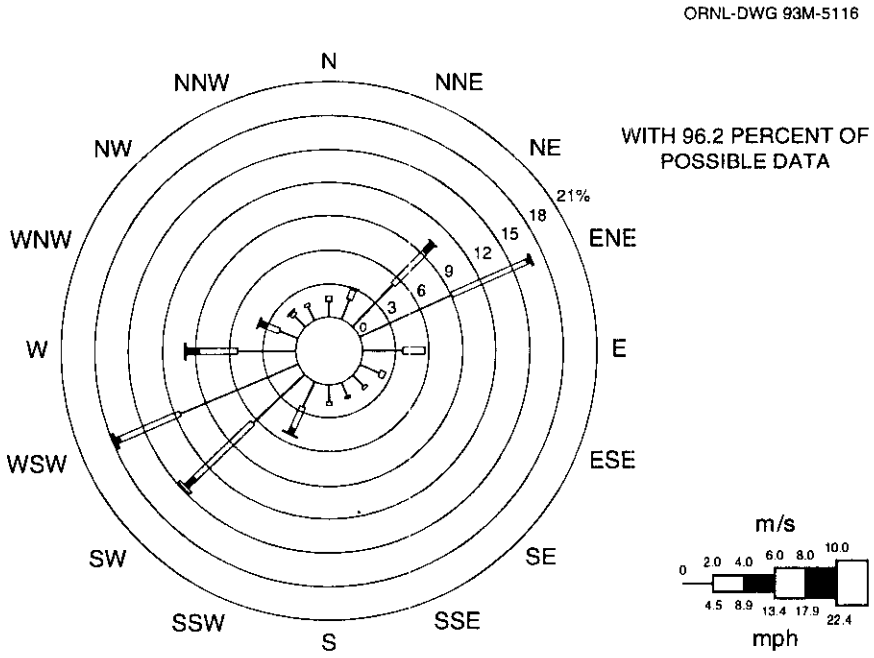

Fig. 3.11. 1992 wind rose for ORNL tower MT4 (30-m level), with 96.2% of possible data.

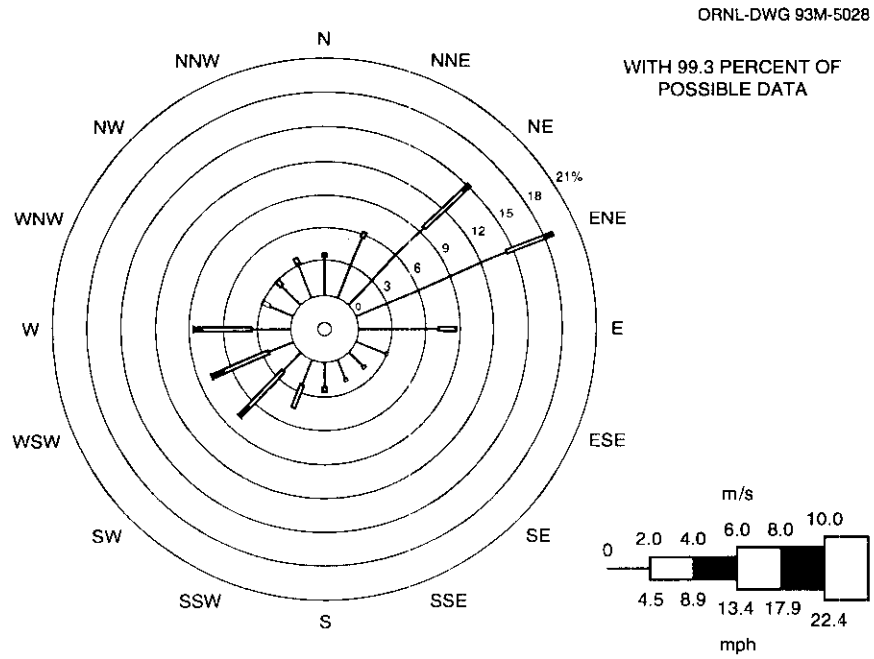

Fig. 3.12. 1992 wind rose for Y-12 Plant tower MT5 (east) (10-m level), with 99.3% of possible data.

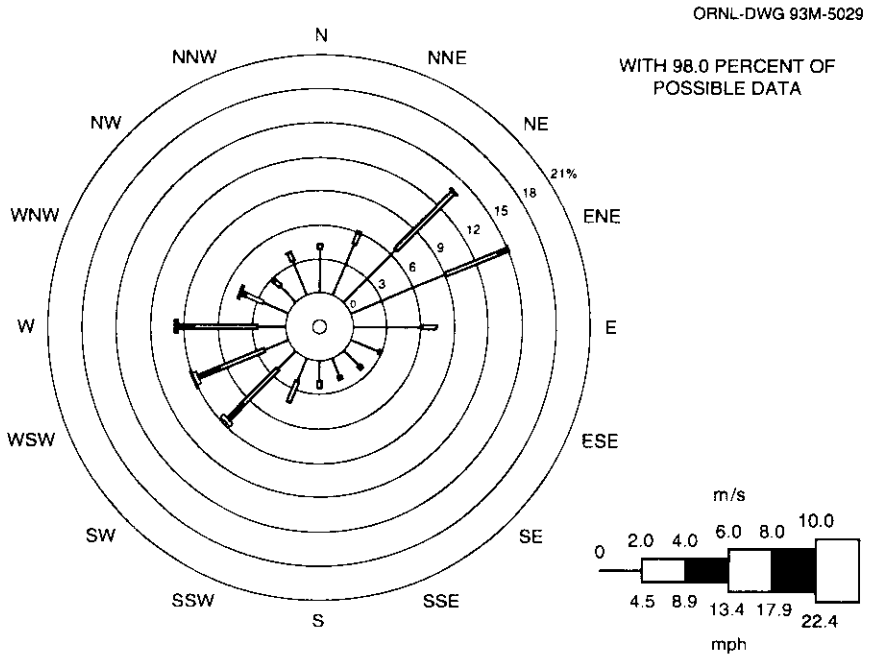

Fig. 3.13. 1992 wind rose for Y-12 Plant tower MT5 (east) (30-m level), with 98.0% of possible data.

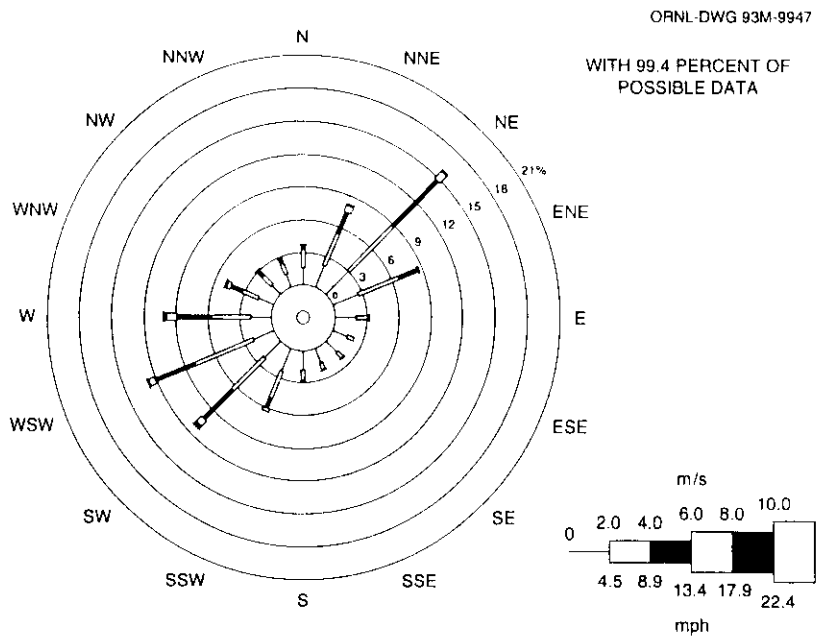

Fig. 3.14. 1992 wind rose for Y-12 Plant tower MT5 (east) (100-m level), with 99.4% of possible data.

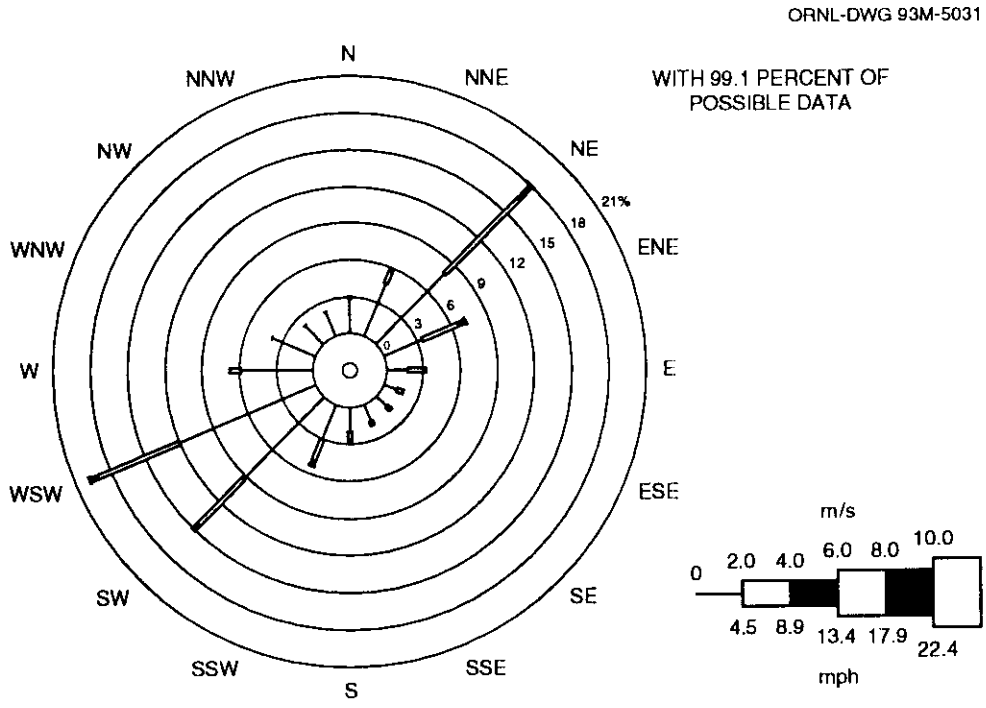

Fig. 3.15. 1992 wind rose for Y-12 Plant tower MT6 (west) (10-m level), with 99.1% of possible data.

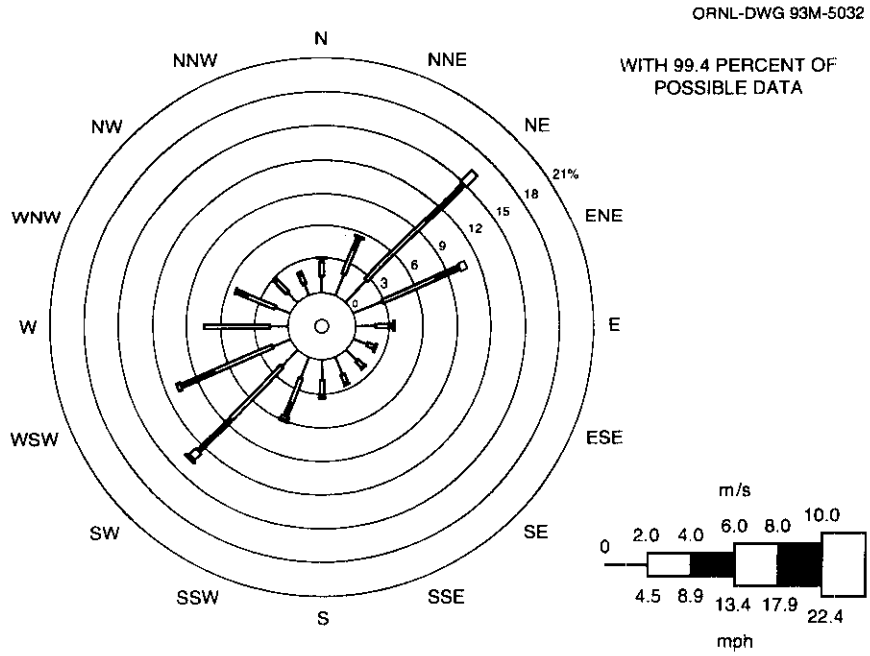

Fig. 3.16. 1992 wind rose for Y-12 Plant tower MT6 (west) (60-m level), with 99.4% of possible data.

4. SURFACE WATER

Table 4.1. 1992 Y-12 Plant annual summary for upper Bear Creek nonradiological data km 11.97[a]

Parameter	Number of samples	Concentration[b]			Reference Value[c]	Number of values exceeding reference
		Max	Min	Av		
Arsenic	52	<0.005	<0.005	<0.005	0.360	0
Cadmium	52	0.135	<0.0003	<0.008	0.004	27[d]
Chromium	52	0.013	<0.001	<0.002	0.016	0
Cyanide	51	0.017	<0.002	<0.002	0.022	0
Lead	52	0.01	<0.0004	<0.0029	0.082	0
Mercury	52	0.001	<0.0002	<0.0002	0.00015	52[e]
Nitrate (as N)	52	320	14	122	[f]	[f]
Dissolved oxygen	52	14.1	6.4	9.6	3[f]	0
Phenols	52	0.008	<0.001	<0.002	[f]	[f]
Total dissolved solids	52	3000	120	1168	[f]	[f]
Total suspended solids	52	23	<5	<6	[f]	[f]
Selenium	52	0.002	<0.002	<0.002	0.020	0
Thallium	52	<0.005	<0.001	<0.001	[f]	[f]
pH, standard units	52	8.2	6.9	[f]	6.5–8.5[g]	0
Aluminum	52	1.84	0.04	0.17	[f]	[f]
Barium	52	1.01	<0.088	<0.417	[f]	[f]
Beryllium	52	<0.0004	<0.0004	<0.0004	0.0013	0
Boron	52	0.166	0.027	0.065	[f]	[f]
Calcium	52	454	<48.7	<215.2	[f]	[f]
Cerium	52	<0.02	<0.02	<0.02	[f]	[f]
Cobalt	52	0.007	<0.002	<0.003	[f]	[f]
Copper	52	0.007	<0.006	<0.006	0.018	0
Gallium	52	<0.02	<0.02	<0.02	[f]	[f]
Iron	52	1.97	<0.06	<0.13	[f]	[f]
Lithium	52	<0.02	<0.02	<0.02	[f]	[f]
Magnesium	52	58.9	6.5	29.7	[f]	[f]
Manganese	52	3.24	0.012	1.111	[f]	[f]
Molydenum	52	<0.006	<0.006	<0.006	[f]	[f]
Nickel	52	0.08	<0.008	<0.029	1.400	0
Niobium	52	<0.01	<0.01	<0.01	[f]	[f]
Phosphorus	52	<0.05	<0.05	<0.05	[f]	[f]
Potassium	51	8.1	2.1	4.6	[f]	[f]
Scandium	30	0.0005	<0.0004	<0.0004	[f]	[f]
Silver	52	<0.006	<0.006	<0.006	0.004	52[e]
Sodium	52	59.8	12.6	37.7	[f]	[f]
Strontium	52	1.27	0.143	0.644	[f]	[f]
Thorium	52	0.01	<0.01	<0.01	[f]	[f]
Titanium	52	0.02	<0.01	<0.01	[f]	[f]
Vanadium	52	<0.004	<0.004	<0.004	[f]	[f]
Zinc	52	0.02	<0.01	<0.01	0.117	0
Zirconium	52	<0.01	<0.004	<0.004	[f]	[f]
PCB, total	52	<0.0005	<0.0005	<0.0005	0.000001	52[e]
Volatile organics, total	52	<0.01	<0.01	<0.01	544	0

[a]See Fig. 4.3 in Vol.1.
[b]All units in mg/L unless otherwise indicated.
[c]Tennessee Water Quality criteria.
[d]Reference value represents the dissolved form of this metal only. The actual data are representative of all forms.
[e]The analytical detection limit for this parameter is higher than the reference value.
[f]Not applicable.
[g]Minimum value/maximum value.

Table 4.2. 1992 Y-12 Plant annual summary for upper Bear Creek radiological data km 11.97[a]

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	52	318	0.07	127	9	*b*
Americium-241 (pCi/L)	52	0.29	–0.58	0.05	0.02	0.16
Beta activity (pCi/L)	52	740	0.13	248.71	20.34	*b*
Neptunium-237 (pCi/L)	52	2.5	0.01	1.13	0.10	3.77
Plutonium-238 (pCi/L)	52	0.7	–0.2	0.01	0.02	0.03
Plutonium-239/240 (pCi/L)	52	0.18	–0.08	0.02	0.01	0.07
Technetium-99 (pCi/mL)	52	1.22	0.04	0.45	0.04	0.0004
Uranium, total (mg/L)	52	0.752	<0.055	<0.220	0.015	*b*
Uranium-235 (%)	52	0.44	0.33	0.37	0.003	*b*

[a]See Fig. 4.3 in Vol. 1.
[b]Not applicable.

Table 4.3. 1992 Y-12 Plant annual summary for upper Bear Creek nonradiological data km 12.4[a]

Parameter	Number of samples	Concentration[b]			Reference value[c]	Number of values exceeding reference
		Max	Min	Av		
Arsenic	52	<0.005	<0.005	<0.005	0.360	0
Cadmium	52	0.011	<0.0003	<0.001	0.004	1[d]
Chromium	52	0.011	<0.001	<0.002	0.016	0
Cyanide	51	<0.007	<0.002	<0.002	0.022	0
Lead	52	0.02	<0.0006	<0.003	0.082	0
Mercury	52	0.001	<0.0002	<0.0002	0.00015	52[e]
Nitrate (as N)	52	43	2.4	24.3	*f*	*f*
Dissolved oxygen	52	10.2	4.6	6.9	3[g]	0
Phenols	52	0.004	<0.001	< 0.002	*f*	*f*
Total dissolved solids	52	1900	76	736	*f*	*f*
Total suspended solids	52	21	<5	<5.9	*f*	*f*
Selenium	52	<0.002	<0.002	<0.002	0.020	0
Thallium	52	0.05	<0.001	<0.002	*f*	*f*
pH, standard units	52	8.7	6.7	*f*	6.5–8.5[h]	0
Aluminum	52	0.98	<0.04	<0.12	*f*	*f*
Barium	52	0.496	<0.018	<0.084	*f*	*f*
Beryllium	52	<0.0004	<0.0004	<0.0004	0.0013	0
Boron	52	0.141	0.021	0.084	*f*	*f*
Calcium	52	293	21.8	153.3	*f*	*f*
Cerium	52	<0.02	<0.02	<0.02	*f*	*f*
Cobalt	52	<0.002	<0.002	<0.002	*f*	*f*
Copper	52	<0.006	<0.006	<0.006	0.018	0
Gallium	52	<0.02	<0.02	<0.02	*f*	*f*
Iron	52	1.25	<0.06	<0.13	*f*	*f*
Lithium	52	0.02	<0.02	<0.02	*f*	*f*
Magnesium	52	43.1	2.93	21.75	*f*	*f*
Manganese	52	0.328	0.005	0.027	*f*	*f*
Molydenum	52	<0.006	<0.006	<0.006	*f*	*f*
Nickel	52	<0.025	<0.008	<0.008	1.400	0
Niobium	52	<0.01	<0.01	<0.01	*f*	*f*
Phosphorus	52	<0.09	<0.05	<0.05	*f*	*f*
Potassium	52	8.4	2.5	4.9	*f*	*f*
Scandium	30	0.0004	<0.0004	<0.0004	*f*	*f*
Silver	52	<0.006	<0.006	<0.006	0.004	52[e]
Sodium	52	75.9	1.9	48.6	*f*	*f*
Strontium	52	0.911	0.043	0.409	*f*	*f*
Thorium	52	0.01	<0.01	<0.01	*f*	*f*
Titanium	52	0.02	<0.01	<0.01	*f*	*f*
Vanadium	52	<0.004	<0.004	<0.004	*f*	*f*
Zinc	52	0.04	<0.01	<0.01	0.117	0
Zirconium	52	<0.01	<0.004	<0.004	*f*	*f*
PCB, total	52	<0.005	<0.0005	<0.0006	0.000001	52[e]
Volatile organics, total	52	<0.01	<0.01	<0.01	544	0

[a]See Fig. 4.3 in Vol.1.
[b]All units in mg/L unless otherwise indicated.
[c]Tennessee Water Quality criteria.
[d]Reference value represents the dissolved form of this metal only. The actual data are representative of all forms.
[e]The analytical detection limit for this parameter is higher than the reference value.
[f]Not applicable.
[g]Minimum value.
[h]Minimum value/maximum value.

Table 4.4. 1992 Y-12 Plant annual radiological summary for upper Bear Creek radiological data km 12.4[a]

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	52	750	0.17	285	19	*b*
Americium-241 (pCi/L)	52	0.63	–0.25	0.10	0.03	0.32
Beta activity (pCi/L)	52	430	0.06	112	11	*b*
Plutonium-238 (pCi/L)	52	0.33	–0.16	0.02	0.01	0.04
Plutonium-239/240 (pCi/L)	52	0.69	–0.15	0.02	0.02	0.07
Neptunium-237 (pCi/L)	52	2.2	0.04	0.70	0.05	2.35
Technetium-99 (pCi/mL)	52	10	–0.04	0.27	0.19	0
Uranium, total (mg/L)	52	0.844	0.017	0.571	0.023	*b*
Uranium-235 (%)	52	0.4	0.28	0.33	0.004	*b*

[a]See Fig. 4.3 in Vol. 1.
[b]Not applicable.

Table 4.5. 1992 annual radiological summary Y-12 Plant diversion ditch[a]

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Thorium, total (mg/L)	49	0.012	<0.003	<0.003	0.0002	*b*
Uranium-235, total (mg/L)	49	0.050	0.010	0.023	0.002	*b*
Uranium-235 (%)	49	0.85	0.31	0.44	0.01	*b*

[a]See Fig. 4.3 in Vol. 1.
[b]Not applicable.

Table 4.6. 1992 Y-12 Plant annual nonradiological data summary for Station 17[a]

(EFPC 23.4 km, near junction of Bear Creek and Scarboro Road)

Parameter	Number of samples	Concentration[b]			Reference value[c]	Number of values exceeding reference
		Max	Min	Av		
Mercury	248	0.0089	0.0005	0.0017	0.00015	248[d]
Nitrate	248	16	<0.1	<5.2	*e*	*e*
Total phosphorus	248	0.74	<0.14	<0.33	*e*	*e*
Copper	248	0.032	<0.006	<0.008	0.018	9
Zinc	248	0.31	0.02	0.06	0.117	16
Chromium	248	0.03	<0.006	<0.006	0.016	2
Molybdenum	248	0.03	<0.006	<0.007	*e*	*e*
Lithium	248	0.2	<0.02	<0.03	*e*	*e*
Selenium	248	0.002	<0.002	<0.002	0.020	0
Cadmium	248	<0.02	<0.004	<0.004	0.004	1
Lead	247	0.061	<0.001	<0.004	0.082	0
Nickel	248	0.04	<0.0008	<0.008	1.400	0
Calcium	247	100	39.6	57	*e*	*e*
Magnesium	247	21.7	6.7	11	*e*	*e*
Sodium	248	43.9	7.1	16.9	*e*	*e*
Potassium	248	4.7	1.5	2.2	*e*	*e*
Sulfate	248	150	<5	<63	*e*	*e*
Chloride	248	33	8	18.4	*e*	*e*
Fluoride	248	72	0.38	1.3	*e*	*e*
Total suspended solids	248	310	<5	<13	*e*	*e*
Total dissolved solids	247	32000	0.32	421	*e*	*e*
Alkalinity	248	200	69	108	*e*	*e*
Total orgainic carbons	246	29	<2	<17.2	*e*	*e*
Residual chlorine, total	251	7.9	0	0.09	*e*	*e*
Cadmium (AA)	247	0.011	–0.0005	<0.0009	*e*	*e*
Temperature, °C	310	36	11	20	*e*	*e*
pH, standard units	317	8.8	7.4	*e*	6.5/8.5[f]	0/16
Dissolved oxygen	299	10.3	2.8	7.4	3	1
Conductivity, mhos/cm	206	471.2	0	6.3	*e*	*e*
Tetrachloroethene	247	<0.010	<0.010	<0.010	0.088	0

[a]Flow during operations and/or discharging.
[b]Units are in mg/L unless otherwise noted.
[c]Tennessee Water Quality criteria.
[d]The analytical detection limit for this parameter is higher than the reference value.
[e]Not applicable.
[f]Minimum value/maximum value.

Table 4.7. 1992 Y-12 Plant annual radiological data summary for Station 17[a]

(EFPC 23.4 km, near junction of Bear Creek and Scarboro Road)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	53	83	0.02	18.99	1.81	*b*
Beta activity (pCi/L)	53	27	0.02	12.34	0.85	*b*
Neptunium-237 (pCi/L)	53	0.53	–0.22	0.06	0.02	0.20
Radium-226 (pCi/L)	49	8.9	–2.2	1.3	0.2	1.3
Radium-228 (pCi/L)	21	5.4	–3.3	0.41	0.36	0.41
Strontium-90 (pCi/L)	52	35	–3.8	1.9	0.77	0.19
Thorium, total (mg/L)	53	0.015	<0.003	<0.003	0.0002	*b*
Uranium, total (mg/L)	52	0.108	0.011	0.026	0.002	*b*
Uranium-235 %	53	5.1	0.26	0.54	0.09	*b*
Plutonium-238 (pCi/L)	52	0.34	–0.22	0.058	0.017	0.145
Plutonium-239/240 (pCi/L)	52	0.84	–0.18	0.035	0.018	0.117
Technetium-99 (pCi/L)	48	0.09	–0.08	0.010	0.005	0.00001
Thorium-234 (pCi/L)	53	67	0.08	8.8	1.3	0.09
Thorium-228 (pCi/L)	53	2.6	0.07	0.85	0.08	0.2
Thorium-230 (pCi/L)	53	2.2	–0.003	0.32	0.06	0.11
Thorium-232 (pCi/L)	52	0.21	–0.08	0.06	0.009	0.113
Uranium-234 (pCi/L)	53	110	0.22	7.74	2.10	1.55
Uranium-235 (pCi/L)	53	4.3	0.01	0.38	0.08	0.06
Uranium-238 (pCi/L)	53	67	0.39	9.03	1.24	1.5

[a]Flow during operations and/or discharging.
[b]Not applicable.

Table 4.8. Y-12 Plant release of uranium to the off-site environment as a liquid effluent

Year	Uranium (Ci)	Uranium (kg)
	Station 17	
1988	0.164	220
1989	0.20	316
1990	0.135	197
1991	0.162	235
1992	0.087	130
	Outfall 304	
1988	0.052	94
1989	0.138	244
1990	0.131	204
1991	0.082	159
1992	0.060	110
	Total off-site release	
1988	0.22	314
1989	0.34	560
1990	0.27	401
1991	0.24	394
1992	0.15	240

Table 4.9. 1992 annual nonradiological data summary

City Flow Monitoring Station (northeast of Y-12 Plant)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
pH, standard units	46	8.3	6.8	c	6.5–8.5[d]	0
Cyanide	45	0.014	<0.002	<0.003	0.014	0
Oil and grease	46	16	<2	<6	20	0
Phenols	45	0.039	<0.001	<0.013	10	0
Total volatile organics	46	0.016	<0.01	<0.01	c	c
Benzene	46	<0.01	<0.01	<0.01	c	c
Methylene chloride	46	<0.01	<0.01	<0.01	c	c
Trichloroethylene	46	<0.01	<0.01	<0.01	c	c
Toluene	46	<0.01	<0.001	<0.01	c	c
Total chlorinated hydrocarbons	46	0.016	<0.01	<0.01	c	c
Biochemical oxygen demand	45	120	<5	<42	300	0
Chemical oxygen demand	46	200	<5	<81	c	c
Hexavalent chromium	45	0.05	<0.01	<0.011	c	c
Trivalent chromium	46	0.006	–0.044	–0.005	c	c
Mercury	46	0.0031	<0.0002	<0.001	0.1	0
Total Kjeldahl nitrogen	46	24	1.5	11.4	90	0
Total suspended solids	46	61	<5	<28	300	0
Selenium	46	<0.002	<0.002	<0.002	c	c
Aluminum	46	0.51	0.08	0.19	c	c
Arsenic	46	<0.4	<0.04	<0.05	0.1	1
Barium	46	0.0613	0.0346	0.046	c	c
Beryllium	46	0.0008	<0.0004	<0.0004	c	c
Boron	46	0.078	0.02	0.036	c	c
Cadmium	46	<0.004	<0.004	<0.004	c	c
Calcium	46	49.9	35.6	41.9	c	c
Cerium	46	<0.02	<0.02	<0.02	c	c
Total chromium	46	0.014	<0.006	<0.006	0.44	0
Cobalt	46	<0.002	<0.002	<0.002	c	c
Copper	46	0.061	<0.006	<0.014	0.04	15
Gallium	46	<0.02	<0.002	<0.02	c	c
Iron	46	1.26	0.17	0.33	1.5	0
Lead	46	0.02	<0.02	<0.02	c	c
Lithium	46	0.05	<0.02	<0.02	c	c
Magnesium	46	11	8.2	9.8	c	c
Manganese	46	0.119	0.048	0.078	1.0	0
Molybdenum	46	<0.006	<0.006	<0.006	c	c
Nickel	46	<0.008	<0.008	<0.008	0.10	0
Niobium	46	<0.01	<0.01	<0.01	c	c
Phosphorus	46	4.74	0.53	2.13	c	c
Potassium	46	10.1	2	5.9	c	c
Scandium	26	<0.0004	<0.0004	<0.0004	c	c
Silver	46	0.05	<0.006	<0.008	0.01	1
Sodium	46	19.5	6.4	12.8	c	c
Strontium	46	0.13	0.09	0.11	c	c
Thallium	40	0.4	<0.03	<0.04	c	c
Thorium	46	<0.01	<0.01	<0.01	c	c
Titanium	46	0.02	<0.01	<0.01	c	c
Vanadium	46	<0.004	<0.004	<0.004	c	c
Zinc	46	0.24	<0.06	<0.12	0.094	30
Zirconium	46	<0.004	<0.004	<0.004	c	c

[a]All units are in mg/L unless noted otherwise.
[b]Sanitary Sewer Industrial Discharge Permit limits.
[c]Not applicable.
[d]Minimum value/maximum value.

Table 4.10. 1992 annual radiological data summary

City Flow Monitoring Station (northeast of Y-12 Plant)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	46	130	–4.4	11.1	2.809172	*a*
Beta activity (pCi/L)	46	32	–40	10.3	1.421704	*a*
Plutonium-238 (pCi/L)	46	0.46	–0.38	0.03	0.023529	0.08
Plutonium-239/240 (pCi/L)	46	0.21	–0.22	–0.0002	0.011705	0.00
Uranium-234 (pCi/L)	46	11	2	3.8	0.241534	0.8
Uranium-235 (%)	46	2.56	0.22	0.86	0.056564	*a*
Uranium-238 (pCi/L)	46	7.8	0.9	2.3	0.18106	0.38
Uranium, total (mg/L)	46	0.017	0.003	0.007	*a*	0
Gamma activity (pCi/L)	46	780	–19	50	18.50509	*a*

[a]Not applicable.

Table 4.11. 1992 annual nonradiological data summary

Union Valley Flow Monitoring Station (east of Y-12 Plant)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
pH, standard units	46	8.2	6.8	*c*	6.5–8.5[d]	0
Cyanide	45	0.044	<0.002	<0.005	0.014	3
Oil and grease	46	1174.8	<1.64	<41.6	20	11
Phenols	45	0.14	<0.001	<0.03	10.0	0
Total volatile organics	46	<0.39	<0.01	<0.02	*c*	*c*
Benzene	46	<0.1	<0.01	<0.01	*c*	*c*
Methylene chloride	46	0.1	<0.01	<0.01	*c*	*c*
Trichloroethylene	46	<0.1	<0.01	<0.01	*c*	*c*
Toluene	46	<0.1	<0.01	<0.01	*c*	*c*
Total chlorinated hydrocarbons	46	0.39	<0.01	<0.02	*c*	*c*
Ammonia	46	32	1.4	15.0	*c*	*c*
Biochemical oxygen demand	45	240	12	90	300	0
Chemical oxygen demand	46	560	<45	<226	*c*	*c*
Hexavalent chromium	45	<0.05	<0.01	<0.01	*c*	*c*
Trivalent chromium	46	0.044	–0.044	–0.001	*c*	*c*
Mercury	46	0.0012	<0.0001	<0.0003	0.1	0
Total Kheldahl nitrogen	46	50	0.3	21.5	90	0
Total suspended solids	46	250	10	71	300	0
Selenium	46	<0.02	<0.002	<0.002	*c*	*c*
Aluminum	46	5.63	0.12	0.68	*c*	*c*
Arsenic	46	<0.4	<0.04	<0.05	0.10	1
Barium	46	0.159	0.0353	0.063	*c*	*c*
Beryllium	46	0.0063	<0.0004	<0.0007	*c*	*c*
Boron	46	0.374	0.019	0.105	*c*	*c*
Cadmium	46	0.005	<0.004	<0.004	*c*	*c*
Calcium	46	5839	<37.4	<180.9	*c*	*c*
Cerium	46	<0.02	<0.02	<0.02	*c*	*c*
Chromium, total	46	0.054	<0.006	<0.009	0.44	0
Cobalt	46	0.011	<0.002	<0.003	*c*	*c*
Copper	46	0.124	<0.006	<0.040	0.04	14
Gallium	46	<0.02	<0.02	<0.02	*c*	*c*
Iron	46	5.93	0.22	0.97	1.0	6
Lead	46	0.39	<0.02	<0.03	1.5	0
Lithium	46	0.7	<0.02	<0.07	*c*	*c*
Magnesium	46	15.1	7.42	11.08	*c*	*c*
Manganese	46	0.938	0.068	0.339	*c*	*c*
Molybdenum	46	0.014	<0.006	<0.006	*c*	*c*
Nickel	46	0.038	<0.008	<0.010	0.10	0
Niobium	46	<0.01	<0.01	<0.01	*c*	*c*
Phosphorus	46	31	0.62	4.97	*c*	*c*
Potassium	46	25.6	3.1	13.2	*c*	*c*
Scandium	20	0.0854	<0.0004	< 0.0047	*c*	*c*
Silver	46	0.109	<0.006	<0.016	0.1	0
Sodium	46	55.2	3.87	19.39	*c*	*c*
Strontium	46	0.19	0.1	0.14	*c*	*c*
Thallium	39	<0.4	<0.03	<0.04	*c*	*c*
Thorium	46	<0.01	<0.01	<0.01	*c*	*c*
Titanium	46	0.08	<0.01	<0.02	*c*	*c*
Vanadium	46	0.008	<0.004	<0.004	*c*	*c*
Zinc	46	0.44	0.02	0.14	2.0	0
Zirconium	46	0.03	<0.004	<0.006	*c*	*c*

[a]All units are in mg/L unless noted otherwise.
[b]Sanitary Sewer Industrial Discharge Permit limits.
[c]Not applicable.
[d]Minimum value/maximum value.

Table 4.12. 1992 annual radiological data summary

Union Valley Flow Monitoring Station (east of Y-12 Plant)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	46	84	<–1.8	<22.2	3.1	*a*
Beta activity (pCi/L)	46	200	0.33	35.3	5.1	*a*
Plutonium-238 (pCi/L)	46	0.73	–0.99	0.02	0.03	0.06
Plutonium-239/240 (pCi/L)	46	0.28	–0.67	0.03	0.02	0.10
Uranium-234 (pCi/L)	46	11	–1.4	2.3	0.4	0.5
Uranium-235 (%)	46	1.2	0.15	0.24	0.02	*a*
Uranium-238 (pCi/L)	46	75	0.31	15.03	2.68	2.50
Uranium, total (mg/L)	46	0.136	0.003	0.029	*a*	*a*
Gamma activity (pCi/L)	46	190	–18	37	7	*a*

[a]Not applicable.

Table 4.13. CY 1992 nonradiological data summary

Y-12 calculated sanitary sewer concentrations

Parameter	Number of samples	Concentration[a]			Reference value[b]	No. of values exceeding reference
		Max	Min	Av		
Flow, L	46	4,226,214	1,345,872	2,395,767	c	c
Flow, gal	46	1,116,395	355,525	632,864.8	c	c
pH, standard units	46	8.3	6.7	7.4	6.5[d]	0
					8.5[e]	0
Cyanide	46	0.015	<0.002[f]	<0.003	0.014	1
Oil and grease	46	16.3	<2[f]	<2.3	20	0
Phenols	46	0.049	<0.001[f]	<0.012	10	0
Total volatile organics	46	0.01	<0.010[f]	<0.010[f]	c	c
Benzene	46	<0.010	<0.010[f]	<0.010	c	c
Methylene chloride	46	<0.010	<0.010[f]	<0.010	c	c
Trichloroethylene	46	<0.010	<0.010[f]	<0.010	c	c
Tetrachloroethene	46	<0.010	<0.010[f]	<0.010	c	c
Toluene	46	<0.010	<0.010[f]	<0.010	c	c
Chlorinated hydrocarbons	46	0.010	<0.010[f]	<0.007	c	c
Ammonia	46	19.6	<0.2[f]	<7.2	c	c
Biochemical oxygen demand	46	123	<5[f]	<35	300	0
Chemical oxygen demand	46	201	<5[f]	<62	c	c
Hexavalent chromium	46	0.05	<0.01	<0.01	c	c
Trivalent chromium	46	0.006	–0.044	–0.005	c	c
Mercury	46	0.0037	<0.0002	<0.0009	0.1	0
Kjeldahl nitrogen	46	34.2	<0.2[f]	<10.3	90	0
Total suspended solids	46	66	<5[f]	<22	300	0
Selenium	46	<0.002	<0.002[f]	<0.002	c	c
Aluminum	46	0.52	<0.04[f]	<0.10	c	c
Arsenic	46	<0.4	<0.04	<0.05	0.10	1[g]
Barium	46	0.062	0.030	0.044	c	c
Beryllium	46	0.0004	<0.0004[f]	<0.0004	c	c
Boron	46	0.082	<0.004[f]	<0.026	c	c
Cadmium	46	<0.004	<0.004	<0.004	c	c
Calcium	46	48.6	<10[f]	<23.1	c	c
Cerium	46	<0.02	<0.02	<0.02	c	c
Total chromium	46	0.015	<0.002	<0.006	0.44	0
Cobalt	46	<0.002	<–0.002	<0.002	c	c
Copper	46	0.063	<0.006[f]	<0.011	0.04	1
Gallium	46	<0.02	<0.02	<0.02	c	c
Iron	46	1.32	<0.06[f]	0.23	1.5	0
Lead	46	<0.02	<0.02[f]	<0.02	0.02	0
Lithium	46	0.02	<0.02[f]	<0.02	c	c
Magnesium	46	10.84	8.12	9.59	c	c
Manganese	46	0.103	<0.010[f]	<0.038	c	c
Molybdenum	46	<0.006	<0.004	<0.006	c	c
Nickel	46	<0.008	<0.004	<0.008	0.10	0
Niobium	46	<0.01	<0.01	<0.01	c	c
Phosphorus	46	3.62	0.25	1.81	c	c
Potassium	46	10.1	0.9	5.1	c	c
Scandium	45	0.0005	<0.0004[f]	<0.0004[f]	c	c
Silver	46	0.054	<0.006[f]	<0.006[f]	0.1	0
Sodium	46	19.9	3.1	11.9	c	c
Strontium	46	0.13	0.08	0.10	c	c
Thallium	46	0.4	<0.03[f]	<0.03	c	c
Thorium	46	0.01	<0.01	<0.01	c	c
Titanium	46	0.02	<0.01[f]	<0.01	c	c

Table 4.13 (continued)

Parameter	Number of samples	Concentration			Reference value[b]	No. of values exceeding reference
		Max	Min	Av		
Vanadium	46	<0.004	<0.002	<0.004	*c*	*c*
Zinc	46	0.25	<0.04	<0.12	2	0
Zirconium	46	<0.004	<0.004[f]	<0.004	*c*	*c*

[a]All units are in mg/L unless otherwise noted.
[b]Sanitary Sewer Industrial User's Permit Limits.
[c]Not applicable.
[d]Minimum value
[e]Maximum value
[f]Calculated value was below the detection limit for that parameter.
[g]The detection limit was higher than the reference value.

Table 4.14. Annual radiological data summary

Y-12 calculated sanitary sewer concentrations

Parameter	Number of samples	Concentration[a]			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity	46	141.75	−18.07	8.53	0.48	*b*
Beta activity	46	28.35	−71.23	4.28	0.35	*b*
Plutonium-238	46	0.52	−0.41	0.03	0.004	0.08
Plutonium-239/240	46	0.24	−0.26	−0.005	0.002	−0.02
Total uranium, mg/L	46	0.02	−0.02	0.003	0.0001	*b*
Uranium-234	46	11.97	0.00	3.89	0.04	0.78
Uranium-235, %	46	3.48	0.19	0.97	0.01	*b*
Uranium-238	46	4.13	−33.84	−0.75	0.14	−0.13
Total gamma	46	981.89	−26.57	53.46	3.35	*b*

[a]Units in pCi/L unless otherwise noted.
[b]Not applicable

Table 4.15. CY 1992 radiological data summary

Y-12 Plant Discharge Point 109 (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity	4	13	8.8	11.2	0.9	*b*
Americium-241	4	0.33	–0.17	0.2	0.1	0.58
Beta activity	4	8.9	0	4.7	1.8	*b*
Neptunium-237	4	2.1	0.05	0.6	0.5	1.93
Radium-226	4	3.8	0.46	1.8	0.7	1.77
Radium-228	1	1.6	1.6	1.6	0	1.6
Strontium-90	4	3.8	–1.5	1.6	1.3	0.16
Technetium-99, pCi/mL	4	0.1	–0.09	–0.003	0.0	–0.000003
Thorium-234	4	1.4	0.9	1.1	0.1	0.01
Total thorium, mg/L	1	0.003	<0.003	<0.003	0	*b*
Thorium-228	4	1.3	0.53	1.0	0.2	0.25
Thorium-230	4	1	0.09	0.5	0.2	0.15
Thorium-232	4	0.19	0.009	0.1	0.04	0.18
Tritium	4	200	10	116.2	44.8	0.58
Total uranium, mg/L	4	0.004	0.002	0.003	0.0004	*b*
Uranium-234	4	11	4.8	6.7	1.4	1.35
Uranium-235	4	0.37	0.18	0.2	0.04	0.04
Uranium-235, %	4	4.1	3	3.5	0.3	*b*
Uranium-238	4	1.4	0.9	1.1	0.1	0.18
Total gamma	4	180	–12	44	45	*b*

[a]Units in pCi/L unless otherwise noted.
[b]Not applicable.

Table 4.16. CY 1992 radiological data summary

Y-12 Plant Discharge Point 135 (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity	4	12	–0.84	5.7	2.6	*b*
Americium-241	4	0.18	–0.2	–0.03	0.1	–0.10
Beta activity	4	6.6	–1.1	1.7	1.8	*b*
Neptunium-237	4	0.23	–0.12	0.03	0.1	0.09
Radium-226	4	2.7	–0.22	1.2	0.7	1.24
Radium-228	1	–0.58	–0.58	–0.58	0	–0.58
Strontium-90	4	7.4	0.3	3.1	1.7	0.31
Technetium-99, pCi/mL	4	0	–0.06	–0.02	0.01	–0.00002
Thorium-234	4	2.4	1.5	1.8	0.2	0.02
Total thorium, mg/L	4	<0.003	<0.003	<0.003	0	*b*
Thorium-228	4	1.1	0.42	0.7	0.1	0.17
Thorium-230	4	0.58	0.18	0.3	0.1	0.1
Thorium-232	4	0.07	–0.1	0.01	0.04	0.03
Tritium	4	230	–100	57.5	67.7	0.29
Total uranium, mg/L	4	0.008	0.004	0.006	0.001	*b*
Uranium-234	4	3.9	1.7	3.0	0.5	0.61
Uranium-235	4	0.31	0.11	0.2	0.05	0.04
Uranium-235, %	4	1.7	0.71	1.1	0.2	*b*
Uranium-238	4	2.4	1.5	1.8	0.2	0.3
Total gamma	4	580	9	164	139	*b*

[a]Units in pCi/L unless otherwise noted.
[b]Not applicable.

Table 4.17. CY 1992 radiological data summary

Y-12 Plant Discharge Point 147

Parameter	Number of samples	Concentration[a]			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity	12	52	0	11.1	4.1	*b*
Americium-241	12	0.52	0.01	0.1	0.04	0.49
Beta activity	12	8.7	–9	3.4	1.3	*b*
Neptunium-237	12	0.32	0.03	0.1	0.02	0.35
Radium-226	10	3	–0.86	0.5	0.3	0.50
Radium-228	4	3	–2.4	–0.3	1.2	–0.34
Strontium-90	12	6.9	–2.5	0.9	0.8	0.09
Technetium-99, pCi/mL	12	0.03	0	–0.001	0.009	0.00000
Thorium-234	12	2.7	0.004	1.2	0.3	0.01
Total thorium, mg/L	12	0.007	<0.003	<0.003	0.0003	*b*
Thorium-228	12	2.3	0.31	1.0	0.2	0.25
Thorium-230	12	0.91	0.05	0.32	0.08	0.1
Thorium-232	12	0.22	–0.05	0.07	0.026	0.14
Tritium	12	240	–430	–10.8	48.2	–0.05
Total uranium, mg/L	12	0.008	<0.001	<0.003	0.001	*b*
Uranium-234	12	10	0.13	4.2	0.9	0.84
Uranium-235	12	0.45	0	0.21	0.05	0.03
Uranium-235, %	9	9.5	1.2	2.6	0.9	*b*
Uranium-238	12	2.7	0.004	1.16	0.27	0.2
Total gamma	12	99	–20	21.7	10.9	*b*

[a]Units pCi/L unless otherwise noted.
[b]Not applicable.

Table 4.18. Surface water analytical results of polychlorinated biphenyls monitoring plan for the Oak Ridge Y-12 Plant, CY 1992

Site number	Location	Date sampled	PCB concentration (mg/L)
PCB-1	Outfall 301, Kerr Hollow Quarry (Fig. 5.21, Vol. 1)	3/26/92	<0.0005
		6/17/92	<0.0005
		9/10/92	<0.0005
		12/9/92	<0.0005
PCB-2	Outfall 302, Rogers Quarry (Fig. 4.5, Vol. 1)	3/26/92	<0.0005
		6/17/92	<0.0005
		9/10/92	<0.0005
		12/2/92	<0.0005
PCB-3	Outfall 303, New Hope Pond (Fig. 4.3, Vol. 1)	*a*	
PCB-5	New Hope Pond Inlet (Fig. 4.3, Vol. 1)	*b*	
PCB-6	Upstream of Outfall 135 (Fig. 4.5, Vol. 1)	3/26/92	<0.0005
		6/17/92	<0.0005
		9/10/92	<0.0005
		12/9/92	<0.0005
PCB-7	Outfall 304, Bear Creek (Fig. 4.5, Vol. 1)	3/26/92	<0.0005
		6/17/92	<0.0005
		9/10/92	<0.0005
		12/9/92	<0.0005

[a]This outlet was closed in April 1989.
[b]This inlet was closed in November 1988.

Table 4.19. Y-12 Plant NPDES-permitted outfalls, 1992

Kerr Hollow Quarry—outfall 301
Rogers Quarry—outfall 302
Bear Creek—outfall 304
Category I outfalls—Uncontaminated precipitation runoff and/or groundwater
Category II outfalls—Cooling water, condensate, building area, and foundation drains
Category III outfalls—Outfalls which consisted of Category I or II type wastewaters along with untreated process wastewaters. The untreated process wastewater portion has been removed from these outfalls and has either been eliminated or undergoes treatment prior to discharge
Category IV outfalls—402 – Steam Condensate from the Lithium Process
405 – Sanitary Landfill #2 Sediment Pond
408 – 9202 Catch Basin
Steam Plant fly ash sluice water—outfall 623
Central Pollution Control Facility—outfall 501
West End Treatment Facility—outfall 502
Steam Plant Wastewater Treatment Facility—outfall 503
Plating Rinsewater Treatment Facility—outfall 504
Building 9204-3 Sump Pump Oil Separator—outfall 506
Groundwater Treatment Facility—outfall 512
Miscellaneous discharges (cooling towers, undergo treatment at 503, vapor blasters)

Table 4.20. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 301, Kerr Hollow Quarry (Fig. 5.21, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow[c], gpm	15	300	4	110	*d*	*d*
pH, standard units	15	8.4	7.0	*d*	6.5/8.5[e]	0
Temperature, °C	15	11.7	8.6	10.1	30.5	0
Mercury	15	<0.002	<0.0002	<0.0003	*d*	*d*
Total suspended solids	15	<5	<5	<5	50	0
Selenium	15	<0.002	<0.002	<0.002	*d*	*d*
Arsenic	15	<0.4	<0.04	<0.06	*d*	*d*
Cadmium	15	<0.004	<0.004	<0.004	*d*	*d*
Chromium	15	<0.006	<0.006	<0.006	*d*	*d*
Copper	15	0.012	<0.002	<0.006	*d*	*d*
Iron	15	0.09	<0.06	<0.06	*d*	*d*
Lead	15	<0.020	<0.020	<0.020	*d*	*d*
Lithium	15	0.34	0.04	0.010	5	0
Nickel	15	<0.008	<0.006	<0.008	*d*	*d*
Potassium	15	1.6	1.1	1.3	*d*	*d*
Sodium	15	0.88	0.61	0.73	*d*	*d*
Zinc	15	0.1	<0.01	<0.03	*d*	*d*
Zirconium	15	<0.01	<0.004	<0.004	3	0

[a]Units in mg/L unless otherwise indicated.
[b]NPDES permit limits.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.

Table 4.21. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 302, Rogers Quarry (McCoy Branch)
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Total suspended solids	53	<5	<5	<5	50	0
Chemical oxygen demand (COD)	53	12	<5	<5	*c*	*c*
Sulfate	53	24	16	21	*c*	*c*
Oil and grease	53	9	<2	<2	15	0
Settleable solids, ml/L	53	<0.1	<0.1	<0.1	0.5	0
Selenium	53	0.003	<0.002	<0.002	0.020	0
Mercury	53	<0.0002	<0.0002	<0.0002	0.00015	53[d]
Arsenic	53	<0.4	<0.04	<0.05	*c*	*c*
Cadmium	53	<0.004	<0.004	<0.004	0.004	0
Chromium	53	<0.006	<0.006	<0.006	0.016	0
Copper	53	<0.006	<0.006	<0.006	0.018	0
Iron	53	0.06	<0.06	<0.06	*c*	*c*
Nickel	53	<0.008	<0.008	<0.008	1.400	0
Zinc	53	0.01	<0.003	<0.01	0.117	0
Lead	53	<0.02	<0.02	<0.02	0.082	0
pH,standard units	53	8.6	7.3	*c*	6.5/8.5[e]	0/1
Temperature, °C	53	27.9	8.1	12.8	30.5	0
Turbidity, NTU	53	88	0.08	2.61	*c*	*c*
Flow, Mgd[f]	346	3.500	0.065	0.339	*c*	*c*

[a]Units in mg/L unless otherwise indicated.
[b]NPDES permit limits and/or Tennessee Water Quality criteria.
[c]Not applicable.
[d]The analytical detection limit for this parameter is higher than the reference value.
[e]Minimum value/maximum value.
[f]Flow during operations and/or discharging.

Table 4.22. CY 1992 radiological data summary

Y-12 Plant Discharge Point 302, Rogers Quarry (McCoy Branch)
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	26	15	–3.1	2.5	0.9	*a*
Americium-241 (pCi/L)	25	0.48	–0.28	0.14	0.04	0.47
Beta activity (pCi/L)	28	12	–3.5	1.8	0.8	*a*
Neptunium-237 (pCi/L)	26	0.31	–0.1	0.03	0.02	0.12
Radium-226 (pCi/L)	27	4.1	–0.85	0.6	0.21	0.6
Radium-228 (pCi/L)	18	4.6	–0.91	1.33	0.36	1.33
Strontium-90 (pCi/L)	27	9.5	–19	1.6	0.9	0.2
Technetium-99 (pCi/mL)	22	0.12	–0.025	0.012	0.006	*a*
Thorium, total (mg/L)	28	0.004	0.003	0.003	0.00004	*a*
Thorium-228 (pCi/L)	28	2.7	–0.03	0.995	0.14	0.25
Thorium-230 (pCi/L)	27	1.3	–0.15	0.32	0.07	0.11
Thorium-232 (pCi/L)	28	0.23	–0.07	0.055	0.01	0.11
Tritium (pCi/L)	28	400	–990	121.57	51.78	0.006
Uranium, total (mg/L)	28	0.001	0.001	0.001	0	*a*
Uranium-234 (pCi/L)	28	1.9	0.02	0.42	0.06	0.08
Uranium-235 (pCi/L)	12	0.07	–0.03	0.02	0.01	*a*
Uranium-235 (%)	0	0	0	0	0	*a*
Gamma, total (pCi/L)	27	380	–22	42.1	18.2	*a*

[a]Not applicable.

Table 4.23. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 304, Bear Creek
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Oil and grease	53	15	<1.67	<2.53	15	0
Biochemical oxygen demand	53	72	<1.88	<6.89	*c*	*c*
Chemical oxygen demand	53	37	<5	<7.7	*c*	*c*
Total dissolved solids	53	310	110	205	*c*	*c*
Total suspended solids	53	220	<5	<11	*c*	*c*
Nitrate as N	53	14	1.2	5.9	*c*	*c*
Conductivity, mhos/cm	53	410	100	258	*c*	*c*
Dissolved oxygen	53	15.4	7.2	9.3	3[d]	0
Turbidity, NTU	53	88	0.02	6.21	*c*	*c*
pH, standard units	53	8.2	7.2	*c*	6.5/8.5[d]	0
Flow, Mgd[e]	366	25.20	0.26	2.57	*c*	*c*

[a]Units in mg/L unless otherwise indicated.
[b]NPDES permit limits.
[c]Not applicable.
[d]Minimum value/maximum value.
[e]Flow during operations and/or discharging.

Table 4.24. CY 1992 radiological data summary

Y-12 Plant Discharge Point 304, Bear Creek
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	53	39	-3.9	17.3	1.3	*a*
Beta activity (pCi/L)	53	31	0	15.8	1.1	*a*
Strontium-90 (pCi/L)	53	12	-2.8	1.79	0.39	0.18
Neptunium-237 (pCi/L)	53	2.3	-0.29	0.17	0.05	0.58
Radium-226 (pCi/L)	47	3.8	-0.6	1.03	0.157	1
Radium-228 (pCi/L)	18	2.1	-1.6	0.52	0.26	1
Total uranium (mg/L)	53	0.062	0.009	0.031	0.002	0.006

[a]Not applicable.

Table 4.25. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 307, West Borrow Area

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow, gpd	4	1,080,000	11,429	309,674	*c*	*c*
pH, standard units	4	8.5	8.0	*c*	6.5/8.5[d]	0
Temperature, °C	4	24.8	12.7	17.7	30.5	*c*
Ammonia	4	<0.2	<0.2	<0.2	*c*	*c*
Biochemical oxygen demand	4	<5	<5	<5	*c*	*c*
Chemical oxygen demand	4	16	9	10	*c*	*c*
Color, ACU	4	710	50	253	*c*	*c*
Oil and grease	4	4	<2	<3	*c*	*c*
Total organic carbon	4	11	6.3	7.0	*c*	*c*
Total supended solids	4	490	28	176	*c*	*c*

[a]Units in mg/L unless otherwise indicated.
[b]Tennessee Water Quality criteria.
[c]Not applicable.
[d]Minimum value/maximum value.

Table 4.26. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 308, East Borrow Area

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow, gpd	4	76,082	3,816	23,784	c	c
pH, standard units	4	8.5	7.4	c	6.5/8.5[d]	0
Temperature, °C	4	24.7	12.3	16.9	30.5	0
Ammonia	4	0.3	<0.20	<0.23	c	c
Biochemical oxygen demand	4	6.15	<5	<5.29	c	c
Chemical oxygen demand	4	16	6.8	<12.2	c	c
Color, ACU	4	500	30	<208	c	c
Oil and grease	4	<2	<2	<2	c	c
Total organic carbon	4	8.3	5.0	<6.5	c	c
Total supended solids	4	120	14	<55	c	c

[a]Units in mg/L unless otherwise indicated.
[b]Tennessee Water Quality criteria
[c]Not applicable.
[d]Minimum value/maximum value.

Table 4.27. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 309, Sanitary Landfill IV
Sedimentation Basin (Fig. 5.21, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow, gpd	3	2663	380.95	1394.98	c	c
pH, standard units	3	9.1	7.9	c	6.5/8.5[d]	0/1
Temperature, °C	3	25.0	10.0	17.4	30.5	0
Ammonia	3	1.0	<0.2	<0.5	c	c
Biochemical oxygen demand	3	8.0	<5	<6	c	c
Chemical oxygen demand	3	12	7.5	<10	c	c
Color, ACU	3	21	10	14	c	c
Oil and grease	3	7.6	<2	<4	c	c
Total organic carbon	3	9.4	7.8	8.5	c	c
Total supended solids	3	14	<5	<8	c	c

[a]Units in mg/L unless otherwise noted.
[b]Tennessee Water Quality criteria.
[c]Not applicable.
[d]Minimum value/maximum value.

Table 4.28. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Category I Outfalls

Outfall	Number of samples	pH (standard units)			Min ref. value[a]	No. of values exceeding reference	Max ref. value[a]	No. of values exceeding reference	Flow (gpd)[b]		
		Max	Min	Av					Max	Min	Av
001	1	8.0	8.0	*c*	6.5	0	8.5	0	9,231	9,231	9,231
003	1	7.6	7.6	*c*	6.5	0	8.5	0	125,600	125,600	125,600
006	1	7.8	7.8	*c*	6.5	0	8.5	0	24,829	24,829	24,829
007	1	7.9	7.9	*c*	6.5	0	8.5	0	10,613	10,613	10,613
009	2	7.9	7.9	*c*	6.5	0	8.5	0	13,796	4,565	9,181
011	0	*d*	*d*	*d*	6.5	0	*c*	*c*	*d*	*d*	*d*
012	0	*d*	*d*	*d*	6.5	0	8.5	*c*	*d*	*d*	*d*
015	1	7.9	7.9	*c*	6.5	0	8.5	0	761	761	761
017	1	7.5	7.5	*c*	6.5	0	8.5	0	15,215	15,215	15,215
018	1	8.3	8.3	*c*	6.5	0	8.5	0	3,044	3,044	3,044
019	1	7.4	7.4	*c*	6.5	0	8.5	0	41,850	41,850	41,850
031	0	*d*	*d*	*d*	6.5	0	*c*	0	*d*	*d*	*d*
032	1	7.2	7.2	*c*	6.5	0	8.5	0	6,087	6,087	6,087
041	1	8.2	8.2	*c*	6.5	0	8.5	0	4,565	4,565	4,565
044	1	8.2	8.2	*c*	6.5	0	8.5	0	2,282	2,282	2,282
045	1	8.1	8.1	*c*	6.5	0	8.5	0	190	190	190
057	1	8.0	8.0	*c*	6.5	0	8.5	0	1,141	1,141	1,141
062	0	*d*	*d*	*d*	6.5	0	*c*	*c*	*d*	*d*	*d*
086	2	8.3	8.2	*c*	6.5	0	8.5	0	4,564	1,141	2,853
108	0	*d*	*d*	*d*	6.5	0	*c*	*c*	*d*	*d*	*d*
134	2	8.0	7.7	*c*	6.5	0	8.5	0	570	47	309
156	1	8.4	8.4	*c*	6.5	0	8.5	0	2,282	2,282	2,282
170	1	8.3	8.3	*c*	6.5	0	8.5	0	3,044	3,044	3,044
194	1	7.0	7.0	*c*	6.5	0	8.5	0	2,282	2,282	2,282
195	1	7.4	7.4	*c*	6.5	0	8.5	0	11,413	11,413	11,413
197	0	*d*	*d*	*d*	6.5	0	*c*	*c*	*d*	*d*	*d*
198	0	*d*	*d*	*d*	6.5	0	*c*	*c*	*d*	*d*	*d*
205	1	7.3	7.3	*c*	6.5	0	8.5	0	1,522	1,522	1,522
207	1	7.8	7.8	*c*	6.5	0	8.5	0	6,847	6,847	6,847
221	2	8.0	7.1	*c*	6.5	0	8.5	0	60,872	9,511	35,192
234	2	8.2	8.0	*c*	6.5	0	8.5	0	2,633	1,522	2,078
236	1	8.3	8.3	*c*	6.5	0	8.5	0	4,200	4,200	4,200

[a]NPDES permit limits.
[b]Flow during operations and/or discharging. No reference value for flow rate.
[c]Not applicable.
[d]No flow.

Table 4.29. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Category II Outfalls

Outfall	Number of samples	pH (standard units)			Min ref. value[a]	No. of values exceeding reference	Max ref. value[a]	No. of values exceeding reference	Temperature (°C)[b]			Flow (gpd)[c]		
		Max	Min	Av					Max	Min	Av	Max	Min	Av
013	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*c*	*c*	*d*	*c*	*c*	*c*
016	2	8.2	8.0	*e*	6.5	0	8.5	0	23.9	18.6	21.3	45,653	7,609	26,631
020	3	8.2	6.5	*e*	6.5	0	8.5	0	22.4	9.4	14.3	380	24	161
023	1	8.0	8.0	*e*	6.5	0	8.5	0	35.0	35.0	35.0	290	290	290
025	2	7.8	7.4	*e*	6.5	0	8.5	0	60.0[f]	34.3	47.2	127	47	87
026	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
027	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
028	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
029	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
030	1	7.8	7.8	*e*	6.5	0	8.5	0	23.8	23.8	23.8	2,282	2,282	2,282
035	3	8.3	7.7	*e*	6.5	0	8.5	0	22.3	17.8	19.6	380	47	174
043	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
046	3	8.3	7.8	*e*	6.5	0	8.5	0	41.2	17.9	28.5	1,522	24	896
054	3	8.4	7.7	*e*	6.5	0	8.5	0	24.4	12.8	16.7	951	127	444
058	2	7.8	7.3	*e*	6.5	0	8.5	0	17.7	13.1	15.4	4,565	380	2,473
060	0	*d*	*d*	*e*	*e*	*e*	*e*	0	*d*	*d*	*d*	*d*	*d*	*d*
066	2	8.4	8.3	*e*	6.5	0	8.5	0	28.1	21.1	24.6	95	95	95
068	4	8.2	7.6	*e*	6.5	0	8.5	0	34.3	18.5	26.1	190	95	135
073	3	8.1	7.9	*e*	6.5	0	8.5	0	23.8	13.6	19.8	27,349	47	12,429
075	1	7.7	7.7	*e*	6.5	0	8.5	0	16.1	16.1	16.1	190	190	190
076	1	7.7	7.7	*e*	6.5	0	8.5	0	15.0	15.0	15.0	47	47	47
078	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
080	1	7.8	7.8	*e*	6.5	0	8.5	0	14.4	14.4	14.4	47	47	47
081	1	7.8	7.8	*e*	6.5	0	8.5	0	13.4	13.4	13.4	380	380	380
087	3	7.6	7.2	*e*	6.5	0	8.5	0	23.7	14.8	18.6	4,505	80	1,655
093	1	7.3	7.3	*e*	6.5	0	8.5	0	17.1	17.1	17.1	380	380	380
094	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
095	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
096	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
098	3	8.1	7.3	*e*	6.5	0	8.5	0	29.6	11.9	18.7	3,044	95	1,807
111	4	8.1	7.3	*e*	6.5	0	8.5	0	28.4	16.1	20.9	4,565	380	2,377
112	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
117	3	8.3	7.5	*e*	6.5	0	8.5	0	25.8	18.8	22.1	127	95	116
131	0	*d*	*d*	*e*	*e*	*e*	*e*	*e*	*d*	*d*	*d*	*d*	*d*	*d*
133	5	7.9	6.9	*e*	6.5	0	8.5	0	24.4	18.6	20.8	60,870	127	14,144
137	1	8.3	8.3	*e*	6.5	0	8.5	0	10.8	10.8	10.8	1,522	1,522	1,522
185	2	7.8	7.5	*e*	6.5	0	8.5	0	34.6	32.4	33.5	1,522	1,522	1,522
201	4	7.9	7.7	*e*	6.5	0	8.5	0	24.0	15.8	19.5	13,610	761	4,639
203	4	8.1	7.4	*e*	6.5	0	8.5	0	25.4	10.5	18.0	4,564	761	1,807
204	3	7.9	7.4	*e*	6.5	0	8.5	0	24.9	10.4	17.6	761	380	507
213	4	8.0	6.9	*e*	6.5	0	8.5	0	24.9	13.2	19.5	1,522	380	856
238	4	8.4	7.8	*e*	6.5	0	8.5	0	21.9	13.2	17.0	6,900	761	2,391
239	4	8.4	7.8	*e*	6.5	0	8.5	0	21.9	13.2	17.0	6,900	761	2,391
240	4	8.4	7.8	*e*	6.5	0	8.5	0	21.9	13.2	17.0	6,900	761	2,391
241	4	8.4	7.8	*e*	6.5	0	8.5	0	21.9	13.2	17.0	6,900	761	2,391

[a]NPDES permit limits.
[b]No reference value for temperature.
[c]Flow during operations and/or discharging. No reference value for flow rate.
[d]No flow.
[e]Not applicable.

Table 4.30. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Category III Outfalls

Outfall	Number of samples	pH (standard units)			Min ref. value[a]	No. of values exceeding reference	Max ref. value[a]	No. of values exceeding reference	Temperature (°C)			Ref. value[a]	No. of values exceeding reference	Flow (gpd)b		
		Max	Min	Av					Max	Min	Av			Max	Min	Av
002	4	8.1	7.9	*c*	6.5	0	8.5	0	19.2	10.1	13.9	30.5	0	51,200	31,500	40,648
071	4	8.0	7.7	*c*	6.5	0	8.5	0	19.1	10.6	15.6	30.5	0	76,088	11,413	53,178
135	4	7.9	7.8	*c*	6.5	0	8.5	0	28.7	20.3	25.6	30.5	0	570,312	355,680	428,222
147	4	8.2	7.7	*c*	6.5	0	8.5	0	21.6	11.2	18.1	30.5	0	6,087	761	3,804
150	4	8.0	7.8	*c*	6.5	0	8.5	0	26.6	13.4	22.4	30.5	0	1,215,705	513,331	908,924
157	4	8.0	7.7	*c*	6.5	0	8.5	0	23.1	15.3	20.0	30.5	0	6,087	1,522	3,825
160	4	7.9	7.4	*c*	6.5	0	8.5	0	23.8	18.7	21.9	30.5	0	85,451	39,079	57,541
162	0	*d*	*d*	*c*	*c*	*c*	*c*	*c*	*d*	*d*	*d*	*c*	0	*d*	*d*	*d*
163	4	8.2	7.9	*c*	6.5	0	8.5	0	25.2	20.0	23.0	30.5	0	272,752	41,509	150,771
169	4	8.1	7.7	*c*	6.5	0	8.5	0	24.3	19.1	21.6	30.5	0	241,951	150,898	205,596
181	0	*d*	*d*	*c*	*c*	*c*	*c*	*c*	*d*	*d*	*d*	*c*	0	*d*	*d*	*d*
192	4	8.1	7.3	*c*	6.5	0	8.5	0	22.9	15.2	18.1	30.5	0	4,404	127	1,798

[a]NPDES permit limits.

[b]Flow during operations and/or discharging. No reference value for flow rate.

[c]Not applicable.

[d]No flow.

Table 4.31. CY 1992 NPDES Permit Number TN 0002968
Y-12 Plant Category IV Outfalls[a]

Outfall	Number of samples	pH (standard units)			Minimum reference value[b]	Number of values exceeding reference	Maximum reference value[b]	Number of values exceeding reference
		Max	Min	Av				
401	*c*				*d*	*d*	*d*	*d*
402	24	8.6	6.5	*d*	6.5	1	8.5	1
403	2	8.3	7.5	*d*	6.5	0	8.5	0
404	*c*				*d*	*d*	*d*	*d*
405	31	9.7	7.3	*d*	6.5	4	8.5	4
406	*c*				*d*	*d*	*d*	*d*
407	*c*				*d*	*d*	*d*	*d*
408	50	8.4	6.5	*d*	6.5	0	8.5	*d*
409	*c*				*d*	*d*	*d*	*d*
410	*c*				*d*	*d*	*d*	*d*
411	*c*				*d*	*d*	*d*	*d*
412	*c*				*d*	*d*	*d*	*d*
413	*c*				*d*	*d*	*d*	*d*
414	*c*				*d*	*d*	*d*	*d*
415	*c*				*d*	*d*	*d*	*d*
416	*c*				*d*	*d*	*d*	*d*
417	*c*				*d*	*d*	*d*	*d*
418	*c*				*d*	*d*	*d*	*d*
419	*c*				*d*	*d*	*d*	*d*
420	*c*				*d*	*d*	*d*	*d*
421	*c*				*d*	*d*	*d*	*d*
422	*c*				*d*	*d*	*d*	*d*

[a]Flow during operation and/or discharging.
[b]NPDES permit limits.
[c]No flow.
[d]Not applicable.

Table 4.32. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 501, Central Pollution Control Facility
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow, [c]gpd	23	16,071	6,715	11,150	*d*	*d*
pH, standard	23	8.3	6.7	*d*	6.0/9.0[e]	0
Temperature, °C	23	28.1	18.9	24.0	30.5	0
Cyanide	23	0.011	<0.002	<0.003	1.2	0
Oil and Grease	23	6.1	<2	<2.3	52	0
Phenols	23	0.007	<0.001	<0.003	*d*	*d*
Total toxic organics	23	0.065	<0.010	<0.012	2.13	0
Chloride	23	560	17	105	*d*	*d*
Color, ACU	23	75	<5	<16	*d*	*d*
Fluoride	23	40	0.39	4.03	*d*	*d*
Mercury	23	0.0009	<0.0002	<0.0002	*d*	*d*
Nitrate	23	1,100	<0.1	<77	*d*	*d*
Total suspended solids	23	12	<5	<6	60	0
Sulfate	23	3,200	220	1,823	*d*	*d*
Sufactants, (MBAS)	23	0.10	<0.05	<0.06	*d*	*d*
Aluminum	23	0.6	<0.2	<0.3	*d*	*d*
Beryllium	23	<0.002	<0.002	<0.002	*d*	*d*
Cadmium	23	<0.02	<0.02	<0.02	0.69	0
Chromium	23	<0.03	<0.03	<0.03	2.77	0
Copper	23	<0.03	<0.03	<0.03	3.38	0
Iron	23	3.8	<0.3	<0.9	*d*	*d*
Lead	23	<0.1	<0.1	<0.1	0.69	0
Nickel	23	0.40	<0.04	<0.15	3.98	0
Phosphorus	23	0.6	<0.2	<0.3	*d*	*d*
Silver	23	<0.03	<0.03	<0.03	0.43	0
Sodium	23	269	30.1	101	*d*	*d*
Zinc	23	0.09	<0.02	<0.06	2.61	0

[a]Units in mg/L unless otherwise noted.
[b]NPDES permit limits.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.

Table 4.33. CY 1992 radiological data summary

Y-12 Plant Discharge Point 501, Central Pollution Control Facility
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	20	170	–64	34.6	14.5	*a*
Americium-241 (pCi/L)	19	0.63	–0.54	0.11	0.05	0.36
Beta Activity (pCi/L)	20	1,300	–62	189	79.3	*a*
Neptunium-237 (pCi/L)	19	0.93	–0.17	0.11	0.06	0.37
Radium-226 (pCi/L)	18	4.3	–0.27	1.14	0.27	1.14
Radium-228 (pCi/L)	7	1.5	–0.88	0.67	0.3	0.67
Strontium-90 (pCi/L)	19	120	–100	12	10	1.15
Technetium-99 (pCi/L)	19	1	–0.04	0.17	0.07	0.0002
Thorium-234 (pCi/L)	20	77	–0.01	11.74	4.55	0.12
Thorium, total (mg/L)	20	0.012	<0.003	<0.003	0.0005	*a*
Thorium-228 (pCi/L)	20	5.1	–0.08	1.26	0.25	0.31
Thorium-230 (pCi/L)	20	1.9	–0.02	0.34	0.1	0.11
Thorium-232 (pCi/L)	20	0.94	–0.13	0.13	0.05	0.26
Tritium (pCi/L)	20	4,200	–360	346	208	0.017
Uranium, total (mg/L)	20	0.23	0.002	0.037	0.014	*a*
Uranium-234 (pCi/L)	20	39	0.58	6.68	2	1.34
Uranium-235 (pCi/L)	19	2.1	0	0.4	0.1	*a*
Uranium-235 (%)	20	0.6	0.32	0.48	0.02	*a*
Uranium-238 (pCi/L)	20	77	0	12	5	1.99
Gamma, total (pCi/L)	20	588	–13	74	29	*a*

[a]Not applicable.

Table 4.34. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 502, West End Treatment Facility
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow[c], gpd	54	37,730	5,770	24,746	*d*	*d*
pH, standard units	54	9.0	6.7	*d*	6.0/9.0[e]	0
Temperature, °C	54	28.5	11.1	22.0	30.5	0
Residual chlorine	54	0.09	<0.01	<0.04	*d*	*d*
Cyanide	54	0.003	<0.002	<0.002	1.2	0
Oil and grease	54	23.76	<2	<3.05	52	0
Total toxic organics	19	<0.01	<0.01	<0.01	2.13	0
Chloride	54	810	200	570	*d*	*d*
Fluoride	54	13	<2.4	<4.7	*d*	*d*
Mercury	54	0.0006	<0.0002	<0.0002	*d*	*d*
Nitrate	54	97	0.1	24.58	*d*	*d*
Total suspended solids	54	63	<5	<9	60	1
Sulfate	54	12,000	5,700	7,811	*d*	*d*
Aluminum	54	0.9	<0.2	<0.4	*d*	*d*
Arsenic	54	0.2	<0.2	<0.2	*d*	*d*
Barium	54	0.106	0.010	0.031	*d*	*d*
Beryllium	54	<0.002	<0.002	<0.002	*d*	*d*
Calcium	54	66.7	<13	<20.1	*d*	*d*
Cadmium	54	<0.06	<0.02	<0.02	0.69	0
Chromium	54	0.18	<0.03	<0.03	2.77	0
Cobalt	54	0.07	<0.01	<0.02	*d*	*d*
Copper	54	0.35	<0.03	<0.06	3.38	0
Iron	54	1.7	<0.1	<0.3	*d*	*d*
Lead	54	<0.1	<0.1	<0.1	0.69	0
Magnesium	54	38.9	<14.3	<27.9	*d*	*d*
Manganese	54	0.486	<0.009	<0.036	*d*	*d*
Molybdenum	54	0.14	<0.03	<0.06	*d*	*d*
Nickel	54	3.12	0.07	0.69	3.98	0
Phosphorus	54	11.3	<0.2	<4.7	*d*	*d*
Potassium	54	201	124	161	*d*	*d*
Silver	54	<0.03	<0.03	<0.03	0.43	0
Sodium	54	4,850	3,180	3,882	*d*	*d*
Zinc	54	0.26	<0.05	<0.09	2.61	0

[a]Units in mg/L unless otherwise noted.
[b]NPDES permit limits.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.

Table 4.35. CY 1992 radiological data summary

Y-12 Plant Discharge Point 502, West End Treatment Facility
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	20	280	–35	66	16	*a*
Americium-241 (pCi/L)	19	0.62	–0.19	0.05	0.04	0.16
Beta activity (pCi/L)	20	470	19	181	23	*a*
Neptunium-237 (pCi/L)	20	0.18	–0.53	–0.04	0.05	–0.14
Radium-226 (pCi/L)	20	4.6	–0.32	1.83	0.33	1.83
Radium-228 (pCi/L)	3	3.6	0.7	1.9	0.9	1.9
Strontium-90 (pCi/L)	20	93	–67	17	10	1.7
Technetium-99 (pCi/L)	20	0.24	–0.16	0.10	0.03	0.0001
Thorium-234 (pCi/L)	20	5.8	0.22	1.35	0.34	0.01
Thorium, total (mg/L)	20	0.006	<0.003	<0.004	0.0002	*a*
Thorium-228 (pCi/L)	20	7.9	0.3	1.4	0.4	0.36
Thorium-230 (pCi/L)	20	2.9	0.02	0.43	0.14	0.14
Thorium-232 (pCi/L)	20	1.5	–0.04	0.12	0.07	0.24
Tritium (pCi/L)	20	8200	510	1952	517	0.1
Uranium, total (mg/L)	19	0.016	0.001	0.003	0.0008	*a*
Uranium-234 (pCi/L)	20	6.4	–0.05	1.24	0.37	0.25
Uranium-235 (pCi/L)	20	0.14	–0.05	0.04	0.01	0.01
Uranium-235 (%)	14	0.52	0.26	0.40	0.02	*a*
Uranium-238 (pCi/L)	20	5.8	0.22	1.35	0.34	0.22
Gamma, total (pCi/L)	20	420	15	78	20	*a*

[a]Not applicable.

Table 4.36. CY 1992 NPDES Permit Number TN 0002986

Y-12 Plant Discharge Point 503, Steam Plant Wastewater Treatment Facility (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow[c], gdp	366	317,100	9,100	121,966	*d*	*d*
pH, standard units	158	8.5	6.3	*d*	6.0/9.0[e]	0
Temperature	158	30.5	1.7	21.4	30.5	0
Oil and grease	157	50.2	1.6	<2.7	20	1
Phenols	157	0.015	0.001	<0.002	*d*	*d*
Chloride	158	720	<31	<276	*d*	*d*
Fluoride	158	5.6	0.4	3.0	*d*	*d*
Mercury	158	0.0006	<0.00002	<0.0002	*d*	*d*
Total suspended solids	158	15	<5	<5.2	100	0
Selenium	158	0.008	<0.002	<0.002	*d*	*d*
Sulfate	158	3,600	<14	<1,235	*d*	*d*
Sulfide	158	1.0	<0.1	<1.0	*d*	*d*
Aluminum	158	2.9	<0.05	<0.4	*d*	*d*
Arsenic	158	<0.4	<0.04	<0.2	*d*	*d*
Barium	158	0.163	<0.032	<0.0904	*d*	*d*
Beryllium	158	<0.002	<0.0004	<0.002	*d*	*d*
Boron	158	0.22	<0.024	<0.05	*d*	*d*
Cadmium	158	<0.02	<0.004	<0.02	*d*	*d*
Calcium	158	782	<151	<447	*d*	*d*
Cerium	158	0.09	<0.02	<0.08	*d*	*d*
Chromium	158	0.05	<0.01	<0.03	0.2	0
Cobalt	158	0.01	<0.002	<0.01	*d*	*d*
Copper	158	<0.03	<0.006	<0.03	1.0	0
Gallium	158	0.10	<0.02	<0.09	*d*	*d*
Iron	158	1.6	<0.1	<0.4	1.0	4
Lead	158	<0.1	<0.02	<0.1	*d*	*d*
Lithium	158	2.89	<0.04	<0.16	*d*	*d*
Magnesium	158	29.8	<0.4	<7.5	*d*	*d*
Manganese	158	0.03	<0.003	<0.01	*d*	*d*
Molybdenum	158	<0.03	<0.01	<0.03	*d*	*d*
Nickel	158	<0.04	<0.01	<0.04	*d*	*d*
Niobium	158	<0.05	<0.01	<0.05	*d*	*d*
Phosphorus	158	0.9	<0.2	<0.2	*d*	*d*
Potassium	158	12	<2.5	<7	*d*	*d*
Scandium	89	0.02	<0.0004	<0.0022	*d*	*d*
Silver	158	<0.03	<0.01	<0.03	*d*	*d*
Sodium	158	654	70.1	246.8	*d*	*d*
Strontium	158	0.833	0.189	0.488	*d*	*d*
Throrium	158	0.07	<0.01	<0.05	*d*	*d*
Titanium	158	<0.06	<0.01	<0.06	*d*	*d*
Vanadium	158	<0.06	<0.004	<0.02	*d*	*d*
Zinc	158	0.07	<0.02	<0.05	1.0	0
Zirconium	158	<0.05	<0.004	<0.02	*d*	*d*

[a]Units in mg/L unless otherwise noted.
[b]NPDES permit limits.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.

Table 4.37. CY 1992 radiological data summary

Y-12 Plant Discharge Point 503, Steam Plant Wastewater Treatment Facility (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	59	200	-100	13	7	*a*
Americium-241 (pCi/L)	57	0.51	-0.16	0.09	0.02	0.32
Beta Activity (pCi/L)	57	160	-49	15.1	4.6	*a*
Neptunium-237 (pCi/L)	56	0.61	-0.31	0.05	0.02	0.17
Radium-226 (pCi/L)	54	4.3	-0.65	0.92	0.14	0.92
Radium-228 (pCi/L)	18	9	-1.9	0.26	0.57	0.26
Strontium-90 (pCi/L)	59	260	-59	19.44	7.18	1.94
Technetium-99 (pCi/mL)	50	0.12	-0.16	0.002	0.01	0.000002
Thorium-234 (pCi/L)	57	6.4	-0.004	0.272	0.111	0.003
Thorium, total (mg/L)	59	0.01	<0.003	<0.003	0.0002	*a*
Thorium-228 (pCi/L)	59	7.9	-0.13	1.18	0.15	0.29
Thorium-230 (pCi/L)	59	3.3	0	0.34	0.08	0.11
Thorium-232 (pCi/L)	58	1.5	-0.05	0.10	0.03	0.20
Tritium (pCi/L)	59	3200	-740	264	63	0.01
Uranium, total (mg/L)	56	0.001	0.001	0.001	0	*a*
Uranium-234 (pCi/L)	58	24	-0.02	0.97	0.47	0.19
Uranium-235 (pCi/L)	58	1.5	-0.05	0.07	0.03	0.01
Uranium-235 (%)	1	0.29	0.29	0.29	0	*a*
Uranium-238 (pCi/L)	57	6.4	-0.004	0.272	0.111	0.045
Gamma, total (pCi/L)	59	770	-27	73	21	*a*

[a]Not applicable.

Table 4.38. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 504, Plating Rinsewater Facilities
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow[c], gpd	15	21,005	10,473	16,607	*d*	*d*
pH, standard units	15	8.4	6.6	*d*	6.0/9.0[e]	0
Temperature, °C	15	28.3	20.1	24.9	30.5	0
Cyanide	15	0.044	<0.002	<0.005	1.2	0
Oil and Grease	15	2.75	<2	<2.10	52.0	0
Total toxic organics	15	0.011	<0.010	<0.010	2.13	0
Chloride	15	230	7.3	30.9	*d*	*d*
Fluoride	15	2.6	0.5	1.4	*d*	*d*
Mercury	15	0.0004	<0.0002	<0.0002	*d*	*d*
Nitrate	15	25	0.50	4.90	*d*	*d*
Total suspended solids	15	<5	<5	<5	60.0	0
Sulfate	15	1,000	<46	<303	*d*	*d*
Aluminum	15	0.7	<0.2	<0.3	*d*	*d*
Beryllium	15	<0.002	<0.002	<0.002	*d*	*d*
Cadmium	15	<0.02	<0.02	<0.02	0.69	0
Chromium	15	<0.03	<0.03	<0.03	2.77	0
Copper	15	<0.03	<0.03	<0.03	3.38	0
Iron	15	4.1	<0.3	<0.7	*d*	*d*
Lead	15	<0.1	<0.1	<0.1	0.69	0
Nickel	15	0.84	<0.04	<0.22	3.98	0
Phosphorus	15	0.5	<0.2	<0.2	*d*	*d*
Potassium	15	177	<2.5	<19.8	*d*	*d*
Silver	15	<0.03	<0.03	<0.03	0.43	0
Sodium	15	76.1	10.6	25.3	*d*	*d*
Zinc	15	0.12	<0.05	<0.06	2.61	*d*

[a]Units in mg/L unless otherwise noted.
[b]NPDES permit limits.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.

Table 4.39. CY 1992 radiological data summary

Y-12 Plant Discharge Point 504, Plating Rinsewater Treatment Facilities (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	15	48	–1.3	11.4	3.7	*a*
Americium-241 (pCi/L)	15	0.32	–0.13	0.11	0.04	0.37
Beta Activity (pCi/L)	15	150	0.01	24.2	10.24	*a*
Neptunium-237 (pCi/L)	14	1.6	–0.19	0.19	0.12	0.63
Radium-226 (pCi/L)	14	4.1	–0.46	0.78	0.34	0.78
Radium-228 (pCi/L)	5	3.7	–1.5	0.75	1.1	0.75
Strontium-90 (pCi/L)	15	85	–63	9.5	9.0	0.9
Technetium-99 (pCi/mL)	12	0.16	–0.01	0.03	0.01	0.00003
Thorium-234 (pCi/L)	15	30	0.63	3.89	1.91	0.04
Thorium, total (mg/L)	15	0.004	<0.003	<0.003	0.0001	*a*
Thorium-228 (pCi/L)	14	2.1	0.06	0.95	0.16	0.24
Thorium-230 (pCi/L)	15	0.54	–0.005	0.178	0.044	0.059
Thorium-232 (pCi/L)	15	0.14	–0.04	0.06	0.01	0.12
Tritium (pCi/L)	15	12,000	–380	888	796	0.04
Uranium, total (mg/L)	15	0.079	0.001	0.01	0.005	*a*
Uranium-234 (pCi/L)	15	12	0.23	2.40	0.76	0.48
Uranium-235 (pCi/L)	15	0.75	–0.01	0.15	0.05	0.03
Uranium-235 (%)	14	0.64	0.38	0.51	0.02	*a*
Uranium-238 (pCi/L)	15	30	0.63	3.89	1.91	0.65
Gamma, total (pci/L)	15	6.2	0.71	22.3	5.3	*a*

[a]Not applicable.

Table 4.40. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 501/504, Central Pollution Control Facility/Plating Rinsewater Treatment Facility[a] (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[b]			Reference value[c]	Number of values exceeding reference
		Max	Min	Av		
Flow[d], gpd	8	39,311	13,236	26,157	*e*	*e*
pH, standard units	8	8.5	7.1	*e*	6.0/9.0[f]	0/*e*
Temperature, °C	8	24.1	16.8	20.7	30.5	0
Cyanide	8	0.019	<0.002	<0.004	1.2	0
Oil and grease	8	5	<2	<3	52	0
Phenols	8	0.016	<0.001	<0.004	*e*	*e*
Total toxic organics	8	<0.010	<0.010	<0.010	2.13	0
Chloride	8	95	15	33	*e*	*e*
Color, ACU	8	25	5	10	*e*	*e*
Fluoride	8	4.40	0.72	2.11	*e*	*e*
Mercury	8	<0.0002	<0.0002	<0.0002	*e*	*e*
Nitrate	8	50	0.76	13.72	*e*	*e*
Total suspended solids	8	5	<5	<5	60	0
Sulfates	8	1,600	470	1,030	*e*	*e*
Surfactants as MBAS	8	0.12	<0.05	<0.06	*e*	*e*
Aluminum	8	0.4	<0.2	<0.3	*e*	*e*
Beryllium	8	<0.002	<0.002	<0.002	*e*	*e*
Cadminum	8	<0.02	<0.02	<0.02	0.69	0
Chromium	8	<0.03	<0.03	<0.03	2.77	0
Copper	8	<0.03	<0.03	<0.03	3.38	0
Iron	8	2.2	<0.3	<0.6	*e*	*e*
Lead	8	<0.1	<0.1	<0.1	0.69	0
Nickel	8	0.79	<0.04	<0.29	3.98	0
Phosphorus	8	0.4	<0.2	<0.2	*e*	*e*
Potassium	8	930	26	267	*e*	*e*
Silver	8	<0.03	<0.03	<0.03	0.43	0
Sodium	8	113	21.9	54.0	*e*	*e*
Zinc	8	0.06	<0.05	<0.05	2.61	0

[a]Combined discharge.
[b]Units in mg/L unless otherwise noted.
[c]NPDES permit limits.
[d]Flow during operations and/or discharging.
[e]Not applicable.
[f]Minimum value/maximum value.

Table 4.41. CY 1992 Y-12 Plant annual radiological data summary

Discharge Point 501/504, Central Pollution Control Facility/Plating Rinsewater Treatment Facility[a] (Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	7	32	7.4	20.5	2.8	*b*
Americium-241 (pCi/L)	7	0.54	–0.11	0.17	0.08	0.58
Beta activity (pCi/L)	7	790	21	167	106	*b*
Neptunium-237 (pCi/L)	7	0.14	–0.25	0.03	0.05	0.11
Radium-226 (pCi/L)	6	1.6	–1.1	0.64	0.48	0.64
Radium-228 (pCi/L)	3	1.9	0.52	1	0.45	1
Strontium-90, (pCi/L)	7	20	–65	–9.34	10.28	–0.93
Technetium-99, (pCi/mL)	7	0.74	–0.041	0.161	0.103	0.0002
Thorium-234 (pCi/L)	7	34	1	9.66	4.49	1.93
Throium, total	7	<0.005	<0.003	<0.003	0.0003	*b*
Thorium-228 (pCi/L)	7	1.9	0.06	0.75	0.24	0.19
Thorium-230 (pCi/L)	7	1.3	0.15	0.43	0.16	0.14
Thorium-232 (pCi/L)	7	0.09	0.008	0.05	0.01	0.10
Tritium (pCi/L)	7	590	–360	5	118	0.0003
Uranium, total (mg/L)	8	0.103	<0.001	<0.026	0.013	*b*
Uranium-235,%	7	0.57	0.35	0.44	0.03	*b*
Uranium-234 (pCi/L)	7	14	1.2	4.93	1.72	0.99
Uranium-235 (pCi/L)	6	0.57	0.33	0.45	0.03	0.07
Uranium-238 (pCi/L)	7	34	1	9.66	4.49	1.61
Gamma, total (pCi/L)	7	130	–26	40.3	19.4	*b*

[a]Combined discharge.
[b]Not applicable.

Table 4.42. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 506, Building 9204-3 Sump Pump Oil Separator

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
Flow, gpm[b]	53	50	50	50	*c*	*c*
pH, standard units	53	9.2	6.7	*c*	6.5/8.5[d]	0/1
Temperature, °C	53	28.0	17.4	22.3	30.5	0
Oil and grease, mg/L	53	9.1	<2	<2.37	15	0

[a]NPDES permit limits.
[b]Flow during operations and/or discharging.
[c]Not applicable.
[d]Minimum value/maximum value.

Table 4.43. CY 1992 NPDES Permit Number TN 0002968

Discharge Point 512, Y-12 Plant, Groundwater Treatment Facility
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Flow[c], gpd	47	26,940	4,370	15,200	*d*	*d*
pH, standard units	47	8.3	7.2	*d*	6.0/9.0[e]	0
Temperature, °C	37	26.7	18.3	21.2	30.5	*d*
Oil and grease	37	4.2	<2	<2.2	15	0
Aluminum	37	0.2	<0.04	<0.1	*d*	*d*
Arsenic	37	<0.2	<0.04	<0.1	*d*	*d*
Barium	37	0.260	0.072	0.116	*d*	*d*
Beryllium	37	<0.002	<0.0004	<0.001	*d*	*d*
Boron	37	50.4	2.38	21.8	*d*	*d*
Cadmium	37	<0.02	<0.004	<0.01	*d*	*d*
Calcium	37	103	47.0	76.3	*d*	*d*
Cerium	37	<0.08	<0.02	<0.05	*d*	*d*
Chromium	37	<0.03	<0.01	<0.02	*d*	*d*
Cobalt	37	<0.01	<0.002	<0.01	*d*	*d*
Copper	37	0.03	<0.01	<0.02	*d*	*d*
Gallium	37	<0.09	<0.02	<0.06	*d*	*d*
Iron	37	0.3	<0.06	<0.2	1.0	0
Lead	37	<0.1	<0.02	<0.06	*d*	*d*
Lithium	37	12.0	0.2	5.2	*d*	*d*
Magnesium	37	20.3	8.22	13.2	*d*	*d*
Manganese	37	2.57	0.017	0.28	*d*	*d*
Molybdenum	37	0.03	<0.01	<0.02	*d*	*d*
Nickel	37	0.05	<0.01	<0.03	*d*	*d*
Niobium	37	<0.05	<0.01	<0.03	*d*	*d*
Phosphorus	37	<0.2	<0.05	<0.13	*d*	*d*
Potassium	37	15.8	5	8.8	*d*	*d*
Scandium	9	<0.002	<0.0004	<0.0008	*d*	*d*
Silver	37	<0.03	<0.01	<0.02	*d*	*d*
Sodium	36	25.8	9.3	16.0	*d*	*d*
Strontium	37	0.351	0.123	0.230	*d*	*d*
Thorium	37	<0.05	<0.01	<0.03	*d*	*d*
Titanium	37	<0.06	<0.01	<0.04	*d*	*d*
Vanadium	37	<0.02	<0.004	<0.012	*d*	*d*
Zinc	37	0.05	<0.01	<0.03	*d*	*d*
Zirconium	37	<0.02	<0.004	<0.012	*d*	*d*
PCB	36	0.24	<0.0005	<0.0072	0.0005[f]	1
Methylene chloride	37	<0.010	<0.010	<0.010	*d*	*d*
Tetrachloroethylene	37	<0.010	<0.010	<0.010	*d*	*d*
Trichlorethylene	37	<0.010	<0.010	<0.010	*d*	*d*

[a]Units in mg/L unless otherwise noted.
[b]NPDES permit limits.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.
[f]The analytical detection limit is used as the reference value.

Table 4.44. CY 1992 radiological data summary

Discharge Point 512, Y-12 Plant, Groundwater Treatment Facility
(Fig. 4.5, Vol. 1)

Parameter	Number of samples	Concentration			Standard error	Percentage of DCG
		Max	Min	Av		
Alpha activity (pCi/L)	6	380	37	198	57	*a*
Americium-241 (pCi/L)	6	0.33	–0.38	0.02	0.10	0.005
Beta activity (pCi/L)	6	110	15	60	15	*a*
Neptunium-237 (pCi/L)	6	0.22	–0.14	0.05	0.05	0.15
Radium-226 (pCi/L)	6	0.65	–0.68	–0.11	0.23	–0.11
Radium-228 (pCi/L)	5	2	–0.27	0.56	0.40	0.56
Strontium-90 (pCi/L)	6	14	–15	1	5	0.12
Technetium-99 (pCi/mL)	6	0.067	0.013	0.03	0.01	0.00003
Thorium-234 (pCi/L)	6	350	16	150	50	1
Thorium, total (mg/L)	6	0.003	<0.003	<0.003	0	*a*
Thorium-228 (pCi/L)	6	0.31	–0.01	0.15	0.05	0.04
Thorium-230 (pCi/L)	6	0.74	0.06	0.27	0.11	0.09
Thorium-232 (pCi/L)	6	0.17	–0.02	0.08	0.03	0.15
Tritium (pCi/L)	6	4,200	–110	1,678	722	0.08
Uranium, total (mg/L)	6	0.933	0.051	0.448	0.141	*a*
Uranium-234 (pCi/L)	6	53	9.9	32	6	6.3
Uranium-235 (pCi/L)	6	4.7	0.28	2.5	0.6	0.4
Uranium-235 (%)	6	0.43	0.2	0.28	0.04	*a*
Uranium-238 (pCi/L)	6	350	16	150	50	25
Gamma, total (pCi/L)	6	200	6	53	30	*a*

[a]Not applicable.

Table 4.45. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Cooling Towers

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
		Discharge point 602				
Temperature, °C	4	27.3	21.2	23.7	30.5	0
pH, standard units	4	8.3	8.1	*c*	6.5–8.5[d]	0
Free chlorine	4	0.14	0.01	0.05	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.008	<0.017	1	0
Zinc	4	0.05	0.02	0.04	1	0
Flow, gpd[e]	4	17,844	13,269	15,402	*c*	*c*
		Discharge point 604				
Temperature, °C	4	22.2	13.9	18.4	30.5	0
pH, standard units	4	8.3	8.0	*c*	6.5–8.5[d]	0
Free chlorine	4	0.08	<0.01	<0.03	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.006	<0.013	1	0
Zinc	4	0.26	0.04	0.16	1	0
Flow, gpd[e]	4	27,511	14,799	19,342	*c*	*c*
		Discharge point 606 (out of service)				
Temperature, °C	0					
pH, standard units	0					
Free chlorine	0					
Chromium	0					
Copper	0					
Zinc	0					
Flow, gpd[e]	0					
		Discharge point 610				
Temperature, °C	4	33.3	25.7	28.6	30.5	1
pH, standard units	4	8.4	7.8	*c*	6.5–8.5[d]	0
Free chlorine	4	0.15	0.01	0.05	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.006	<0.021	1	0
Zinc	4	0.15	<0.03	<0.07	1	0
Flow, gpd[e]	4	18,736	11,500	14,459	*c*	*c*
		Discharge point 612				
Temperature, °C	4	23.7	21.2	22.8	30.5	0
pH, standard units	3	8.2	8.0	*c*	6.5–8.5[d]	0
Free chlorine	3	0.04	0.01	0.03	0.5	0
Chromium	3	<0.03	<0.006	<0.014	1	0
Copper	3	0.03	<0.017	<0.025	1	0
Zinc	3	0.12	0.1	0.11	1	0
Flow, gpd[e]	3	6,727	3,737	4,983	*c*	*c*

Table 4.45 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge point 613						
Temperature, °C	4	28.7	25.3	27.0	30.5	0
pH, standard units	4	8.4	8.0	*c*	6.5–8.5[d]	0
Free chlorine	4	0.21	0.03	0.09	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.010	<0.018	1	0
Zinc	4	0.07	0.03	0.05	1	0
Flow, gpd[e]	4	77,363	32,730	46,702	*c*	*c*
Discharge point 615						
Temperature, °C	4	28.8	8.5	20.5	30.5	0
pH, standard units	4	8.3	7.8	*c*	6.5–8.5[d]	0
Free chlorine	4	0.04	0.01	0.02	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.119	0.097	0.111	1	0
Zinc	4	0.74	0.45	0.53	1	0
Flow, gpd[e]	4	2,656	1,707	2,138	*c*	*c*
Discharge point 616 (torn down)						
Temperature, °C	0					
pH, standard units	0					
Free chlorine	0					
Chromium	0					
Copper	0					
Zinc	0					
Flow, gpd[e]	0					
Discharge point 617						
Temperature, °C	4	26.2	19.6	22.9	30.5	0
pH, standard units	4	8.4	7.8	*c*	6.5–8.5[d]	0
Free chlorine	4	0.03	0.01	0.02	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.017	<0.022	1	0
Zinc	4	1.04	0.04	0.36	1	0
Flow, gpd[e]	4	22,218	5,290	13,027	*c*	*c*
Discharge point 618						
Temperature, °C	4	27.3	23.5	25.7	30.5	0
pH, standard units	4	8.7	7.9	*c*	6.5–8.5[d]	0–1
Free chlorine	4	0.09	0.01	0.05	0.5	0
Chromium	4	0.03	<0.006	<0.013	1	0
Copper	4	0.079	0.016	0.042	1	0
Zinc	4	0.1	0.05	0.07	1	0
Flow, gpd[e]	4	11,214	5,607	8,034	*c*	*c*

Table 4.45 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge point 619						
Temperature, °C	3	23.3	6.6	17.4	30.5	0
pH, standard units	3	8.2	7.5	*c*	6.5–8.5[d]	0
Free chlorine	3	0.06	0.02	0.04	0.5	0
Chromium	3	0.03	<0.006	<0.015	1	0
Copper	3	0.074	<0.03	<0.049	1	0
Zinc	3	0.36	0.10	0.19	1	0
Flow, gpd[e]	3	14,785	7,666	10,934	*c*	*c*
Discharge point 620						
Temperature, °C	4	27.4	17.7	22.7	30.5	0
pH, standard units	4	8.4	7.9	*c*	6.5–8.5[d]	0
Free chlorine	4	0.09	0.01	0.04	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.04	0.022	0.033	1	0
Zinc	4	0.28	0.24	0.27	1	0
Flow, gpd[e]	4	2,464	663	1,337	*c*	*c*
Discharge point 622						
Temperature, °C	4	30.1	28.6	29.2	30.5	0
pH, standard units	4	8.3	8.1	*c*	6.5–8.5[d]	0
Free chlorine	4	0.07	0.03	0.04	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.007	<0.014	1	0
Zinc	4	0.05	0.03	0.04	1	0
Flow, gpd[e]	4	45,682	23,000	34,175	*c*	*c*
Discharge point 624 (combined with 622)						
Temperature, °C	0					
pH, standard units	0					
Free chlorine	0					
Chromium	0					
Copper	0					
Zinc	0					
Flow, gpd[e]	0					
Discharge point 626						
Temperature, °C	4	26.7	15.4	21.6	30.5	0
pH, standard units	4	8.5	8.0	*c*	6.5–8.5[d]	0
Free chlorine	4	0.05	0.03	0.04	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.008	<0.018	1	0
Zinc	4	0.05	0.03	0.04	1	0
Flow, gpd[e]	4	2,974	718	1,613	*c*	*c*

Table 4.45 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge point 628						
Temperature, °C	2	30.0	23.8	26.9	30.5	0
pH, standard units	2	7.9	7.8	c	6.5–8.5[d]	0
Free chlorine	2	0.06	0.02	0.04	0.5	0
Chromium	2	0.03	<0.016	<0.023	1	0
Copper	2	0.05	0.037	0.044	1	0
Zinc	2	0.24	0.11	0.18	1	0
Flow, gpd[e]	2	12,420	10,781	11,601	c	c
Discharge point 630						
Temperature, °C	4	28.9	18.6	23.2	30.5	0
pH, standard units	4	8.0	7.4	c	6.5–8.5[d]	0
Free chlorine	4	0.09	0.02	0.04	0.5	0
Chromium	4	0.03	<0.006	<0.013	1	0
Copper	4	0.108	0.035	0.081	1	0
Zinc	4	0.44	0.08	0.18	1	0
Flow, gpd[e]	4	3,806	2,208	2,907	c	c
Discharge point 632						
Temperature, °C	3	24.5	20.0	22.6	30.5	0
pH, standard units	3	8.3	8.2	c	6.5–8.5[d]	0
Free chlorine	3	0.06	0.02	0.04	0.5	0
Chromium	3	<0.006	<0.006	<0.006	1	0
Copper	3	0.057	0.022	0.036	1	0
Zinc	3	0.04	0.03	0.03	1	0
Flow, gpd[e]	3	9,857	5,750	7,256	c	c
Discharge point 633 (out of service)						
Temperature, °C	0					
pH, standard units	0					
Free chlorine	0					
Chromium	0					
Copper	0					
Zinc	0					
Flow, gpd[e]	0					
Discharge point 634						
Temperature, °C	4	28.9	19.3	25.0	30.5	0
pH, standard units	4	8.4	7.8	c	6.5–8.5[d]	0
Free chlorine	4	0.11	0.01	0.05	0.5	0
Chromium	4	<0.03	<0.006	<0.012	1	0
Copper	4	0.03	<0.010	<0.020	1	0
Zinc	4	0.13	0.1	0.12	1	0
Flow, gpd[e]	4	15,180	2,919	7,687	c	c

[a]Units in mg/L unless otherwise noted.
[b]NPDES permits limits.
[c]Not applicable.
[d]Minimum value\maximum value.
[e]Flow during operations and/or discharging.

Table 4.46. CY 1992 NPDES Permit Number TN 0002968

Y-12 Plant Discharge Point 623, Flyash Sluice

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
pH, standard units	15	8.5	7.5	*b*	6.5–8.5[c]	0
Flow, gpd[d]	48	528,000	22,000	97,625	*b*	*b*

[a]NPDES permit limits.
[b]Not applicable.
[c]Minimum value/maximum value.
[d]Flow during operations and/or discharging.

Table 4.47. CY 1992 Y-12 Plant data summary for outfalls not specifically enumerated on the NPDES permit

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point 4				
Flow[c], gpd	4	13,696	3,804	6,848	*d*	*d*
pH, standard units	4	8.2	7.1	*d*	6.5–8.5[e]	0
Temperature, °C	4	22	9.5	15.2	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	6.2	5	5.4	*d*	*d*
Total organic carbon	4	44	14	28	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
		Discharge Point 8				
Flow[c], gpd	4	7,609	1,522	3,519	*d*	*d*
pH, standard units	4	8.2	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	4	24.5	7.3	18.1	30.5	0
Ammonia	4	0.9	<0.2	<0.4	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	11	5	7.8	*d*	*d*
Total organic carbon	4	18	4.4	10.6	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
		Discharge Point 10				
Flow[c], gpd	4	9,131	3,044	6,094	*d*	*d*
pH, standard units	4	8.2	7.9	*d*	6.5–8.5[e]	0
Temperature, °C	4	25.6	21.2	24.1	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	6.9	<5	<5	*d*	*d*
Total organic carbon	4	21	10	15	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
		Discharge Point 14				
Flow[c], gpd	4	22,827	6,112	11,990	*d*	*d*
pH, standard units	4	8.3	7.4	*d*	6.5–8.5[e]	0
Temperature, °C	4	22	17.2	20.0	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	<5	<5	<5	*d*	*d*
Total organic carbon	4	26	11	19	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
		Discharge Point 21				
Flow[c], gpd	4	355,588	86,400	221,709	*d*	*d*
pH, standard units	4	8.2	7.4	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.3	17.2	19.9	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	7.4	<5	<6.5	*d*	*d*
Total organic carbon	4	22	10	16	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*

Table 4.47 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point 33						
Flow[c], gpd	4	17,120	380	4,851	*d*	*d*
pH, standard units	4	7.8	7.3	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.8	14	17.8	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	78	<5	<23	*d*	*d*
Chemical oxygen demand	4	24	<5	<10	*d*	*d*
Total organic carbon	4	32	9.6	22.9	*d*	*d*
Total suspended solids	4	68	<5	<21	*d*	*d*
Discharge Point 34						
Flow[c], gpd	4	136,800	45,654	89,361	*d*	*d*
pH, standard units	4	8.1	7.4	*d*	6.5–8.5[e]	0
Temperature, °C	4	28.4	20.8	25	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	<5	<5	<5	*d*	*d*
Total organic carbon	4	23	12	18	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 36						
Flow[c], gpd	4	9,891	190	2,901	*d*	*d*
pH, standard units	4	8.1	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.7	7.7	16	30.5	0
Ammonia	4	<0.5	<0.2	<0.3	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	46	14	28	*d*	*d*
Total organic carbon	4	28	7.7	16.7	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 39						
Flow[c], gpd	2	2,282	761	1,522	*d*	*d*
pH, standard units	2	7.8	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	2	17.6	9.6	13.6	30.5	0
Ammonia	2	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	2	<5	<5	<5	*d*	*d*
Chemical oxygen demand	2	7.1	5.6	6.4	*d*	*d*
Total organic carbon	2	18	11	15	*d*	*d*
Total suspended solids	2	<5	<5	<5	*d*	*d*
Discharge Point 42						
Flow[c], gpd	4	24,729	11,413	19,023	*d*	*d*
pH, standard units	4	7.9	7.1	*d*	6.5–8.5[e]	0
Temperature, °C	4	30.1	15.2	26.5	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	7.6	<5.0	<6.3	*d*	*d*
Total organic carbon	4	19	12	13	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*

Table 4.47 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point 47						
Flow[c], gpd	4	73,090	5,707	39,399	*d*	*d*
pH, standard units	4	8.1	7.5	*d*	6.5–8.5[e]	0
Temperature, °C	4	26.2	21.5	22.2	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	5.8	5	5.6	*d*	*d*
Total organic carbon	4	19	11	12	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 48						
Flow[c], gpd	4	21,100	1,522	11,311	*d*	*d*
pH, standard units	4	8.3	7.5	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.8	21.4	22.1	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	16	<5	<12.3	*d*	*d*
Total organic carbon	4	19	16	16	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 49						
Flow[c], gpd	4	15,979	11,413	13,981	*d*	*d*
pH, standard units	4	8.2	7.6	7.9	6.5–8.5[e]	0
Temperature, °C	4	23.9	19.2	21.7	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	5.3	<5	<5.1	*d*	*d*
Total organic carbon	4	22	12	16	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 51						
Flow[c], gpd	4	76,088	39,942	56,114	*d*	*d*
pH, standard units	4	7.5	7.3	7.4	6.5–8.5[e]	0
Temperature, °C	4	18.3	15.1	16.8	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	5.9	<5	<5.3	*d*	*d*
Total organic carbon	4	48	20	35	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 53						
Flow[c], gpd	1	1,522	1,522	1,522	*d*	*d*
pH, standard units	1	7.4	7.4	*d*	6.5–8.5[e]	0
Temperature, °C	1	18.7	18.7	19	30.5	0
Ammonia	1	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	1	<5	<5	<5	*d*	*d*
Chemical oxygen demand	1	6.8	6.8	6.8	*d*	*d*
Total organic carbon	1	22	22	22	*d*	*d*
Total suspended solids	1	<5	<5	<5	*d*	*d*

Table 4.47 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point 55						
Flow[c], gpd	4	79,890	47,555	68,004	*d*	*d*
pH, standard units	4	7.8	7.6	*d*	6.5–8.5[e]	0
Temperature, °C	4	27.4	15.6	22.3	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	5.4	<5.0	<5.1	*d*	*d*
Total organic carbon	4	26	16	21	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 63						
Flow[c], gpd	4	7,609	1,522	3,614	*d*	*d*
pH, standard units	4	8.3	7.4	*d*	6.5–8.5[e]	0
Temperature, °C	4	19.6	12.6	16.7	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	19	6.8	12.7	*d*	*d*
Total organic carbon	4	22	5.3	13.4	*d*	*d*
Total suspended solids	4	7	<5	<5.6	*d*	*d*
Discharge Point 64						
Flow[c], gpd	4	26,251	761	9,701	*d*	*d*
pH, standard units	4	8.2	7.7	*d*	6.5–8.5[e]	0
Temperature, °C	4	23.8	13.6	18.5	30.5	0
Ammonia	4	0.22	<0.2	<0.21	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	22	9.2	15.3	*d*	*d*
Total organic carbon	4	11	3.4	7.5	*d*	*d*
Total suspended solids	4	11	<5	<6.5	*d*	*d*
Discharge Point 67						
Flow[c], gpd	4	28,533	22,827	24,729	*d*	*d*
pH, standard units	4	8.0	7.7	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.2	11.2	17.3	30.5	0
Ammonia	4	0.48	<0.2	<0.27	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	<5	<5	<5	*d*	*d*
Total organic carbon	4	24	3.6	17.9	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 71						
Flow[c], gpd	4	81,797	11,413	54,605	*d*	*d*
pH, standard units	4	8.0	7.7	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.2	11.2	17.3	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	6.3	<5	<5.5	*d*	*d*
Total organic carbon	4	20	6.1	15.5	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*

Table 4.47 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point 83						
Flow[c], gpd	3	13,316	9,211	10,679	*d*	*d*
pH, standard units	3	8.3	8.1	*d*	6.5–8.5[e]	0
Temperature, °C	3	20.6	13.5	16.5	30.5	0
Ammonia	3	0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	3	10.8	<5.0	<6.9	*d*	*d*
Chemical oxygen demand	3	37	6.3	16.9	*d*	*d*
Total organic carbon	3	13	3.5	7.2	*d*	*d*
Total suspended solids	3	<5	<5	<5	*d*	*d*
Discharge Point 88						
Flow[c], gpd	4	5,707	190	2,029	*d*	*d*
pH, standard units	4	8.2	7.9	*d*	6.5–8.5[e]	0
Temperature, °C	4	29.4	9.2	20.9	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	6.3	<5	<5	*d*	*d*
Total organic carbon	4	18	15	16	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 99						
Flow[c], gpd	4	3,804	1,141	2,377	*d*	*d*
pH, standard units	4	8	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	4	21.9	14.2	17.7	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	6.2	<5	<5.3	*d*	*d*
Total organic carbon	4	27	17	21	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 109						
Flow[c], gpd	4	624,309	26,621	249,389	*d*	*d*
pH, standard units	4	8.1	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	4	22.1	13.6	17.9	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	11	<5	<7	*d*	*d*
Total organic carbon	4	30	19	23	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 110						
Flow[c], gpd	4	7,609	47	2,199	*d*	*d*
pH, standard units	4	8.3	7.4	*d*	6.5–8.5[e]	0
Temperature, °C	4	24.6	8.4	17.8	30.5	0
Ammonia	4	0.23	<0.20	<0.21	*d*	*d*
Biochemical oxygen demand	4	11.2	<5	<6.6	*d*	*d*
Chemical oxygen demand	4	31	9.5	17.1	*d*	*d*
Total organic carbon	4	18	14	16	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*

Table 4.47 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point 113						
Flow[c], gpd	4	11,413	3,044	7,829	*d*	*d*
pH, standard units	4	8.2	8.0	*d*	6.5–8.5[e]	0
Temperature, °C	4	31.6	14.1	21.5	30.5	1
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	<5	<5	<5	*d*	*d*
Total organic carbon	4	22	9	16	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 114						
Flow[c], gpd	4	2,380	570	1,784	*d*	*d*
pH, standard units	4	8.1	7.6	*d*	6.5–8.5[e]	0
Temperature, °C	4	24.9	20.8	23.4	30.5	0
Ammonia	4	1.4	<0.2	<0.5	*d*	*d*
Biochemical oxygen demand	4	8.98	<5	<6.58	*d*	*d*
Chemical oxygen demand	4	30	5.6	13.3	*d*	*d*
Total organic carbon	4	39	22	27	*d*	*d*
Total suspended solids	4	7.5	<5	<5.6	*d*	*d*
Discharge Point 122						
Flow[c], gpd	4	2,282	570	1,474	*d*	*d*
pH, standard units	4	8	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	4	32.1	14.8	24.7	30.5	1
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	6	<5	<5.5	*d*	*d*
Total organic carbon	4	25	13	19	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 125						
Flow[c], gpd	4	137,160	84,300	113,463	*d*	*d*
pH, standard units	4	7.9	7.7	*d*	6.5–8.5[e]	0
Temperature, °C	4	26.6	15.7	21.4	30.5	0
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	<5	<5	<5	*d*	*d*
Total organic carbon	4	26	12	20	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 126						
Flow[c], gpd	3	28,931	3,044	18,901	*d*	*d*
pH, standard units	3	8.3	7.3	*d*	6.5–8.5[e]	0
Temperature, °C	3	24	17.7	21.7	30.5	0
Ammonia	3	1	0.2	0.6	*d*	*d*
Biochemical oxygen demand	3	69	5	36	*d*	*d*
Chemical oxygen demand	3	92	28	60	*d*	*d*
Total organic carbon	3	34	20	27	*d*	*d*
Total suspended solids	3	93	32	58	*d*	*d*

Table 4.47 (continued)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point 135						
Flow[c], gpd	4	570,312	355,680	416,702	*d*	*d*
pH, standard units	4	7.9	7.8	*d*	6.5–8.5[e]	0
Temperature, °C	4	30.6	20.3	26.1	30.5	1
Ammonia	4	<0.2	<0.2	<0.2	*d*	*d*
Biochemical oxygen demand	4	<5	<5	<5	*d*	*d*
Chemical oxygen demand	4	7.4	<5	<5.6	*d*	*d*
Total organic carbon	4	23	8.7	16.9	*d*	*d*
Total suspended solids	4	<5	<5	<5	*d*	*d*
Discharge Point 142						
Flow[c], gpd	4	4,565	380	1,712	*d*	*d*
pH, standard units	4	8.4	7.2	*d*	6.5–8.5[e]	0
Temperature, °C	4	26	13.1	19.3	30.5	0
Ammonia	4	0.3	<0.2	<0.25	*d*	*d*
Biochemical oxygen demand	4	10.4	<5.0	<6.4	*d*	*d*
Chemical oxygen demand	4	120	40	62	*d*	*d*
Total organic carbon	4	28	12.0	16.8	*d*	*d*
Total suspended solids	4	140	27	80	*d*	*d*

[a]Units in mg/L unless otherwise noted.
[b]Tennessee Water Quality Criteria.
[c]Flow during operations and/or discharging.
[d]Not applicable.
[e]Minimum value/maximum value.

Table 4.48. Y-12 Plant toxicity control monitoring program summary information for 1992[a]

Site/building	Test date	Species	NOEC[b] (%)	IWC[c] (%)
Groundwater Treatment Facility (Outfall 512)	1/9/92	Fathead minnow	100	1.9
	1/9/92	*Ceriodaphnia*	25	1.9
Oil/Water Separator—9204-3 (Outfall 506)	2/7/92	Fathead minnow	100	0.3
	2/7/92	*Ceriodaphnia*	100	0.3
Central Pollution Control Facility (Outfall 501)	2/20/92	Fathead minnow	50	1.2
	2/20/92	*Ceriodaphnia*	12	1.2
9202 Catch Basin (Outfall 408)	3/12/92	Fathead minnow	15	0.8
	3/12/92	*Ceriodaphnia*	12	0.8
Lithium Steam Condensate (Outfall 402)	5/14/92	Fathead minnow	<3%	<NOEC
	5/14/92	*Ceriodaphnia*	6%	<NOEC
West End Treatment Facility	5/28/92	Fathead minnow	60	0.7
	5/28/92	*Ceriodaphnia*	5	0.7
West End Treatment Facility	6/25/92	*Ceriodophnia*	≥11	0.7
Cooling Tower 602	8/6/92	Fathead minnow	100	0.5
	8/6/92	*Ceriodaphnia*	100	0.5
Plating Rinsewater Treatment Facility	10/1/92	Fathead minnow	50	1.4
	10/1/92	*Ceriodaphnia*	100	1.4
Steam Plant Wastewater Treatment Facility	10/1/92	Fathead minnow	100	11.2
	10/1/92	*Ceriodaphnia*	12	11.2
Central Pollution Control Facility	10/8/92	Fathead minnow	100	1.2
	10/8/92	*Ceriodaphnia*	30	1.2

[a]These 7-day toxicity tests using *Ceriodaphnia* and fathead minnows were completed in 1992 as part of the TCMP conducted for the Y-12 Plant by Oak Ridge National Laboratory. Summarized are the effluents and their corresponding NOECs and IWCs.
Note: Discharge from the treatment facilities is intermittent because of batch operations.

[b]No-observed-effect concentrations.

[c]The in-stream waste concentration (IWC) based on 4.7 cfs at East Fork Poplar Creek, Station 8 (annual average flow rate).

Table 4.49. Sampling and analysis plan for White Oak Creek headwaters

Analyte	Collection frequency	Sample type	Analysis frequency
Anions			
Fluoride	Monthly	Flow proportional composite	Monthly
Nitrate (as N)	Monthly	Flow proportional composite	Monthly
Sulfate (as SO_4)	Monthly	Flow proportional composite	Monthly
Field measurements			
Conductivity	Monthly	Flow-through cell	Monthly
Dissolved oxygen	Monthly	Flow-through cell	Monthly
Temperature	Monthly	Flow-through cell	Monthly
Turbidity	Monthly	Flow-through cell	Monthly
pH	Monthly	Flow-through cell	Monthly
Metals			
Aluminum	Monthly	Flow proportional composite	Monthly
Antimony	Monthly	Flow proportional composite	Monthly
Arsenic	Monthly	Flow proportional composite	Monthly
Barium	Monthly	Flow proportional composite	Monthly
Beryllium	Monthly	Flow proportional composite	Monthly
Boron	Monthly	Flow proportional composite	Monthly
Cadmium	Monthly	Flow proportional composite	Monthly
Calcium	Monthly	Flow proportional composite	Monthly
Chromium	Monthly	Flow proportional composite	Monthly
Cobalt	Monthly	Flow proportional composite	Monthly
Copper	Monthly	Flow proportional composite	Monthly
Iron	Monthly	Flow proportional composite	Monthly
Lead	Monthly	Flow proportional composite	Monthly
Lithium	Monthly	Flow proportional composite	Monthly
Magnesium	Monthly	Flow proportional composite	Monthly
Manganese	Monthly	Flow proportional composite	Monthly
Molybdenum	Monthly	Flow proportional composite	Monthly
Nickel	Monthly	Flow proportional composite	Monthly
Phosphorus	Monthly	Flow proportional composite	Monthly
Selenium	Monthly	Flow proportional composite	Monthly
Silicon	Monthly	Flow proportional composite	Monthly
Silver	Monthly	Flow proportional composite	Monthly
Sodium	Monthly	Flow proportional composite	Monthly
Strontium	Monthly	Flow proportional composite	Monthly
Tin	Monthly	Flow proportional composite	Monthly
Titanium	Monthly	Flow proportional composite	Monthly
Vanadium	Monthly	Flow proportional composite	Monthly
Zinc	Monthly	Flow proportional composite	Monthly
Zirconium	Monthly	Flow proportional composite	Monthly
Others			
Oil and grease	Monthly	Grab	Monthly
Total dissolved solids	Monthly	Grab	Monthly
Total organic carbon	Monthly	Grab	Monthly
Total suspended solids	Monthly	Flow proportional composite	Monthly

Table 4.50. Sampling and analysis plan for Melton Hill Dam

Analyte	Collection frequency	Sample type	Analysis frequency
Anions			
Fluoride	Monthly	Flow proportional composite	Monthly
Nitrate (as N)	Monthly	Flow proportional composite	Monthly
Sulfate (as SO_4)	Monthly	Flow proportional composite	Monthly
Field measurements			
Conductivity	Monthly	Flow-through cell	Monthly
Dissolved oxygen	Monthly	Flow-through cell	Monthly
Temperature	Monthly	Flow-through cell	Monthly
Turbidity	Monthly	Flow-through cell	Monthly
pH	Monthly	Flow-through cell	Monthly
Metals			
Aluminum	Monthly	Flow proportional composite	Monthly
Antimony	Monthly	Flow proportional composite	Monthly
Arsenic	Monthly	Flow proportional composite	Monthly
Barium	Monthly	Flow proportional composite	Monthly
Beryllium	Monthly	Flow proportional composite	Monthly
Boron	Monthly	Flow proportional composite	Monthly
Cadmium	Monthly	Flow proportional composite	Monthly
Calcium	Monthly	Flow proportional composite	Monthly
Chromium	Monthly	Flow proportional composite	Monthly
Cobalt	Monthly	Flow proportional composite	Monthly
Copper	Monthly	Flow proportional composite	Monthly
Iron	Monthly	Flow proportional composite	Monthly
Lead	Monthly	Flow proportional composite	Monthly
Lithium	Monthly	Flow proportional composite	Monthly
Magnesium	Monthly	Flow proportional composite	Monthly
Manganese	Monthly	Flow proportional composite	Monthly
Molybdenum	Monthly	Flow proportional composite	Monthly
Nickel	Monthly	Flow proportional composite	Monthly
Phosphorus	Monthly	Flow proportional composite	Monthly
Selenium	Monthly	Flow proportional composite	Monthly
Silicon	Monthly	Flow proportional composite	Monthly
Silver	Monthly	Flow proportional composite	Monthly
Sodium	Monthly	Flow proportional composite	Monthly
Strontium	Monthly	Flow proportional composite	Monthly
Tin	Monthly	Flow proportional composite	Monthly
Titanium	Monthly	Flow proportional composite	Monthly
Vanadium	Monthly	Flow proportional composite	Monthly
Zinc	Monthly	Flow proportional composite	Monthly
Zirconium	Monthly	Flow proportional composite	Monthly
Others			
Oil and grease	Monthly	Grab	Monthly
Total dissolved solids	Monthly	Grab	Monthly
Total organic carbon	Monthly	Grab	Monthly
Total suspended solids	Monthly	Flow proportional composite	Monthly

Table 4.51. 1992 surface water analyses at White Oak Creek headwaters[a]

Analyte	Number detected/ number of samples	Concentration[b]				Percentage of ref. value[e]
		Max	Min	Av[c]	Standard error[d]	
Anions						
Fluoride	1/12	0.40	<0.10	~0.13*	0.025	~3.1
Nitrate (as N)	0/12	<1.0	<1.0	~1.0	0	*f*
Sulfate (as SO_4)	12/12	14	1.9	3.7*	0.95	1.5
Field measurements						
Conductivity, mS/cm	12/12	2.1	0.030	0.70*	0.18	*f*
Dissolved oxygen, ppm	12/12	12	8.5	10*	0.40	*f*
Temperature, °C	12/12	18	8.9	13*	0.85	*f*
Turbidity, NTU	12/12	63	11	34*	4.6	*f*
pH, standard units	12/12	8.2	7.2	7.8*	0.097	*f*
Metals						
Aluminum, total	11/12	1.9	<0.050	~0.53*	0.19	~270
Antimony, total	0/12	<0.050	<0.050	~0.050	0	*f*
Arsenic, total	0/12	<0.010	<0.010	~0.010	0	*f*
Barium, total	12/12	0.13	0.044	0.081*	0.0070	4.1
Beryllium, total	0/12	<0.0010	<0.0010	~0.0010	0	*f*
Boron, total	0/12	<0.080	<0.080	~0.080	0	*f*
Cadmium, total	0/12	<0.0050	<0.0050	~0.0050	0	*f*
Calcium, total	12/12	32	15	24*	1.7	*f*
Chromium, total	7/12	0.015	<0.0040	~0.0070*	0.0011	~14
Cobalt, total	0/12	<0.0040	<0.0040	~0.0040	0	*f*
Copper, total	0/12	<0.0070	<0.0070	~0.0070	0	*f*
Iron, total	12/12	2.0	0.051	0.51*	0.19	170
Lead, total	0/12	<0.050	<0.050	~0.050	0	*f*
Lithium, total[g]	1/12	<15	<0.0010	~13*	1.7	*f*
Magnesium, total	12/12	16	6.7	11*	0.89	*f*
Manganese, total	11/12	0.36	<0.010	~0.079*	0.038	~160
Molybdenum, total	0/12	<0.040	<0.040	~0.040	0	*f*
Nickel, total	2/12	<0.010	<0.0040	~0.0057*	0.00076	*f*
Phosphorus, total	0/12	<0.30	<0.30	~0.30	0	*f*
Selenium, total	0/12	<0.0050	<0.0050	~0.0050	0	*f*
Silicon, total	12/12	9.8	3.2	4.8*	0.60	*f*
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0	*f*
Sodium, total[h]	2/12	<5.0	0.47	~4.2*	0.51	*f*
Strontium, total	12/12	0.036	0.019	0.028*	0.0019	*f*
Tin, total	0/12	<0.050	<0.050	~0.050	0	*f*
Titanium, total	2/12	0.030	<0.020	~0.021*	0.00093	*f*
Vanadium, total	3/12	0.0043	<0.0020	~0.0022*	0.00019	*f*
Zinc, total	4/12	0.090	<0.0050	~0.014*	0.0070	~0.28
Zirconium, total	0/12	<0.020	<0.020	~0.020	0	*f*
Others						
Oil and grease	3/12	8.0	<2.0	~2.8*	0.51	*f*
Total dissolved solids	12/12	170	85	130*	7.9	*f*
Total organic carbon	12/12	4.7	0.60	1.3*	0.32	*f*
Total suspended solids	7/12	85	<5.0	~19*	7.8	*f*

[a]See Fig. 4.7, Vol. 1.

[b]Units in mg/L unless otherwise noted.

[c]Average concentrations significantly greater than zero are identified by an *.

[d]Standard error of the mean.

[e]Average concentration as a percentage of the national primary or secondary drinking water standards when a reference exists, when the parameter is a contaminant, and when the average concentration is significantly greater than zero.

[f]Not applicable.

[g]Note that the analytical detection limit for lithium for October and November was 0.001 mg/L. The detection limit for January through September and for December was 15 mg/L.

[h]Note that the analytical detection limit for sodium for October and November was 0.05 mg/L. The detection limit for January through September and for December was 5 mg/L.

Table 4.52. 1992 surface water analyses at Melton Hill Dam[a]

Analyte	Number detected/ number of samples	Concentration[b]				Percentge of ref. value[e]
		Max	Min	Av[c]	Standard error[d]	
Anions						
Fluoride	1/12	0.30	<0.10	~0.12*	0.017	~2.9
Nitrate (as N)	0/12	<1.0	<1.0	~1.0	0	*f*
Sulfate (as SO_4)	12/12	34	17	22*	1.2	8.7
Field measurements						
Conductivity, mS/cm	12/12	2.4	0.050	0.85*	0.23	*f*
Dissolved oxygen, ppm	12/12	12	7.8	9.4*	0.44	*f*
Temperature, °C	12/12	21	8.5	15*	1.2	*f*
Turbidity, NTU	12/12	71	15	37*	4.0	*f*
pH, standard units	12/12	8.2	7.4	7.8*	0.084	*f*
Metals						
Aluminum, total	10/12	2.5	<0.050	~0.56*	0.21	~280
Antimony, total	0/12	<0.050	<0.050	~0.050	0	*f*
Arsenic, total	0/12	<0.010	<0.010	~0.010	0	*f*
Barium, total	12/12	0.080	0.026	0.037*	0.0041	1.9
Beryllium, total	0/12	<0.0010	<0.0010	~0.0010	0	*f*
Boron, total	0/12	<0.080	<0.080	~0.080	0	*f*
Cadmium, total	0/12	<0.0050	<0.0050	~0.0050	0	*f*
Calcium, total	12/12	40	32	36*	0.58	*f*
Chromium, total	5/12	0.014	<0.0040	~0.0061*	0.0010	~12
Cobalt, total	0/12	<0.0040	<0.0040	~0.0040	0	*f*
Copper, total	1/12	0.026	<0.0070	~0.0086*	0.0016	~0.86
Iron, total	11/12	4.2	<0.050	~0.68*	0.34	~230
Lead, total	0/12	<0.050	<0.050	~0.050	0	*f*
Lithium, total[g]	2/12	<15	0.0031	~13*	1.7	*f*
Magnesium, total	12/12	10	8.9	9.5*	0.12	*f*
Manganese, total	12/12	2.0	0.010	0.26	0.16	*f*
Molybdenum, total	0/12	<0.040	<0.040	~0.040	0	*f*
Nickel, total	3/12	0.012	<0.0040	~0.0065*	0.00089	*f*
Phosphorus, total	0/12	<0.30	<0.30	~0.30	0	*f*
Selenium, total	0/12	<0.0050	<0.0050	~0.0050	0	*f*
Silicon, total	12/12	5.8	1.5	3.1*	0.42	*f*
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0	*f*
Sodium, total[h]	3/12	5.4	4.5	~5.0*	0.058	*f*
Strontium, total	12/12	0.10	0.081	0.089*	0.0015	*f*
Tin, total	0/12	<0.050	<0.050	~0.050	0	*f*
Titanium, total	3/12	0.035	<0.020	~0.022*	0.0014	*f*
Vanadium, total	3/12	0.0066	<0.0020	~0.0025*	0.00038	*f*
Zinc, total	5/12	0.11	<0.0050	~0.025*	0.011	~0.50
Zirconium, total	0/12	<0.020	<0.020	~0.020	0	*f*
Others						
Oil and grease	7/13	21	<2.0	~4.5*	1.5	*f*
Total dissolved solids	12/12	200	140	160*	4.5	*f*
Total organic carbon	12/12	2.8	1.9	2.2*	0.076	*f*
Total suspended solids	8/12	66	<5.0	~18*	5.2	*f*

[a]See Fig. 4.7, Vol. 1.

[b]Units in mg/L unless otherwise noted.

[c]Average concentrations significantly greater than zero are identified by an *.

[d]Standard error of the mean.

[e]Average concentration as a percentage of the national primary or secondary drinking water standards when a reference exists, when the parameter is a contaminant, and when the average concentration is significantly greater than zero.

[f]Not applicable.

[g]Note that the analytical detection limit for lithium for October and November was 0.001 mg/L. The detection limit for January through September and for December was 15 mg/L.

[h]Note that the analytical detection limit for sodium for October and November was 0.05 mg/L. The detection limit for January through September and for December was 5 mg/L.

Table 4.53. Summary of collection and analysis frequencies of surface and effluent water samples for radiological analysis

Station	Analysis	Collection frequency	Sample type	Analysis frequency
STP	Gamma scan, gross beta, total rad Sr	Weekly	Flow proportional composite	Monthly
7500 Road Bridge, MB1, MB2, WOC	Gamma scan, ^{3}H, total rad Sr	Weekly	Flow proportional composite	Monthly
First Creek, Fifth Creek, Raccoon Creek	Gamma scan, total rad Sr	Weekly	Grab	Monthly
Gallaher	Gamma scan, gross alpha, gross beta, ^{3}H, ^{238}Pu, ^{239}Pu, total rad Sr, total U	Weekly	Time proportional commposite	Quarterly
Kingston	Gamma scan, gross alpha, gross beta, ^{3}H, ^{238}Pu, ^{239}Pu, total rad Sr, total U	Weekly	Grab	Quarterly
MHD	Gamma scan, gross alpha[a], gross beta[b]	Weekly	Flow proportional composite	Monthly
NRWTF	Gamma scan, gross alpha, gross beta, ^{3}H, total rad Sr	Weekly	Flow proportional composite	Monthly
NWT	Gamma scan, total rad Sr	Weekly	Flow proportional composite	Monthly
WOC Headwaters	Gamma scan, gross alpha[a], gross beta[b]	Weekly	Flow proportional composite	Monthly
WOD	Gamma scan, gross alpha[a], gross beta[b]	Weekly	Flow proportional composite	Weekly
WOD	^{3}H, total rad Sr	Weekly	Flow proportional composite	Monthly

[a]If gross alpha >1 Bq/L, analyze for ^{241}Am, ^{244}Cm, ^{238}Pu, ^{239}Pu, ^{228}Th, ^{230}Th, ^{233}Th, ^{234}U, ^{235}U, and ^{238}U.
[b]If gross beta >30 Bq/L, analyze for total rad Sr.

Table 4.54. 1992 radionuclide concentrations in surface waters around ORNL[a]

Radionuclide	Number detected/ number of samples	Concentration (pCi/L)[b]					Percent DCG[g]
		Max[c]	Min[c]	Av[d]	Standard error[e]	DCG[f]	
			Melton Hill Dam				
^{60}Co	2/12	62*	−32	10	6.8	5,000	*h*
^{137}Cs	1/12	24	−22	3.4	4.0	3,000	*h*
Gross alpha	8/12	7.0*	−0.14	2.2*	0.55	*h*	*h*
Gross beta	9/12	35*	1.1	12*	3.1	*h*	*h*
			White Oak Creek Headwaters				
^{60}Co	1/12	16*	−22	3.0	3.4	5,000	*h*
^{137}Cs	2/12	35	−24	6.1	5.3	3,000	*h*
Gross alpha	5/12	11*	−0.27	2.5*	0.89	*h*	*h*
Gross beta	12/12	25*	4.3*	12*	1.8	*h*	*h*
			7500 Road Bridge				
^{60}Co	0/12	24	−57	−3.2	6.1	5,000	*h*
^{137}Cs	11/12	200*	35	100*	13	3,000	3.5
Total rad Sr	12/12	140*	51*	79*	6.8	1,000	7.9
^{3}H	12/12	19,000*	1,600*	7,200*	1,300	2,000,000	0.36
			First Creek				
^{60}Co	1/12	41*	−27	0.56	4.9	5,000	*h*
^{137}Cs	1/12	73*	−14	10	6.4	3,000	*h*
Total rad Sr	12/12	540*	120*	300*	45	1,000	30
			Fifth Creek				
^{60}Co	2/12	43*	−27	7.5	5.1	5,000	*h*
^{137}Cs	3/12	51*	−11	5.2	4.9	3,000	*h*
Total rad Sr	12/12	54*	22*	36*	3.1	1,000	3.6
			Melton Branch 2				
^{60}Co	2/12	30	−14	5.0	3.9	5,000	*h*
^{137}Cs	2/12	46*	−19	3.9	5.0	3,000	*h*
Total rad Sr	10/12	6.2*	0.41	3.5*	0.50	1,000	0.35
^{3}H	12/12	22,000*	3,000*	9,900*	2,100	2,000,000	0.49
			Northwest Tributary				
^{60}Co	0/12	19	−11	2.7	2.6	5,000	*h*
^{137}Cs	3/12	68*	−24	13	7.4	3,000	*h*
Total rad Sr	12/12	68*	24*	51*	3.4	1,000	5.1
			Raccoon Creek				
^{60}Co	1/12	38*	−16	5.5	4.5	5,000	*h*
^{137}Cs	1/12	32	−19	6.5	4.3	3,000	*h*
Total rad Sr	11/12	43*	3.0	22*	3.7	1,000	2.2

[a]See Fig. 4.7, Vol. 1.

[b]Multiply pCi/L by 0.037 to convert to Bq/L.

[c]Individual concentrations significantly greater than zero are identified by an *.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

[f]Derived concentration guide for ingestion of water. From DOE Order 5400.5.

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

[h]Not applicable.

Table 4.55. 1992 radionuclide concentrations at ORNL NPDES locations[a]

Radionuclide	Number detected/ number of samples	Concentration (pCi/L)[b] Max[c]	Min[c]	Av[d]	Standard error[e]	DCG[f]	Percent DCG[g]
			Sewage Treatment Plant (X01)				
^{60}Co	2/12	38*	−35	13*	5.6	5,000	0.27
^{137}Cs	1/12	14	−24	−0.50	2.9	3,000	*h*
Gross alpha	0/1	0.65	0.65	0.65	*h*	*h*	*h*
Gross beta	12/12	570*	300*	450*	30	*h*	*h*
Total rad Sr	12/12	260*	110*	200*	13	1,000	20
			Nonradiological Wastewater Treatment Facility (X12)				
^{60}Co	2/12	38*	−14	14*	4.8	5,000	0.28
^{137}Cs	12/12	2,200*	590*	1,200*	150	3,000	40
Gross alpha	12/12	27*	4.6*	13*	2.3	*h*	*h*
Gross beta	12/12	2,300*	380*	1,200*	200	*h*	*h*
Total rad Sr	12/12	760*	13*	170*	71	1,000	17
^{3}H	12/12	140,000*	6,200*	71,000*	11,000	2,000,000	3.5
			Melton Branch 1 (X13)				
^{60}Co	1/12	19	−24	1.5	3.7	5,000	*h*
^{137}Cs	1/12	41	−32	3.2	5.0	3,000	*h*
Total rad Sr	12/12	510*	230*	400*	28	1,000	40
^{3}H	12/12	1,300,000*	230,000*	790,000*	89,000	2,000,000	39
			White Oak Creek (X14)				
^{60}Co	1/12	19	−11	4.1	3.0	5,000	*h*
^{137}Cs	10/12	200*	14	75*	15	3,000	2.5
Total rad Sr	12/12	200*	65*	120*	11	1,000	12
^{3}H	12/12	100,000*	4,300*	54,000*	10,000	2,000,000	2.7
			White Oak Dam (X15)				
^{60}Co	22/52	21*	−1.9	4.3*	0.56	5,000	0.085
^{137}Cs	52/52	190*	15*	59*	5.8	3,000	2.0
Gross alpha	50/52	18*	1.4*	7.0*	0.48	*h*	*h*
Gross beta	52/52	860*	200*	430*	20	*h*	*h*
Total rad Sr	12/12	320*	120*	210*	16	1,000	21
^{3}H	12/12	350,000*	68,000*	190,000*	27,000	2,000,000	9.5

[a]See Fig. 4.7, Vol. 1.

[b]Multiply pCi/L by 0.037 to convert to Bq/L.

[c]Individual concentrations significantly greater than zero are identified by an *.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

[f]Derived concentration guide for ingestion of water. From DOE Order 5400.5.

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

[h]Not applicable.

Table 4.56. 1992 monthly stream flows[a]

Month	Flow (10^9 L)				Average ratio[e]
	Melton Branch 1	White Oak Creek[b]	White Oak Dam[c]	Clinch River[d]	
January	0.34	0.94	1.3	610	0.0036
February	0.24	0.66	0.97	210	0.016
March	0.26	0.80	1.1	170	0.012
April	0.21	0.47	0.74	140	0.0067
May	0.12	0.31	0.50	100	0.0053
June	0.092	0.31	0.49	140	0.0054
July	0.16	0.65	0.83	280	0.0033
August	0.23	0.53	1.0	360	0.0045
September	0.068	0.33	0.43	310	0.0034
October	0.076	0.35	0.45	210	0.0050
November	0.35	0.70	0.92	290	0.010
December	0.51	1.1	1.6	470	0.0040

[a]See Fig. 4.7, Vol. 1.
[b]White Oak Creek above its confluence of Melton Branch.
[c]White Oak Creek at White Oak Dam.
[d]Clinch River at Melton Hill Dam.
[e]Flow ratios White Oak Creek:Clinch River at White Oak Dam are calculated daily and averaged for the month.

Table 4.57. 1992 mercury concentrations in ORNL area surface water

Stream	Site[a]	Number detected/ number of samples	Concentration (μg/L)				Percentage TWQ[d]
			Max	Min	Av[b]	Standard error[c]	
1st Creek	341	3/6	0.21	<0.050	~0.13*	0.035	8.8
5th Creek	261	0/6	<0.050	<0.050	~0.050	0	<2.1
	363	0/6	<0.050	<0.050	~0.050	0	<2.1
	367	3/6	3.2	<0.050	~0.80	0.51	130
WOC	106	6/6	0.26	0.20	0.23*	0.010	11
	202	6/6	0.12	0.10	0.11*	0.0033	5.0
	207	6/6	0.17	0.15	0.16*	0.0037	7.1
	222	0/6	<0.050	<0.050	~0.050	0	<2.1
	301	6/6	0.14	0.070	0.11*	0.011	5.8
	302	6/6	0.14	0.080	0.11*	0.012	5.8
	304	6/6	0.15	0.12	0.14*	0.0042	6.3
	Headwaters	0/6	<0.050	<0.050	~0.050	0	<2.1
	X01	5/6	0.070	<0.050	~0.062*	0.0040	2.9

[a]See Fig. 4.8, Vol. 1.
[b]Average concentrations significantly greater than zero are identified by an *.
[c]Standard error of the mean.
[d]Maximum concentration as a percentage of Tennessee Water Quality (TWQ) Standard, 2.4 μg/L, for the protection of fish and aquatic life.

Table 4.58. Water analyses at Gallaher and Kingston water treatment plants[a]

Analyte	Number detected/ number of samples	Concentration				DWS[e]	Percent of DWS[f]
		Max[b]	Min[b]	Av[c]	Standard error[d]		
				Gallaher			
Metals (mg/L)							
Total U[g]	4/4	0.00025	0.00017	0.00021*	0.000022	*h*	*h*
Radionuclides (pCi/L)[i]							
^{60}Co	0/4	1.9	–0.16	0.61	0.46	200	*h*
^{137}Cs	2/4	1.1*	–1.4	0.074	0.52	120	*h*
Gross alpha	1/4	6.5*	–0.22	1.6	1.6	15	*h*
Gross beta	3/4	13*	4.6	7.0*	2.0	50	14
^{238}Pu	2/4	0.070*	–0.014	0.023	0.017	1.6	*h*
^{239}Pu	0/4	0.0027	–0.030	–0.0093	0.0071	1.2	*h*
Total rad Sr	3/4	2.7	0.54*	1.5*	0.46	8	18
Total U[g,j]	4/4	0.17	0.11	0.14*	0.014	20	0.69
^{3}H	3/4	1,400*	–54	800*	310	20,000	4.0
				Kingston			
Metals (mg/L)							
Total U[g]	4/4	0.00019	0.00010	0.00015*	0.000021	*h*	*h*
Radionuclides (pCi/L)[i]							
^{60}Co	2/4	0.54	0.24*	0.36*	0.065	200	0.18
^{137}Cs	2/4	0.51*	0.16	0.36*	0.089	120	0.30
Gross alpha	2/4	1.9*	0.43	1.1*	0.31	15	7.0
Gross beta	3/4	3.5*	0.27	2.5*	0.75	50	5.0
^{238}Pu	0/4	0.0081	–0.010	–0.00047	0.0041	1.6	*h*
^{239}Pu	0/4	0.0049	–0.054	–0.017	0.013	1.2	*h*
Total rad Sr	2/4	0.32*	–0.27	0.058	0.12	8	*h*
Total U[g,j]	4/4	0.13	0.066	0.10*	0.014	20	0.50
^{3}H	1/4	700*	27	330	160	20,000	*h*

[a]See Fig. 4.9, Vol. 1.

[b]Individual concentrations significantly greater than zero are identified by an *.

[c]Average concentrations significantly greater than zero are identified by an *.

[d]Standard error of the mean.

[e]National Primary Drinking Water Standard. From 40 CFR 141, as amended. The value for Total rad Sr is based upon the ^{90}Sr limit. The value for gross beta is a regulatory guide for assessing compliance without further analysis. Because no drinking water standards are established for ^{60}Co, ^{137}Cs, ^{238}Pu, ^{239}Pu, or total uranium, 4% of the DOE DCG is given as a reference value for these radionuclides.

[f]Average concentration as a percentage of the National Primary Drinking Water Limit, or 4% of the DCG for ingestion of water (from DOE Order 5400.5), when a reference exists and when the average concentration is significantly greater than zero.

[g]Laboratory method does not permit a test for significance for the maximum and minimum values.

[h]Not applicable.

[i]Multiply pCi/L by 0.037 to convert to Bq/L.

[j]Activity derived from mass assuming natural abundance of ^{234}U, ^{235}U, and ^{238}U.

Table 4.59. ORNL NPDES-permitted outfalls, 1992

X01—Sewage Treatment Plant
X02—Coal Yard Runoff Treatment Facility
X12—Nonradiological Wastewater Treatment Facility
X13—Melton Branch
X14—White Oak Creek
X15—White Oak Dam
Category I—Storm drains
Category II—Roof drains, parking lot drains, storage area drains, spill area drains, once-through cooling water, cooling-tower blowdown, condensate, and disposal demonstration area
Category III—Process and/or lab drains
Cooling Systems—Cooling water, cooling tower blowdown, and cleaning wastes originating at space cooling facilities

Table 4.60. Sampling and analysis plan for ORNL Sewage Treatment Plant (X01)

Analyte	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
Trichloroethylene	Monthly	Grab	Monthly
Bromodichloromethane	Monthly	Grab	Monthly
Phenols, total	Monthly	Grab	Monthly

Table 4.61. Sampling and analysis plan for ORNL Coal Yard Runoff Treatment Facility (X02)

Analyte	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 4.62. Sampling and analysis plan for ORNL Nonradiological Wastewater Treatment Facility (X12)

Analyte	Collection frequency	Type	Analysis frequency
Flow	Daily	Continuous	Daily
pH	Continuous	Continuous	Continuous
Downstream pH	Daily	Grab	Daily
Temperature	Weekly	Grab	Weekly
TSS	Weekly	24-h composite	Weekly
Oil and grease	Weekly	Grab	Weekly
TTO	Weekly	Grab	Weekly
Cyanide, total	Weekly	Grab	Weekly
Cadmium, total	Weekly	24-h composite	Weekly
Chromium, total	Weekly	24-h composite	Weekly
Copper, total	Weekly	24-h composite	Weekly
Lead, total	Weekly	24-h composite	Weekly
Nickel, total	Weekly	24-h composite	Weekly
Silver, total	Weekly	24-h composite	Weekly
Zinc, total	Weekly	24-h composite	Weekly
BOD	Weekly	24-h composite	Weekly
Nitrate	Weekly	24-h composite	Weekly
Sulfate	Weekly	24-h composite	Weekly
Phosphorus, total	Weekly	24-h composite	Weekly
Phenol, total	Weekly	Grab	Weekly
Fluoride	Weekly	24-h composite	Weekly
Arsenic, total	Weekly	24-h composite	Weekly
Iron, total	Weekly	24-h composite	Weekly
Mercury, total	Weekly	24-h composite	Weekly
Selenium, total	Weekly	24-h composite	Weekly
Benzene	Weekly	Grab	Weekly
Chlorobenzene	Weekly	Grab	Weekly
Chloroform	Weekly	Grab	Weekly
Bromodichloromethane	Weekly	Grab	Weekly
Methylene chloride	Weekly	Grab	Weekly
Tetrachloroethylene	Weekly	Grab	Weekly
Trichloroethylene	Weekly	Grab	Weekly
1,1-Dichloroethane	Weekly	Grab	Weekly

Table 4.63. Sampling and analysis plan for ORNL Melton Branch (X13)

Analyte	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 4.64. Sampling and analysis plan for ORNL White Oak Dam (X14)

Analyte	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 4.65. Sampling and analysis plan for ORNL White Oak Dam (X15)

Analyte	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 4.66. Sampling and analysis plan for ORNL Category I outfalls

Analyte	Collection frequency	Type	Analysis frequency
Flow	Yearly	Instantaneous	Yearly
pH	Yearly	Grab	Yearly
Downstream pH	Yearly	Grab	Yearly
Temperature	Yearly	Grab	Yearly
Oil and grease	Yearly	Grab	Yearly
TSS	Yearly	Grab	Yearly
Gross beta[a]	Yearly	Grab	Yearly

[a]If gross beta >30 Bq/L, analyze for total radioactive strontium.

Table 4.67. Sampling and analysis plan for ORNL Category II outfalls

Analyte	Collection frequency	Type	Analysis frequency
Flow	Quarterly	Instantaneous	Quarterly
pH	Quarterly	Grab	Quarterly
Downstream pH	Quarterly	Grab	Quarterly
Temperature	Quarterly	Grab	Quarterly
Oil and grease	Quarterly	Grab	Quarterly
TSS	Quarterly	Grab	Quarterly
Gross beta[a]	Quarterly	Grab	Quarterly

[a]If gross beta >30 Bq/L, analyze for total radioactive strontium.

Table 4.68. Sampling and analysis plan for ORNL Category III outfalls

Analyte	Collection frequency	Type	Analysis frequency
Flow	Quarterly	Instantaneous	Quarterly
pH	Quarterly	Grab	Quarterly
^{60}Co	Quarterly	Grab	Quarterly
^{137}Cs	Quarterly	Grab	Quarterly
Gross beta[a]	Quarterly	Grab	Quarterly

[a]If gross beta >30 Bq/L, analyze for total radioactive strontium.

Table 4.69. Sampling and analysis plan for ORNL Cooling Systems

Analyte	Collection frequency	Type	Analysis frequency
Flow	Quarterly	*a*	Quarterly
pH	Quarterly	Grab	Quarterly
Downstream pH	Quarterly	Grab	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 4.70. NPDES Permit Number TN 0002941, 1992 ORNL discharge point X01 (Sewage Treatment Plant)[a]

Flow rates (1×10^6 L/d)—Max: 1.5, Min: 0.31, Av: 0.75

Analyte	Number detected/ number of samples	Concentration[b]			
		Max[c]	Min[c]	Av[d]	Standard error[e]
Field measurements					
Chlorine, total residual	157/157	0.43	0.010	0.21*	0.0065
Dissolved oxygen	251/251	15	6.2	9.8*	0.095
Downstream pH, standard units	52/52	8.3	7.1	7.8*	0.032
Temperature, °C	303/303	28	8.9	20*	0.27
pH, standard units	52/52	8.0	7.2	7.6*	0.029
Metals					
Copper, total	2/12	0.010	<0.0070	~0.0073*	0.00026
Mercury, total	1/12	0.00021	<0.000050	~0.000063*	0.000013
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0
Zinc, total	11/12	0.071	0.019	~0.044*	0.0054
Others					
Ammonia (as N)	157/157	0.63	0.020	0.093*	0.0075
Biochemical oxygen demand	5/157	8.0	<5.0	~5.0*	0.024
Cyanide, total	0/12	<0.0020	<0.0020	~0.0020	0
Fecal coliform (col/100 mL)[f]	65/157	200	<1.0	~1.8	1.1
Oil and grease	54/157	94	<2.0	~3.5*	0.62
Phenolics, total recoverable	0/12	<0.0010	<0.0010	~0.0010	0
Total suspended solids	12/157	44	<5.0	~5.6*	0.30
Volatile organics					
Bromodichloromethane	1/12	U0.0050	J0.0010	~0.0047*	0.00033
Trichloroethylene	0/12	U0.0050	U0.0050	~0.0050	0

[a]See Fig. 4.7, Vol. 1.

[b]Units in mg/L unless otherwise noted.

[c]Prefix "J" means the value was estimated; "B" means the value was found in the laboratory blank; "U" (undetected) means the value for an organic analyte was below the analytical detection limit; "<" means the value for any analyte (excluding organics) was below the analytical detection limit.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

[f]The geometric mean is computed rather than the average.

Table 4.71. NPDES Permit Number TN 0002941, 1992 ORNL discharge point X02 (Coal Yard Runoff Treatment Facility)[a]

Flow rates (1×10^6 L/d)—Max: 0.31, Min: 0, Av: 0.037

Analyte	Number detected/ number of samples	Concentration[b]			
		Max	Min	Av[c]	Standard error[d]
Anions					
Sulfate (as SO_4)	12/12	2100	910	1600*	120
Field measurements					
Downstream pH, standard units	249/249	8.4	7.0	7.9*	0.016
Temperature, °C	249/249	30	4.0	17*	0.45
pH, standard units	249/249	8.8	6.1	7.7*	0.025
Metals					
Arsenic, total	5/34	0.16	<0.050	~0.059*	0.0045
Cadmium, total	0/34	<0.0050	<0.0050	~0.0050	0
Chromium, total	22/34	0.026	<0.0040	~0.0097*	0.0013
Copper, total	4/34	0.012	<0.0070	~0.0072*	0.00016
Iron, total	34/34	0.57	0.079	0.21*	0.020
Lead, total	0/34	<0.050	<0.050	~0.050	0
Manganese, total	34/34	0.19	0.0048	0.042*	0.0063
Nickel, total	11/34	0.016	<0.0040	~0.0074*	0.00059
Selenium, total	35/35	0.20	0.0060	0.075*	0.010
Silver, total	5/34	<0.020	<0.0050	~0.0059*	0.00052
Zinc, total	16/34	0.075	<0.0050	~0.013*	0.0024
Others					
Oil and grease	15/34	43	<2.0	~3.7*	1.2
Total suspended solids	28/35	19	<5.0	~6.9*	0.56

[a]See Fig. 4.7, Vol. 1.
[b]Units in mg/L unless otherwise noted.
[c]Average concentrations significantly greater than zero are identified by an *.
[d]Standard error of the mean.

Table 4.72. NPDES Permit Number TN 0002941, 1992
ORNL discharge point X12 (Nonradiological Wastewater Treatment Facility)[a]

Flow rates (1×10^6 L/d)—Max: 2.4, Min: 1.2, Av: 1.8

Analyte	Number detected/ number of samples	Concentration[b]			
		Max[c]	Min[c]	Av[d]	Standard error[e]
Anions					
Fluoride	51/52	2.4	<0.10	~1.4*	0.055
Nitrate (as N)	50/52	79	<1.0	~6.1*	1.6
Sulfate (as SO_4)	52/52	350	68	230*	7.6
Field measurements					
Downstream pH, standard units	251/251	8.8	7.0	7.9*	0.019
Temperature, °C	251/251	26	10	19*	0.28
pH, standard units	*f*	8.2	7.1	7.5*	0.0081
Metals					
Arsenic, total	1/52	<0.080	<0.050	~0.051*	0.00072
Cadmium, total	0/52	<0.0050	<0.0050	~0.0050	0
Chromium, total	19/52	0.010	<0.0040	~0.0052*	0.00026
Copper, total	14/52	0.056	<0.0070	~0.0090*	0.0010
Iron, total	3/52	2.0	<0.050	~0.089*	0.037
Lead, total	0/52	<0.050	<0.050	~0.050	0
Mercury, total	5/52	0.00030	0.000030	~0.000061*	0.0000065
Nickel, total	14/52	0.090	<0.0040	~0.0085*	0.0017
Phosphorus, total	29/52	<0.50	0.040	~0.24*	0.011
Selenium, total	0/52	<0.070	<0.050	~0.050*	0.00038
Silver, total	1/52	<0.020	<0.0050	~0.0057*	0.00040
Zinc, total	49/52	1.3	<0.0050	~0.057*	0.025
Others					
Biochemical oxygen demand	1/52	6.0	<5.0	~5.0*	0.019
Cyanide, total	1/52	0.0060	<0.0020	~0.0021*	0.000077
Oil and grease	15/52	11	<2.0	~2.7*	0.25
Phenolics, total recoverable	0/52	<0.0010	<0.0010	~0.0010	0
Total suspended solids	1/52	10	<5.0	~5.1*	0.096
Total toxic organics	0/52	<0.010	<0.010	~0.010	0
Volatile organics					
1,1-Dichloroethane	0/53	U0.0050	U0.0050	~0.0050	0
Benzene	2/53	U0.0050	JB0.0010	~0.0049*	0.000077
Bromodichloromethane	0/53	U0.0050	U0.0050	~0.0050	0
Chlorobenzene	0/53	U0.0050	U0.0050	~0.0050	0
Chloroform	1/53	U0.0050	J0.0010	~0.0049*	0.000075
Methylene chloride	2/53	U0.0050	JB0.0020	~0.0049*	0.000079
Tetrachloroethylene	0/53	U0.0050	U0.0050	~0.0050	0
Trichloroethylene	0/53	U0.0050	U0.0050	~0.0050	0

[a]See Fig. 4.7, Vol. 1.

[b]Units in mg/L unless otherwise noted.

[c]Prefix "J" means the value was estimated; "B" means the value was found in the laboratory blank; "U" (undetected) means the value for an organic analyte was below the analytical detection limit; "<" means the value for any analyte (excluding organics) was below the analytical detection limit.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

[f]pH monitoring is continuous.

Table 4.73. NPDES Permit Number TN 0002941, 1992 ORNL discharge point X13 (Melton Branch 1)[a]

Flow rates (1×10^6 L/d)—Max: 79, Min: 0.23, Av: 6.8

Analyte	Number detected/ number of samples	Concentration[b]			
		Max[c]	Min[c]	Av[d]	Standard error[e]
Anions					
Fluoride	12/12	3.1	0.50	1.3*	0.26
Nitrate (as N)	8/12	1.4	<0.10	~0.69*	0.13
Sulfate (as SO_4)	12/12	320	32	130*	27
Field measurements					
Chlorine, total residual	1/52	0.080	<0.010	~0.011*	0.0013
Conductivity, mS/cm	12/12	2.3	0.15	0.96*	0.21
Dissolved oxygen	52/52	14	7.4	10*	0.22
Temperature, °C	64/64	24	5.3	15*	0.74
Turbidity, NTU	12/12	58	6.0	17*	4.2
pH, standard units	12/12	8.3	7.0	7.6*	0.11
Metals					
Aluminum, total	12/12	2.9	0.11	0.70*	0.24
Arsenic, total	0/12	<0.050	<0.050	~0.050	0
Cadmium, total	0/12	<0.0050	<0.0020	~0.0023*	0.00025
Chromium, total	9/12	0.020	<0.0040	~0.0084*	0.0014
Copper, total	4/12	0.025	<0.0070	~0.011*	0.0019
Iron, total	12/12	2.6	0.12	0.70*	0.20
Lead, total	0/12	<0.040	<0.0040	~0.0071*	0.0030
Manganese, total	12/12	0.44	0.068	0.18*	0.031
Mercury, total	0/12	<0.000050	<0.000050	~0.000050	0
Nickel, total	3/12	0.011	<0.0040	~0.0064*	0.00087
Phosphorus, total	10/12	1.2	<0.20	~0.54*	0.091
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0
Zinc, total	11/12	0.13	<0.0050	~0.048*	0.013
Others					
Ammonia (as N)	12/12	0.42	0.040	0.079*	0.031
Biochemical oxygen demand	1/12	6.0	<5.0	~5.1*	0.083
Oil and grease	21/52	41	<2.0	~3.6*	0.79
Phenolics, total recoverable	0/12	<0.0010	<0.0010	~0.0010	0
Total dissolved solids	12/12	680	210	380*	42
Total organic carbon	12/12	7.6	2.4	3.5*	0.46
Total suspended solids	10/12	81	<5.0	~21*	7.0
PCBs					
PCB, total	0/12	U0.0020	U0.0010	~0.0018*	0.00013
Volatile organics					
Chloroform	1/12	U0.0050	J0.0020	~0.0048*	0.00025
Trichloroethylene	2/12	U0.0050	J0.0020	~0.0045*	0.00034

[a]See Fig. 4.7, Vol. 1.

[b]Units in mg/L unless otherwise noted.

[c]Prefix "J" means the value was estimated; "B" means the value was found in the laboratory blank; "U" (undetected) means the value for an organic analyte was below the analytical detection limit; "<" means the value for any analyte (excluding organics) was not below the analytical detection limit.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

Table 4.74. NPDES Permit Number TN 0002941, 1992 ORNL discharge point X14 (White Oak Creek)[a]

Flow rates (1×10^6 L/d)—Max: 110, Min: 0.038, Av: 19

Analyte	Number detected/ number of samples	Concentration[b]			
		Max[c]	Min[c]	Av[d]	Standard error[e]
Anions					
Fluoride	12/12	1.2	0.30	0.83*	0.074
Nitrate (as N)	12/12	2.3	0.70	1.4*	0.14
Sulfate (as SO_4)	12/12	62	29	42*	2.8
Field measurements					
Chlorine, total residual	1/52	0.060	<0.010	~0.011*	0.00096
Conductivity, mS/cm	12/12	2.0	0.040	0.82*	0.21
Dissolved oxygen	52/52	13	7.7	10*	0.20
Temperature, °C	64/64	25	7.4	16*	0.65
Turbidity, NTU	12/12	32	5.0	11*	2.7
pH, standard units	12/12	8.6	7.3	7.8*	0.097
Metals					
Aluminum, total	12/12	0.29	0.055	0.17*	0.023
Arsenic, total	0/12	<0.050	<0.050	~0.050	0
Cadmium, total	0/12	<0.0050	<0.0020	~0.0023*	0.00025
Chromium, total	5/12	0.0099	<0.0040	~0.0055*	0.00068
Copper, total	1/12	0.0070	<0.0070	~0.0070	0
Iron, total	11/12	0.50	<0.050	~0.17*	0.036
Lead, total	0/12	<0.020	<0.0040	~0.0054*	0.0013
Manganese, total	12/12	0.15	0.015	0.038*	0.011
Mercury, total	1/12	0.000050	<0.000050	~0.000050	0
Nickel, total	1/12	<0.010	<0.0040	~0.0060*	0.00085
Phosphorus, total	9/12	0.70	<0.20	~0.32*	0.046
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0
Zinc, total	10/12	0.065	<0.0050	~0.024*	0.0053
Others					
Ammonia (as N)	12/12	0.43	0.040	0.083*	0.032
Biochemical oxygen demand	2/12	7.0	<5.0	~5.2*	0.17
Oil and grease	19/52	200	<2.0	~7.7*	3.9
Phenolics, total recoverable	0/12	<0.0010	<0.0010	~0.0010	0
Total dissolved solids	12/12	250	140	220*	11
Total organic carbon	12/12	3.7	1.6	2.2*	0.22
Total suspended solids	5/12	15	<5.0	~6.3*	0.84
PCBs					
PCB, total	0/12	U0.0020	U0.0010	~0.0018*	0.00013
Volatile organics					
Chloroform	11/12	U0.0050	J0.0010	~0.0021*	0.00029
Trichloroethylene	0/12	U0.0050	U0.0050	~0.0050	0

[a]See Fig. 4.7, Vol 1.

[b]Units in mg/L unless otherwise noted.

[c]Prefix "J" means the value was estimated; "B" means the value was found in the laboratory blank; "U" (undetected) means the value for an organic analyte was below the analytical detection limit; "<" means the value for any analyte (excluding organics) was below the analytical detection limit.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

Table 4.75. NPDES Permit Number TN 0002941, 1992 ORNL discharge point X15 (White Oak Dam)[a]

Flow rates (1×10^6 L/d)—Max: 190, Min: 10, Av: 27

Analyte	Number detected/ number of samples	Concentration[b]			
		Max[c]	Min[c]	Av[d]	Standard error[e]
Anions					
Fluoride	12/12	1.1	0.30	0.72*	0.072
Nitrate (as N)	8/12	1.4	0.30	~0.73*	0.11
Sulfate (as SO_4)	12/12	60	28	46*	3.2
Field Measurements					
Chlorine, total residual	1/52	0.080	<0.010	~0.011*	0.0013
Conductivity, mS/cm	12/12	2.8	0.12	0.93*	0.24
Dissolved oxygen	52/52	14	6.4	10*	0.23
Temperature, °C	64/64	28	4.3	17*	0.86
Turbidity, NTU	12/12	30	7.0	16*	2.1
pH, standard units	12/12	9.4	7.1	7.9*	0.17
Metals					
Aluminum, total	12/12	2.9	0.23	0.87*	0.21
Arsenic, total	0/12	<0.010	<0.010	~0.010	0
Cadmium, total	0/12	<0.0050	<0.0020	~0.0023*	0.00025
Chromium, total	11/12	0.056	<0.0040	~0.017*	0.0039
Copper, total	3/12	0.056	<0.0070	~0.011*	0.0041
Iron, total	12/12	2.7	0.37	0.93*	0.18
Lead, total	1/12	<0.0050	<0.0040	~0.0041*	0.000083
Manganese, total	12/12	0.56	0.057	0.16*	0.038
Mercury, total	6/12	0.00029	0.000010	~0.000086*	0.000025
Nickel, total	2/12	0.086	<0.0040	~0.013*	0.0067
Phosphorus, total	7/12	0.50	<0.20	~0.26*	0.027
Silver, total	0/12	<0.0050	<0.0050	~0.0050	0
Zinc, total	9/12	0.052	<0.0050	~0.023*	0.0051
Others					
Ammonia (as N)	12/12	0.59	0.040	0.16*	0.044
Biochemical oxygen demand	1/12	6.0	<5.0	~5.1*	0.083
Oil and grease	32/52	45	<2.0	~8.6*	1.4
Total dissolved solids	12/12	290	140	230*	12
Total organic carbon	12/12	5.8	1.8	3.0*	0.30
Total suspended solids	11/12	39	<5.0	~15*	2.5
PCBs					
PCB, total	0/12	U0.0020	U0.0010	~0.0018*	0.00013
Volatile organics					
Chloroform	0/12	U0.0050	U0.0050	~0.0050	0
Trichloroethylene	0/12	U0.0050	U0.0050	~0.0050	0

[a]See Fig. 4.7, Vol 1.

[b]Units in mg/L unless otherwise noted.

[c]Prefix "J" means the value was estimated; "B" means the value was found in the laboratory blank; "U" (undetected) means the value for an organic analyte was below the analytical detection limit; "<" means the value for any analyte (excluding organics) was below the analytical detection limit.

[d]Average concentrations significantly greater than zero are identified by an *.

[e]Standard error of the mean.

Table 4.76. NPDES Permit Number TN 0002941, 1992
ORNL Category I outfalls

Flow (1×106 L/d)—Max 0.16; Min 0.0014; Av 0.060

Analyte	Number detected/ number of samples	Concentration[a]			
		Max	Min	Av[b]	Standard error[c]
Field measurements					
Downstream pH, standard units	3/3	7.9	7.6	7.8*	0.088
Temperature, °C	3/3	15	9.8	12*	1.7
pH, standard units	3/3	7.9	7.6	7.7*	0.088
Others					
Oil and grease	2/3	200	<2.0	~110	56
Total suspended solids	3/3	11	5.0	8.0*	1.7

[a]Units in mg/L unless otherwise noted.
[b]Average concentrations significantly greater than zero are identified by an *.
[c]Standard error of the mean.

Table 4.77. NPDES Permit Number TN 0002941, 1992
ORNL Category II outfalls

Flow (1×10^6 L/d)—Max 0.89; Min 0.0011; Av 0.11

Analyte	Number detected/ number of samples	Concentration[a]			
		Max	Min	Av[b]	Standard error[c]
Field measurements					
Dissolved oxygen	1/1	10	10	10	*d*
Downstream pH, standard units	169/169	8.6	7.1	7.8*	0.019
Downstream temperature, °C	44/44	26	9.3	18*	0.72
Temperature, °C	170/170	65	7.8	18*	0.60
pH, standard units	169/169	8.9	7.0	7.7*	0.026
Others					
Oil and grease	85/170	180	<2.0	~9.4*	1.7
Total suspended solids	86/168	330	<5.0	~21*	3.4

[a]Units in mg/L unless otherwise noted.
[b]Average concentrations significantly greater than zero are identified by an *.
[c]Standard error of the mean.
[d]Not applicable.

Table 4.78. NPDES Permit Number TN 0002941, 1992
ORNL Category III outfalls

Flow (1×10^6 L/d)—Max 0.74; Min 0.00055; Av 0.084

Analyte	Number detected/ number of samples	Concentration[a]			
		Max	Min	Av[b]	Standard error[c]
Field measurements					
Conductivity, mS/cm	2/2	0.090	0.050	0.070	0.020
Dissolved oxygen	3/3	9.9	9.4	9.7*	0.15
Downstream pH, standard units	1/1	7.4	7.4	7.4	*d*
Temperature, °C	66/66	32	5.4	18*	0.80
Turbidity (JTU)	2/2	8.0	7.0	7.5*	0.50
pH, standard units	66/66	9.0	7.0	8.0*	0.051

[a]Units in mg/L unless otherwise noted.
[b]Average concentrations significantly greater than zero are identified by an *.
[c]Standard error of the mean.
[d]Not applicable.

Table 4.79. NPDES Permit Number TN 0002941, 1992
ORNL Cooling Systems

Flow (1×10^6 L/d)—Max 0.71; Min 0.00038; Av 0.15

Analyte	Number detected/ Number of samples	Concentration[a]			
		Max	Min	Av[b]	Standard error[c]
Field measurements					
Chlorine, total residual	42/45	0.19	<0.010	~0.095*	0.0081
Downstream pH, standard units	45/45	8.7	7.6	8.2*	0.035
Temperature, °C	45/45	37	3.7	24*	0.96
pH, standard units	45/45	9.0	7.5	8.5*	0.057
Metals					
Chromium, total	36/45	0.44	<0.0040	~0.026*	0.0097
Copper, total	40/45	1.1	<0.0070	~0.13*	0.027
Zinc, total	45/45	6.1	0.0022	0.31*	0.13

[a]Units in mg/L unless otherwise noted.
[b]Average concentrations significantly greater than zero are identified by an *.
[c]Standard error of the mean.

Table 4.80. Radionuclide concentrations at ORNL Category outfalls, 1992

Radionuclide	Number detected/ number of samples	Concentration (pCi/L)[a]				DCG[e]	Percent DCG[f]
		Max[b]	Min[b]	Av[c]	Standard error[d]		
			Category I outfalls				
Gross beta	1/3	2700*	−11	890	890	*g*	*g*
Total rad Sr[h]	1/1	1700*	1700*	1700	*g*	1000	*g*
			Category II outfalls				
Gross beta	110/168	5100*	−19	66*	33	*g*	*g*
Total rad Sr[h]	2/2	3500*	1500*	2500	1000	1000	*g*
			Category III outfalls[i]				
^{60}Co	3/5	12*	−0.81	6.1*	2.7	5000	0.12
^{137}Cs	3/5	430*	0.27	94	85	3000	*g*
Gross beta	5/5	7600*	14*	2700	1300	*g*	*g*
Total rad Sr[h]	4/4	4300*	780*	1900	840	1000	*g*

[a]Multiply pCi/L by 0.037 to convert to Bq/L.

[b]Individual concentrations significantly greater than zero are identified by an *.

[c]Average concentrations significantly greater than zero are identified by an *.

[d]Standard error of the mean.

[e]Derived concentration guide for ingestion of water. From DOE Order 5400.5.

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

[g]Not applicable.

[h]Total radioactive strontium analyzed when gross beta >30 Bq/L.

[i]Radionuclide concentrations are monitored at outfalls 302, 304, 341, 342, and 368.

Table 4.81. 1992 toxicity test results of ORNL wastewaters and ambient waters

Outfall	Test date	Treatment[a]	Fathead minnow NOEC[b] (%)	*Ceriodaphnia* NOEC[b] (%)	In-stream waste concentration[c] (%)
Coal Yard Runoff Treatment Facility (X02)	Feb	N	25	12	0.8
	May	N	50	25	1.3
	Nov	N	100	50	0.6
Sewage Treatment Plant (X01)	Apr	N	NT[d]	25	11.9
	Oct	N	NT[d]	25	18.2
Nonradiologial Wastewater Treatment Plant (X12)	June				
	Dec	N	NT[d]	100	NC[e]
		N	NT[d]	100	NC[e]
Melton Branch (X13)	Feb	N	<100	100	
	Mar[f]	N	<100	NT[d]	
		UV	100	NT[d]	
	Apr	N	<100	100	
		UV	<100	NT[d]	
	June	N	100	100	
		UV	100	NT[d]	
	Aug	N	<100	100	
		UV	100	NT[d]	
	Oct	N	100	100	
		UV	100	NT[d]	
	Dec	N	100	100	
		UV	100	NT[d]	
White Oak Creek (X14)	Feb	N	<100	100	
	Mar[f]	N	<100	NT[d]	
		UV	100	NT[d]	
	Apr	N	<100	100	
		UV	<100	NT[d]	
	June	N	100	<100	
		UV	100	NT[d]	
	July[f]	N	NT[d]	100	
	Aug	N	100	<100	
		UV	100	NT[d]	
	Sep[f]	N	NT[d]	100	
	Oct	N	<100	<100	
		UV	100	NT[d]	
	Nov[f]	N	NT[d]	100	
	Dec	N	100	100	
		UV	100	NT[d]	

[a]N = No sample pretreatment; UV = ultraviolet light pretreatment.
[b]No-observed-effect concentration.
[c]Based on critical low flow of White Oak Creek.
[d]NT = not tested.
[e]NC = not calculated.
[f]Confirmatory test.

Table 4.82. 1992 average water quality parameters measured during toxicity tests of ORNL wastewaters and ambient waters

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

Outfall	Test date	pH standard (units)	Conductivity (µS/cm)	Alkalinity (mg/L $CaCO_3$)	Hardness (mg/L $CaCO_3$)
Coal Yard	Feb	7.7	1576	14	970
Runoff Treatment	May	7.5	2440	17	1060
Facility (X02)	Nov	7.6	2600	24	1620
Sewage Treatment	Apr	8.0	452	115	167
Plant (X01)	Oct	8.0	423	102	160
Nonradiological	June	8.0	724	84	139
Wastewater Treatment	Dec	7.8	955	80	241
Plant (X12)					
Melton Branch	Feb	8.2	268	113	143
(X13)	Mar	8.0	274	123	141
	Apr	8.1	425	127	230
	June	8.1	485	105	243
	Aug	8.1	599	101	295
	Oct.	8.0	755	93	378
	Dec.	8.0	540	109	263
White Oak Creek	Feb	8.1	276	106	131
(X14)	Mar	8.1	307	111	140
	Apr	8.1	319	126	164
	June	8.2	354	119	159
	July	8.1	370	116	157
	Aug	8.1	348	113	157
	Sep	8.1	363	119	164
	Oct	8.2	408	123	180
	Nov	8.1	381	119	170
	Dec	8.1	401	119	171

Table 4.83. K-25 Site water monitoring locations

Location	Agency	Type	NPDES ID if applicable
Clinch River (Brashear Island)	DOE	Perimeter	
West Fork Poplar Creek	DOE	Perimeter	
K-710A (inactive)	TDEC/DOE	NPDES[a]	008
K-716	DOE	Perimeter	
K-901-A	TDEC/DOE	NPDES[b]	007
K-1007-B	TDEC/DOE	NPDES[b]	006
K-1203	TDEC/DOE	NPDES	005
K-1407-E and K-1407-F (inactive)	TDEC/DOE	NPDES	010 and 012
K-1407-J	TDEC/DOE	NPDES	011
K-1513	DOE	Perimeter[c]	
K-1515-C	TDEC/DOE	NPDES	009
K-1700	TDEC/DOE	NPDES[b]	001
K-1710	DOE	Perimeter	
K-1770	DOE	Perimeter	

[a]Removed from NPDES permit October 1, 1992.
[b]Removed from NPDES permit and placed in K-25 Site monitoring program October 1, 1992.
[c]Added to NPDES permit October 1, 1992

Table 4.84. Radionuclide concentrations at K-25 Site discharges and surface water monitoring locations

(Figs. 4.11, 4.12, and 4.13, Vol. 1)

Radionuclide	Number of samples[a]	Concentration (pCi/L)[b]			DCG	Percentage of DCG	Sum of the fraction of the DCGs
		Max	Min	Av			
K-1203 (sewage treatment plant)							
^{234}U	12	3.70	1.23	1.80	500	0.36	c
^{235}U	12	0.17	0.04	0.06	600	0.009	c
^{236}U	12	0.04	0.01	0.02	500	0.004	c
^{238}U	12	1.98	0.67	0.97	600	0.16	c
^{137}Cs	12	23.9	−22.1	7.59	3,000	0.25	c
^{99}Tc	12	1840	−289	591	100,000	0.59	c
^{237}Np	12	4.17	−0.91	1.03	30	3.44	c
^{238}Pu	12	5.66	0	1.78	40	4.44	c
^{239}Pu	12	4.83	0	0.66	30	2.20	c
Gross alpha	12	36.1	7.33	23.2	c	c	c
Gross beta	12	21.0	6.98	12.7	c	c	c
All listed radioisotopes		c	c	c	c	c	0.12
K-1700 (coal pile runoff and once-through cooling water)							
^{234}U	12	21.6	6.17	9.31	500	1.86	c
^{235}U	12	0.99	0.29	0.43	600	0.001	c
^{236}U	12	0.45	0.13	0.19	500	0.03	c
^{238}U	12	11.5	3.29	4.96	600	0.83	c
^{137}Cs	12	19.2	−20.8	−2.06	3,000	<0.001	c
^{99}Tc	12	1680	−238	492	100,000	0.49	c
^{237}Np	12	0.95	−0.95	0.15	30	0.49	c
^{238}Pu	12	6.01	−0.42	2.06	40	0.49	c
^{239}Pu	12	2.32	−0.84	0.39	30	5.14	c
Gross alpha	12	17.4	7.51	11.1	c	c	c
Gross beta	12	69.0	3.26	23.9	c	c	c
All listed radioisotopes		c	c	c	c	c	0.10
K-1007-B (settling basin for laboratory and surface water runoff)							
^{234}U	12	1.23	0.62	0.67	500	0.13	c
^{235}U	12	0.049	0.024	0.003	600	0.004	c
^{236}U	12	0.013	0.006	0.007	500	0.001	c
^{238}U	12	0.66	0.33	0.36	600	0.06	c
^{137}Cs	12	34.2	−34.2	−0.72	3,000	0.06	c
^{99}Tc	12	1540	−318	388	100,000	0.39	c
^{237}Np	12	10.4	−0.87	1.06	30	3.55	c
^{238}Pu	12	4.59	−0.01	1.59	40	3.98	c
^{239}Pu	12	0.96	−1.23	0.091	30	0.30	c
Gross alpha	12	3.41	−2.27	1.11	c	c	c
Gross beta	12	10.4	3.59	7.14	c	c	c
All listed radioisotopes		c	c	c	c	c	0.08
K-901-A (settling basin for laboratory and surface water runoff)							
^{234}U	12	3.09	1.23	1.95	500	0.39	c
^{235}U	12	0.076	0.03	0.05	600	0.008	c
^{236}U	12	0.032	0.012	0.02	500	0.004	c
^{238}U	12	1.65	0.662	1.05	600	0.18	c
^{137}Cs	12	30.8	−11.2	4.29	3,000	0.14	c
^{99}Tc	12	1490	−365	391	100,000	0.39	c
^{237}Np	12	1.30	−0.95	0.12	30	0.41	c
^{238}Pu	12	4.68	−6.21	1.30	40	3.25	c
^{239}Pu	12	1.06	−3.11	−0.15	30	<0.001	c
Gross alpha	12	7.38	−0.60	2.07	c	c	c

Table 4.84 (continued)

Radionuclide	Number of samples[a]	Concentration (pCi/L)[b]			DCG	Percentage of DCG	Sum of the fraction of the DCGs
		Max	Min	Av			
Gross beta	12	18.90	4.21	9.90	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.043
K-1407-J (treated effluents from Central Neutralization Facility and TSCA Incinerator)							
^{234}U	12	222	15.40	101	500	20.1	*c*
^{235}U	12	5.79	0.30	2.08	600	0.35	*c*
^{236}U	12	2.29	0.16	1.04	500	0.21	*c*
^{238}U	12	119	8.29	54.0	600	9.00	*c*
^{137}Cs	12	21.3	−21.3	3.37	3,000	0.11	*c*
^{99}Tc	12	1670	−159	451	100,000	0.45	*c*
^{237}Np	12	7.41	−1.46	2.32	30	7.72	*c*
^{238}Pu	12	9.43	−1.46	2.73	40	6.83	*c*
^{239}Pu	12	1.10	−0.02	0.40	30	1.33	*c*
Gross alpha	12	186	−43	51.8	*c*	*c*	*c*
Gross beta	12	1270	−43	164	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.46
West Fork Poplar Creek (upstream of the K-25 Site)							
^{234}U	3	0.419	−0.456	−0.164	500	<0.001	*c*
^{235}U	2	62.0	32.2	47.1	600	7.85	*c*
^{137}Cs	6	18.7	−9.36	2.98	3,000	0.099	*c*
^{99}Tc	6	160	−518	−191	100,000	<0.001	*c*
^{237}Np	6	2.50	−0.70	0.382	30	1.27	*c*
^{238}Pu	5	4.63	−0.76	1.54	40	0.038	*c*
^{239}Pu	5	1.25	−0.01	0.33	30	1.11	*c*
Gross alpha	5	4.07	−1.45	0.21	*c*	*c*	*c*
Gross beta	5	10.4	−0.17	3.48	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.14
K-1710 (Poplar Creek upstream of the K-25 Site)							
^{234}U	3	1.31	0.432	0.726	500	0.15	*c*
^{235}U	3	70	0	38.7	600	6.45	*c*
^{238}U	3	2.18	0.436	1.31	600	0.22	*c*
^{137}Cs	12	17.9	−36.3	−1.87	3,000	<0.001	*c*
^{99}Tc	12	1270	−501	79.84	100,000	0.080	*c*
^{237}Np	12	1.37	−0.70	0.493	30	1.65	*c*
^{238}Pu	12	4.9	−0.43	1.75	40	4.37	*c*
^{239}Pu	12	2.22	−0.02	0.376	30	1.25	*c*
Gross alpha	12	4.64	−0.64	1.70	*c*	*c*	*c*
Gross beta	12	8.28	−3.33	4.30	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.15
K-1513 (Clinch River upstream of the K-25 Site)							
^{137}Cs	9	19.9	−27.3	1.60	3,000	0.05	*c*
^{99}Tc	9	1430	−96.2	454.8	100,000	0.45	*c*
^{237}Np	9	1.73	0	0.74	30	2.45	*c*
^{238}Pu	9	4.10	1.01	2.37	40	5.92	*c*
^{239}Pu	9	2.27	0	0.58	30	1.92	*c*
Gross alpha	9	4.82	−1.80	0.65	*c*	*c*	*c*
Gross beta	9	60.1	−3.76	9.35	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.13
K-1770 (Clinch River downstream of the K-25 Site)							
^{137}Cs	9	19.9	−20.3	−0.11	3,000	<0.001	*c*
^{99}Tc	9	1640	−102	349	100,000	0.35	*c*
^{237}Np	9	5.62	−0.41	1.13	30	3.75	*c*
^{238}Pu	9	8.42	0.85	3.49	40	8.70	*c*
^{239}Pu	9	27.7	0	3.80	30	12.65	*c*
Gross alpha	9	4.89	−0.60	1.08	*c*	*c*	*c*

Table 4.84 (continued)

Radionuclide	Number of samples[a]	Concentration (pCi/L)[b]			DCG	Percentage of DCG	Sum of the fraction of the DCGs
		Max	Min	Av			
Gross beta	9	12.10	–4.56	4.36	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.35
Clinch River at Brashear Island (downstream of the K-25 Site)							
^{137}Cs	3	17	–15.3	2.23	3,000	0.07	*c*
^{99}Tc	3	48.6	–22.9	8.43	100,000	0.008	*c*
^{237}Np	3	0.43	0	0.14	30	0.48	*c*
^{238}Pu	3	3.28	1.83	2.70	40	6.74	*c*
^{239}Pu	3	0.497	0	0.166	30	0.55	*c*
Gross alpha	3	0	–1.19	–0.74	*c*	*c*	*c*
Gross beta	3	6.72	1.71	3.876	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.10
Mitchell Branch (within facility)							
^{137}Cs	3	2.59	–28.1	–8.54	3,000	<0.001	*c*
^{99}Tc	3	1860	0	661	100,000	6.61	*c*
^{237}Np	3	1.31	0	0.436	30	1.46	*c*
^{238}Pu	3	4.15	1.37	2.71	40	6.78	*c*
^{239}Pu	3	0.59	0	0.20	30	0.66	*c*
Gross alpha	3	5.63	–0.89	1.78	*c*	*c*	*c*
Gross beta	3	251	2.56	85.5	*c*	*c*	*c*
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	0.19
K-1070-C/D (discharge from Stormdrain SD-190 resulting from runoff from the burial ground)							
^{234m}Pa	3	6800	2750	4247	70,000	*c*	
^{137}Cs	3	0	–12.7	–6.62	3,000	*c*	
^{40}K	1	388	388	388	7,000	*c*	
^{234}Th	3	257	–87.3	82.63	10,000	*c*	
Gross alpha	3	9.99	3.23	7.09	*c*	*c*	
Gross beta	3	30.2	9.85	17.52	*c*	*c*	
All listed radioisotopes		*c*	*c*	*c*	*c*	*c*	

[a]Grab samples were taken quarterly at West Fork Poplar Creek, the Clinch River, and Mitchell Branch. At the other locations a 24-hour composite sample was taken monthly.

[b]Multiply pCi/L by 0.037 to convert to Bq/L.

[c]Not applicable.

Table 4.85. 1992 K-25 Site parameters detected at West Fork Poplar Creek

(Figs. 4.11 and 4.12, Vol. 1)

Parameter	Number of samples	Concentration[a]				Number of values exceeding reference
		Max	Min	Av	Reference value[b]	
Alkalinity	1	77	77	77	c	c
Ammonia nitrogen	3	0.22	0.22	0.22	c	c
Calcium	1	74	74	74	c	c
Chloride	1	5	5	5	c	c
Conductivity, µmho/cm	1	248	248	248	c	c
Copper	1	0.0063	0.0063	0.0063	0.018	0
Dissolved oxygen	1	7.9	7.9	7.9	c	c
Dissolved solids	3	190	136	158	c	c
Fluoride	3	0.2	0.1	0.15	c	c
Iron	1	0.27	0.27	0.27	c	c
Manganese	4	0.24	0.09	0.1387	c	c
Methylene chloride	14	0.002	0.002	0.002	4.7R	c
Nitrate	4	0.69	0.36	0.47	c	c
pH, standard units	4	7.8	6.7	7.425	6.5–8.5	0
Phosphate	1	0.09	0.09	0.09	c	c
Potassium	1	1.9	1.9	1.9	c	c
Sodium	4	5.4	3.7	4.35	c	c
Sulfate	4	40	33	37.75	c	c
Suspended solids	4	15	14	14.75	c	c
Temperature, °C	4	23.5	8	15.5	c	c
Zinc	4	0.008	0.0052	0.0072	0.117	0

[a]Units = mg/L unless otherwise noted.
[b]Tennessee water quality criteria.
[c]Not applicable.

Table 4.86. 1992 K-25 Site parameters detected at Clinch River (Brashear Island)

(Figs. 4.11 and 4.12, Vol. 1)

Parameter	Number of samples	Concentration[a]				Number of values exceeding reference
		Max	Min	Av	Reference value[b]	
Arsenic	3	0.005	0.002	0.004	0.05	0
Cadmium	3	0.002	0.0005	0.0012	0.004	0
Chemical oxygen demand	3	14	11	12.5	c	c
Copper	3	0.0059	0.004	0.0049	0.018	0
Dissolved solids	3	168	136	154	c	c
Fluoride	3	0.2	0.1	0.1333	c	c
Lead	3	0.004	0.002	0.0033	0.082	0
Manganese	3	0.14	0.03	0.0693	c	c
Nickel	3	0.05	0.01	0.0233	1.400	0
Nitrate	3	0.5	0.38	0.46	c	c
pH, standard units	3	8.4	8	8.2	6.5–8.5	0
Sodium	3	4.8	4.1	4.4333	c	c
Sulfate	3	22	20	21	c	c
Suspended solids	3	58	6	24	c	c
Temperature, °C	3	21.4	9.5	16.633	c	c
Zinc	3	0.0091	0.004	0.0065	0.117	0

[a]Units = mg/L unless otherwise noted.
[b]Tennessee water quality criteria.
[c]Not applicable.

Table 4.87. 1992 K-25 Site parameters detected at K-716 (Poplar Creek)

(Figs. 4.11 and 4.12, Vol. 1)

Parameter	Number of samples	Concentration[a]				Number of values exceeding reference
		Max	Min	Av	Reference value[b]	
Arsenic	9	0.0058	0.002	0.0039	0.36	0
Chemical oxygen demand	9	52	6	24	c	c
Copper	9	0.0088	0.0056	0.00762	0.018	0
Dissolved solids	9	238	106	160.666	c	c
Fluoride	9	0.4	0.1	0.17142	c	c
Lead	9	0.018	0.0005	0.00812	0.082	0
Manganese	9	0.35	0.063	0.178	c	c
Mercury	9	0.00092	0.00031	0.00061	0.0024	0
Methylene chloride	9	0.005	0.001	0.003	16R	0
Nitrate	9	2.7	0.5	1.015	c	c
pH, standard units	9	8.8	7.45	7.97111	6.5–8.5	0
Sodium	9	9.9	3.1	5.81111	c	c
Sulfate	9	31	20	26.6111	c	c
Suspended solids	9	521	6	99.2222	c	c
Temperature, °C	9	24.9	4.8	17.8444	c	c
Trichloroethene	9	0.001	0.001	0.001	c	c
Uranium	9	0.004	0.001	0.00237	c	c
Zinc	9	0.047	0.0056	0.0216	0.117	0

[a]Units = mg/L unless otherwise noted.
[b]Tennessee water quality criteria.
[c]Not applicable.

Table 4.88. 1992 K-25 Site parameters detected at K-1513 (Clinch River)

(Figs. 4.11 and 4.12, Vol. 1)

Parameter	Number of samples	Concentration[a]				Number of values exceeding reference
		Max	Min	Av	Reference value[b]	
Chemical oxygen demand	9	8	8	8	c	c
Chloroethane	9	0.021	0.009	0.01	c	c
Copper	9	0.004	0.004	0.004	0.018	0
Di-n-butylphthalate	9	0.001	0.001	0.001	12R	0
Dissolved solids	9	178	128	147.33	c	c
Fluoride	9	0.2	0.1	0.15	c	c
Manganese	9	0.054	0.028	0.037	c	c
Methylene chloride	9	0.008	0.005	0.0065	16R	0
Nitrate	9	0.75	0.37	0.54	c	c
pH, standard units	9	8.35	7.65	8.04	6.5–8.5	0
Sodium	9	5	3.7	4.45	c	c
Sulfate	9	23	19	20.8	c	c
Suspended solids	9	17	1	7.66	c	c
Temperature, °C	9	21.3	8.3	15.8	c	c
Zinc	9	0.0058	0.003	0.0047	0.117	0

[a]Units = mg/L unless otherwise noted.
[b]Tennessee water quality criteria.
[c]Not applicable.

Table 4.89. 1992 K-25 Site parameters detected at K-1710 (Poplar Creek)

(Figs. 4.11 and 4.12, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Alkalinity	10	95	95	95	c	c
Calcium	10	88	88	88	c	c
Chloride	10	7	7	7	c	c
Chlorine	10	0.04	0.04	0.04	c	c
Chloroethane	10	0.001	0.001	0.001	c	c
Conductivity, µmho/cm	10	300	300	300	c	c
Copper	10	0.062	0.0061	0.034	0.018	1
Dissolved oxygen	10	9.8	9.8	9.8	c	c
Dissolved solids	10	222	104	164	c	c
Fluoride	10	0.4	0.1	0.257	c	c
Iron	10	1.7	1.7	1.7	c	c
Lead	10	0.002	0.002	0.002	0.082	0
Manganese	10	0.28	0.087	0.177	c	c
Mercury	10	0.000	0.0003	0.0005	0.00015R	4
Methylene chloride	10	0.01	0.002	0.006	16R	0
Nitrate	10	3	0.1	1.387	c	c
pH, standard units	10	7.95	7	7.617	6.5–8.5	0
Phosphorus	10	0.39	0.39	0.39	c	c
Potassium	10	2.5	2.5	2.5	c	c
Sodium	10	11	2.6	6.44	c	c
Sulfate	10	40	22	31.62	c	c
Suspended solids	10	143	5	62.1	c	c
Temperature, °C	10	25.7	7.5	16.35	c	c
Uranium	10	0.005	0.001	0.0029	c	c
Zinc	10	0.16	0.004	0.036	0.177F	1

[a]Units = mg/L unless otherwise noted.
[b]Tennessee Water Quality Criteria.
[c]Not applicable.

Table 4.90. 1992 K-25 Site parameters detected at K-1770 (Clinch River)

(Fig. 4.11, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Chemical oxygen demand	9	6	5	5.5	c	c
Copper	9	0.0041	0.0041	0.004	0.018	0
Di-n-butylphthalate	9	0.001	0.001	0.001	12R	0
Dissolved solids	9	198	142	157.3	c	c
Fluoride	9	0.2	0.1	0.15	c	c
Lead	9	0.005	0.005	0.005	0.05	0
Manganese	9	0.27	0.036	0.098	c	c
Methylene chloride	9	0.002	0.002	0.002	16R	0
Nickel	9	0.019	0.019	0.019	1.4	0
Nitrate	9	1.4	0.54	0.846	c	c
pH, standard units	9	8.5	7.75	8.171	6.5–8.5	0
Sodium	9	5.1	3.8	4.45	c	c
Sulfate	9	23	20	21.72	c	c
Suspended solids	9	151	3	36.75	c	c
Temperature, °C	9	23.2	7.6	16.91	c	c
Uranium	9	0.002	0.001	0.001	c	c
Zinc	9	0.008	0.0053	0.006	0.117	0

[a]Units = mg/L unless otherwise noted.
[b]Tennessee Water Quality Criteria.
[c]Not applicable.

Table 4.91. 1992 K-25 Site parameters detected at Mitchell Branch

(Figs. 4.11 and 4.13, Vol. 1)

Parameter	Number of samples	Concentration[a]			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Dissolved solids	3	136	104	116.6	c	c
Fluoride	3	0.2	0.2	0.2	c	c
Manganese	3	0.057	0.027	0.039	c	c
Nitrate	3	0.11	0.11	0.11	c	c
pH, standard units	3	8.2	7.7	7.966	6.5–8.5	0
Sodium	3	0.77	0.52	0.65	c	c
Sulfate	3	4	3	3.333	c	c
Suspended solids	3	5	3	4	c	c
Temperature, °C	3	18.1	9.2	14.03	c	c
Uranium	3	0.007	0.007	0.007	c	c

[a]Units = mg/L unless otherwise noted.
[b]Tennessee Water Quality Criteria.
[c]Not applicable.

Table 4.92. K-25 Site NPDES sampling frequency, January 1 to September 30, 1992[a]

(Figs. 4.11 and 4.13, Vol. 1)

Location	Sampling type	Sample frequency	Analysis frequency[b]	Parameter analyzed
K-1700 (001)	Grab	Daily		pH
K-1700 (001)	*c*	Daily		Flow
K-1700 (001)	24 h/comp.	2/week		Aluminum
K-1700 (001)	24 h/comp.	4/week		Chemical oxygen demand
K-1700 (001)	24 h/comp.	2/week		Chromium
K-1700 (001)	24 h/comp.	2/week		Dissolved solids
K-1700 (001)	24 h/comp.	2/week		Fluoride
K-1700 (001)	24 h/comp.	2/week		Nitrate/nitrogen
K-1700 (001)	Grab	2/week		Oil and grease
K-1700 (001)	24 h/comp.	4/week		Total suspended solids
K-1700 (001)	Grab	4/week		Temperature
K-1700 (001)	Grab	4/week		Turbidity
K-1700 (001)	24 h/comp.	2/week		Lead
K-1700 (001)	24 h/comp.	2/week		Zinc
K-1700 (001)	24 h/comp.	1/week		Uranium[d]
K-1700 (001)	24 h/comp.	1/week	1/month	Cesium
K-1700 (001)	24 h/comp.	1/week	1/month	Neptunium
K-1700 (001)	24 h/comp.	1/week	1/month	Plutonium
K-1700 (001)	24 h/comp.	1/week	1/month	Technetium
K-1203 (005)	Grab	Daily		pH
K-1203 (005)	Grab	Daily		Chlorine, residual
K-1203 (005)	Grab	Daily		Dissolved oxygen
K-1203 (005)	Grab	Daily		Settleable solids
K-1203 (005)	*c*	Daily		Flow
K-1203 (005)	24 h/comp.	3/week		Ammonia nitrogen
K-1203 (005)	24 h/comp.	3/week		Biochemical oxygen demand
K-1203 (005)	Grab	3/week		Fecal coliform
K-1203 (005)	24 h/comp.	3/week		Total suspended solids
K-1203 (005)	24 h/comp.	1/week		Uranium[d]
K-1203 (005)	24 h/comp.	1/week	1/month	Technetium
K-1007-B (006)	Grab	Daily		pH
K-1007-B (006)	Grab	1/week		Dissolved oxygen
K-1007-B (006)	*c*	Daily		Flow
K-1007-B (006)	24 h/comp.	1/week		Chemical oxygen demand
K-1007-B (006)	24 h/comp.	1/week		Chromium
K-1007-B (006)	24 h/comp.	1/week		Fluoride
K-1007-B (006)	Grab	1/week		Oil and grease
K-1007-B (006)	24 h/comp.	1/week		Total suspended solids
K-1007-B (006)	24 h/comp.	1/week		Uranium[d]
K-1007-B (006)	24 h/comp.	1/week	1/month	Cesium
K-1007-B (006)	24 h/comp.	1/week	1/month	Plutonium
K-1007-B (006)	24 h/comp.	1/week	1/month	Neptunium
K-1007-B (006)	24 h/comp.	1/week	1/month	Technetium
K-901-A (007)	Grab	Daily		pH
K-901-A (007)	Grab	Daily		Dissolved oxygen
K-901-A (007)	*c*	Daily		Flow
K-901-A (007)	24 h/comp.	2/week		Chemical oxygen demand
K-901-A (007)	24 h/comp.	1/week		Chromium
K-901-A (007)	24 h/comp.	1/week		Fluoride
K-901-A (007)	Grab	1/week		Oil and grease
K-901-A (007)	24 h/comp.	2/week		Total suspended solids
K-901-A (007)	Grab	2/week		Turbidity
K-901-A (007)	24 h/comp.	1/week		Uranium[d]
K-901-A (007)	24 h/comp.	1/week	1/month	Cesium
K-901-A (007)	24 h/comp.	1/week	1/month	Neptunium
K-901-A (007)	24 h/comp.	1/week	1/month	Plutonium
K-901-A (007)	24 h/comp.	1/week	1/month	Technetium
K-1515-C (009)	Grab	1/week		pH
K-1515-C (009)	*c*	Daily		Flow

Table 4.92 (continued)

Location	Sampling type	Sample frequency	Analysis frequency[b]	Parameter analyzed
K-1515-C (009)	Grab	1/week		Total suspended solids
K-1515-C (009)	Grab	1/week		Aluminum
K-1515-C (009)	Grab	1/week		Sulfate
K-1515-C (009)	Grab	1/week		Chemical oxygen demand
K-1407-J (011)	Continuous	Daily		pH
K-1407-J (011)	Continuous	Daily		Flow
K-1407-J (011)	Grab	Daily		Temperature
K-1407-J (011)	24 h/comp.	2/week		Cadmium
K-1407-J (011)	24 h/comp.	2/week		Chromium
K-1407-J (011)	24 h/comp.	2/week		Copper
K-1407-J (011)	24 h/comp.	2/week		Lead
K-1407-J (011)	24 h/comp.	2/week		Nickel
K-1407-J (011)	24 h/comp.	2/week		Silver
K-1407-J (011)	24 h/comp.	2/week		Zinc
K-1407-J (011)	Grab	1/week		Cyanide
K-1407-J (011)	Grab	1/week		Total toxic organics
K-1407-J (011)	Grab	2/week		Oil and grease
K-1407-J (011)	24 h/comp.	4/week		Total suspended solids
K-1407-J (011)	24 h/comp.	1/week		Polychlorinated biphenyls
K-1407-J (011)	24 h/comp.	1/week		Uranium[d]
K-1407-J (011)	Grab	1/week		Phenols
K-1407-J (011)	Grab	5/week		GC/MS[e] fraction volatile compounds
K-1407-J (011)	72 h/comp.	1/month		GC/MS acid compounds
K-1407-J (011)	72 h/comp.	1/month		GC/MS base/neutral compounds
K-1407-J (011)	24 h/comp.	1/week	1/month	Cesium
K-1407-J (011)	24 h/comp.	1/week	1/month	Plutonium
K-1407-J (011)	24 h/comp.	1/week	1/month	Neptunium
K-1407-J (011)	24 h/comp.	1/week	1/month	Technetium
K-1407-E/F (010)	Grab	Continuous		Flow
K-1407-E/F (010)	Grab	1/week		Temperature
K-1407-E/F (010)	24 h/comp.	1/week		Total suspended solids
K-1407-E/F (010)	Grab	1/week		Oil and grease
K-1407-E/F (010)	24 h/comp.	1/week		Chromium
K-1407-E/F (010)	24 h/comp.	1/week		Copper
K-1407-E/F (010)	24 h/comp.	1/week		Iron
K-1407-E/F (010)	24 h/comp.	1/week		Zinc
K-1407-E/F (010)	24 h/comp.	1/week		Arsenic
K-1407-E/F (010)	24 h/comp.	1/week		Cadmium
K-1407-E/F (010)	24 h/comp.	1/week		Lead
K-1407-E/F (010)	24 h/comp.	1/week		Manganese
K-1407-E/F (010)	24 h/comp.	1/week		Nickel
K-1407-E/F (010)	24 h/comp.	1/week		Selenium
K-1407-E/F (010)	24 h/comp.	1/week		Silver
K-1407-E/F (010)	24 h/comp.	1/month		Sulfate
K-1407-E/F (010)	Grab	Continuous		pH
K-1407-E/F (010)	24 h/comp.	1/week		Polychlorinated biphenyls
K-1407-E/F (010)	24 h/comp.	1/week		Uranium[d]
K-1407-E/F (010)	24 h/comp.	1/week		Cesium
K-1407-E/F (010)	24 h/comp.	1/week		Neptunium
K-1407-E/F (010)	24 h/comp.	1/week		Plutonium
K-1407-E/F (010)	24 h/comp.	1/week		Technetium

[a]A new NPDES permit went into effect on October 1, 1992.
[b]Analysis frequency is identical to sample frequency unless otherwise noted.
[c]Not applicable.
[d]An isotopic analysis is conducted on uranium if any week is above 0.02 mg/L.
[e]Gas chromatograph/mass spectrometer.

Table 4.93. K-25 Site NPDES sampling frequency, October 1 through December 31, 1992[a]

(Figs. 4.11 and 4.13, Vol. 1)

Location	Sampling type	Sample frequency	Analysis frequency[b]	Parameter analyzed
K-1203 (005)	Grab	Daily		pH
K-1203 (005)	Grab	Daily		Chlorine, residual
K-1203 (005)	Grab	Daily		Dissolved oxygen
K-1203 (005)	Grab	5/week		Settleable solids
K-1203 (005)	*c*	Daily		Flow
K-1203 (005)	Grab	3/week		Ammonia nitrogen
K-1203 (005)	24 h/comp.	3/week		Biochemical oxygen demand
K-1203 (005)	Grab	3/week		Fecal coliform
K-1203 (005)	24 h/comp.	3/week		Total suspended solids
K-1515-C (009)	Grab	1/week		pH
K-1515-C (009)	*c*	Daily		Flow
K-1515-C (009)	Grab	1/week		Total suspended solids
K-1515-C (009)	Grab	1/week		Aluminum
K-1515-C (009)	Grab	1/week		Chlorine
K-1515-C (009)	Grab	1/week		Settleable solids
K-1407-J (011)	Continuous	Daily		pH
K-1407-J (011)	Continuous	Daily		Flow
K-1407-J (011)	Grab	Daily		Temperature
K-1407-J (011)	24 h/comp.	1/quarter		Cadmium
K-1407-J (011)	24 h/comp.	1/quarter		Chromium
K-1407-J (011)	24 h/comp.	1/quarter		Copper
K-1407-J (011)	24 h/comp.	1/quarter		Lead
K-1407-J (011)	24 h/comp.	1/quarter		Nickel
K-1407-J (011)	24 h/comp.	1/quarter		Silver
K-1407-J (011)	24 h/comp.	1/quarter		Zinc
K-1407-J (011)	Grab	1/quarter		Total toxic organics
K-1407-J (011)	Grab	2/week		Oil and grease
K-1407-J (011)	24 h/comp.	4/week		Total suspended solids
K-1407-J (011)	24 h/comp.	1/month		Polychlorinated biphenyls
K-1407-J (011)	24 h/comp.	1/week		Chemical oxygen demand
K-1407-J (011)	24 h/comp.	2/week		Chlorine, total residual
K-1407-J (011)	24 h/comp.	4/week		Chloride
K-1407-J (011)	24 h/comp.	1/month		Uranium[d]
K-1407-J (011)	Grab	1/month		GC/MS[e] fraction volatile compounds
K-1407-J (011)	72 h/comp.	1/month		GC/MS acid compounds
K-1407-J (011)	72 h/comp.	1/month		GC/MS base/neutral compounds
K-1407-J (011)	24 h/comp.	1/week	1/month	Cesium
K-1407-J (011)	24 h/comp.	1/week	1/month	Plutonium
K-1407-J (011)	24 h/comp.	1/week	1/month	Neptunium
K-1407-J (011)	24 h/comp.	1/week	1/month	Technetium
K-1407-E (010)	Grab	Continuous		Flow
K-1407-E (010)	Grab	1/week		Temperature
K-1407-E (010)	24 h/comp.	1/week		Total suspended solids
K-1407-E (010)	Grab	1/week		Oil and grease
K-1407-E (010)	24 h/comp.	1/week		Chromium
K-1407-E (010)	24 h/comp.	1/week		Copper
K-1407-E (010)	24 h/comp.	1/week		Iron
K-1407-E (010)	24 h/comp.	1/week		Zinc
K-1407-E (010)	24 h/comp.	1/week		Cadmium
K-1407-E (010)	24 h/comp.	1/week		Lead
K-1407-E (010)	24 h/comp.	1/week		Nickel
K-1407-E (010)	24 h/comp.	1/week		Selenium
K-1407-E (010)	24 h/comp.	1/week		Silver
K-1407-E (010)	24 h/comp.	1/month		Sulfate

Table 4.93 (continued)

Location	Sampling type	Sample frequency	Analysis frequency[b]	Parameter analyzed
K-1407-E (010)	Continuous	Recorder		pH
K-1407-E (010)	24 h/comp.	1/week		Polychlorinated biphenyls
K-1407-E (010)	24 h/comp.	1/week		Uranium[d]
K-1407-E (010)	24 h/comp.	1/week		Cesium
K-1407-E (010)	24 h/comp.	1/week		Neptunium
K-1407-E (010)	24 h/comp.	1/week		Plutonium
K-1407-E (010)	24 h/comp.	1/week		Technetium
K-1407-F (012)	Continuous	Recorder		Flow
K-1407-F (012)	Grab	1/week		Temperature
K-1407-F (012)	24h/comp.	1/week		Total suspended solids
K-1407-F (012)	Grab	1/week		Oil and grease
K-1407-F (012)	24h/comp.	1/week		Chromium
K-1407-F (012)	24h/comp.	1/week		Copper
K-1407-F (012)	24h/comp.	1/week		Zinc
K-1407-F (012)	24h/comp.	1/week		Iron
K-1407-F (012)	24h/comp.	1/month		Sulfate
K-1407-F (012)	24h/comp.	1/week		Cadmium
K-1407-F (012)	24h/comp.	1/week		Lead
K-1407-F (012)	24h/comp.	1/week		Nickel
K-1407-F (012)	24h/comp.	1/week		Selenium
K-1407-F (012)	24h/comp.	1/week		Silver
K-1407-F (012)	24h/comp.	1/week		Polychlorinated biphenyls

[a]A new NPDES permit went into effect on October 1, 1992.
[b]Analysis frequency is identical to sample frequency unless otherwise noted.
[c]Not applicable.
[d]An isotopic analysis is conducted on uranium if any week is above 0.02 mg/L.
[e]Gas chromatograph/mass spectrometer.

Table 4.94. K-25 Site storm drain outfalls

Category[a]	Effluent analytes	Monitoring frequency
I	Flow pH	Semiannually
II	Flow pH Total suspended solids	Quarterly
III	Flow pH Oil and grease Total suspended solids	Monthly
IV	Flow pH Oil and grease Total suspended solids Total residual chlorine	Weekly

[a]Category I: intermittent flow and storm water runoff from areas remotely associated with plant activities.
Category II: intermittent flow and storm water runoff from building roof drains and paved areas associated with plant activities.
Category III: intermittent flow and storm water runoff from areas associated with concentrated storage areas, roof drains, and parking lots.
Category IV: continuous flow, including cooling water discharges and runoff from industrial areas.

Table 4.95. K-25 Site NPDES permit discharges

Serial discharges	Effluent discharges	Average flow (gal × 10^6/d)	Receiving stream
K-1700 (001)	Surface runoff once-through cooling	0.58	Poplar Creek
K-1407-J (011)	Metals cleaning facility Uranium recovery Chemical Process Development Facility TSCA Incinerator Steam plant and coal yard effluents	0.12	Poplar Creek
K-1407-E/F (010)	Steam plant and coal yard effluents Surface runoff	*a*	Mitchell Branch
K-901-A (007)	Surface runoff	0.1	Clinch River
K-1203 (005)	Sanitary wastewaters rganic industrial wastewaters	0.43	Poplar Creek
K-1007-B (006)	Potable water from once-through cooling systems Fire water from once-through systems Surface runoff	1.04	Poplar Creek
K-1515-C (009)	Water from sludge and back-wash systems associated with the potable water plant Surface runoff	0.22	Clinch River

[a]No discharges occurred in 1992.

Table 4.96. 1992 NPDES Permit Number TN 0002950

Storm drain discharge points

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point SD100				
Chlorine, mg/L	14	1.1	0.05	0.5636	0.14	14
Flow, MGD	12	15.06	0.53	2.30	*b*	*b*
Oil and grease, mg/L	14	7.7	<2	<3.2214	*b*	*b*
Suspended solids, mg/L	14	11	<1	<2.7857	*b*	*b*
Temperature, °C	11	20.2	13.3	17.0364	*b*	*b*
pH, standard units	17	8.7	7.7	8.1529	6.0/9.0	0
		Discharge Point SD110				
Flow, MGD	1	0.007	0.007	0.007	*b*	*b*
Suspended solids, mg/L	1	22	22	22.0	*b*	*b*
Temperature, °C	1	13.8	13.8	13.8	*b*	*b*
pH, standard units	1	7.8	7.8	7.8	4.0/9.0	0
		Discharge Point SD120				
Flow, MGD	3	0.232	0	0.12	*b*	*b*
Oil and grease, mg/L	3	6.3	<2	<3.4333	*b*	*b*
Suspended solids, mg/L	3	17	2	9.6667	*b*	*b*
Temperature, °C	1	16	16	16.0	*b*	*b*
pH, standard units	3	7.4	6.6	7.0	4.0/9.0	0
		Discharge Point SD124				
Chlorine, mg/L	13	0.06	0.01	0.0346	0.14	0
Flow, MGD	13	0.07	0.0014	0.007	*b*	*b*
Oil and grease, mg/L	13	6.7	<2	<2.6	*b*	*b*
Suspended solids, mg/L	13	7	<1	<2.0	*b*	*b*
Temperature, °C	10	17.7	9.5	13.0200	*b*	*b*
pH, standard units	16	8.8	7.8	8.1687	6.0/9.0	0
		Discharge Point SD130				
Chlorine, mg/L	15	0.06	0.01	0.0257	0.14	0
Flow, MGD	17	18.1	0.0	1.46	*b*	*b*
Oil and grease, mg/L	15	6.9	<2	<2.6933	*b*	*b*
Suspended solids, mg/L	15	25	1	7.9333	*b*	*b*
Temperature, °C	12	17.4	10.7	13.3583	*b*	*b*
pH, standard units	18	8.2	7.4	7.7	6.0/9.0	0
		Discharge Point SD140				
Flow, MGD	1	0.004	0.004	0.004	*b*	*b*
Suspended solids, mg/L	1	1	1	1.0	*b*	*b*
pH, standard units	1	6.8	6.8	6.8	4.0/9.0	0
		Discharge Point SD142				
Flow, MGD	3	0.27	0.001	0.098	*b*	*b*
Oil and grease, mg/L	3	2.8	<2	<2.2667	*b*	*b*
Suspended solids, mg/L	3	4	<1	<2.6667	*b*	*b*
Temperature, °C	1	9.3	9.3	9.3	*b*	*b*
pH, standard units	3	8	7.5	7.8	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point SD144				
Flow, MGD	3	0.94	0.001	0.31	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	13	4	8.0	*b*	*b*
Temperature, °C	1	6.6	6.6	6.6	*b*	*b*
pH, standard units	3	8	7.8	7.8667	4.0/9.0	0
		Discharge Point SD146				
Flow, MGD	3	0.95	0.0004	0.32	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	193	20	80.0	*b*	*b*
Temperature, °C	1	8.2	8.2	8.2	*b*	*b*
pH, standard units	3	8.4	8	8.2333	4.0/9.0	0
		Discharge Point SD148				
Flow, MGD	3	0.0029	0.0004	0.0013	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	5	<1	<2.3333	*b*	*b*
Temperature, °C	1	7.4	7.4	7.4	*b*	*b*
pH, standard units	3	8.4	7.7	8.1	4.0/9.0	0
		Discharge Point SD150				
Flow, MGD	3	0.045	0.01	0.032	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	3	2	2.3333	*b*	*b*
pH, standard units	3	8.3	7.2	7.6	4.0/9.0	0
		Discharge Point SD152				
Flow, MGD	1	0.024	0.024	0.024	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
pH, standard units	1	7.6	7.6	7.6	4.0/9.0	0
		Discharge Point SD154				
Flow, MGD	3	0.15	0.00028	0.08	*b*	*b*
Oil and grease, mg/L	3	4.2	<2	<3.1667	*b*	*b*
Suspended solids, mg/L	3	15	<1	<9.3333	*b*	*b*
pH, standard units	3	7.6	7	7.3333	4.0/9.0	0
		Discharge Point SD158				
Flow, MGD	1	0.011	0.011	0.011	*b*	*b*
Suspended solids, mg/L	1	4	4	4.0	*b*	*b*
pH, standard units	1	7.4	7.4	7.4	4.0/9.0	0
		Discharge Point SD160				
Flow, MGD	1	0.0016	0.0016	0.0016	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
pH, standard units	1	7.9	7.9	7.9	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point SD162						
Flow, MGD	3	0.029	0.003	0.016	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	12	2	5.6667	*b*	*b*
Temperature, °C	1	10.8	10.8	10.8	*b*	*b*
pH, standard units	3	8.4	7.6	8.0	4.0/9.0	0
Discharge Point SD168						
Flow, MGD	1	0.00019	0.00019	0.00019	*b*	*b*
Suspended solids, mg/L	1	2	2	2.0	*b*	*b*
pH, standard units	1	7.8	7.8	7.8	4.0/9.0	0
Discharge Point SD170						
Chlorine, mg/L	13	0.1	0.01	0.0346	0.019	11
Flow, MGD	17	0.267	0.07	0.14	*b*	*b*
Oil and grease, mg/L	14	11.25	<2	<2.9250	*b*	*b*
Suspended solids, mg/L	14	2	<1	<1.1429	*b*	*b*
Temperature, °C	12	21.3	12.9	18.1083	*b*	*b*
pH, standard units	17	8.6	7.3	8.2824	6.0/9.0	0
Discharge Point SD180						
Chemical oxygen demand, mg/L	5	<5	<5	<5.0	*b*	*b*
Chlorine, mg/L	89	0.1	0.01	0.0206	*b*	*b*
Dissolved oxygen, ppm	17	10.5	7.8	8.9764	*b*	*b*
Flow, MGD	23	0.22	0.014	0.051	*b*	*b*
Oil and grease, mg/L	13	5.8	<2	<2.5923	*b*	*b*
Sulfite, mg/L	6	4	<1	<1.8333	*b*	*b*
Suspended solids, mg/L	13	28	<1	<3.4615	*b*	*b*
Temperature, °C	11	20.1	10	14.3273	*b*	*b*
Total residual chlorine vol, mg/L	2	<0.05	<0.05	<0.0500	*b*	*b*
pH, standard units	18	8.7	7.7	8.30	6.0/9.0	0
Discharge Point SD190						
Chemical oxygen demand (COD), mg/L	6	<5	<5	<5.0	*b*	*b*
Chlorine, mg/L	88	0.07	0.01	0.0180	*b*	*b*
Dissolved oxygen, ppm	17	10.4	8.3	9.0059	*b*	*b*
Flow, MGD	21	0.1	0.022	0.047	*b*	*b*
Oil and grease, mg/L	13	3.9	<2	<2.2692	*b*	*b*
Sulfite, mg/L	6	3	<1	<1.5	*b*	*b*
Suspended solids, mg/L	13	32	2	8.6154	*b*	*b*
Temperature, °C	11	18.8	10.4	14.0909	*b*	*b*
pH, standard units	18	8.5	7.5	8.0666	6.0/9.0	0
Discharge Point SD197						
Flow, MGD	3	0.099	0.049	0.068	*b*	*b*
Oil and grease, mg/L	3	2.6	<2	<2.2	*b*	*b*
Suspended solids, mg/L	3	15	7	12.3333	*b*	*b*
Temperature, °C	3	20.5	6.2	14.3	*b*	*b*
pH, standard units	3	8.4	7.4	7.9	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point SD198				
Flow, MGD	1	0.065	0.065	0.065	*b*	*b*
Suspended solids, mg/L	1	3	3	3.0	*b*	*b*
pH, standard units	1	7.8	7.8	7.8	4.0/9.0	0
		Discharge Point SD200				
Flow, MGD	3	0.085	0	0.035	*b*	*b*
Oil and grease, mg/L	2	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	2	26	8	17.0	*b*	*b*
Temperature, °C	1	17.4	17.4	17.4	*b*	*b*
pH, standard units	2	7.6	7.5	7.55	4.0/9.0	0
		Discharge Point SD210				
Flow, MGD	1	0.45	0.45	0.45	*b*	*b*
Suspended solids, mg/L	1	5	5	5.0	*b*	*b*
Temperature, °C	1	15.4	15.4	15.4	*b*	*b*
pH, standard units	1	6.9	6.9	6.9	4.0/9.0	0
		Discharge Point SD220				
Flow, MGD	3	0.026	0.0	0.011	*b*	*b*
Oil and grease, mg/L	2	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	2	16	4	10.0	*b*	*b*
Temperature, °C	2	16.5	11.1	13.8	*b*	*b*
pH, standard units	2	7.9	7.1	7.5	4.0/9.0	0
		Discharge Point SD230				
Flow, MGD	3	0.086	0.010	0.037	*b*	*b*
Oil and grease, mg/L	3	2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	3	<1	<1.6667	*b*	*b*
pH, standard units	3	8.3	6.9	7.7333	4.0/9.0	0
		Discharge Point SD240				
Flow, MGD	3	0.4	0.014	0.159	*b*	*b*
Oil and grease, mg/L	3	5.6	<2	<4.2	*b*	*b*
Suspended solids, mg/L	3	7	1	3.3333	*b*	*b*
pH, standard units	3	7.8	6.9	7.4	4.0/9.0	0
		Discharge Point SD254				
Flow, MGD	1	0.00096	0.00096	0.00096	*b*	*b*
Suspended solids, mg/L	1	9	9	9.0	*b*	*b*
pH, standard units	1	8	8	8.0	4.0/9.0	0
		Discharge Point SD330				
Flow, MGD	0.4	0.4	0.4		*b*	*b*
Suspended solids, mg/L	1	6	6	6.0	*b*	*b*
pH, standard units	1	6.6	6.6	6.6	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point SD352				
Flow, MGD	1	0.0008	0.0008	0.0008	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
pH, standard units	1	7.3	7.3	7.3	4.0/9.0	0
		Discharge Point SD380				
Flow, MGD	3	0.108	0.025	0.05	*b*	*b*
Oil and grease, mg/L	3	5.2	<2	<3.5667	*b*	*b*
Suspended solids, mg/L	3	1	<1	<1.0	*b*	*b*
pH, standard units	3	8.2	7.2	7.8	4.0/9.0	0
		Discharge Point SD390				
Flow, MGD	2	0.5	0.002	0.25	*b*	*b*
Oil and grease, mg/L	2	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	2	6	3	4.5	*b*	*b*
Temperature, °C	1	9.5	9.5	9.5	*b*	*b*
pH, standard units	2	7.7	7.1	7.4	4.0/9.0	0
		Discharge Point SD430				
Flow, MGD	3	1.39	0.02	0.5	*b*	*b*
Oil and grease, mg/L	3	3.2	2	2.73	b	*b*
Suspended solids, mg/L	3	2	<1	<1.667	*b*	*b*
Temperature, °C	1	9.3	9.3	9.3	*b*	*b*
pH, standard units	3	7.5	7	7.2	4.0/9.0	0
		Discharge Point SD440				
Flow, MGD	3	0.38	0.02	0.16	*b*	*b*
Oil and grease, mg/L	3	2.6	<2	<2.267	*b*	*b*
Suspended solids, mg/L	3	9	2	4.333	*b*	*b*
pH, standard units	3	8.1	7.5	7.733	4.0/9.0	0
		Discharge Point SD480/490				
Flow, MGD	3	1.8	0.3	0.95	*b*	*b*
Oil and grease, mg/L	3	2.3	<2	<2.1	*b*	*b*
Suspended solids, mg/L	3	7	<1	<3.0	*b*	*b*
Temperature, °C	1	13.6	13.6	13.6	*b*	*b*
pH, standard units	3	7.7	6.7	7.13	4.0/9.0	0
		Discharge Point SD510				
Flow, MGD	3	0.07	0.001	0.05	*b*	*b*
Oil and grease, mg/L	3	2.5	<2	<2.167	*b*	*b*
Suspended solids, mg/L	3	1	<1	<1.0	*b*	*b*
pH, standard units	3	8.2	7.2	7.83	4.0/9.0	0
		Discharge Point SD560				
Flow, MGD	3	0.156	0.0004	0.05	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	2	<1	<1.333	*b*	*b*
pH, standard units	3	8.3	7.1	7.63	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point SD610				
Flow, MGD	3	4.18	0.45	1.9	*b*	*b*
Oil and grease, mg/L	3	3.3	<2	<2.433	*b*	*b*
Suspended solids, mg/L	3	5	2	3.333	*b*	*b*
pH, standard units	3	8.3	7.2	7.767	4.0/9.0	0
		Discharge Point SD640				
Flow, MGD	1	0.13	0.13	0.13	*b*	*b*
Suspended solids, mg/L	1	8	8	8.0	*b*	*b*
pH, standard units	1	5.9	5.9	5.9	4.0/9.0	0
		Discharge Point SD660				
Flow, MGD	1	0.0023	0.0023	0.0023	*b*	*b*
Suspended solids, mg/L	1	9	9	9.0	*b*	*b*
pH, standard units	1	6.9	6.9	6.9	4.0/9.0	0
		Discharge Point SD670				
Flow, MGD	1	0.009	0.009	0.009	*b*	*b*
Suspended solids, mg/L	1	2	2	2.0	*b*	*b*
pH, standard units	1	7	7	7.0	4.0/9.0	0
		Discharge Point SD680				
Flow, MGD	1	0.14	0.14	0.14	*b*	*b*
Suspended solids, mg/L	1	5	5	5.0	*b*	*b*
pH, standard units	1	6.4	6.4	6.4	4.0/9.0	0
		Discharge Point SD690				
Flow, MGD	3	1.2	0.067	0.52	*b*	*b*
Oil and grease, mg/L	3	2.7	<2	<2.23	*b*	*b*
Suspended solids, mg/L	3	2	1	1.33	*b*	*b*
pH, standard units	3	8.1	6.7	7.37	*b*	*b*
		Discharge Point SD700				
Flow, MGD	3	0.13	0.014	0.07	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	24	2	9.67	*b*	*b*
Temperature, °C	1	13.6	13.6	13.6	*b*	*b*
pH, standard units	3	8	7.1	7.7	4.0/9.0	0
		Discharge Point SD710				
Flow, MGD	4	46.26	0.33	12.4	*b*	*b*
Oil and grease, mg/L	4	2.2	<2	<2.05	*b*	*b*
Suspended solids, mg/L	4	43	<1	<17.0	*b*	*b*
Temperature, °C	1	9.5	9.5	9.5	*b*	*b*
pH, standard units	4	7.9	7	7.6	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
Discharge Point SD712						
Flow, MGD	3	0.011	0.0008	0.0045	*b*	*b*
Oil and grease, mg/L	3	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	3	14	2	6.67	*b*	*b*
pH, standard units	3	7.9	7.1	7.57	4.0/9.0	0
Discharge Point SD720						
Flow, MGD	2	0.12	0.0014	0.059	*b*	*b*
Oil and grease, mg/L	2	3.1	<2	<2.550	*b*	*b*
Suspended solids, mg/L	2	42	5	23.5	*b*	*b*
Temperature, °C	2	14.8	6.7	10.75	*b*	*b*
pH, standard units	2	7.6	6.7	7.15	4.0/9.0	0
Discharge Point SD750						
Flow, MGD	3	0.0006	0.0	0.0002	*b*	*b*
Oil and grease, mg/L	1	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	1	4	4	4.0	*b*	*b*
Temperature, °C	1	8.8	8.8	8.8	*b*	*b*
pH, standard units	1	7.7	7.7	7.7	4.0/9.0	0
Discharge Point SD760						
Flow, MGD	3	0.005	0.0	0.002	*b*	*b*
Oil and grease, mg/L	1	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
Temperature, °C	1	8.1	8.1	8.1	*b*	*b*
pH, standard units	1	7.8	7.8	7.8	4.0/9.0	0
Discharge Point SD780						
Flow, MGD	1	0.006	0.006	0.006	*b*	*b*
Oil and grease, mg/L	1	3.4	3.4	3.4	*b*	*b*
Suspended solids, mg/L	1	9	9	9.0	*b*	*b*
Temperature, °C	1	16.2	16.2	16.2	*b*	*b*
pH, standard units	1	8	8	8.0	4.0/9.0	0
Discharge Point SD810						
Flow, MGD	1	0.0014	0.0014	0.0014	*b*	*b*
Suspended solids, mg/L	1	2	2	2.0	*b*	*b*
pH, standard units	1	6.4	6.4	6.4	4.0/9.0	0
Discharge Point SD820						
Flow, MGD	1	0.0004	0.0004	0.0004	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
pH, standard units	1	7.4	7.4	7.4	4.0/9.0	0
Discharge Point SD830						
Flow, MGD	1	0.014	0.014	0.014	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
Temperature, °C	1	11.2	11.2	11.2	*b*	*b*
pH, standard units	1	7.4	7.4	7.4	4.0/9.0	0

Table 4.96 (continued)

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
		Discharge Point SD850				
Flow, MGD	1	0.0014	0.0014	0.0014	*b*	*b*
Suspended solids, mg/L	1	3	3	3.0	*b*	*b*
Temperature, °C	1	19.4	19.4	19.4	*b*	*b*
pH, standard units	1	8.3	8.3	8.3	4.0/9.0	0
		Discharge Point SD860				
Flow, MGD	1	0.0001	0.0001	0.0001	*b*	*b*
Suspended solids, mg/L	1	3	3	3.0	*b*	*b*
Temperature, °C	1	13.6	13.6	13.6	*b*	*b*
pH, standard units	1	8.5	8.5	8.5	4.0/9.0	0
		Discharge Point SD870				
Flow, MGD	1	0.0046	0.0046	0.0046	*b*	*b*
Suspended solids, mg/L	1	12	12	12.0	*b*	*b*
Temperature, °C	1	12.2	12.2	12.2	*b*	*b*
pH, standard units	1	7.6	7.6	7.6	4.0/9.0	0
		Discharge Point SD880				
Flow, MGD	1	0.004	0.004	0.004	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
Temperature, °C	1	18.6	18.6	18.6	*b*	*b*
pH, standard units	1	8.2	8.2	8.2	4.0/9.0	0
		Discharge Point SD890				
Flow, MGD	1	0.0076	0.0076	0.0076	*b*	*b*
Suspended solids, mg/L	1	4	4	4.0	*b*	*b*
Temperature, °C	1	11.4	11.4	11.4	*b*	*b*
pH, standard units	1	7.7	7.7	7.7	4.0/9.0	0
		Discharge Point SD900				
Flow, MGD	1	0.002	0.002	0.002	*b*	*b*
Suspended solids, mg/L	1	<1	<1	<1.0	*b*	*b*
Temperature, °C	1	12.3	12.3	12.3	*b*	*b*
pH, standard units	1	7.7	7.7	7.7	4.0/9.0	0
		Discharge Point SD992				
Flow, MGD	4	0.44	0.054	0.22	*b*	*b*
Oil and grease, mg/L	3	5.5	<2	<3.166	*b*	*b*
Suspended solids, mg/L	3	418	9	164.0	*b*	*b*
Temperature, °C	2	12.5	8.4	10.450	*b*	*b*
pH, standard units	4	6.4	2.9	4.850	4.0/9.0	0
		Discharge Point SD994				
Flow, MGD	2	0.001	0.0002	0.0007	*b*	*b*
Oil and grease, mg/L	2	<2	<2	<2.0	*b*	*b*
Suspended solids, mg/L	2	7	<1	<4.0	*b*	*b*
Temperature, °C	2	18.3	8.7	13.5	*b*	*b*
pH, standard units	2	8.4	6.9	7.65	4.0/9.0	0

[a]NPDES permit limit.

[b]Not applicable.

Table 4.97. 1992 K-25 Site NPDES Permit Number TN 0002950

Discharge Point K-1700, Mitchell Branch, K-25 Site (Fig. 4.11, Vol. 1)[a]

Parameter	Number of samples	Concentration			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Aluminum, mg/L	82	3.5	<0.1	<0.2697	1.0	4
Chemical oxygen demand, mg/L	157	152	<5	<7.0350	c	c
Chromium, mg/L	82	0.012	<0.01	<0.0104	0.08	0
Dissolved solids, mg/L	78	270	98	211.8333	c	c
Flow, MGD	274	4.04	0.26	0.59	c	c
Fluoride, mg/L	82	0.3	<0.1	<0.17	c	c
Lead, mg/L	82	0.0145	<0.002	<0.0036	1.29	0
Nitrate nitrogen, mg/L	81	5.1	<0.05	0.637	20.0	0
Oil and grease, mg/L	80	35.66	<2	<2.69	15.0	1
Suspended solids, mg/L	157	225	<1	<8.0860	50.0	0
Temperature, °C	273	25.5	5.6	16.8245	c	c
Turbidity, NTU	158	80	2.2	8.1342	c	c
Uranium, mg/L	9	0.023	0.009	0.0142	c	c
Zinc, mg/L	82	0.092	<0.02	<0.0252	2.12	0
pH, standard units	271	8.4	7	7.7310	6.0/9.0	0

[a]This outfall was deleted from the NPDES permit in October 1992.
[b]NPDES permit limit.
[c]Not applicable.

Table 4.98. 1992 NPDES Permit Number TN 0002950

Discharge Point K-1203, Sewage Treatment Plant, K-25 Site (Fig. 4.13, Vol. 1)[a]

Parameter	Number of samples	Concentration			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Ammonia nitrogen, mg/L	159	0.35	<0.2	<0.2020	7.0	0
Biological oxygen demand, mg/L	160	15.9	<5	<5.9128	20.0	0
Chemical oxygen demand, mg/L	119	47	<5	<9.4076	c	c
Chlorine, mg/L	627	0.42	0.01	0.0739	0.24	1
Dissolved oxygen, mg/L	366	13.3	6.4	8.9291	10.0	0
Fecal coliform, col/100 mL	162	706	<1	<39.9877	400.0	2
Flow, MGD	365	1.35	0.184	0.43	c	c
Nitrate nitrogen, mg/L	122	11.24	0.33	5.92	c	c
Settleable solids, ml/L	340	1.4	<0.1	<0.1057	0.5	1
Suspended solids, mg/L	158	29	1	6.08	45.0	0
Temperature, °C	5	20.2	11.9	16.7	c	0
Uranium, mg/L	9	0.006	0.002	0.004	c	c
pH, standard units	366	8.4	7	7.8052	6.0/9.0	0

[a]The permit limits stated are those effective as of October 1992.
[b]NPDES permit limit.
[c]Not applicable.

Table 4.99. 1992 K-25 Site NPDES Permit Number TN 0002950

Discharge Point K-1007-B, Holding Pond, K-25 Site (Fig. 4.11, Vol. 1)[a]

Parameter	Number of samples	Concentration			Reference Value[b]	Number of values exceeding reference
		Max	Min	Av		
Chemical oxygen demand, mg/L	41	22	<5	<7.5244	25	1
Chromium, mg/L	42	0.0105	<0.01	<0.0100	0.05	0
Dissolved oxygen, mg/L	274	18	5.1	9.5608	5.0	0
Flow, MGD	274	14.5	0.09	1.04	c	c
Fluoride, mg/L	41	0.2	<0.1	<0.1244	1.5	0
Oil and grease, mg/L	40	7.53	<2	<2.2590	15.0	0
Suspended solids, mg/L	41	25	4	8.9512	50.0	0
Uranium, mg/L	1	0.001	0.001	0.0010	c	c
pH, standard units	274	9.2	7.3	8.3880	6.0/10.0	0

[a]This outfall was deleted from the NPDES permit in October 1992.
[b]NPDES permit limit.
[c]Not applicable.

Table 4.100. 1992 K-25 Site NPDES Permit Number TN 0002950

Discharge Point K-901-A, Holding Pond, K-25 Site (Fig. 4.11, Vol. 1)[a]

Parameter	Number of samples	Concentration			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Chemical oxygen demand, mg/L	79	243	<5	<8.886	c	c
Chromium, mg/L	40	0.61	<0.01	<0.0258	0.05	1
Dissolved oxygen, mg/L	273	13	4.2	7.8407	10.0	6
Flow, MGD	274	1.6	0.003	0.101	c	c
Fluoride, mg/L	40	0.3	<0.1	<0.15	1.5	0
Oil and grease, mg/L	40	10.6	<2	<2.258	15.0	0
Suspended solids, mg/L	79	296	4	16.9367	50.0	2
Turbidity, NTU	79	36	1.5	15.5	c	c
Uranium, mg/L	9	0.004	0.002	0.0027	c	c
pH, standard units	274	8.8	7	7.9215	6.0/9.0	0

[a]This outfall was deleted from the NPDES permit in October 1992.
[b]NPDES permit limit.
[c]Not applicable.

Table 4.101. 1992 K-25 Site NPDES Permit Number TN 0002950

Discharge Point K-1515-C, Holding Pond, K-25 Site (Fig. 4.13, Vol. 1)[a]

Parameter	Number of samples	Concentration			Reference Value[b]	Number of values exceeding reference
		Max	Min	Av		
Aluminum, mg/L	54	1	0.13	0.5097	2.0	0
Chemical oxygen demand, mg/L	40	30	<5	<5.7750	*c*	*c*
Chlorine, mg/L	30	0.34	0.02	0.0845	1.0	0
Flow, MGD	366	2.35	0.06	0.2183	*c*	*c*
Petroleum hydrocarbons, mg/L	1	0.11	0.11	0.1100	*c*	*c*
Settleable solids, ml/L	40	0.1	<0.1	<0.1	0.5	0
Sulfate, mg/L	40	37	11	19.6250	*c*	*c*
Suspended solids, mg/L	54	18	<1	<6.4815	40.0	0
Temperature, °C	5	13.95	5.2	8.8500	*c*	*c*
pH, standard units	287	8.5	6.1	7.4549	6.0/9.0	0

[a]The permit values listed are those effective as of October 1992.
[b]NPDES permit limit.
[c]Not applicable.

Table 4.102. 1992 NPDES Permit Number TN 0002950

Discharge Point K-1407-J, Treatment Pond at K-25 Site
(Fig. 4.13, Vol. 1)[a]

Parameter	Number of samples	Concentration			Reference Value[b]	Number of values exceeding reference
		Max	Min	Av		
1,1,1-Trichloroethane, mg/L	42	<0.005	<0.0005	<0.0046929	c	c
1,1,2,2-Tetrachloroethane, mg/L	41	<0.0069	<0.0038	<0.0052488	c	c
1,1,2-Trichloroethane, mg/L	41	<0.005	<0.0012	<0.0049073	c	c
1,1-Dichloroethane, mg/L	41	<0.005	<0.0011	<0.0048610	c	c
1,1-Dichloroethene, mg/L	41	0.006	<0.0012	<0.0046098	c	c
1,2,4-Trichlorobenzene, mg/L	41	<0.012	<0.0013	<0.0088488	c	c
1,2-Dichlorobenzene, mg/L	41	<0.010	<0.0019	<0.0063390	c	c
1,2-Dichloroethane, mg/L	41	<0.005	<0.0028	<0.0046439	c	c
1,2-Dichloroethene (total), mg/L	6	<0.0016	<0.0009	<0.0014833	c	c
1,2-Dichloropropane, mg/L	41	6	<0.0007	<0.0050659	c	c
1,2-Diphenylhydrazine, mg/L	1	<0.0021	<0.0021	<0.0021	c	c
1,3-Dichlorobenzene, mg/L	41	<0.01	<0.0015	<0.0063293	c	c
1,4-Dichlorobenzene, mg/L	41	<0.01	<0.0018	<0.0066415	c	c
2,4,6-Trichlorophenol, mg/L	41	<0.012	<0.0019	<0.0089610	c	c
2,4-Dichlorophenol, mg/L	41	<0.012	<0.0023	<0.0089707	c	c
2,4-Dimethylphenol, mg/L	41	<0.012	<0.0021	<0.0089659	c	c
2,4-Dinitrophenol, mg/L	41	<0.059	<0.0035	<0.0290122	c	c
2,4-Dinitrotoluene, mg/L	41	<0.012	<0.0016	<0.0093195	c	c
2,6-Dinitrotoluene, mg/L	41	<0.012	<0.0017	<0.0088585	c	c
2-Butanone, mg/L	1	<0.01	<0.01	<0.01	c	c
2-Chloroethylvinyl ether, mg/L	41	<0.01	<0.0046	<0.0097463	c	c
2-Chloronaphthalene, mg/L	41	<0.012	<0.001	<0.0088415	c	c
2-Chlorophenol, mg/L	41	<0.012	<0.0019	<0.0090341	c	c
2-Nitrophenol, mg/L	41	<0.012	<0.0022	<0.0090780	c	c
3,3'-Dichlorobenzidine, mg/L	41	<0.024	<0.0026	<0.0190878	c	c
4,6-Dinitro-2-methylphenol, mg/L	41	<0.059	<0.0024	<0.0453268	c	c
4-Bromophenyl-phenylether, mg/L	41	<0.012	<0.0015	<0.0088537	c	c
4-Chloro-3-methylphenol, mg/L	41	<0.012	<0.022	<0.0090049	c	c
4-Chlorophenyl-phenylether, mg/L	41	<0.012	<0.0016	<0.0091366	c	c
4-Nitrophenol, mg/L	40	<0.059	<0.0024	<0.0425375	c	c
Acenaphthene, mg/L	41	<0.012	<0.0017	<0.0088585	c	c
Acenaphthylene, mg/L	41	<0.012	<0.001	<0.0090366	c	c
Acetone, mg/L	1	<0.01	<0.01	<0.01	c	c
Acetonitrile, mg/L	1	<0.01	<0.01	<0.01	c	c
Anthracene, mg/L	41	<0.012	<0.0019	<0.0088707	c	c
Aroclor-1016, mg/L	42	<0.0006	<0.0005	<0.0005048	c	c
Aroclor-1221, mg/L	42	<0.0006	<0.0005	<0.0005048	c	c
Aroclor-1232, mg/L	42	<0.0006	<0.0005	<0.0005048	c	c
Aroclor-1242, mg/L	42	<0.0006	<0.0005	<0.0005048	c	c
Aroclor-1248, mg/L	42	<0.0006	<0.0005	<0.0005048	c	c
Aroclor-1254, mg/L	42	0.00019	<0.005	<0.0009426	c	c
Aroclor-1260, mg/L	42	<0.00012	<0.0005	<0.0009619	c	c
Arsenic, mg/L	80	0.004	<0.002	<0.0038	c	c
Benzene, mg/L	42	<0.005	<0.0007	<0.0047976	c	c
Benzidine, mg/L	40	<0.059	<0.0045	<0.0289125	c	c
Benzo(a)anthracene, mg/L	41	<0.012	<0.0011	<0.0095634	c	c
Benzo(a)pyrene, mg/L	41	<0.012	<0.0025	<0.0089585	c	c
Benzo(b)fluoranthene, mg/L	41	<0.012	<0.0041	<0.0092707	c	c
Benzo(g,h,i)perylene, mg/L	41	<0.012	<0.0019	<0.0091317	c	c
Benzo(k)fluoranthene, mg/L	41	<0.012	<0.0025	<0.0089732	c	c
Bromodichloromethane, mg/L	42	0.007	<0.0017	<0.0044500	c	c

Table 4.102 (continued)

Parameter	Number of samples	Concentration			Reference Value[b]	Number of values exceeding reference
		Max	Min	Av		
Bromoform, mg/L	42	<0.005	<0.0019	<0.0048762	c	c
Bromomethane, mg/L	41	<0.01	<0.0016	<0.0097951		
Butylbenzylphthalate, mg/L	41	0.005	<0.0021	<0.0087220	c	c
Cadmium, mg/L	80	<0.002	<0.0005	<0.0023	0.69	0
Carbon tetrachloride, mg/L	42	<0.005	<0.0006	<0.0045286	0.5	0
Chemical oxygen demand, mg/L	32	11	<5	<5.4687	c	c
Chloride, mg/L	80	1927	35	309.9579	39479.0	0
Chlorine, mg/L	43	0.09	0.01	0.0316	0.14	0
Chlorobenzene, mg/L	41	0.001	<0.0004	<0.0049366	c	c
Chloroethane, mg/L	41	0.01	<0.0017	<0.0088220	c	c
Chloroform, mg/L	42	0.043	<0.0045	<0.0063524	0.5	0
Chloromethane, mg/L	41	<0.01	<0.0017	<0.0097976	c	c
Chromium, mg/L	81	0.017	<0.01	<0.0137	2.77	0
Chrysene, mg/L	41	<0.012	<0.0018	<0.0089341	c	c
Copper, mg/L	80	0.04	<0.004	<0.0103	2.15	0
Cyanide colorimetric, mg/L	40	0.14	<0.1	<0.1240	c	c
Di-n-butylphthalate, mg/L	41	0.004	<0.0024	<0.0073634	c	c
Di-n-octylphthalate, mg/L	41	<0.012	<0.0025	<0.0089756	c	c
Dibenz(a,h)anthracene, mg/L	41	<0.012	<0.0024	<0.0089488	c	c
Dibromochloromethane, mg/L	42	<0.005	<0.0008	<0.0045833	c	c
Diethylphthalate, mg/L	41	<0.012	<0.0008	<0.0089390	c	c
Dimethylphthalate, mg/L	41	<0.012	<0.0014	<0.0088146	c	c
Dissolved solids, mg/L	59	3864	498	1671.475	c	c
Ethylbenzene, mg/L	41	<0.0072	<0.0005	<0.0052122	c	c
Flow, MGD	365	0.62	0	0.117	c	c
Fluoranthene, mg/L	41	<0.012	<0.0022	<0.0089366	c	c
Fluorene, mg/L	41	<0.010	<0.0019	<0.0088	c	c
Hexachlorobenzene, mg/L	41	<0.012	<0.0019	<0.0088683	c	c
Hexachlorobutadiene, mg/L	41	<0.012	<0.0009	<0.0087293	c	c
Hexachlorocyclopentadiene, mg/L	41	<0.012	<0.002	<0.0098537	c	c
Hexachloroethane, mg/L	41	<0.012	<0.0016	<0.0088463	c	c
Indeno(1,2,3-cd)pyrene, mg/L	41	<0.012	<0.0027	<0.0091024	c	c
Iron, mg/L	81	0.8	0.06	0.2789	c	c
Isophorone, mg/L	41	<0.012	<0.0013	<0.0088854	c	c
Lead, mg/L	81	0.0072	<0.002	<0.0040	0.69	0
Manganese, mg/L	80	0.079	<0.01	<0.0328	c	c
Methylene chloride, mg/L	41	0.011	<0.0012	<0.0042	c	c
N-Nitroso-di-n-propylamine, mg/L	41	<0.012	<0.0031	<0.0098805	c	c
N-Nitrosodimethylamine, mg/L	41	<0.012	<0.01	<0.0100488	c	c
N-Nitrosodiphenylamine, mg/L	41	<0.012	<0.0019	<0.0088732	c	c
Naphthalene, mg/L	43	<0.010	<0.0009	<0.0084	c	c
Nickel, mg/L	81	0.15	<0.01	<0.0618	3.98	0
Nitrobenzene, mg/L	41	<0.012	<0.0016	<0.0088561	c	c
Oil and Grease, mg/L	112	12.4	<2	<2.533	30.0	0
Pentachlorophenol, mg/L	41	<0.059	<0.0021	<0.0428317	c	c
Phenanthrene, mg/L	41	<0.012	<0.0015	<0.0092805	0.0003132	0
Phenol, mg/L	41	<0.010	<0.0015	<0.0088	c	c
Pyrene, mg/L	41	<0.012	<0.0019	<0.0088683	c	c
Selenium, mg/L	80	<0.025	<0.002	<0.0048	c	c
Silver, mg/L	81	<0.1	<0.006	<0.0128	0.43	0
Sulfate, mg/L	70	1000	140	426.8857	c	c
Suspended solids, mg/L	211	46	<1	4.7	40	0
Temperature, °C	260	32.4	8.5	19.5934	30.5	0

Table 4.102 (continued)

Parameter	Number of samples	Concentration			Reference value[b]	Number of values exceeding reference
		Max	Min	Av		
Tetrachloroethene, mg/L	42	<0.005	<0.0004	<0.0047405	0.7	0
Toluene, mg/L	41	<0.006	<0.0006	<0.0050390	*c*	*c*
Total residual chlorine vol, mg/L	1	0.05	0.05	0.0500	*c*	*c*
Trichloroethene, mg/L	42	0.007	<0.00145	<0.0041893	0.5	0
Trichlorofluoromethane, mg/L	39	<0.005	<0.0011	<0.0049	*c*	*c*
Uranium, mg/L	11	0.43	0.017	0.1158	*c*	*c*
Vinyl chloride, mg/L	42	0.002	<0.0015	<0.0096071	0.2	0
Zinc, mg/L	80	0.037	<0.02	<0.0276	2.61	0
bis(2-Chloroethoxy)methane, mg/L	41	<0.012	<0.0024	<0.0092902	*c*	*c*
bis(2-Chloroethyl)ether, mg/L	41	<0.012	<0.0023	<0.0093366	*c*	*c*
bis(2-Chloroisopropyl)ether, mg/L	41	<0.012	<0.0033	<0.0093610	*c*	*c*
bis(2-Ethylhexyl)phthalate, mg/L	41	0.025	<0.0025	<0.0086	*c*	*c*
cis-1,3-Dichloropropene, mg/L	41	<0.005	<0.0009	<0.0049	*c*	*c*
pH, standard units	261	8.9	7.3	7.9451	6.0/9.0	0
trans-1,2-Dichloroethene, mg/L	35	<0.01	<0.005	<0.0051429	*c*	*c*
trans-1,3-Dichloropropene, mg/L	41	<0.005	<0.0002	<0.0048829	*c*	*c*

[a]The permit values listed are those effective as of October 1992.
[b]NPDES permit limit.
[c]Not applicable.

Table 4.103. 1992 K-25 Site NPDES Permit Number TN 0002950

Discharge Point SD-190, Burial Ground, K-25 Site

Parameter	Number of samples	Concentration			Reference value[a]	Number of values exceeding reference
		Max	Min	Av		
Arsenic, mg/L	4	<0.005	<0.002	<0.0035	0.44	0
Cadmium, mg/L	4	<0.002	<0.0005	<0.0012	0.01	0
Chromium, mg/L	4	<0.01	<0.01	<0.0100	0.08	0
Copper mg/L	4	0.011	<0.004	<0.0074	0.022	0
Lead, mg/L	4	<0.004	<0.002	<0.0030	0.93	0
Mercury, mg/L	4	<0.002	<0.0002	<0.0009	0.011	0
Nickel, mg/L	4	<0.05	<0.05	<0.0500	0.0	0
Zinc, mg/L	4	0.04	<0.02	<0.0298	1.52	0

[a]The permitted values listed were those in effect prior to October 1992.

Table 4.104. 1992 K-25 Site NPDES Permit Number TN 0002950

Toxicity test results at the K-25 Site

K-25 Site outfall	Test date	NOEC[a] (%)	NOEL[b] (%)	LC50[c] (%)
		Fathead Minnows		
K-1407-J (011)	February	100		
	April	100		
	June	100		
	August	100		
	November (LC50)		75	75
K-1203 (005)	November (LC50)		100	100
		Ceriodaphnia spp.		
K-1407-J (011)	February	50		
	April	25		
	June	100		
	August	100		
	November (LC50)		75	75
K-1203 (005)	November (LC50)		100	100

[a]No-observed-effect concentration.
[b]No-observed-effect limit.
[c]Lethal concentration for 50% of the test organisms.

Table 4.105. 1992 K-25 Site average water quality parameters measured during toxicity tests of the K-25 Site wastewaters

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

K-25 Site outfall	Test date	pH (standard units)	Conductivity (μs/cm)	Alkalinity (mg/L $CaCO_3$)	Hardness (mg/L $CaCO_3$)
K-1203	Nov.	8.0	385	108	170
K-1407-J	Feb.	7.97	2340	76	800
	April	8.0	3220	81	880
	June	7.9	913	72	372
	Aug.	8.1	2050	87	490
	Nov.	8.1	1603	63	636

5. GROUNDWATER

Table 5.1. Analytes sought in groundwater on the Oak Ridge Reservation during 1992

Analyte	National Primary Drinking Water	National Secondary Drinking Water	Tennessee Primary Drinking Water	4% of DOE DCG[a]
		Anions (mg/L)		
Bromide				
Chloride		250		
Fluoride	4.0	2.0		
Nitrate	10			
Phosphate				
Sulfate (as SO_4)		250		
		Base/neutral/acid extractable organics (µg/L[b])		
1,2,4-Trichlorobenzene				
1,2-Dichlorobenzene	600			
1,3-Dichlorobenzene				
1,4-Dichlorobenzene	75	5.0	75	
2,4,5-Trichlorophenol				
2,4,6-Trichlorophenol				
2,4-Dichlorophenol				
2,4-Dimethylphenol				
2,4-Dinitrophenol				
2,4-Dinitrotoluene				
2,6-Dinitrotoluene				
2-Chloronaphthalene				
2-Chlorophenol				
2-Methylnaphthalene				
2-Methylphenol				
2-Nitroaniline				
2-Nitrophenol				
3,3'-Dichlorobenzidine				
3-Nitroaniline				
4,6-Dinitro-2-methylphenol				
4-Bromophenylphenyl ether				
4-Chloro-3-methylphenol				
4-Chloroaniline				
4-Chlorophenylphenyl ether				
4-Methylphenol				
4-Nitroaniline				
4-Nitrophenol				
Acenaphthene				
Acenaphthylene				
Anthracene				
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(ghi)perylene				
Benzo(k)fluoranthene				
Benzoic acid				
Benzyl alcohol				
Benzyl butyl phthalate				
Bis(2-chloroethoxy) methane				
Bis(2-chloroethyl) ether				
Bis(2-chloroisopropyl) ether				
Bis(2-ethylhexyl) phthalate				
Chrysene				
Di-n-butylphthalate				
Di-n-octylphthalate				
Dibenzo(a,h)anthracene				

Table 5.1 (continued)

Analyte	National Primary Drinking Water	National Secondary Drinking Water	Tennessee Primary Drinking Water	4% of DOE DCG[a]
Dibenzofuran				
Diethyl phthalate				
Dimethyl phthalate				
Fluoranthene				
Fluorene				
Hexachlorobenzene				
Hexachlorobutadiene				
Hexachlorocyclopentadiene				
Hexachloroethane				
Indeno(1,2,3-cd)pyrene				
Isophorone				
N-Nitrosodi-n-propylamine				
N-Nitrosodiphenylamine				
Naphthalene				
Nitrobenzene				
Pentachlorophenol	1.0			
Phenanthrene				
Phenol				
Pyrene				
	Field measurements			
Conductivity, mS/cm				
Dissolved oxygen, ppm				
Redox, mV				
Temperature, °C				30.5
Turbidity, NTU[c]	1.0			
pH, standard units		(6.5, 8.5)		(6.0, 9.0)
	Metals (mg/L)			
Aluminum		0.2		
Antimony				
Arsenic	0.05			0.05
Barium	1.0[d]			
Beryllium				
Boron				
Cadmium	0.005[e]			0.01
Calcium				
Chromium	0.1			0.05
Cobalt				
Copper		1.0		
Iron		0.3		
Lead	0.05			0.05
Lithium				
Magnesium				
Manganese		0.05		
Mercury	0.002			0.002
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	0.05			0.01
Silicon				
Silver		0.1		0.05
Sodium				
Strontium				
Thallium				

Table 5.1 (continued)

Analyte	National Primary Drinking Water	National Secondary Drinking Water	Tennessee Primary Drinking Water	4% of DOE DCG[a]
Tin				
Titanium				
Uranium, total	0.020[f]			
Vanadium				
Zinc		5.0		
Zirconium				
Others				
Alkalinity, mg/L				
Phenolics, total recoverable, mg/L				
Total dissolved solids, mg/L		500	500	
Total organic carbon, mg/L				
Total organic halides, µg/L				
Total petroleum hydrocarbons, mg/L			1.0[g]	
Total suspended solids, mg/L				
Radionuclides[h] (pCi/L)				
^{241}Am				1
^{60}Co				200
^{137}Cs				120
Gross alpha	15			
Gross beta	50[i]			
^{3}H	20,000			80,000
^{237}Np				1
^{238}Pu				2
$^{239/240}Pu$				1
^{226}Ra	5.0			4
^{228}Ra	5.0			4
^{99}Tc				4,000
^{228}Th				16
^{230}Th				12
^{232}Th				2
^{234}Th				400
Total rad Sr	8.0			40
^{234}U				20
^{235}U				24
^{238}U				24
Uranium, total	13[f]			24
Volatile organics (µg/L[b])				
1,1,1-Trichloroethane	200		200	
1,1,2,2-Tetrachloroethane				
1,1,2-Trichloroethane				
1,1-Dichloroethane				
1,1-Dichloroethene	7.0		7.0	
1,2-Dichloroethane	5.0		5.0	
1,2-Dichloroethene	70			
1,2-Dichloropropane	5.0			
2-Butanone				
2-Hexanone				
4-Methyl-2-pentanone				
Acetone				
Benzene	5.0		5.0	
Bromodichloromethane	100[j]			

Table 5.1 (continued)

Analyte	National Primary Drinking Water	National Secondary Drinking Water	Tennessee Primary Drinking Water	4% of DOE DCG[a]
Bromoform	100[j]			
Bromomethane				
Carbon disulfide				
Carbon tetrachloride	5.0		5.0	
Chlorobenzene	100			
Chloroethane	200			
Chloroform	100[j]			
Chloromethane				
Dibromochloromethane	100[j]			
Ethylbenzene	700			
Methylene chloride				
Styrene	100			
Tetrachloroethene	5.0			
Toluene	1,000			
Trichloroethene	5.0		5.0	
Vinyl acetate				
Vinyl chloride	2.0		2.0	
Xylene, total	10,000			
cis-1,3-Dichloropropene				
trans-1,3-Dichloropropene				

[a]4% of the DOE derived concentration guide (DCG) to represent the DOE criterion of 4 mrem effective dose equivalent from ingestion of drinking water.

[b]Divide µg/L by 1000 to convert to mg/L.

[c]JTU and NTU are roughly equivalent in the range of 25 to 1000 JTU.

[d]2.0 mg/L effective January 1993.

[e]Effective July 1992. Preceded by 0.01 mg/L.

[f]Proposed by EPA.

[g]TDEC Underground Storage Tank limit.

[h]Multiply pCi/L by 0.037 to convert to Bq/L.

[i]Regulatory guide for assessing compliance without further analysis.

[j]Limit for total trihalomethanes (bromodichloromethane + bromoform + chloroform + dibromochloromethane).

Table 5.2. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Background

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	34/50	4.0	1.0	1.7	250	0
Fluoride (mg/L)	35/50	1.7	0.10	0.36	4	0
Nitrate nitrogen (mg/L)	4/50	0.98	0.27	0.65	10	0
Sulfate (mg/L)	50/50	35	4.3	15	250	0
Aluminum ICAP (mg/L)	42/50	8.4	0.029	0.87	0.2	22
Aluminum filtered ICAP (mg/L)	26/50	1.3	0.020	0.11	0.2	2
Barium ICAP (mg/L)	50/50	0.60	0.019	0.13	1	4
Barium filtered ICAP (mg/L)	50/50	0.25	0.011	0.10	1	3
Beryllium ICAP (mg/L)	3/50	0.0011	0.0005	0.0008	*d*	*d*
Boron ICAP (mg/L)	49/50	0.18	0.0060	0.033	*d*	*d*
Boron filtered ICAP (mg/L)	49/50	0.16	0.0054	0.035	*d*	*d*
Cadmium AAS (mg/L)	9/50	0.051	0.0020	0.010	0.005	2
Cadmium filtered AAS (mg/L)	5/50	0.051	0.0024	0.016	0.005	2
Calcium ICAP (mg/L)	50/50	77	1.2	29	*d*	*d*
Calcium filtered ICAP (mg/L)	50/50	75	1.1	28	*d*	*d*
Chromium AAS (mg/L)	11/50	0.12	0.012	0.031	0.05	2
Cobalt ICAP (mg/L)	5/50	0.0094	0.0056	0.0067	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/50	0.0060	0.0060	0.0060	*d*	*d*
Copper ICAP (mg/L)	25/50	0.046	0.0041	0.013	1	0
Copper filtered ICAP (mg/L)	25/50	0.026	0.0042	0.011	1	0
Iron ICAP (mg/L)	49/50	14	0.011	1.8	0.3	30
Iron filtered ICAP (mg/L)	41/50	4.8	0.0058	0.56	0.3	10
Lead AAS (mg/L)	19/50	0.044	0.0041	0.014	0.05	0
Lead filtered AAS (mg/L)	1/50	0.0045	0.0045	0.0045	0.05	0
Magnesium ICAP (mg/L)	50/50	12	0.13	5.7	*d*	*d*
Magnesium filtered ICAP (mg/L)	50/50	11	0.10	5.3	*d*	*d*
Manganese ICAP (mg/L)	50/50	2.2	0.0011	0.32	0.05	28
Manganese filtered ICAP (mg/L)	45/50	2.1	0.0011	0.29	0.05	21
Mercury CVAA (mg/L)	2/50	0.0002	0.0002	0.0002	0.002	0
Nickel ICAP (mg/L)	16/50	0.34	0.010	0.037	*d*	*d*
Nickel filtered ICAP (mg/L)	9/50	0.023	0.012	0.016	*d*	*d*
Potassium ICAP (mg/L)	43/50	4.4	0.67	1.7	*d*	*d*
Potassium filtered ICAP (mg/L)	40/50	3.0	0.82	1.6	*d*	*d*
Selenium filtered ICAP (mg/L)	2/50	0.072	0.055	0.064	0.01	2
Silver ICAP (mg/L)	3/50	0.045	0.0064	0.024	0.05	0
Silver filtered ICAP (mg/L)	1/50	0.011	0.011	0.011	0.05	0
Sodium ICAP (mg/L)	50/50	110	2.6	15	*d*	*d*
Sodium filtered ICAP (mg/L)	50/50	110	1.6	14	*d*	*d*
Strontium ICAP (mg/L)	50/50	0.52	0.012	0.091	*d*	*d*
Strontium filtered ICAP (mg/L)	50/50	0.53	0.011	0.087	*d*	*d*
Uranium fluorimetric (mg/L)	7/50	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	2/50	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	3/50	0.012	0.0050	0.0079	*d*	*d*
Zinc ICAP (mg/L)	47/50	0.084	0.0025	0.020	5	0
Zinc filtered ICAP (mg/L)	45/50	0.055	0.0022	0.017	5	0
Conductivity, field measurement (μmhos/cm)	*d*/50	500	70	240	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/50	12	0.70	3.8	*d*	*d*
pH, field measurement (standard units)	*d*/50	9.2	3.4	6.8	6.5/8.5	22
Redox, field measurement (mV)	*d*/50	370	−140	110	*d*	*d*
Water temperature, field measurement (°C)	*d*/50	19	12	16	30.5	0
Alkalinity-CO_3 (mg/L)	4/50	26	20	23	*d*	*d*
Alkalinity-HCO_3 (mg/L)	50/50	230	24	110	*d*	*d*

Table 5.2 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Conductivity (μmhos/cm)	50/50	740	78	260	*d*	*d*
Dissolved solids (mg/L)	50/50	360	64	180	500	0
pH (standard units)	*d*/50	9.2	6.2	7.3	6.5/8.5	11
Total suspended solids (mg/L)	42/50	7,200	1.0	270	*d*	*d*
Turbidity (NTU)	50/50	10,000	0.38	250	1	46
Gross alpha (pCi/L)	16/50	26	1.5	4.9	15	1
Gross beta (pCi/L)	25/50	91	2.4	11	50	1
1,1,1-Trichloroethane (μg/L)	1/50	1.0J	1.0J	~1.0	200	0
1,1,2,2-Tetrachloroethane (μg/L)	1/50	1.0BJ	1.0BJ	~1.0	*d*	*d*
2-Butanone (μg/L)	1/50	6.0BJ	6.0BJ	~6.0	*d*	*d*
2-Hexanone (μg/L)	2/50	1.0BJ	1.0BJ	~1.0	*d*	*d*
4-Methyl-2-pentanone (μg/L)	6/50	3.0BJ	1.0BJ	~1.5	*d*	*d*
Acetone (μg/L)	4/50	6.0BJ	1.0BJ	~3.0	*d*	*d*
Carbon disulfide (μg/L)	1/50	2.0BJ	2.0BJ	~2.0	*d*	*d*
Methylene chloride (μg/L)	11/50	2.0BJ	1.0J	~1.4	*d*	*d*
Tetrachloroethene (μg/L)	1/50	1.0J	1.0J	~1.0	5	0
Toluene (μg/L)	2/50	0.60BJ	0.60BJ	~0.60	1,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.3. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Bear Creek Springs

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	17/20	84	1.5	26	250	0
Fluoride (mg/L)	12/20	0.60	0.20	0.29	4	0
Nitrate nitrogen (mg/L)	14/20	59	0.31	29	10	11
Sulfate (mg/L)	20/20	64	2.3	24	250	0
Aluminum ICAP (mg/L)	20/20	1.1	0.028	0.20	0.2	5
Aluminum filtered ICAP (mg/L)	12/20	0.14	0.020	0.052	0.2	0
Barium ICAP (mg/L)	20/20	0.24	0.025	0.089	1	0
Barium filtered ICAP (mg/L)	20/20	0.24	0.023	0.088	1	0
Beryllium filtered ICAP (mg/L)	3/20	0.0004	0.0004	0.0004	*d*	*d*
Boron ICAP (mg/L)	20/20	0.26	0.0067	0.059	*d*	*d*
Boron filtered ICAP (mg/L)	20/20	0.29	0.0056	0.070	*d*	*d*
Calcium ICAP (mg/L)	20/20	240	19	92	*d*	*d*
Calcium filtered ICAP (mg/L)	20/20	260	18	92	*d*	*d*
Copper ICAP (mg/L)	5/20	0.049	0.0044	0.015	1	0
Copper filtered ICAP (mg/L)	13/20	0.070	0.0042	0.013	1	0
Iron ICAP (mg/L)	20/20	1.1	0.022	0.21	0.3	4
Iron filtered ICAP (mg/L)	10/20	0.033	0.0090	0.019	0.3	0
Lead AAS (mg/L)	1/20	0.0047	0.0047	0.0047	0.05	0
Magnesium ICAP (mg/L)	20/20	26	7.3	16	*d*	*d*
Magnesium filtered ICAP (mg/L)	20/20	29	7.0	17	*d*	*d*
Manganese ICAP (mg/L)	20/20	0.46	0.0029	0.065	0.05	5
Manganese filtered ICAP (mg/L)	17/20	0.032	0.0016	0.0096	0.05	0
Nickel filtered ICAP (mg/L)	5/20	0.024	0.013	0.017	*d*	*d*
Potassium ICAP (mg/L)	19/20	5.4	0.73	2.5	*d*	*d*
Potassium filtered ICAP (mg/L)	19/20	7.2	0.65	2.5	*d*	*d*
Silver ICAP (mg/L)	4/20	0.0079	0.0065	0.0071	0.05	0
Sodium ICAP (mg/L)	20/20	26	0.57	9.7	*d*	*d*
Sodium filtered ICAP (mg/L)	20/20	28	0.48	10	*d*	*d*
Strontium ICAP (mg/L)	20/20	0.54	0.019	0.19	*d*	*d*
Strontium filtered ICAP (mg/L)	20/20	0.65	0.017	0.21	*d*	*d*
Uranium fluorimetric (mg/L)	12/20	0.28	0.033	0.11	0.02	12
Uranium, filt. fluorimetric (mg/L)	13/20	0.28	0.0010	0.094	0.02	12
Zinc ICAP (mg/L)	19/20	0.061	0.0022	0.014	5	0
Zinc filtered ICAP (mg/L)	19/20	0.034	0.0026	0.011	5	0
Conductivity, field measurement (μmhos/cm)	*d*/20	1,300	120	460	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/20	9.6	6.0	7.9	*d*	*d*
pH, field measurement (standard units)	*d*/20	8.6	6.9	7.4	6.5/8.5	1
Water temperature, field measurement (°C)	*d*/20	21	11	14	30.5	0
Alkalinity-HCO_3 (mg/L)	20/20	340	79	190	*d*	*d*
Conductivity (μmhos/cm)	20/20	1,400	180	630	*d*	*d*
Dissolved solids (mg/L)	20/20	1,000	80	410	500	7
pH (standard units)	*d*/20	8.3	7.2	7.8	6.5/8.5	0
Total suspended solids (mg/L)	18/20	31	1.0	8.2	*d*	*d*
Turbidity (NTU)	20/20	30	0.80	4.4	1	18
Uranium-234 (pCi/L)	10/20	50	3.5	17	20	2
Uranium-235 (pCi/L)	4/15	3.5	1.9	2.5	24	0
Neptunium-237 (pCi/L)	1/20	1.7	1.7	1.7	1	1
Uranium-238 (pCi/L)	12/20	64	4.4	21	24	4
Americium-241 (pCi/L)	1/20	2.2	2.2	2.2	1	1
Technetium-99 (pCi/L)	10/20	4,800	7.2	2,200	4,000	4

Table 5.3 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	12/20	55	7.8	30	15	10
Gross beta (pCi/L)	15/20	130	2.2	55	50	8
Strontium (pCi/L)	4/20	29	11	23	8	4
Tritium (pCi/L)	6/15	860	570	720	20,000	0
1,2-Dichloroethene (µg/L)	6/20	6.0	2.0J	~3.5	70	0
4-Methyl-2-pentanone (µg/L)	10/20	4.0J	1.0BJ	~2.1	*d*	*d*
Acetone (µg/L)	7/20	9.0J	2.0BJ	~5.3	*d*	*d*
Methylene chloride (µg/L)	3/20	1.0BJ	1.0BJ	~1.0	*d*	*d*
Tetrachloroethene (µg/L)	2/20	1.0J	1.0J	~1.0	5	0
Tetrachlorocthene (µg/L)	6/20	5.0	2.0J	~3.7	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.4. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Bear Creek Surface Water

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	18/20	71	1.4	16	250	0
Fluoride (mg/L)	15/20	1.3	0.10	0.37	4	0
Nitrate nitrogen (mg/L)	16/20	240	1.6	33	10	7
Sulfate (mg/L)	20/20	70	5.0	21	250	0
Aluminum ICAP (mg/L)	20/20	1.5	0.031	0.54	0.2	12
Aluminum filtered ICAP (mg/L)	14/20	0.10	0.021	0.040	0.2	0
Barium ICAP (mg/L)	20/20	0.63	0.045	0.13	1	0
Barium filtered ICAP (mg/L)	20/20	0.68	0.025	0.12	1	0
Beryllium filtered ICAP (mg/L)	1/20	0.0004	0.0004	0.0004	*d*	*d*
Boron ICAP (mg/L)	20/20	4.1	0.011	0.42	*d*	*d*
Boron filtered ICAP (mg/L)	20/20	4.4	0.023	0.43	*d*	*d*
Cadmium AAS (mg/L)	2/20	0.0031	0.0021	0.0026	0.005	0
Cadmium filtered AAS (mg/L)	2/20	0.0041	0.0022	0.0031	0.005	0
Calcium ICAP (mg/L)	20/20	340	8.8	75	*d*	*d*
Calcium filtered ICAP (mg/L)	20/20	390	8.7	75	*d*	*d*
Chromium AAS (mg/L)	1/20	0.014	0.014	0.014	0.05	0
Cobalt ICAP (mg/L)	1/20	0.0051	0.0051	0.0051	*d*	*d*
Copper ICAP (mg/L)	3/20	0.0088	0.0050	0.0065	1	0
Copper filtered ICAP (mg/L)	9/20	0.012	0.0043	0.0072	1	0
Iron ICAP (mg/L)	20/20	3.1	0.039	0.65	0.3	13
Iron filtered ICAP (mg/L)	15/20	0.32	0.0062	0.060	0.3	1
Lead AAS (mg/L)	2/20	0.011	0.0056	0.0083	0.05	0
Magnesium ICAP (mg/L)	20/20	42	1.9	12	*d*	*d*
Magnesium filtered ICAP (mg/L)	20/20	48	1.7	12	*d*	*d*
Manganese ICAP (mg/L)	20/20	2.2	0.0095	0.38	0.05	16
Manganese filtered ICAP (mg/L)	20/20	1.8	0.0073	0.31	0.05	9
Nickel ICAP (mg/L)	3/20	0.051	0.016	0.033	*d*	*d*
Nickel filtered ICAP (mg/L)	4/20	0.064	0.011	0.031	*d*	*d*
Potassium ICAP (mg/L)	20/20	7.9	1.4	2.5	*d*	*d*
Potassium filtered ICAP (mg/L)	19/20	8.1	0.76	2.4	*d*	*d*
Selenium ICAP (mg/L)	1/20	0.071	0.071	0.071	0.01	1
Silver ICAP (mg/L)	1/20	0.0061	0.0061	0.0061	0.05	0
Silver filtered ICAP (mg/L)	1/20	0.0067	0.0067	0.0067	0.05	0
Sodium ICAP (mg/L)	20/20	60	2.1	11	*d*	*d*
Sodium filtered ICAP (mg/L)	20/20	64	2.0	11	*d*	*d*
Strontium ICAP (mg/L)	20/20	0.97	0.027	0.19	*d*	*d*
Strontium filtered ICAP (mg/L)	20/20	1.2	0.024	0.20	*d*	*d*
Uranium fluorimetric (mg/L)	15/20	0.31	0.020	0.089	0.02	13
Uranium, filtered fluorimetric (mg/L)	17/20	0.31	0.0010	0.078	0.02	14
Vanadium ICAP (mg/L)	1/20	0.0051	0.0051	0.0051	*d*	*d*
Zinc ICAP (mg/L)	19/20	0.030	0.0036	0.012	5	0
Zinc filtered ICAP (mg/L)	20/20	0.034	0.0025	0.0093	5	0
Conductivity, field measurement (μmhos/cm)	*d*/20	2,100	50	430	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/20	11	6.6	8.9	*d*	*d*
pH, field measurement (standard units)	*d*/20	8.1	6.9	7.5	6.5/8.5	0
Water temperature, field measurement (°C)	*d*/20	23	9.0	14	30.5	0
Alkalinity-HCO_3 (mg/L)	20/20	210	23	120	*d*	*d*
Conductivity (μmhos/cm)	20/20	2,400	80	540	*d*	*d*
Dissolved solids (mg/L)	*d*/20	1,900	76	390	500	3
pH (standard units)	*d*/20	8.3	6.8	7.9	6.5/8.5	0

Table 5.4 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Total suspended solids (mg/L)	19/20	99	2.0	23	*d*	*d*
Turbidity (NTU)	20/20	110	0.60	21	1	19
Uranium-234 (pCi/L)	7/20	14	3.0	8.5	20	0
Uranium-235 (pCi/L)	4/15	2.2	1.2	1.5	24	0
Neptunium-237 (pCi/L)	3/20	3.0	1.7	2.6	1	3
Uranium-238 (pCi/L)	10/20	38	2.5	13	24	2
Americium-241 (pCi/L)	2/20	2.7	1.5	2.1	1	2
Technetium-99 (pCi/L)	8/20	6,500	7.0	2,300	4,000	2
Gross alpha (pCi/L)	16/20	130	6.4	33	15	11
Gross beta (pCi/L)	17/20	370	3.6	68	50	7
Strontium (pCi/L)	3/20	47	11	25	8	3
Tritium (pCi/L)	4/15	730	620	690	20,000	0
1,2-Dichloroethene (μg/L)	3/20	6.0	4.0J	~5.3	70	0
2-Hexanone (μg/L)	1/20	10B	10B	~10	*d*	*d*
4-Methyl-2-pentanone (μg/L)	11/20	86B	1.0BJ	~11	*d*	*d*
Acetone (μg/L)	8/20	8.0BJ	1.0BJ	~4.1	*d*	*d*
Methylene chloride (μg/L)	3/20	1.0BJ	1.0BJ	~1.0	*d*	*d*
Trichloroethene (μg/L)	1/20	2.0J	2.0J	~2.0	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.5. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Exit Pathway—Traverse A

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	12/12	31	3.0	18	250	0
Fluoride (mg/L)	8/12	0.20	0.10	0.19	4	0
Nitrate nitrogen (mg/L)	12/12	22	1.4	10	10	6
Sulfate (mg/L)	12/12	26	4.1	18	250	0
Aluminum ICAP (mg/L)	9/12	0.38	0.022	0.10	0.2	2
Aluminum filtered ICAP (mg/L)	5/12	0.049	0.022	0.034	0.2	0
Barium ICAP (mg/L)	12/12	0.13	0.055	0.10	1	0
Barium filtered ICAP (mg/L)	12/12	0.13	0.053	0.095	1	0
Boron ICAP (mg/L)	12/12	0.13	0.017	0.056	*d*	*d*
Boron filtered ICAP (mg/L)	12/12	0.12	0.024	0.059	*d*	*d*
Calcium ICAP (mg/L)	12/12	83	30	67	*d*	*d*
Calcium filtered ICAP (mg/L)	12/12	84	30	65	*d*	*d*
Copper ICAP (mg/L)	4/12	0.0068	0.0041	0.0052	1	0
Copper filtered ICAP (mg/L)	2/12	0.015	0.0040	0.0095	1	0
Iron ICAP (mg/L)	12/12	8.0	0.015	1.4	0.3	4
Iron filtered ICAP (mg/L)	11/12	0.38	0.0052	0.064	0.3	1
Lead AAS (mg/L)	1/12	0.0047	0.0047	0.0047	0.05	0
Magnesium ICAP (mg/L)	12/12	24	12	18	*d*	*d*
Magnesium filtered ICAP (mg/L)	12/12	25	12	18	*d*	*d*
Manganese ICAP (mg/L)	12/12	0.23	0.0017	0.055	0.05	4
Manganese filtered ICAP (mg/L)	11/12	0.17	0.0012	0.038	0.05	4
Nickel filtered ICAP (mg/L)	2/12	0.017	0.013	0.015	*d*	*d*
Potassium ICAP (mg/L)	12/12	28	1.4	8.8	*d*	*d*
Potassium filtered ICAP (mg/L)	12/12	29	1.4	8.7	*d*	*d*
Silver ICAP (mg/L)	1/12	0.011	0.011	0.011	0.05	0
Silver filtered ICAP (mg/L)	1/12	0.0085	0.0085	0.0085	0.05	0
Sodium ICAP (mg/L)	12/12	16	2.9	11	*d*	*d*
Sodium filtered ICAP (mg/L)	12/12	16	2.6	11	*d*	*d*
Strontium ICAP (mg/L)	12/12	0.18	0.055	0.13	*d*	*d*
Strontium filtered ICAP (mg/L)	12/12	0.18	0.053	0.13	*d*	*d*
Uranium fluorimetric (mg/L)	12/12	0.091	0.0020	0.043	0.02	7
Uranium, filtered fluorimetric (mg/L)	12/12	0.098	0.0020	0.045	0.02	8
Zinc ICAP (mg/L)	12/12	0.023	0.0044	0.010	5	0
Zinc filtered ICAP (mg/L)	12/12	0.048	0.0037	0.010	5	0
Conductivity, field measurement (μmhos/cm)	*d*/12	670	330	550	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/12	7.7	1.2	4.9	*d*	*d*
pH, field measurement (standard units)	*d*/12	8.4	6.7	7.3	6.5/8.5	0
Redox, field measurement (mV)	*d*/12	230	−28	130	*d*	*d*
Water temperature, field measurement (°C)	*d*/12	18	11	14	30.5	0
Alkalinity-HCO_3 (mg/L)	12/12	260	130	190	*d*	*d*
Conductivity (μmhos/cm)	12/12	630	330	530	*d*	*d*
Dissolved solids (mg/L)	12/12	420	180	330	500	0
pH (standard units)	*d*/12	8.2	7.3	7.5	6.5/8.5	0
Total suspended solids (mg/L)	6/12	72	2.0	18	*d*	*d*
Turbidity (NTU)	12/12	200	0.50	23	1	10
Gross alpha (pCi/L)	10/12	28	2.3	17	15	6
Gross beta (pCi/L)	10/12	78	3.6	42	50	6

Table 5.5 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,2-Dichloroethene (µg/L)	2/12	3.0J	2.0J	~2.5	70	0
2-Butanone (µg/L)	1/12	2.0BJ	2.0BJ	~2.0	*d*	*d*
4-Methyl-2-pentanone (µg/L)	1/12	4.0BJ	4.0BJ	~4.0	*d*	*d*
Acetone (µg/L)	2/12	6.0BJ	1.0J	~3.5	*d*	*d*
Ethylbenzene (µg/L)	1/12	1.0J	1.0J	~1.0	700	0
Methylene chloride (µg/L)	2/12	2.0BJ	1.0J	~1.5	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.6. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Exit Pathway—Traverse B

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	23/24	51	5.0	26	250	0
Fluoride (mg/L)	23/24	3.5	0.10	0.81	4	0
Nitrate nitrogen (mg/L)	23/24	49	0.25	19	10	15
Sulfate (mg/L)	24/24	94	2.0	33	250	0
Aluminum ICAP (mg/L)	21/24	27	0.028	1.5	0.2	8
Aluminum filtered ICAP (mg/L)	19/24	0.19	0.022	0.066	0.2	0
Barium ICAP (mg/L)	24/24	0.22	0.0047	0.094	1	0
Barium filtered ICAP (mg/L)	24/24	0.22	0.0012	0.083	1	0
Beryllium ICAP (mg/L)	7/24	0.0007	0.0004	0.0005	*d*	*d*
Beryllium filtered ICAP (mg/L)	5/24	0.0006	0.0003	0.0005	*d*	*d*
Boron ICAP (mg/L)	24/24	2.3	0.032	0.46	*d*	*d*
Boron filtered ICAP (mg/L)	24/24	2.3	0.024	0.47	*d*	*d*
Calcium ICAP (mg/L)	24/24	150	1.8	70	*d*	*d*
Calcium filtered ICAP (mg/L)	24/24	150	1.4	64	*d*	*d*
Chromium AAS (mg/L)	2/24	0.067	0.013	0.040	0.05	1
Cobalt ICAP (mg/L)	4/24	0.099	0.0051	0.029	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/24	0.0058	0.0058	0.0058	*d*	*d*
Copper ICAP (mg/L)	10/24	1.2	0.0043	0.14	1	1
Copper filtered ICAP (mg/L)	10/24	0.0086	0.0040	0.0059	1	0
Iron ICAP (mg/L)	24/24	790	0.23	36	0.3	23
Iron filtered ICAP (mg/L)	21/24	2.0	0.016	0.48	0.3	11
Lead AAS (mg/L)	4/24	0.47	0.0042	0.12	0.05	1
Magnesium ICAP (mg/L)	24/24	33	0.58	20	*d*	*d*
Magnesium filtered ICAP (mg/L)	24/24	32	0.47	19	*d*	*d*
Manganese ICAP (mg/L)	24/24	9.0	0.0036	0.42	0.05	9
Manganese filtered ICAP (mg/L)	23/24	0.058	0.0017	0.026	0.05	2
Mercury CVAA (mg/L)	1/24	0.0004	0.0004	0.0004	0.002	0
Molybdenum ICAP (mg/L)	4/24	0.071	0.019	0.033	*d*	*d*
Molybdenum filtered ICAP (mg/L)	4/24	0.021	0.011	0.015	*d*	*d*
Nickel ICAP (mg/L)	8/24	0.60	0.010	0.10	*d*	*d*
Nickel filtered ICAP (mg/L)	6/24	0.028	0.010	0.015	*d*	*d*
Potassium ICAP (mg/L)	24/24	16	0.90	4.7	*d*	*d*
Potassium filtered ICAP (mg/L)	24/24	17	1.2	4.9	*d*	*d*
Sodium ICAP (mg/L)	24/24	200	7.4	46	*d*	*d*
Sodium filtered ICAP (mg/L)	24/24	210	7.3	46	*d*	*d*
Strontium ICAP (mg/L)	24/24	0.79	0.053	0.26	*d*	*d*
Strontium filtered ICAP (mg/L)	24/24	0.41	0.052	0.23	*d*	*d*
Uranium fluorimetric (mg/L)	19/24	0.24	0.0010	0.068	0.02	8
Uranium, filtered fluorimetric (mg/L)	18/24	0.30	0.0010	0.076	0.02	8
Vanadium ICAP (mg/L)	1/24	0.011	0.011	0.011	*d*	*d*
Zinc ICAP (mg/L)	23/24	3.1	0.0024	0.15	5	0
Zinc filtered ICAP (mg/L)	24/24	0.060	0.0021	0.012	5	0
Conductivity, field measurement (μmhos/cm)	*d*/24	1100	290	680	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/24	12	0.40	4.8	*d*	*d*
pH, field measurement (standard units)	*d*/24	9.4	6.9	7.8	6.5/8.5	4
Redox, field measurement (mV)	*d*/24	230	–48	61	*d*	*d*
Water temperature, field measurement (°C)	*d*/24	18	11	14	30.5	0
Alkalinity-CO_3 (mg/L)	4/24	50	6.0	27	*d*	*d*
Alkalinity-HCO_3 (mg/L)	24/24	300	160	210	*d*	*d*
Conductivity (μmhos/cm)	24/24	990	330	690	*d*	*d*

Table 5.6 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Dissolved solids (mg/L)	24/24	660	210	430	500	10
pH (standard units)	*d*/24	9.0	6.9	7.8	6.5/8.5	4
Total suspended solids (mg/L)	23/24	1500	1.0	130	*d*	*d*
Turbidity (NTU)	24/24	370	1.3	39	1	24
Gross alpha (pCi/L)	18/24	89	2.3	26	15	9
Gross beta (pCi/L)	21/24	160	2.8	52	50	7
1,1,1-Trichloroethane (µg/L)	2/24	2.0J	2.0J	~2.0	200	0
1,1-Dichloroethane (µg/L)	2/24	1.0J	1.0J	~1.0	*d*	*d*
1,1-Dichloroethene (µg/L)	10/24	6.0	1.0J	~3.1	7	0
1,2-Dichloroethene (µg/L)	16/24	34	2.0J	~9.9	70	0
4-Methyl-2-pentanone (µg/L)	10/24	2.0BJ	1.0BJ	~1.7	*d*	*d*
Acetone (µg/L)	7/24	7.0BJ	3.0BJ	~4.4	*d*	*d*
Carbon tetrachloride (µg/L)	2/24	2.0J	1.0J	~1.5	5	0
Methylene chloride (µg/L)	6/24	2.0BJ	1.0BJ	~1.3	*d*	*d*
Tetrachloroethene (µg/L)	1/24	1.0J	1.0J	~1.0	5	0
Trichloroethene (µg/L)	19/24	95	2.0J	~27	5	16

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.7. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Exit Pathway—Traverse C

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	24/24	63	1.2	30	250	0
Fluoride (mg/L)	19/24	0.50	0.10	0.21	4	0
Nitrate nitrogen (mg/L)	24/24	61	1.5	29	10	16
Sulfate (mg/L)	24/24	46	3.1	27	250	0
Aluminum ICAP (mg/L)	16/24	0.64	0.020	0.092	0.2	1
Aluminum filtered ICAP (mg/L)	12/24	1.7	0.022	0.18	0.2	1
Barium ICAP (mg/L)	24/24	0.28	0.0086	0.13	1	0
Barium filtered ICAP (mg/L)	24/24	0.27	0.0060	0.13	1	0
Beryllium ICAP (mg/L)	1/24	0.0003	0.0003	0.0003	*d*	*d*
Beryllium filtered ICAP (mg/L)	1/24	0.0004	0.0004	0.0004	*d*	*d*
Boron ICAP (mg/L)	23/24	0.15	0.0093	0.049	*d*	*d*
Boron filtered ICAP (mg/L)	24/24	0.17	0.0082	0.045	*d*	*d*
Calcium ICAP (mg/L)	24/24	220	21	110	*d*	*d*
Calcium filtered ICAP (mg/L)	24/24	190	19	110	*d*	*d*
Copper ICAP (mg/L)	5/24	0.042	0.0041	0.020	1	0
Copper filtered ICAP (mg/L)	8/24	0.020	0.0040	0.0069	1	0
Iron ICAP (mg/L)	22/24	17	0.0062	2.8	0.3	15
Iron filtered ICAP (mg/L)	15/24	4.3	0.0056	0.63	0.3	6
Lead AAS (mg/L)	1/24	0.0079	0.0079	0.0079	0.05	0
Magnesium ICAP (mg/L)	24/24	41	19	27	*d*	*d*
Magnesium filtered ICAP (mg/L)	24/24	39	17	26	*d*	*d*
Manganese ICAP (mg/L)	24/24	0.92	0.0016	0.29	0.05	15
Manganese filtered ICAP (mg/L)	24/24	0.91	0.0015	0.24	0.05	15
Nickel filtered ICAP (mg/L)	2/24	0.060	0.010	0.035	*d*	*d*
Potassium ICAP (mg/L)	24/24	4.5	0.64	2.4	*d*	*d*
Potassium filtered ICAP (mg/L)	24/24	3.9	0.62	2.5	*d*	*d*
Silver filtered ICAP (mg/L)	1/24	0.0064	0.0064	0.0064	0.05	0
Sodium ICAP (mg/L)	24/24	27	1.6	12	*d*	*d*
Sodium filtered ICAP (mg/L)	24/24	23	1.7	12	*d*	*d*
Strontium ICAP (mg/L)	24/24	1.3	0.048	0.39	*d*	*d*
Strontium filtered ICAP (mg/L)	24/24	1.4	0.047	0.39	*d*	*d*
Uranium fluorimetric (mg/L)	20/24	0.0070	0.0010	0.0030	0.02	0
Uranium, filtered fluorimetric (mg/L)	18/24	0.0080	0.0010	0.0034	0.02	0
Vanadium filtered ICAP (mg/L)	1/24	0.0053	0.0053	0.0053	*d*	*d*
Zinc ICAP (mg/L)	23/24	0.071	0.0032	0.015	5	0
Zinc filtered ICAP (mg/L)	24/24	0.068	0.0024	0.012	5	0
Conductivity, field measurement (μmhos/cm)	*d*/24	1200	290	800	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/24	11	0.50	2.9	*d*	*d*
pH, field measurement (standard units)	*d*/24	9.0	6.3	7.1	6.5/8.5	2
Redox, field measurement (mV)	*d*/24	250	−90	91	*d*	*d*
Water temperature, field measurement (°C)	*d*/24	18	14	16	30.5	0
Alkalinity-CO_3 (mg/L)	2/24	12	6.0	9.0	*d*	*d*
Alkalinity-HCO_3 (mg/L)	24/24	320	80	250	*d*	*d*
Conductivity (μmhos/cm)	24/24	1300	280	840	*d*	*d*
Dissolved solids (mg/L)	24/24	880	180	530	500	11
pH (standard units)	*d*/24	9.2	6.9	7.5	6.5/8.5	1
Total suspended solids (mg/L)	16/24	42	1.0	13	*d*	*d*
Turbidity (NTU)	24/24	76	0.40	14	1	21
Gross alpha (pCi/L)	9/24	34	1.9	13	15	3
Gross beta (pCi/L)	22/24	49	4.7	23	50	0

Table 5.7 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,1,1-Trichloroethane (µg/L)	9/24	1.0J	0.80J	~0.96	200	0
1,1-Dichloroethane (µg/L)	2/24	1.0J	1.0J	~1.0	*d*	*d*
1,1-Dichloroethene (µg/L)	1/24	1.0J	1.0J	~1.0	7	0
1,2-Dichloroethene (µg/L)	18/24	9.0B	1.0J	~4.3	70	0
2-Butanone (µg/L)	1/24	2.0BJ	2.0BJ	~2.0	*d*	*d*
2-Hexanone (µg/L)	3/24	3.0J	1.0BJ	~1.7	*d*	*d*
4-Methyl-2-pentanone (µg/L)	8/24	4.0BJ	1.0BJ	~2.0	*d*	*d*
Acetone (µg/L)	10/24	95	2.0BJ	~22	*d*	*d*
Benzene (µg/L)	2/24	2.0BJ	2.0BJ	~2.0	5	0
Carbon tetrachloride (µg/L)	12/24	3.0J	0.90J	~1.6	5	0
Chloroform (µg/L)	14/24	2.0J	0.60J	~1.6	100	0
Methylene chloride (µg/L)	10/24	2.0BJ	1.0BJ	~1.6	*d*	*d*
Tetrachloroethene (µg/L)	10/24	5.0B	1.0J	~2.8	5	0
Toluene (µg/L)	3/24	2.0BJ	1.0J	~1.7	1000	0
Trichloroethene (µg/L)	24/24	96	5.0	~45	5	23
Vinyl acetate (µg/L)	1/24	1.0J	1.0J	~1.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.8. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Exit Pathway—Traverse W

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	18/19	21,000	9.0	1,600	250	8
Fluoride (mg/L)	17/19	1.9	0.10	1.0	4	0
Nitrate nitrogen (mg/L)	4/19	4.8	0.40	2.5	10	0
Sulfate (mg/L)	19/19	19,000	6.0	1,800	250	13
Aluminum ICAP (mg/L)	11/19	4.4	0.042	0.81	0.2	5
Aluminum filtered ICAP (mg/L)	7/19	0.058	0.022	0.039	0.2	0
Antimony filtered ICAP (mg/L)	1/19	0.074	0.074	0.074	*d*	*d*
Barium ICAP (mg/L)	15/19	0.14	0.0039	0.060	1	0
Barium filtered ICAP (mg/L)	15/19	0.087	0.0039	0.053	1	0
Boron ICAP (mg/L)	19/19	1.4	0.025	0.33	*d*	*d*
Boron filtered ICAP (mg/L)	19/19	1.4	0.025	0.33	*d*	*d*
Calcium ICAP (mg/L)	19/19	680	53	290	*d*	*d*
Calcium filtered ICAP (mg/L)	19/19	660	54	280	*d*	*d*
Chromium AAS (mg/L)	2/19	0.020	0.013	0.016	0.05	0
Cobalt ICAP (mg/L)	3/19	0.0062	0.0054	0.0057	*d*	*d*
Copper ICAP (mg/L)	7/19	0.025	0.0042	0.010	1	0
Copper filtered ICAP (mg/L)	4/19	0.014	0.0049	0.0087	1	0
Iron ICAP (mg/L)	19/19	70	0.32	9.5	0.3	19
Iron filtered ICAP (mg/L)	19/19	15	0.010	3.9	0.3	15
Lead AAS (mg/L)	3/19	0.082	0.0086	0.035	0.05	1
Magnesium ICAP (mg/L)	19/19	270	14	110	*d*	*d*
Magnesium filtered ICAP (mg/L)	19/19	260	14	110	*d*	*d*
Manganese ICAP (mg/L)	19/19	1.6	0.015	0.19	0.05	13
Manganese filtered ICAP (mg/L)	19/19	0.45	0.0089	0.081	0.05	9
Molybdenum ICAP (mg/L)	2/19	4.0	3.5	3.8	*d*	*d*
Molybdenum filtered ICAP (mg/L)	2/19	4.1	4.0	4.0	*d*	*d*
Nickel ICAP (mg/L)	2/19	0.016	0.011	0.013	*d*	*d*
Potassium ICAP (mg/L)	19/19	25	1.2	7.8	*d*	*d*
Potassium filtered ICAP (mg/L)	19/19	19	1.0	7.4	*d*	*d*
Selenium ICAP (mg/L)	1/19	0.12	0.12	0.12	0.01	1
Selenium filtered ICAP (mg/L)	1/19	0.16	0.16	0.16	0.01	1
Silver filtered ICAP (mg/L)	2/19	0.017	0.0072	0.012	0.05	0
Sodium ICAP (mg/L)	19/19	1,100	3.0	260	*d*	*d*
Sodium filtered ICAP (mg/L)	19/19	1,100	3.1	250	*d*	*d*
Strontium ICAP (mg/L)	19/19	13	0.065	4.9	*d*	*d*
Strontium filtered ICAP (mg/L)	19/19	12	0.063	4.7	*d*	*d*
Uranium fluorimetric (mg/L)	7/19	0.0020	0.0010	0.0013	0.02	0
Uranium filtered fluorimetric (mg/L)	4/19	0.0020	0.0010	0.0012	0.02	0
Vanadium ICAP (mg/L)	3/19	0.0088	0.0051	0.0067	*d*	*d*
Vanadium filtered ICAP (mg/L)	2/19	0.0057	0.0057	0.0057	*d*	*d*
Zinc ICAP (mg/L)	18/19	0.15	0.0041	0.034	5	0
Zinc filtered ICAP (mg/L)	16/19	0.051	0.0026	0.015	5	0
Conductivity, field measurement (μmhos/cm)	*d*/19	7,900	410	2,800	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/19	5.0	0.10	1.1	*d*	*d*
pH, field measurement (standard units)	*d*/19	7.8	6.4	7.3	6.5/8.5	1
Redox, field measurement (mV)	*d*/19	210	−180	−69	*d*	*d*
Water temperature, field measurement (°C)	*d*/19	17	12	14	30.5	0
Alkalinity-HCO_3 (mg/L)	19/19	230	140	170	*d*	*d*
Conductivity (μmhos/cm)	19/19	8,300	430	3,000	*d*	*d*
Dissolved solids (mg/L)	19/19	6,400	270	2,500	500	15

Table 5.8 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
pH (standard units)	*d*/19	7.7	7.0	7.3	6.5/8.5	0
Total suspended solids (mg/L)	18/19	1100	2.0	76	*d*	*d*
Turbidity (NTU)	19/19	110	2.5	32	1	19
Gross alpha (pCi/L)	9/19	8.8	2.3	4.5	15	0
Gross beta (pCi/L)	11/19	25	3.0	8.5	50	0
2-Butanone (µg/L)	4/19	17B	13B	~15	*d*	*d*
4-Methyl-2-pentanone (µg/L)	3/19	2.0BJ	2.0BJ	~2.0	*d*	*d*
Acetone (µg/L)	3/19	6.0BJ	4.0BJ	~5.3	*d*	*d*
Methylene chloride (µg/L)	6/19	2.0BJ	1.0BJ	~1.8	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.9. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Bear Creek Lysimeter Demo

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	6/7	28	2.2	15	250	0
Fluoride (mg/L)	2/7	0.10	0.10	0.10	4	0
Nitrate nitrogen (mg/L)	4/7	1300	650	850	10	4
Sulfate (mg/L)	4/7	8.1	2.0	6.1	250	0
Aluminum ICAP (mg/L)	5/7	0.39	0.084	0.24	0.2	3
Aluminum filtered ICAP (mg/L)	2/7	0.025	0.024	0.025	0.2	0
Barium ICAP (mg/L)	7/7	2.4	0.44	1.5	1	4
Barium filtered ICAP (mg/L)	7/7	2.3	0.43	1.4	1	4
Boron ICAP (mg/L)	5/7	0.075	0.018	0.038	*d*	*d*
Boron filtered ICAP (mg/L)	6/7	1.1	0.012	0.28	*d*	*d*
Calcium ICAP (mg/L)	7/7	1300	67	670	*d*	*d*
Calcium filtered ICAP (mg/L)	7/7	1100	65	620	*d*	*d*
Copper filtered ICAP (mg/L)	1/7	0.0042	0.0042	0.0042	1	0
Iron ICAP (mg/L)	6/7	0.65	0.083	0.30	0.3	3
Iron filtered ICAP (mg/L)	5/7	0.15	0.056	0.11	0.3	0
Magnesium ICAP (mg/L)	7/7	80	6.5	43	*d*	*d*
Magnesium filtered ICAP (mg/L)	7/7	74	6.3	43	*d*	*d*
Manganese ICAP (mg/L)	5/7	0.14	0.0092	0.090	0.05	3
Manganese filtered ICAP (mg/L)	5/7	0.14	0.019	0.087	0.05	3
Nickel ICAP (mg/L)	1/7	0.12	0.12	0.12	*d*	*d*
Potassium ICAP (mg/L)	5/7	8.0	0.65	2.9	*d*	*d*
Potassium filtered ICAP (mg/L)	5/7	6.8	0.91	3.2	*d*	*d*
Sodium ICAP (mg/L)	7/7	39	4.3	20	*d*	*d*
Sodium filtered ICAP (mg/L)	7/7	30	4.3	18	*d*	*d*
Strontium ICAP (mg/L)	7/7	2.8	0.11	1.5	*d*	*d*
Strontium filtered ICAP (mg/L)	7/7	2.7	0.11	1.5	*d*	*d*
Uranium fluorimetric (mg/L)	4/7	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	4/7	0.0010	0.0010	0.0010	0.02	0
Zinc ICAP (mg/L)	5/7	0.042	0.0035	0.018	5	0
Zinc filtered ICAP (mg/L)	6/7	0.26	0.0063	0.056	5	0
Conductivity, field measurement (µmhos/cm)	*d*/7	5500	340	3100	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/7	5.6	0.80	2.0	*d*	*d*
pH, field measurement (standard units)	*d*/7	7.2	6.4	6.9	6.5/8.5	1
Redox, field measurement (mV)	*d*/7	230	40	120	*d*	*d*
Water temperature, field measurement (°C)	*d*/7	18	14	16	30.5	0
Alkalinity-HCO_3 (mg/L)	7/7	260	200	230	*d*	*d*
Conductivity (µmhos/cm)	7/7	5900	420	3400	*d*	*d*
Dissolved solids (mg/L)	7/7	4800	230	2700	500	4
pH (standard units)	*d*/7	7.6	6.8	7.2	6.5/8.5	0
Total suspended solids (mg/L)	7/7	53	3.0	14	*d*	*d*
Turbidity (NTU)	7/7	25	0.40	6.5	1	6
Gross alpha (pCi/L)	4/7	92	6.3	33	15	3
Gross beta (pCi/L)	4/7	340	29	140	50	3
4-Methyl-2-pentanone (µg/L)	1/7	2.0BJ	2.0BJ	~2.0	*d*	*d*
Chloroform (µg/L)	1/7	0.90J	0.90J	~0.90	100	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.10. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Oil Landfarm

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	70/78	81	1.1	19	250	0
Fluoride (mg/L)	50/78	5.7	0.10	0.69	4	3
Nitrate nitrogen (mg/L)	38/78	250	0.26	35	10	13
Sulfate (mg/L)	75/78	460	1.0	45	250	4
Aluminum ICAP (mg/L)	66/78	15	0.023	1.1	0.2	31
Aluminum filtered ICAP (mg/L)	46/78	5.5	0.020	0.19	0.2	4
Arsenic filtered ICAP (mg/L)	1/78	0.079	0.079	0.079	0.05	1
Barium ICAP (mg/L)	78/78	0.97	0.016	0.18	1	0
Barium filtered ICAP (mg/L)	78/78	2.2	0.015	0.19	1	1
Beryllium ICAP (mg/L)	8/78	0.0018	0.0004	0.0009	*d*	*d*
Beryllium filtered ICAP (mg/L)	3/78	0.0006	0.0005	0.0005	*d*	*d*
Boron ICAP (mg/L)	77/78	0.93	0.0069	0.11	*d*	*d*
Boron filtered ICAP (mg/L)	77/78	1.5	0.0045	0.12	*d*	*d*
Cadmium AAS (mg/L)	2/78	0.0037	0.0020	0.0028	0.005	0
Cadmium filtered AAS (mg/L)	1/78	0.0040	0.0040	0.0040	0.005	0
Calcium ICAP (mg/L)	78/78	330	0.69	89	*d*	*d*
Calcium filtered ICAP (mg/L)	78/78	1,000	0.63	96	*d*	*d*
Chromium AAS (mg/L)	14/78	0.20	0.010	0.038	0.05	3
Cobalt ICAP (mg/L)	5/78	0.030	0.0060	0.013	*d*	*d*
Copper ICAP (mg/L)	35/78	0.053	0.0043	0.014	1	0
Copper filtered ICAP (mg/L)	26/78	0.032	0.0040	0.0085	1	0
Iron ICAP (mg/L)	75/78	42	0.013	1.7	0.3	40
Iron filtered ICAP (mg/L)	58/78	8.0	0.0050	0.36	0.3	12
Lead AAS (mg/L)	15/78	0.074	0.0044	0.020	0.05	1
Lead filtered AAS (mg/L)	1/78	0.0075	0.0075	0.0075	0.05	0
Magnesium ICAP (mg/L)	78/78	60	0.15	21	*d*	*d*
Magnesium filtered ICAP (mg/L)	78/78	70	0.020	20	*d*	*d*
Manganese ICAP (mg/L)	72/78	1.1	0.0011	0.10	0.05	15
Manganese filtered ICAP (mg/L)	64/78	1.1	0.0011	0.077	0.05	7
Nickel ICAP (mg/L)	16/78	0.055	0.010	0.025	*d*	*d*
Nickel filtered ICAP (mg/L)	11/78	0.038	0.010	0.022	*d*	*d*
Potassium ICAP (mg/L)	76/78	11	0.75	3.4	*d*	*d*
Potassium filtered ICAP (mg/L)	75/78	11	0.69	3.3	*d*	*d*
Selenium ICAP (mg/L)	5/78	0.064	0.052	0.055	0.01	5
Selenium filtered ICAP (mg/L)	2/78	0.39	0.051	0.22	0.01	2
Silver ICAP (mg/L)	2/78	0.24	0.0070	0.12	0.05	1
Silver filtered ICAP (mg/L)	2/78	0.041	0.0062	0.024	0.05	0
Sodium ICAP (mg/L)	78/78	260	0.76	25	*d*	*d*
Sodium filtered ICAP (mg/L)	78/78	250	0.72	25	*d*	*d*
Strontium ICAP (mg/L)	78/78	2.7	0.035	0.59	*d*	*d*
Strontium filtered ICAP (mg/L)	78/78	2.6	0.034	0.60	*d*	*d*
Uranium fluorimetric (mg/L)	44/78	0.047	0.0010	0.0052	0.02	3
Uranium filtered fluorimetric (mg/L)	42/78	0.051	0.0010	0.0055	0.02	3
Vanadium ICAP (mg/L)	11/78	0.096	0.0051	0.018	*d*	*d*
Vanadium filtered ICAP (mg/L)	4/78	0.012	0.0051	0.0072	*d*	*d*
Zinc ICAP (mg/L)	72/78	0.52	0.0027	0.030	5	0
Zinc filtered ICAP (mg/L)	71/78	0.42	0.0025	0.023	5	0
Conductivity, field measurement (μmhos/cm)	*d*/78	2,100	160	660	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/78	8.9	0.30	3.4	*d*	*d*
pH, field measurement (standard units)	*d*/78	11	5.9	7.5	6.5/8.5	16

Table 5.10 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Redox, field measurement (mV)	d/78	240	−260	63	d	d
Water temperature, field measurement (°C)	d/78	20	7.6	15	30.5	0
Alkalinity-CO_3 (mg/L)	9/78	86	26	61	d	d
Alkalinity-HCO_3 (mg/L)	75/78	440	73	230	d	d
Conductivity (μmhos/cm)	78/78	2,500	150	710	d	d
Dissolved solids (mg/L)	78/78	1,900	70	460	500	25
pH (standard units)	d/78	11	6.4	7.8	6.5/8.5	10
Total suspended solids (mg/L)	66/78	1,000	1.0	63	d	d
Turbidity (NTU)	78/78	320	0.50	24	1	66
Neptunium-237 (pCi/L)	1/5	13	13	13	1	1
Uranium-238 (pCi/L)	1/5	2.6	2.6	2.6	24	0
Americium-241 (pCi/L)	1/4	3.2	3.2	3.2	1	1
Technetium-99 (pCi/L)	2/5	2,200	1,600	1,900	4,000	0
Gross alpha (pCi/L)	36/78	60	1.6	11	15	8
Gross beta (pCi/L)	56/78	75	2.5	17	50	5
Strontium (pCi/L)	1/5	23	23	23	8	1
1,1,1-Trichloroethane (μg/L)	12/78	13	1.0J	~3.9	200	0
1,1,2,2-Tetrachloroethane (μg/L)	1/78	1.0J	1.0J	~1.0	d	d
1,1-Dichloroethane (μg/L)	8/78	7.0	3.0J	~4.6	d	d
1,1-Dichloroethene (μg/L)	12/78	36	0.80J	~11	7	5
1,2-Dichloroethene (μg/L)	17/78	57	1.0J	~13	70	0
2-Butanone (μg/L)	2/78	14	13	14	d	d
2-Hexanone (μg/L)	2/78	4.0BJ	3.0J	~3.5	d	d
4-Methyl-2-pentanone (μg/L)	15/78	4.0J	1.0BJ	~1.9	d	d
Acetone (μg/L)	9/78	9.0J	2.0BJ	~4.3	d	d
Carbon disulfide (μg/L)	1/78	2.0BJ	2.0BJ	~2.0	d	d
Carbon tetrachloride (μg/L)	13/78	8.0DJ	1.0J	~3.7	5	2
Chloroethane (μg/L)	1/78	2.0J	2.0J	~2.0	200	0
Chloroform (μg/L)	9/78	5.0DJ	0.70J	~2.9	100	0
Methylene chloride (μg/L)	15/78	2.0BJ	1.0BJ	~1.3	d	d
Tetrachloroethene (μg/L)	9/78	3.0DJ	1.0J	~1.6	5	0
Toluene (μg/L)	1/78	1.0J	1.0J	~1.0	1,000	0
Trichloroethene (μg/L)	27/78	370D	0.80J	~93	5	26
Vinyl chloride (μg/L)	1/78	2.0J	2.0J	~2.0	2	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.11. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Rust Spoil Area

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	6/6	37	1.0	17	250	0
Fluoride (mg/L)	4/6	0.30	0.10	0.23	4	0
Nitrate nitrogen (mg/L)	3/6	18	11	15	10	3
Sulfate (mg/L)	6/6	51	1.4	26	250	0
Aluminum ICAP (mg/L)	5/6	0.14	0.033	0.061	0.2	0
Aluminum filtered ICAP (mg/L)	5/6	0.054	0.023	0.034	0.2	0
Barium ICAP (mg/L)	6/6	0.28	0.035	0.11	1	0
Barium filtered ICAP (mg/L)	6/6	0.27	0.035	0.11	1	0
Boron ICAP (mg/L)	6/6	0.081	0.017	0.054	*d*	*d*
Boron filtered ICAP (mg/L)	6/6	0.084	0.021	0.054	*d*	*d*
Calcium ICAP (mg/L)	6/6	180	39	110	*d*	*d*
Calcium filtered ICAP (mg/L)	6/6	180	39	110	*d*	*d*
Copper ICAP (mg/L)	2/6	0.013	0.0041	0.0085	1	0
Copper filtered ICAP (mg/L)	3/6	0.0049	0.0044	0.0046	1	0
Iron ICAP (mg/L)	6/6	0.20	0.011	0.064	0.3	0
Iron filtered ICAP (mg/L)	4/6	0.039	0.0057	0.016	0.3	0
Magnesium ICAP (mg/L)	6/6	24	20	23	*d*	*d*
Magnesium filtered ICAP (mg/L)	6/6	24	20	22	*d*	*d*
Manganese ICAP (mg/L)	6/6	3.8	0.0025	1.6	0.05	3
Manganese filtered ICAP (mg/L)	3/6	3.6	2.6	3.2	0.05	3
Nickel ICAP (mg/L)	1/6	0.012	0.012	0.012	*d*	*d*
Nickel filtered ICAP (mg/L)	1/6	0.011	0.011	0.011	*d*	*d*
Potassium ICAP (mg/L)	6/6	4.3	0.96	2.6	*d*	*d*
Potassium filtered ICAP (mg/L)	6/6	4.2	0.84	2.5	*d*	*d*
Silver filtered ICAP (mg/L)	1/6	0.014	0.014	0.014	0.05	0
Sodium ICAP (mg/L)	6/6	12	1.0	6.6	*d*	*d*
Sodium filtered ICAP (mg/L)	6/6	12	1.0	6.4	*d*	*d*
Strontium ICAP (mg/L)	6/6	0.41	0.018	0.21	*d*	*d*
Strontium filtered ICAP (mg/L)	6/6	0.42	0.018	0.21	*d*	*d*
Uranium fluorimetric (mg/L)	3/6	0.0020	0.0020	0.0020	0.02	0
Uranium filtered fluorimetric (mg/L)	3/6	0.0020	0.0020	0.0020	0.02	0
Zinc ICAP (mg/L)	6/6	0.049	0.0048	0.019	5	0
Zinc filtered ICAP (mg/L)	6/6	0.018	0.0022	0.0076	5	0
Conductivity, field measurement (µmhos/cm)	*d*/6	1200	360	700	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/6	7.3	0.70	4.0	*d*	*d*
pH, field measurement (standard units)	*d*/6	7.2	5.8	6.6	6.5/8.5	2
Redox, field measurement (mV)	*d*/6	240	160	200	*d*	*d*
Water temperature, field measurement (°C)	*d*/6	16	12	15	30.5	0
Alkalinity-HCO_3 (mg/L)	6/6	420	190	300	*d*	*d*
Conductivity (µmhos/cm)	6/6	1100	340	720	*d*	*d*
Dissolved solids (mg/L)	6/6	660	180	420	500	3
pH (standard units)	*d*/6	7.9	6.7	7.3	6.5/8.5	0
Total suspended solids (mg/L)	4/6	6.0	1.0	2.8	*d*	*d*
Turbidity (NTU)	6/6	3.5	0.60	1.9	1	5
Gross alpha (pCi/L)	4/6	5.1	1.7	3.3	15	0
Gross beta (pCi/L)	3/6	47	14	30	50	0

Table 5.11 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,2-Dichloroethene (μg/L)	2/6	4.0J	3.0J	~3.5	70	0
Methylene chloride (μg/L)	1/6	11B	11B	~11	*d*	*d*
Tetrachloroethene (μg/L)	1/6	2.0J	2.0J	~2.0	5	0
Trichloroethene (μg/L)	3/6	6.0	3.0J	~4.7	5	1

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.12. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
S3 Ponds

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	15/27	180	8.6	48	250	0
Fluoride (mg/L)	20/27	9.0	0.10	2.2	4	5
Nitrate nitrogen (mg/L)	18/27	11,000	0.86	3,200	10	15
Sulfate (mg/L)	21/27	2,200	1.0	200	250	2
Aluminum ICAP (mg/L)	20/27	800	0.031	110	0.2	9
Aluminum filtered ICAP (mg/L)	19/27	780	0.020	120	0.2	5
Barium ICAP (mg/L)	27/27	340	0.0012	39	1	10
Barium filtered ICAP (mg/L)	27/27	340	0.0012	27	1	10
Beryllium ICAP (mg/L)	6/27	0.078	0.0003	0.029	*d*	*d*
Beryllium filtered ICAP (mg/L)	5/27	0.082	0.0004	0.040	*d*	*d*
Boron ICAP (mg/L)	27/27	2.1	0.0084	0.57	*d*	*d*
Boron filtered ICAP (mg/L)	27/27	3.5	0.0059	0.63	*d*	*d*
Cadmium AAS (mg/L)	6/27	2.8	0.035	1.3	0.005	6
Cadmium filtered AAS (mg/L)	6/27	2.8	0.034	1.2	0.005	6
Calcium ICAP (mg/L)	27/27	10,000	0.62	1,800	*d*	*d*
Calcium filtered ICAP (mg/L)	27/27	9,800	0.56	1,500	*d*	*d*
Chromium AAS (mg/L)	8/27	0.28	0.010	0.11	0.05	3
Chromium filtered AAS (mg/L)	4/27	0.30	0.016	0.21	0.05	3
Cobalt ICAP (mg/L)	5/27	1.9	0.51	1.3	*d*	*d*
Cobalt filtered ICAP (mg/L)	4/27	1.8	0.0070	1.1	*d*	*d*
Copper ICAP (mg/L)	16/27	1.4	0.0042	0.24	1	1
Copper filtered ICAP (mg/L)	9/27	1.3	0.0054	0.39	1	2
Iron ICAP (mg/L)	26/27	14	0.030	3.6	0.3	20
Iron filtered ICAP (mg/L)	19/27	16	0.0083	1.9	0.3	5
Lead AAS (mg/L)	9/27	0.067	0.0045	0.017	0.05	1
Lead filtered AAS (mg/L)	2/27	0.0049	0.0047	0.0048	0.05	0
Magnesium ICAP (mg/L)	27/27	2,200	0.061	310	*d*	*d*
Magnesium filtered ICAP (mg/L)	27/27	2,200	0.086	240	*d*	*d*
Manganese ICAP (mg/L)	25/27	220	0.0012	28	0.05	13
Manganese filtered ICAP (mg/L)	25/27	220	0.0010	27	0.05	7
Mercury CVAA (mg/L)	3/27	0.11	0.053	0.091	0.002	3
Mercury filtered CVAA (mg/L)	4/27	0.10	0.0002	0.072	0.002	3
Molybdenum ICAP (mg/L)	4/27	0.021	0.012	0.015	*d*	*d*
Molybdenum filtered ICAP (mg/L)	6/27	0.016	0.010	0.014	*d*	*d*
Nickel ICAP (mg/L)	5/27	20	0.020	11	*d*	*d*
Nickel filtered ICAP (mg/L)	3/27	19	15	17	*d*	*d*
Potassium ICAP (mg/L)	27/27	190	1.3	42	*d*	*d*
Potassium filtered ICAP (mg/L)	27/27	170	0.93	34	*d*	*d*
Selenium ICAP (mg/L)	2/27	0.056	0.052	0.054	0.01	2
Selenium filtered ICAP (mg/L)	2/27	0.055	0.052	0.054	0.01	2
Silver ICAP (mg/L)	4/27	0.67	0.0072	0.39	0.05	3
Silver filtered ICAP (mg/L)	2/27	0.63	0.0077	0.32	0.05	1
Sodium ICAP (mg/L)	27/27	3,100	0.73	790	*d*	*d*
Sodium filtered ICAP (mg/L)	27/27	3,100	0.69	680	*d*	*d*
Strontium ICAP (mg/L)	27/27	320	0.019	37	*d*	*d*
Strontium filtered ICAP (mg/L)	27/27	320	0.020	27	*d*	*d*
Uranium fluorimetric (mg/L)	15/27	36	0.0010	3.1	0.02	6
Uranium filtered fluorimetric (mg/L)	13/27	34	0.0010	3.3	0.02	6
Vanadium ICAP (mg/L)	1/27	0.0082	0.0082	0.0082	*d*	*d*
Zinc ICAP (mg/L)	24/27	4.0	0.0034	0.54	5	0
Zinc filtered ICAP (mg/L)	25/27	4.2	0.0026	0.51	5	0

Table 5.12 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Conductivity, field measurement (μmhos/cm)	*d*/27	45,000	130	8,800	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/27	17	0.30	3.1	*d*	*d*
pH, field measurement (standard units)	*d*/27	11	3.8	7.6	6.5/8.5	15
Redox, field measurement (mV)	*d*/27	420	−220	110	*d*	*d*
Water temperature, field measurement (°C)	*d*/27	22	11	16	30.5	0
Alkalinity-CO_3 (mg/L)	9/27	430	40	230	*d*	*d*
Alkalinity-HCO_3 (mg/L)	24/27	610	42	220	*d*	*d*
Conductivity (μmhos/cm)	27/27	52,000	130	10,000	*d*	*d*
Dissolved solids (mg/L)	27/27	61,000	92	12,000	500	19
pH (standard units)	*d*/27	10	3.8	7.7	6.5/8.5	15
Total suspended solids (mg/L)	23/27	82	1.0	25	*d*	*d*
Turbidity (NTU)	27/27	81	0.40	13	1	25
Uranium-234 (pCi/L)	3/7	2,000	20	1,200	20	3
Uranium-235 (pCi/L)	2/6	550	180	360	24	2
Neptunium-237 (pCi/L)	2/7	530	460	500	1	2
Uranium-238 (pCi/L)	4/7	4,900	29	2,200	24	4
Americium-241 (pCi/L)	5/7	38	0.83	15	1	3
Technetium-99 (pCi/L)	6/7	74,000	2,800	28,000	4,000	4
Gross alpha (pCi/L)	4/27	24,000	2.5	3,300	15	8
Gross beta (pCi/L)	19/27	48,000	2.8	7,500	50	7
Strontium (pCi/L)	2/7	250	160	210	8	2
Tritium (pCi/L)	5/9	4,300	590	2,800	20,000	0
1,2-Dichloroethene (μg/L)	3/27	100DJ	54DJ	~73	70	1
2-Butanone (μg/L)	2/27	27	25	26	*d*	*d*
4-Methyl-2-pentanone (μg/L)	5/27	97BDJ	1.0BJ	~20	*d*	*d*
Acetone (μg/L)	10/27	6,000D	2.0BJ	~890	*d*	*d*
Carbon disulfide (μg/L)	1/27	1.0J	1.0J	~1.0	*d*	*d*
Chloroform (μg/L)	2/27	69DJ	2.0J	~35	100	0
Methylene chloride (μg/L)	10/27	560BD	1.0BJ	~130	*d*	*d*
Tetrachloroethene (μg/L)	7/27	9,000D	0.40J	~3,000	5	3
Toluene (μg/L)	3/27	1.0J	0.60BJ	~0.87	1,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.13. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Spoil Area I

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	18/22	17	0.70	5.2	250	0
Fluoride (mg/L)	7/22	0.20	0.10	0.14	4	0
Nitrate nitrogen (mg/L)	13/22	34	0.32	12	10	6
Sulfate (mg/L)	22/22	40	1.6	13	250	0
Aluminum ICAP (mg/L)	17/22	0.13	0.022	0.051	0.2	0
Aluminum filtered ICAP (mg/L)	15/22	1.4	0.020	0.12	0.2	1
Antimony filtered ICAP (mg/L)	1/22	0.070	0.070	0.070	*d*	*d*
Barium ICAP (mg/L)	22/22	0.41	0.012	0.083	1	0
Barium filtered ICAP (mg/L)	21/22	0.35	0.013	0.082	1	0
Beryllium ICAP (mg/L)	2/22	0.0007	0.0006	0.0006	*d*	*d*
Beryllium filtered ICAP (mg/L)	3/22	0.0006	0.0003	0.0005	*d*	*d*
Boron ICAP (mg/L)	22/22	0.57	0.0043	0.045	*d*	*d*
Boron filtered ICAP (mg/L)	21/22	0.18	0.0043	0.029	*d*	*d*
Calcium ICAP (mg/L)	22/22	110	34	72	*d*	*d*
Calcium filtered ICAP (mg/L)	21/22	120	39	70	*d*	*d*
Chromium AAS (mg/L)	1/22	0.016	0.016	0.016	0.05	0
Cobalt filtered ICAP (mg/L)	1/22	0.021	0.021	0.021	*d*	*d*
Copper ICAP (mg/L)	10/22	0.020	0.0040	0.0094	1	0
Copper filtered ICAP (mg/L)	14/22	0.014	0.0040	0.0082	1	0
Iron ICAP (mg/L)	17/22	1.1	0.011	0.12	0.3	1
Iron filtered ICAP (mg/L)	13/22	1.3	0.0096	0.14	0.3	1
Magnesium ICAP (mg/L)	22/22	25	9.5	19	*d*	*d*
Magnesium filtered ICAP (mg/L)	22/22	26	0.0054	18	*d*	*d*
Manganese ICAP (mg/L)	20/22	0.034	0.0012	0.0072	0.05	0
Manganese filtered ICAP (mg/L)	16/22	0.046	0.0010	0.0085	0.05	0
Mercury CVAA (mg/L)	1/22	0.0002	0.0002	0.0002	0.002	0
Molybdenum filtered ICAP (mg/L)	1/22	0.011	0.011	0.011	*d*	*d*
Nickel ICAP (mg/L)	4/22	0.029	0.016	0.020	*d*	*d*
Nickel filtered ICAP (mg/L)	3/22	0.034	0.014	0.025	*d*	*d*
Potassium ICAP (mg/L)	21/22	4.8	0.85	2.2	*d*	*d*
Potassium filtered ICAP (mg/L)	21/22	4.0	0.90	2.1	*d*	*d*
Silver ICAP (mg/L)	1/22	0.0063	0.0063	0.0063	0.05	0
Sodium ICAP (mg/L)	22/22	10	0.90	3.7	*d*	*d*
Sodium filtered ICAP (mg/L)	21/22	9.6	0.99	4.2	*d*	*d*
Strontium ICAP (mg/L)	22/22	0.20	0.017	0.081	*d*	*d*
Strontium filtered ICAP (mg/L)	22/22	0.21	0.0008	0.077	*d*	*d*
Uranium fluorimetric (mg/L)	9/22	0.0020	0.0010	0.0013	0.02	0
Uranium filtered fluorimetric (mg/L)	11/22	0.0020	0.0010	0.0012	0.02	0
Zinc ICAP (mg/L)	22/22	0.052	0.0049	0.015	5	0
Zinc filtered ICAP (mg/L)	21/22	0.030	0.0047	0.012	5	0
Conductivity, field measurement (μmhos/cm)	*d*/22	690	320	480	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/22	9.7	0.10	5.1	*d*	*d*
pH, field measurement (standard units)	*d*/22	7.9	6.8	7.3	6.5/8.5	0
Redox, field measurement (mV)	*d*/22	250	−46	180	*d*	*d*
Water temperature, field measurement (°C)	*d*/22	18	12	15	30.5	0
Alkalinity-HCO_3 (mg/L)	22/22	350	180	230	*d*	*d*
Conductivity (μmhos/cm)	22/22	750	370	510	*d*	*d*
Dissolved solids (mg/L)	22/22	500	190	300	500	1
pH (standard units)	*d*/22	8.1	7.0	7.6	6.5/8.5	0
Total suspended solids (mg/L)	11/22	46	1.0	7.1	*d*	*d*
Turbidity (NTU)	22/22	25	0.30	3.4	1	11

Table 5.13 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	12/22	17	1.5	5.7	15	1
Gross beta (pCi/L)	12/22	70	2.8	28	50	3
1,2-Dichloroethene (μg/L)	9/22	14	2.0J	~7.1	70	0
2-Butanone (μg/L)	1/22	7.0BJ	7.0BJ	~7.0	*d*	*d*
4-Methyl-2-pentanone (μg/L)	5/22	3.0BJ	1.0BJ	~2.0	*d*	*d*
Acetone (μg/L)	4/22	7.0BJ	1.0J	~3.5	*d*	*d*
Bromodichloromethane (μg/L)	1/22	4.0J	4.0J	~4.0	100	0
Chloroform (μg/L)	3/22	11	0.70J	~4.6	100	0
Methylene chloride (μg/L)	3/22	14B	2.0BJ	~6.0	*d*	*d*
Tetrachloroethene (μg/L)	11/22	20	5.0	10	5	9
Toluene (μg/L)	4/22	0.70BJ	0.60BJ	~0.63	1000	0
Trichloroethene (μg/L)	11/22	11	2.0J	~5.8	5	4

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.14. Constituents in groundwater at the Y-12 Plant site

Bear Creek Hydrogeologic Regime
Y-12 Burial Grounds

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	104/120	4800	1.0	230	250	10
Fluoride (mg/L)	64/120	7.4	0.10	1.4	4	9
Nitrate nitrogen (mg/L)	15/120	27	0.24	8.0	10	3
Sulfate (mg/L)	110/120	630	1.9	31	250	3
Aluminum ICAP (mg/L)	94/120	68	0.020	1.4	0.2	50
Aluminum filtered ICAP (mg/L)	57/120	1.1	0.020	0.083	0.2	6
Barium ICAP (mg/L)	119/120	1.3	0.014	0.15	1	2
Barium filtered ICAP (mg/L)	119/120	0.41	0.0093	0.12	1	0
Beryllium ICAP (mg/L)	11/120	0.0033	0.0003	0.0010	*d*	*d*
Beryllium filtered ICAP (mg/L)	6/120	0.0008	0.0003	0.0006	*d*	*d*
Boron ICAP (mg/L)	118/120	0.98	0.0046	0.16	*d*	*d*
Boron filtered ICAP (mg/L)	119/120	0.97	0.0056	0.16	*d*	*d*
Cadmium AAS (mg/L)	1/120	0.0021	0.0021	0.0021	0.005	0
Calcium ICAP (mg/L)	120/120	390	0.83	40	*d*	*d*
Calcium filtered ICAP (mg/L)	120/120	120	0.77	36	*d*	*d*
Chromium AAS (mg/L)	22/120	0.34	0.010	0.040	0.05	4
Chromium filtered AAS (mg/L)	1/120	0.012	0.012	0.012	0.05	0
Cobalt ICAP (mg/L)	5/120	0.053	0.0052	0.015	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/120	0.0050	0.0050	0.0050	*d*	*d*
Copper ICAP (mg/L)	50/120	0.15	0.0041	0.010	1	0
Copper filtered ICAP (mg/L)	33/120	0.022	0.0045	0.0077	1	0
Iron ICAP (mg/L)	120/120	95	0.0094	3.3	0.3	76
Iron filtered ICAP (mg/L)	98/120	6.5	0.0050	0.19	0.3	13
Lead AAS (mg/L)	22/120	0.078	0.0043	0.018	0.05	2
Lead filtered AAS (mg/L)	1/120	0.0098	0.0098	0.0098	0.05	0
Magnesium ICAP (mg/L)	120/120	29	0.069	7.1	*d*	*d*
Magnesium filtered ICAP (mg/L)	120/120	27	0.048	6.5	*d*	*d*
Manganese ICAP (mg/L)	118/120	1.9	0.0012	0.15	0.05	57
Manganese filtered ICAP (mg/L)	113/120	1.0	0.0011	0.079	0.05	31
Molybdenum ICAP (mg/L)	2/120	0.032	0.026	0.029	*d*	*d*
Molybdenum filtered ICAP (mg/L)	3/120	0.033	0.021	0.028	*d*	*d*
Nickel ICAP (mg/L)	24/120	0.50	0.010	0.075	*d*	*d*
Nickel filtered ICAP (mg/L)	18/120	0.70	0.011	0.079	*d*	*d*
Potassium ICAP (mg/L)	112/120	30	0.61	3.3	*d*	*d*
Potassium filtered ICAP (mg/L)	111/120	23	0.62	3.2	*d*	*d*
Selenium filtered ICAP (mg/L)	2/120	0.064	0.051	0.058	0.01	2
Sodium ICAP (mg/L)	120/120	1800	0.92	130	*d*	*d*
Sodium filtered ICAP (mg/L)	120/120	1800	0.99	130	*d*	*d*
Strontium ICAP (mg/L)	120/120	2.0	0.011	0.27	*d*	*d*
Strontium filtered ICAP (mg/L)	120/120	1.9	0.0073	0.26	*d*	*d*
Uranium fluorimetric (mg/L)	38/120	0.089	0.0010	0.011	0.02	6
Uranium filtered fluorimetric (mg/L)	30/120	0.090	0.0010	0.014	0.02	7
Vanadium ICAP (mg/L)	6/120	0.086	0.0063	0.022	*d*	*d*
Zinc ICAP (mg/L)	106/120	0.36	0.0028	0.024	5	0
Zinc filtered ICAP (mg/L)	101/120	0.075	0.0022	0.015	5	0
Conductivity, field measurement (μmhos/cm)	*d*/120	9000	29	880	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/120	11	0.30	3.3	*d*	*d*
pH, field measurement (standard units)	*d*/120	11	4.8	7.5	6.5/8.5	45
Redox, field measurement (mV)	*d*/120	320	−260	88	*d*	*d*
Water temperature, field measurement (°C)	*d*/120	20	9.0	15	30.5	0

Table 5.14 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-CO_3 (mg/L)	28/120	280	6.0	110	*d*	*d*
Alkalinity-HCO_3 (mg/L)	120/120	600	1.0	180	*d*	*d*
Conductivity (μmhos/cm)	120/120	9,300	30	900	*d*	*d*
Dissolved solids (mg/L)	120/120	12,000	38	10	500	21
pH (standard units)	*d*/120	11	5.5	7.8	6.5/8.5	39
Total suspended solids (mg/L)	102/120	940	1.0	36	*d*	*d*
Turbidity (NTU)	120/120	850	0.30	25	1	109
Uranium-234 (pCi/L)	2/3	13	8.0	10	20	0
Neptunium-237 (pCi/L)	1/3	4.4	4.4	4.4	1	1
Uranium-238 (pCi/L)	2/3	26	11	18	24	1
Americium-241 (pCi/L)	2/3	2.2	1.8	2.0	1	2
Gross alpha (pCi/L)	47/120	110	1.5	8.8	15	6
Gross beta (pCi/L)	56/120	300	2.3	21	50	6
Strontium (pCi/L)	2/3	50	18	34	8	2
Tritium (pCi/L)	2/3	9,200	1,200	5,200	20,000	0
1,1,1-Trichloroethane (μg/L)	7/120	490DJ	6.0DJ	~150	200	3
1,1,2-Trichloroethane (μg/L)	1/120	8.0	8.0	8.0	*d*	*d*
1,1-Dichloroethane (μg/L)	24/120	4,200D	1.0J	370	*d*	*d*
1,1-Dichloroethene (μg/L)	6/120	280DJ	10D	~91	7	6
1,2-Dichloroethane (μg/L)	3/120	5.0DJ	2.0J	~3.3	5	0
1,2-Dichloroethene (μg/L)	17/120	1,400D	1.0J	~170	70	5
2-Butanone (μg/L)	6/120	7.0BJ	2.0BJ	~3.8	*d*	*d*
2-Hexanone (μg/L)	1/120	1.0BJ	1.0BJ	~1.0	*d*	*d*
4-Methyl-2-pentanone (μg/L)	26/120	20BDJ	1.0BJ	~3.0	*d*	*d*
Acetone (μg/L)	20/120	75BDJ	2.0BJ	~12	*d*	*d*
Benzene (μg/L)	2/120	3.0J	1.0J	~2.0	5	0
Carbon disulfide (μg/L)	6/120	3.0BJ	1.0BJ	~2.0	*d*	*d*
Chloroethane (μg/L)	4/120	13	3.0J	~8.3	200	0
Chloroform (μg/L)	3/120	2.0J	2.0J	~2.0	100	0
Ethylbenzene (μg/L)	3/120	13	1.0J	~5.0	700	0
Methylene chloride (μg/L)	32/120	340BDJ	1.0BJ	~13	*d*	*d*
Tetrachloroethene (μg/L)	22/120	29,000D	1.0J	~3,700	5	14
Toluene (μg/L)	3/120	4.0J	0.60BJ	~2.2	1,000	0
Trichloroethene (μg/L)	21/120	24,000D	1.0J	~2,700	5	9
Vinyl acetate (μg/L)	1/120	2.0BJ	2.0BJ	~2.0	*d*	*d*
Vinyl chloride (μg/L)	11/120	120D	2.0J	~25	2	10
Xylenes (μg/L)	1/120	57	57	57	10,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.15. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Ash Disposal Basin

Parameter	Number detected/ number of samples	Detected results			Reference value[a]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	9/16	1.1	1.0	1.1	250	0
Fluoride (mg/L)	1/16	0.20	0.20	0.20	4	0
Sulfate (mg/L)	16/16	4.2	1.5	2.5	250	0
Aluminum ICAP (mg/L)	12/16	0.15	0.024	0.066	0.2	0
Aluminum filtered ICAP (mg/L)	6/16	0.061	0.026	0.041	0.2	0
Arsenic filtered ICAP (mg/L)	1/16	0.050	0.050	0.050	0.05	0
Barium ICAP (mg/L)	16/16	0.054	0.0063	0.024	1	0
Barium filtered ICAP (mg/L)	16/16	0.054	0.0061	0.023	1	0
Beryllium ICAP (mg/L)	2/16	0.0063	0.0003	0.0033	*d*	*d*
Beryllium filtered ICAP (mg/L)	3/16	0.0019	0.0005	0.0010	*d*	*d*
Boron ICAP (mg/L)	16/16	0.037	0.0064	0.019	*d*	*d*
Boron filtered ICAP (mg/L)	16/16	0.043	0.0065	0.020	*d*	*d*
Calcium ICAP (mg/L)	16/16	40	24	32	*d*	*d*
Calcium filtered ICAP (mg/L)	16/16	40	25	33	*d*	*d*
Cobalt ICAP (mg/L)	1/16	0.0055	0.0055	0.0055	*d*	*d*
Copper ICAP (mg/L)	5/16	0.023	0.0060	0.012	1	0
Copper filtered ICAP (mg/L)	3/16	0.015	0.0048	0.0097	1	0
Iron ICAP (mg/L)	16/16	0.40	0.020	0.12	0.3	1
Iron filtered ICAP (mg/L)	12/16	0.076	0.0061	0.027	0.3	0
Magnesium ICAP (mg/L)	16/16	22	13	18	*d*	*d*
Magnesium filtered ICAP (mg/L)	16/16	23	14	18	*d*	*d*
Manganese ICAP (mg/L)	13/16	0.014	0.0016	0.0053	0.05	0
Manganese filtered ICAP (mg/L)	11/16	0.011	0.0022	0.0040	0.05	0
Molybdenum ICAP (mg/L)	1/16	0.013	0.013	0.013	*d*	*d*
Nickel ICAP (mg/L)	4/16	0.042	0.013	0.023	*d*	*d*
Nickel filtered ICAP (mg/L)	1/16	0.022	0.022	0.022	*d*	*d*
Potassium ICAP (mg/L)	15/16	4.1	0.60	1.8	*d*	*d*
Potassium filtered ICAP (mg/L)	15/16	4.2	0.73	1.9	*d*	*d*
Silver ICAP (mg/L)	1/16	0.010	0.010	0.010	0.05	0
Sodium ICAP (mg/L)	16/16	2.3	0.38	0.92	*d*	*d*
Sodium filtered ICAP (mg/L)	16/16	2.3	0.34	0.95	*d*	*d*
Strontium ICAP (mg/L)	16/16	0.029	0.016	0.021	*d*	*d*
Strontium filtered ICAP (mg/L)	16/16	0.027	0.016	0.021	*d*	*d*
Uranium fluorimetric (mg/L)	1/16	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	1/16	0.0051	0.0051	0.0051	*d*	*d*
Zinc ICAP (mg/L)	16/16	0.030	0.0022	0.012	5	0
Zinc filtered ICAP (mg/L)	15/16	0.033	0.0022	0.011	5	0
Conductivity, field measurement (µmhos/cm)	*d*/16	350	210	280	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/16	14	3.9	7.3	*d*	*d*
pH, field measurement (standard units)	*d*/16	7.9	6.7	7.4	6.5/8.5	0
Redox, field measurement (mV)	*d*/16	220	110	170	*d*	*d*
Water temperature, field measurement (°C)	*d*/16	18	13	15	30.5	0
Alkalinity-HCO_3 (mg/L)	16/16	180	120	160	*d*	*d*
Conductivity (µmhos/cm)	16/16	360	220	310	*d*	*d*
Conductivity, Rep. 2 (µmhos/cm)	4/4	360	240	320	*d*	*d*
Conductivity, Rep. 3 (µmhos/cm)	4/4	360	240	320	*d*	*d*
Conductivity, Rep. 4 (µmhos/cm)	4/4	370	240	320	*d*	*d*
Dissolved solids (mg/L)	16/16	220	110	170	500	0
pH (standard units)	*d*/16	8.0	7.1	7.7	6.5/8.5	0
pH, Rep. 2 (standard units)	*d*/4	8.0	7.3	7.7	6.5/8.5	0

Table 5.15 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
pH, Rep. 3 (standard units)	*d*/4	8.0	7.3	7.7	6.5/8.5	0
pH, Rep. 4 (standard units)	*d*/4	8.0	7.2	7.6	6.5/8.5	0
Total organic carbon (mg/L)	9/16	30	1.0	5.9	*d*	*d*
Total organic halide (μg/L)	5/16	130	12	41	*d*	*d*
Total suspended solids (mg/L)	6/16	2.0	1.0	1.5	*d*	*d*
Turbidity (NTU)	16/16	5.5	0.60	2.6	1	13
Gross alpha (pCi/L)	5/16	3.1	1.9	2.5	15	0
Gross beta (pCi/L)	8/16	6.6	3.1	4.7	50	0
1,1,1-Trichloroethane (μg/L)	3/16	2.0J	1.0J	~1.7	200	0
4-Methyl-2-pentanone (μg/L)	6/16	2.0BJ	1.0BJ	~1.7	*d*	*d*
Acetone (μg/L)	3/16	7.0BJ	3.0BJ	~4.3	*d*	*d*
Methylene chloride (μg/L)	2/16	2.0BJ	1.0BJ	~1.5	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.16. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Chestnut Ridge Security Pits

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	61/64	10	1.0	2.5	250	0
Fluoride (mg/L)	5/64	0.20	0.10	0.14	4	0
Nitrate nitrogen (mg/L)	34/64	3.0	0.20	0.81	10	0
Sulfate (mg/L)	54/64	12	1.0	3.2	250	0
Aluminum ICAP (mg/L)	47/64	0.61	0.020	0.088	0.2	6
Aluminum filtered ICAP (mg/L)	29/64	0.043	0.020	0.027	0.2	0
Arsenic ICAP (mg/L)	2/64	0.083	0.065	0.074	0.05	2
Arsenic filtered ICAP (mg/L)	1/64	0.083	0.083	0.083	0.05	1
Barium ICAP (mg/L)	64/64	0.12	0.0070	0.025	1	0
Barium filtered ICAP (mg/L)	64/64	0.11	0.0067	0.024	1	0
Boron ICAP (mg/L)	55/64	0.69	0.0044	0.051	*d*	*d*
Boron filtered ICAP (mg/L)	54/64	0.69	0.0042	0.053	*d*	*d*
Cadmium AAS (mg/L)	1/64	0.0031	0.0031	0.0031	0.005	0
Calcium ICAP (mg/L)	64/64	68	20	40	*d*	*d*
Calcium filtered ICAP (mg/L)	64/64	64	20	39	*d*	*d*
Chromium AAS (mg/L)	4/64	0.021	0.013	0.016	0.05	0
Copper ICAP (mg/L)	20/64	0.10	0.0040	0.027	1	0
Copper filtered ICAP (mg/L)	15/64	0.027	0.0044	0.011	1	0
Iron ICAP (mg/L)	60/64	84	0.0090	1.9	0.3	13
Iron filtered ICAP (mg/L)	32/64	0.32	0.0051	0.032	0.3	1
Lead AAS (mg/L)	7/64	0.049	0.0044	0.016	0.05	0
Magnesium ICAP (mg/L)	64/64	39	15	24	*d*	*d*
Magnesium filtered ICAP (mg/L)	64/64	39	15	23	*d*	*d*
Manganese ICAP (mg/L)	49/64	1.2	0.0011	0.047	0.05	4
Manganese filtered ICAP (mg/L)	30/64	0.34	0.0010	0.022	0.05	3
Molybdenum ICAP (mg/L)	1/64	0.010	0.010	0.010	*d*	*d*
Nickel ICAP (mg/L)	4/64	0.073	0.014	0.030	*d*	*d*
Potassium ICAP (mg/L)	52/64	5.8	0.60	1.8	*d*	*d*
Potassium filtered ICAP (mg/L)	52/64	5.8	0.61	1.8	*d*	*d*
Silver ICAP (mg/L)	2/64	0.0065	0.0061	0.0063	0.05	0
Sodium ICAP (mg/L)	64/64	4.6	0.15	1.2	*d*	*d*
Sodium filtered ICAP (mg/L)	64/64	13	0.45	1.4	*d*	*d*
Strontium ICAP (mg/L)	64/64	0.076	0.0093	0.021	*d*	*d*
Strontium filtered ICAP (mg/L)	64/64	0.18	0.0083	0.022	*d*	*d*
Uranium fluorimetric (mg/L)	15/64	0.0070	0.0010	0.0017	0.02	0
Uranium filtered fluorimetric (mg/L)	14/64	0.0040	0.0010	0.0015	0.02	0
Zinc ICAP (mg/L)	58/64	0.060	0.0034	0.014	5	0
Zinc filtered ICAP (mg/L)	57/64	0.047	0.0021	0.0099	5	0
Conductivity, field measurement (μmhos/cm)	*d*/64	560	230	370	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/64	12	1.3	7.0	*d*	*d*
pH, field measurement (standard units)	*d*/64	8.6	6.7	7.6	6.5/8.5	1
Redox, field measurement (mV)	*d*/64	240	–90	170	*d*	*d*
Water temperature, field measurement (°C)	*d*/64	20	11	15	30.5	0
Alkalinity-CO_3 (mg/L)	1/64	2.0	2.0	2.0	*d*	*d*
Alkalinity-HCO_3 (mg/L)	64/64	320	130	200	*d*	*d*
Conductivity (μmhos/cm)	64/64	580	250	380	*d*	*d*
Dissolved solids (mg/L)	64/64	450	130	210	500	0
pH (standard units)	*d*/64	8.7	7.0	7.8	6.5/8.5	2
Total suspended solids (mg/L)	42/64	8200	1.0	210	*d*	*d*
Turbidity (NTU)	64/64	750	0.20	27	1	53

Table 5.16 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	23/64	89	1.5	9.2	15	2
Gross beta (pCi/L)	23/64	450	2.3	43	50	3
1,1,1-Trichloroethane (µg/L)	37/64	410D	1.0J	~69	200	3
1,1-Dichloroethane (µg/L)	27/64	130	0.90J	~35	*d*	*d*
1,1-Dichloroethene (µg/L)	18/64	99D	1.0J	~33	7	12
1,2-Dichloroethane (µg/L)	2/64	5.0	4.0J	~4.5	5	0
1,2-Dichloroethene (µg/L)	10/64	21	3.0J	~8.3	70	0
4-Methyl-2-pentanone (µg/L)	7/64	3.0BJ	2.0BJ	~2.3	*d*	*d*
Acetone (µg/L)	10/64	20B	3.0BJ	~9.0	*d*	*d*
Chloroform (µg/L)	1/64	1.0J	1.0J	~1.0	100	0
Ethylbenzene (µg/L)	1/64	1.0BJ	1.0BJ	~1.0	700	0
Methylene chloride (µg/L)	13/64	22B	0.80BJ	~6.1	*d*	*d*
Tetrachloroethene (µg/L)	33/64	47	0.90J	~15	5	23
Trichloroethene (µg/L)	6/64	2.0J	1.0J	~1.5	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.17. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
East Chestnut Ridge Waste Pile

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	16/16	11	2.2	7.2	250	0
Nitrate nitrogen (mg/L)	15/16	3.0	0.27	0.99	10	0
Sulfate (mg/L)	15/16	4.7	2.0	3.2	250	0
Aluminum ICAP (mg/L)	9/16	0.075	0.021	0.041	0.2	0
Aluminum filtered ICAP (mg/L)	9/16	0.045	0.021	0.028	0.2	0
Barium ICAP (mg/L)	16/16	0.22	0.0086	0.082	1	0
Barium filtered ICAP (mg/L)	16/16	0.21	0.0082	0.082	1	0
Beryllium ICAP (mg/L)	2/16	0.0017	0.0003	0.0010	*d*	*d*
Beryllium filtered ICAP (mg/L)	1/16	0.0004	0.0004	0.0004	*d*	*d*
Boron ICAP (mg/L)	15/16	0.098	0.0050	0.024	*d*	*d*
Boron filtered ICAP (mg/L)	13/16	0.063	0.0051	0.021	*d*	*d*
Calcium ICAP (mg/L)	16/16	50	43	47	*d*	*d*
Calcium filtered ICAP (mg/L)	16/16	51	40	46	*d*	*d*
Copper ICAP (mg/L)	3/16	0.0099	0.0040	0.0066	1	0
Copper filtered ICAP (mg/L)	2/16	0.0054	0.0046	0.0050	1	0
Iron ICAP (mg/L)	15/16	10	0.0067	1.0	0.3	4
Iron filtered ICAP (mg/L)	5/16	0.088	0.0062	0.027	0.3	0
Lead AAS (mg/L)	1/16	0.0055	0.0055	0.0055	0.05	0
Magnesium ICAP (mg/L)	16/16	32	25	28	*d*	*d*
Magnesium filtered ICAP (mg/L)	16/16	33	23	28	*d*	*d*
Manganese ICAP (mg/L)	9/16	0.033	0.0011	0.0097	0.05	0
Manganese filtered ICAP (mg/L)	7/16	0.016	0.0011	0.0087	0.05	0
Potassium ICAP (mg/L)	13/16	2.2	0.68	1.1	*d*	*d*
Potassium filtered ICAP (mg/L)	16/16	2.2	0.63	1.2	*d*	*d*
Selenium filtered ICAP (mg/L)	1/16	0.065	0.065	0.065	0.01	1
Sodium ICAP (mg/L)	16/16	4.3	1.3	2.9	*d*	*d*
Sodium filtered ICAP (mg/L)	16/16	4.3	1.4	2.9	*d*	*d*
Strontium ICAP (mg/L)	16/16	0.022	0.015	0.018	*d*	*d*
Strontium filtered ICAP (mg/L)	16/16	0.021	0.015	0.017	*d*	*d*
Uranium fluorimetric (mg/L)	1/16	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	1/16	0.0010	0.0010	0.0010	0.02	0
Zinc ICAP (mg/L)	16/16	0.043	0.0053	0.012	5	0
Zinc filtered ICAP (mg/L)	16/16	0.014	0.0033	0.0081	5	0
Conductivity, field measurement (μmhos/cm)	*d*/16	510	210	420	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/16	9.4	5.9	7.6	*d*	*d*
pH, field measurement (standard units)	*d*/16	7.7	7.0	7.4	6.5/8.5	0
Redox, field measurement (mV)	*d*/16	440	130	210	*d*	*d*
Water temperature, field measurement (°C)	*d*/16	18	14	16	30.5	0
Alkalinity-HCO_3 (mg/L)	16/16	240	200	230	*d*	*d*
Conductivity (μmhos/cm)	16/16	490	410	460	*d*	*d*
Dissolved solids (mg/L)	16/16	280	210	240	500	0
pH (standard units)	*d*/16	8.0	7.3	7.6	6.5/8.5	0
Total suspended solids (mg/L)	11/16	38	1.0	8.8	*d*	*d*
Turbidity (NTU)	16/16	130	0.40	12	1	12
Gross alpha (pCi/L)	2/16	3.1	3.0	3.1	15	0
Gross beta (pCi/L)	3/16	7.5	2.7	4.4	50	0

Table 5.17 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,2-Dichloropropane (μg/L)	1/16	3.0J	3.0J	~3.0	5	0
2-Butanone (μg/L)	1/16	12	12	12	*d*	*d*
4-Methyl-2-pentanone (μg/L)	4/16	5.0J	1.0BJ	~2.8	*d*	*d*
Acetone (μg/L)	2/16	14	1.0BJ	~7.5	*d*	*d*
Carbon disulfide (μg/L)	1/16	1.0J	1.0J	~1.0	*d*	*d*
Chloroform (μg/L)	2/16	4.0J	0.70J	~2.4	100	0
Methylene chloride (μg/L)	6/16	11B	1.0BJ	~4.7	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.18. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Kerr Hollow Quarry

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	28/28	15	1.0	4.8	250	0
Fluoride (mg/L)	25/28	3.0	0.10	1.5	4	0
Nitrate nitrogen (mg/L)	14/28	1.2	0.23	0.56	10	0
Sulfate (mg/L)	28/28	78	2.3	22	250	0
Aluminum ICAP (mg/L)	21/28	1.3	0.022	0.20	0.2	5
Aluminum filtered ICAP (mg/L)	16/28	0.79	0.022	0.085	0.2	1
Arsenic ICAP (mg/L)	1/28	0.060	0.060	0.060	0.05	1
Arsenic filtered ICAP (mg/L)	2/28	0.054	0.052	0.053	0.05	2
Barium ICAP (mg/L)	28/28	0.45	0.020	0.13	1	0
Barium filtered ICAP (mg/L)	28/28	0.44	0.018	0.12	1	0
Beryllium ICAP (mg/L)	6/28	0.0009	0.0003	0.0005	*d*	*d*
Beryllium filtered ICAP (mg/L)	4/28	0.0010	0.0003	0.0005	*d*	*d*
Boron ICAP (mg/L)	28/28	0.94	0.0076	0.25	*d*	*d*
Boron filtered ICAP (mg/L)	28/28	0.92	0.014	0.26	*d*	*d*
Calcium ICAP (mg/L)	28/28	48	28	39	*d*	*d*
Calcium filtered ICAP (mg/L)	28/28	44	28	38	*d*	*d*
Cobalt ICAP (mg/L)	1/28	0.0052	0.0052	0.0052	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/28	0.0068	0.0068	0.0068	*d*	*d*
Copper ICAP (mg/L)	7/28	0.025	0.0046	0.014	1	0
Copper filtered ICAP (mg/L)	9/28	0.039	0.0042	0.011	1	0
Iron ICAP (mg/L)	27/28	8.2	0.011	1.3	0.3	17
Iron filtered ICAP (mg/L)	21/28	2.3	0.0071	0.23	0.3	4
Lead AAS (mg/L)	2/28	0.0074	0.0045	0.0059	0.05	0
Magnesium ICAP (mg/L)	28/28	36	14	25	*d*	*d*
Magnesium filtered ICAP (mg/L)	28/28	36	14	24	*d*	*d*
Manganese ICAP (mg/L)	25/28	0.25	0.0023	0.038	0.05	5
Manganese filtered ICAP (mg/L)	23/28	0.070	0.0010	0.018	0.05	1
Molybdenum ICAP (mg/L)	5/28	0.023	0.010	0.015	*d*	*d*
Molybdenum filtered ICAP (mg/L)	5/28	0.019	0.010	0.013	*d*	*d*
Nickel ICAP (mg/L)	3/28	0.019	0.010	0.013	*d*	*d*
Nickel filtered ICAP (mg/L)	2/28	0.028	0.011	0.019	*d*	*d*
Potassium ICAP (mg/L)	27/28	18	1.1	8.1	*d*	*d*
Potassium filtered ICAP (mg/L)	28/28	18	0.84	8.0	*d*	*d*
Silver ICAP (mg/L)	2/28	0.0090	0.0069	0.0079	0.05	0
Silver filtered ICAP (mg/L)	2/28	0.013	0.010	0.011	0.05	0
Sodium ICAP (mg/L)	28/28	27	0.75	6.9	*d*	*d*
Sodium filtered ICAP (mg/L)	28/28	26	0.66	6.8	*d*	*d*
Strontium ICAP (mg/L)	28/28	8.7	0.036	2.6	*d*	*d*
Strontium filtered ICAP (mg/L)	28/28	9.9	0.036	2.6	*d*	*d*
Uranium fluorimetric (mg/L)	25/28	0.016	0.0010	0.0046	0.02	0
Uranium filtered fluorimetric (mg/L)	25/28	0.014	0.0010	0.0040	0.02	0
Zinc ICAP (mg/L)	24/28	0.035	0.0034	0.012	5	0
Zinc filtered ICAP (mg/L)	24/28	0.18	0.0027	0.018	5	0
Conductivity, field measurement (μmhos/cm)	*d*/28	630	280	400	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/28	13	0.50	5.5	*d*	*d*
pH, field measurement (standard units)	*d*/28	8.2	7.0	7.6	6.5/8.5	0
Redox, field measurement (mV)	*d*/28	250	−170	110	*d*	*d*
Water temperature, field measurement (°C)	*d*/28	22	11	15	30.5	0
Alkalinity-HCO_3 (mg/L)	28/28	240	140	200	*d*	*d*
Conductivity (μmhos/cm)	28/28	570	310	430	*d*	*d*

Table 5.18 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Conductivity, Rep. 2 (μmhos/cm)	28/28	570	310	430	*d*	*d*
Conductivity, Rep. 3 (μmhos/cm)	28/28	570	310	430	*d*	*d*
Conductivity, Rep. 4 (μmhos/cm)	28/28	580	310	430	*d*	*d*
Dissolved solids (mg/L)	28/28	340	160	240	500	0
pH (standard units)	*d*/28	8.2	7.5	7.9	6.5/8.5	0
pH, Rep. 2 (standard units)	*d*/28	8.2	7.5	7.9	6.5/8.5	0
pH, Rep. 3 (standard units)	*d*/28	8.2	7.5	7.9	6.5/8.5	0
pH, Rep. 4 (standard units)	*d*/28	8.3	7.5	7.9	6.5/8.5	0
Total organic carbon (mg/L)	17/28	14	1.0	3.2	*d*	*d*
Total organic carbon, Rep. 2 (mg/L)	22/28	25	1.0	3.7	*d*	*d*
Total organic carbon, Rep. 3 (mg/L)	20/28	14	1.0	2.8	*d*	*d*
Total organic carbon, Rep. 4 (mg/L)	22/28	56	1.0	8.1	*d*	*d*
Total organic halide (μg/L)	6/28	33	10	19	*d*	*d*
Total organic halide, Rep. 2 (μg/L)	6/28	350	10	77	*d*	*d*
Total organic halide, Rep. 3 (μg/L)	6/28	240	15	61	*d*	*d*
Total organic halide, Rep. 4 (μg/L)	10/28	94	11	22	*d*	*d*
Total suspended solids (mg/L)	23/28	220	1.0	27	*d*	*d*
Turbidity (NTU)	28/28	95	0.30	14	1	22
Gross alpha (pCi/L)	16/28	28	2.0	7.0	15	1
Gross beta (pCi/L)	20/28	39	2.9	14	50	0
1,1-Dichloroethene (μg/L)	1/28	3.0J	3.0J	~3.0	7	0
2-Butanone (μg/L)	1/28	15B	15B	~15	*d*	*d*
4-Methyl-2-pentanone (μg/L)	7/28	3.0BJ	1.0BJ	~2.0	*d*	*d*
Acetone (μg/L)	6/28	7.0BJ	2.0BJ	~4.2	*d*	*d*
Benzene (μg/L)	1/28	3.0BJ	3.0BJ	~3.0	5	0
Carbon tetrachloride (μg/L)	3/28	5.0	2.0J	~3.0	5	0
Chlorobenzene (μg/L)	1/28	1.0BJ	1.0BJ	~1.0	100	0
Chloroform (μg/L)	1/28	0.80J	0.80J	~0.80	100	0
Methylene chloride (μg/L)	4/28	2.0BJ	1.0BJ	~1.7	*d*	*d*
Tetrachloroethene (μg/L)	1/28	2.0J	2.0J	~2.0	5	0
Toluene (μg/L)	3/28	3.0BJ	1.0J	~2.0	1000	0
Trichloroethene (μg/L)	1/28	3.0BJ	3.0BJ	~3.0	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.19. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Landfill II

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	8/8	15	1.0	3.1	250	0
Fluoride (mg/L)	4/8	1.8	0.10	1.3	4	0
Sulfate (mg/L)	6.8	12	1.0	7.0	250	0
Aluminum ICAP (mg/L)	6/8	0.52	0.029	0.17	0.2	2
Aluminum filtered ICAP (mg/L)	4/8	0.038	0.024	0.030	0.2	0
Barium ICAP (mg/L)	8/8	0.24	0.024	0.15	1	0
Barium filtered ICAP (mg/L)	8/8	0.36	0.024	0.20	1	0
Boron ICAP (mg/L)	8/8	0.13	0.0057	0.028	*d*	*d*
Boron filtered ICAP (mg/L)	7/8	0.027	0.0091	0.017	*d*	*d*
Calcium ICAP (mg/L)	8/8	83	25	38	*d*	*d*
Calcium filtered ICAP (mg/L)	8/8	82	24	36	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/8	0.0058	0.0058	0.0058	*d*	*d*
Copper ICAP (mg/L)	5/8	0.011	0.0047	0.0079	1	0
Copper filtered ICAP (mg/L)	2/8	0.010	0.0046	0.0073	1	0
Iron ICAP (mg/L)	8/8	2.6	0.0096	0.55	0.3	3
Iron filtered ICAP (mg/L)	4/8	0.23	0.0097	0.10	0.3	0
Magnesium ICAP (mg/L)	8/8	21	14	18	*d*	*d*
Magnesium filtered ICAP (mg/L)	8/8	21	14	18	*d*	*d*
Manganese ICAP (mg/L)	7/8	0.71	0.0010	0.11	0.05	1
Manganese filtered ICAP (mg/L)	5/8	0.71	0.0010	0.15	0.05	1
Molybdenum ICAP (mg/L)	1/8	0.010	0.010	0.010	*d*	*d*
Nickel ICAP (mg/L)	2/8	0.024	0.018	0.021	*d*	*d*
Nickel filtered ICAP (mg/L)	1/8	0.018	0.018	0.018	*d*	*d*
Potassium ICAP (mg/L)	7/8	13	0.78	3.0	*d*	*d*
Potassium filtered ICAP (mg/L)	7/8	2.2	0.96	1.4	*d*	*d*
Silver filtered ICAP (mg/L)	1/8	0.0068	0.0068	0.0068	0.05	0
Sodium ICAP (mg/L)	8/8	34	0.54	9.4	*d*	*d*
Sodium filtered ICAP (mg/L)	8/8	20	0.55	5.1	*d*	*d*
Strontium ICAP (mg/L)	8/8	1.4	0.030	0.43	*d*	*d*
Strontium filtered ICAP (mg/L)	8/8	0.66	0.033	0.26	*d*	*d*
Uranium fluorimetric (mg/L)	7/8	0.0060	0.0010	0.0029	0.02	0
Uranium filtered fluorimetric (mg/L)	7/8	0.0060	0.0010	0.0026	0.02	0
Zinc ICAP (mg/L)	8/8	0.055	0.0025	0.016	5	0
Zinc filtered ICAP (mg/L)	8/8	0.022	0.0039	0.0084	5	0
Conductivity, field measurement (µmhos/cm)	*d*/8	510	260	330	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/8	19	3.5	9.2	*d*	*d*
pH, field measurement (standard units)	*d*/8	9.0	6.5	7.9	6.5/8.5	1
Redox, field measurement (mV)	*d*/8	260	100	170	*d*	*d*
Water temperature, field measurement (°C)	*d*/8	19	11	16	30.5	0
Alkalinity-CO_3 (mg/L)	1/8	12	12	12	*d*	*d*
Alkalinity-HCO_3 (mg/L)	8/8	300	140	180	*d*	*d*
Conductivity (µmhos/cm)	8/8	650	230	350	*d*	*d*
Dissolved solids (mg/L)	8/8	320	160	200	500	0
pH (standard units)	*d*/8	8.3	6.7	7.9	6.5/8.5	0
Total organic carbon (mg/L)	5/8	44	1.0	11	*d*	*d*
Total organic halide (µg/L)	6/8	46	10	24	*d*	*d*
Total suspended solids (mg/L)	6/8	21	3.0	11	*d*	*d*
Turbidity (NTU)	8/8	29	1.6	9.5	1	8
Gross alpha (pCi/L)	5/8	18	3.5	8.7	15	1
Gross beta (pCi/L)	5/8	230	2.6	52	50	1

Table 5.19 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,1,1-Trichloroethane (µg/L)	1/8	6.0	6.0	6.0	200	0
1,1-Dichloroethane (µg/L)	1/8	22	22	22	*d*	*d*
1,2-Dichloroethene (µg/L)	1/8	3.0J	3.0J	~3.0	70	0
2-Butanone (µg/L)	2/8	2.0BJ	1.0BJ	~1.5	*d*	*d*
4-Methyl-2-pentanone (µg/L)	4/8	4.0BJ	1.0BJ	~2.5	*d*	*d*
Acetone (µg/L)	4/8	15B	4.0BJ	~7.0	*d*	*d*
Chloroethane (µg/L)	1/8	3.0J	3.0J	~3.0	200	0
Ethylbenzene (µg/L)	2/8	1.0J	1.0J	~1.0	700	0
Methylene chloride (µg/L)	4/8	6.0B	1.0J	~2.5	*d*	*d*
Tetrachloroethene (µg/L)	1/8	2.0J	2.0J	~2.0	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.20. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Landfill II Expansion

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	28/32	25	1.0	5.8	250	0
Fluoride (mg/L)	4/32	0.10	0.10	0.10	4	0
Nitrate nitrogen (mg/L)	16/32	0.76	0.23	0.42	10	0
Sulfate (mg/L)	32/32	26	1.4	7.9	250	0
Aluminum ICAP (mg/L)	27/32	51	0.021	3.2	0.2	13
Aluminum filtered ICAP (mg/L)	16/32	1.3	0.021	0.27	0.2	4
Arsenic ICAP (mg/L)	1/32	0.053	0.053	0.053	0.05	1
Barium ICAP (mg/L)	32/32	0.20	0.0057	0.024	1	0
Barium filtered ICAP (mg/L)	32/32	0.026	0.0037	0.011	1	0
Beryllium ICAP (mg/L)	4/32	0.0069	0.0005	0.0024	*d*	*d*
Boron ICAP (mg/L)	25/32	0.044	0.0040	0.015	*d*	*d*
Boron filtered ICAP (mg/L)	26/32	0.051	0.0045	0.015	*d*	*d*
Cadmium AAS (mg/L)	2/32	0.017	0.011	0.014	0.005	2
Calcium ICAP (mg/L)	32/32	440	22	64	*d*	*d*
Calcium filtered ICAP (mg/L)	32/32	54	22	36	*d*	*d*
Chromium AAS (mg/L)	14/32	0.22	0.011	0.056	0.05	3
Chromium filtered AAS (mg/L)	4/32	0.019	0.011	0.016	0.05	0
Cobalt ICAP (mg/L)	1/32	0.052	0.052	0.052	*d*	*d*
Copper ICAP (mg/L)	16/32	0.38	0.0053	0.062	1	0
Copper filtered ICAP (mg/L)	10/32	0.019	0.0047	0.0083	1	0
Iron ICAP (mg/L)	31/32	92	0.016	3.7	0.3	11
Iron filtered ICAP (mg/L)	15/32	0.43	0.0055	0.047	0.3	1
Lead AAS (mg/L)	6/32	0.26	0.0042	0.095	0.05	3
Magnesium ICAP (mg/L)	32/32	250	0.18	30	*d*	*d*
Magnesium filtered ICAP (mg/L)	32/32	27	0.018	17	*d*	*d*
Manganese ICAP (mg/L)	27/32	4.8	0.0012	0.22	0.05	5
Manganese filtered ICAP (mg/L)	20/32	0.024	0.0011	0.0053	0.05	0
Mercury CVAA (mg/L)	3/32	0.0043	0.0004	0.0028	0.002	2
Molybdenum ICAP (mg/L)	6/32	0.047	0.030	0.036	*d*	*d*
Molybdenum filtered ICAP (mg/L)	7/32	0.047	0.029	0.037	*d*	*d*
Nickel ICAP (mg/L)	11/32	0.22	0.014	0.055	*d*	*d*
Nickel filtered ICAP (mg/L)	8/32	0.035	0.014	0.026	*d*	*d*
Potassium ICAP (mg/L)	32/32	18	0.68	3.6	*d*	*d*
Potassium filtered ICAP (mg/L)	31/32	16	0.67	3.1	*d*	*d*
Selenium ICAP (mg/L)	1/32	0.069	0.069	0.069	0.01	1
Sodium ICAP (mg/L)	32/32	5.6	0.54	2.4	*d*	*d*
Sodium filtered ICAP (mg/L)	32/32	5.4	0.73	2.4	*d*	*d*
Strontium ICAP (mg/L)	32/32	0.38	0.018	0.047	*d*	*d*
Strontium filtered ICAP (mg/L)	32/32	0.093	0.017	0.030	*d*	*d*
Uranium fluorimetric (mg/L)	18/32	0.0030	0.0010	0.0017	0.02	0
Uranium filtered fluorimetric (mg/L)	13/32	0.0040	0.0010	0.0019	0.02	0
Vanadium ICAP (mg/L)	7/32	0.19	0.0062	0.050	*d*	*d*
Vanadium filtered ICAP (mg/L)	4/32	0.024	0.0085	0.017	*d*	*d*
Zinc ICAP (mg/L)	32/32	11	0.0057	0.40	5	1
Zinc filtered ICAP (mg/L)	31/32	0.31	0.0037	0.029	5	0
Conductivity, field measurement (µmhos/cm)	*d*/32	710	210	360	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/32	12	3.3	7.3	*d*	*d*
pH, field measurement (standard units)	*d*/32	11	6.6	7.9	6.5/8.5	4
Redox, field measurement (mV)	*d*/32	240	33	170	*d*	*d*
Water temperature, field measurement (°C)	*d*/32	20	12	16	30.5	0

Table 5.20 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-CO_3 (mg/L)	5/32	120	4.0	55	*d*	*d*
Alkalinity-HCO_3 (mg/L)	29/32	230	11	160	*d*	*d*
Chemical oxygen demand (mg/L)	3/32	11	6.0	7.7	*d*	*d*
Conductivity (µmhos/cm)	32/32	620	190	350	*d*	*d*
Dissolved solids (mg/L)	32/32	290	110	200	500	0
pH (standard units)	*d*/32	12	7.0	8.2	6.5/8.5	5
Total organic carbon (mg/L)	20/32	28	1.0	4.8	*d*	*d*
Total organic halide (µg/L)	15/32	130	10	30	*d*	*d*
Total suspended solids (mg/L)	23/32	3900	1.0	360	*d*	*d*
Turbidity (NTU)	32/32	2800	0.30	130	1	25
Gross alpha (pCi/L)	9/32	52	1.5	10	15	2
Gross beta (pCi/L)	10/32	96	2.3	20	50	1
2-Butanone (µg/L)	1/32	1.0BJ	1.0BJ	~1.0	*d*	*d*
2-Hexanone (µg/L)	2/32	1.0BJ	1.0BJ	~1.0	*d*	*d*
4-Methyl-2-pentanone (µg/L)	10/32	2.0BJ	1.0BJ	~1.9	*d*	*d*
Acetone (µg/L)	10/32	5.0BJ	1.0BJ	~3.0	*d*	*d*
Methylene chloride (µg/L)	5/32	6.0B	1.0BJ	~2.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.21. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Landfill III

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	19/28	110	1.0	22	250	0
Fluoride (mg/L)	1/28	0.10	0.10	0.10	4	0
Nitrate nitrogen (mg/L)	13/28	0.73	0.23	0.41	10	0
Sulfate (mg/L)	27/28	22	1.0	5.8	250	0
Aluminum ICAP (mg/L)	22/28	100	0.020	11	0.2	12
Aluminum filtered ICAP (mg/L)	14/28	0.81	0.020	0.096	0.2	1
Arsenic ICAP (mg/L)	4/28	0.26	0.061	0.15	0.05	4
Barium ICAP (mg/L)	28/28	0.18	0.0077	0.029	1	0
Barium filtered ICAP (mg/L)	28/28	0.032	0.0077	0.015	1	0
Beryllium ICAP (mg/L)	7/28	0.010	0.0004	0.0038	*d*	*d*
Beryllium filtered ICAP (mg/L)	1/28	0.0003	0.0003	0.0003	*d*	*d*
Boron ICAP (mg/L)	23/28	0.12	0.0050	0.022	*d*	*d*
Boron filtered ICAP (mg/L)	27/28	0.064	0.0051	0.020	*d*	*d*
Cadmium AAS (mg/L)	2/28	0.0037	0.0025	0.0031	0.005	0
Calcium ICAP (mg/L)	28/28	94	26	43	*d*	*d*
Calcium filtered ICAP (mg/L)	28/28	58	27	37	*d*	*d*
Chromium AAS (mg/L)	7/28	12	0.012	2.8	0.05	5
Chromium filtered AAS (mg/L)	3/28	2.4	0.012	0.82	0.05	2
Cobalt ICAP (mg/L)	5/28	0.14	0.0087	0.076	*d*	*d*
Cobalt filtered ICAP (mg/L)	4/28	0.033	0.0054	0.014	*d*	*d*
Copper ICAP (mg/L)	13/28	0.34	0.0042	0.072	1	0
Copper filtered ICAP (mg/L)	3/28	0.029	0.0057	0.015	1	0
Iron ICAP (mg/L)	27/28	180	0.016	17	0.3	14
Iron filtered ICAP (mg/L)	24/28	2.2	0.0060	0.12	0.3	1
Lead AAS (mg/L)	10/28	0.63	0.0058	0.18	0.05	5
Magnesium ICAP (mg/L)	28/28	55	15	26	*d*	*d*
Magnesium filtered ICAP (mg/L)	28/28	34	15	22	*d*	*d*
Manganese ICAP (mg/L)	14/28	2.3	0.0011	0.33	0.05	8
Manganese filtered ICAP (mg/L)	16/28	0.69	0.0016	0.092	0.05	2
Mercury CVAA (mg/L)	4/28	0.0010	0.0002	0.0006	0.002	0
Molybdenum ICAP (mg/L)	8/28	0.13	0.011	0.039	*d*	*d*
Molybdenum filtered ICAP (mg/L)	4/28	0.019	0.010	0.015	*d*	*d*
Nickel ICAP (mg/L)	5/28	4.4	0.029	1.7	*d*	*d*
Nickel filtered ICAP (mg/L)	4/28	1.5	0.011	0.51	*d*	*d*
Potassium ICAP (mg/L)	19/28	18	0.64	3.6	*d*	*d*
Potassium filtered ICAP (mg/L)	21/28	7.2	0.61	1.8	*d*	*d*
Selenium filtered ICAP (mg/L)	1/28	0.053	0.053	0.053	0.01	1
Silver ICAP (mg/L)	1/28	0.0099	0.0099	0.0099	0.05	0
Silver filtered ICAP (mg/L)	1/28	0.0063	0.0063	0.0063	0.05	0
Sodium ICAP (mg/L)	28/28	7.1	0.46	1.8	*d*	*d*
Sodium filtered ICAP (mg/L)	28/28	12	0.47	2.0	*d*	*d*
Strontium ICAP (mg/L)	28/28	0.11	0.012	0.032	*d*	*d*
Strontium filtered ICAP (mg/L)	28/28	0.16	0.012	0.033	*d*	*d*
Uranium fluorimetric (mg/L)	8/28	0.0040	0.0010	0.0021	0.02	0
Uranium filtered fluorimetric (mg/L)	9/28	0.0020	0.0010	0.0013	0.02	0
Vanadium ICAP (mg/L)	8/28	0.32	0.0071	0.11	*d*	*d*
Zinc ICAP (mg/L)	28/28	1.7	0.0032	0.16	5	0
Zinc filtered ICAP (mg/L)	27/28	0.15	0.0036	0.018	5	0

Table 5.21 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Conductivity, field measurement (µmhos/cm)	*d*/28	690	240	360	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/28	15	1.8	6.5	*d*	*d*
pH, field measurement (standard units)	*d*/28	8.7	4.3	7.3	6.5/8.5	4
Redox, field measurement (mV)	*d*/28	250	-81	110	*d*	*d*
Water temperature, field measurement (°C)	*d*/28	18	13	15	30.5	0
Alkalinity-HCO_3 (mg/L)	28/28	230	120	170	*d*	*d*
Conductivity (µmhos/cm)	28/28	640	260	380	*d*	*d*
Dissolved solids (mg/L)	28/28	420	150	210	500	0
pH (standard units)	*d*/28	8.0	7.1	7.7	6.5/8.5	0
Total organic carbon (mg/L)	21/28	11	1.0	3.6	*d*	*d*
Total organic halide (µg/L)	3/28	52	13	34	*d*	*d*
Total suspended solids (mg/L)	19/28	1200	1.0	200	*d*	*d*
Turbidity (NTU)	28/28	2000	0.50	190	1	23
Gross alpha (pCi/L)	14/28	39	1.4	6.5	15	2
Gross beta (pCi/L)	10/28	120	2.7	23	50	1
1,1-Dichloroethane (µg/L)	1/28	0.90J	0.90J	~0.90	*d*	*d*
1,2-Dichloroethene (µg/L)	1/28	4.0J	4.0J	~4.0	70	0
4-Methyl-2-pentanone (µg/L)	4/28	2.0BJ	1.0BJ	~1.7	*d*	*d*
Acetone (µg/L)	6/28	20B	2.0BJ	~5.8	*d*	*d*
Methylene chloride (µg/L)	9/28	22B	1.0BJ	~4.1	*d*	*d*
Trichloroethene (µg/L)	1/28	6.0	6.0	6.0	5	1

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.22. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Landfill IV

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	19/20	2.5	1.0	1.6	250	0
Fluoride (mg/L)	1/20	0.20	0.20	0.20	4	0
Nitrate nitrogen (mg/L)	12/20	0.60	0.25	0.35	10	0
Sulfate (mg/L)	12/20	7.0	1.1	3.0	250	0
Aluminum ICAP (mg/L)	20/20	3.0	0.031	0.36	0.2	8
Aluminum filtered ICAP (mg/L)	9/20	0.11	0.021	0.050	0.2	0
Barium ICAP (mg/L)	20/20	0.029	0.0073	0.015	1	0
Barium filtered ICAP (mg/L)	20/20	0.029	0.0062	0.014	1	0
Beryllium ICAP (mg/L)	5/20	0.0015	0.0003	0.0009	*d*	*d*
Boron ICAP (mg/L)	19/20	0.69	0.0045	0.063	*d*	*d*
Boron filtered ICAP (mg/L)	20/20	0.62	0.0054	0.076	*d*	*d*
Calcium ICAP (mg/L)	20/20	52	25	35	*d*	*d*
Calcium filtered ICAP (mg/L)	20/20	50	25	32	*d*	*d*
Chromium AAS (mg/L)	2/20	0.17	0.035	0.10	0.05	1
Cobalt ICAP (mg/L)	1/20	0.011	0.011	0.011	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/20	0.035	0.035	0.035	*d*	*d*
Copper ICAP (mg/L)	8/20	0.011	0.0048	0.0076	1	0
Copper filtered ICAP (mg/L)	5/20	0.0068	0.0045	0.0058	1	0
Iron ICAP (mg/L)	20/20	4.1	0.035	0.66	0.3	8
Iron filtered ICAP (mg/L)	8/20	4.8	0.0067	0.61	0.3	1
Lead AAS (mg/L)	6/20	0.021	0.0043	0.0086	0.05	0
Magnesium ICAP (mg/L)	20/20	32	15	21	*d*	*d*
Magnesium filtered ICAP (mg/L)	20/20	30	13	18	*d*	*d*
Manganese ICAP (mg/L)	19/20	0.26	0.0021	0.028	0.05	3
Manganese filtered ICAP (mg/L)	9/20	0.84	0.0010	0.097	0.05	1
Mercury CVAA (mg/L)	1/20	0.0002	0.0002	0.0002	0.002	0
Nickel ICAP (mg/L)	7/20	0.60	0.017	0.11	*d*	*d*
Nickel filtered ICAP (mg/L)	5/20	1.9	0.017	0.40	*d*	*d*
Potassium ICAP (mg/L)	14/20	4.4	0.60	1.9	*d*	*d*
Potassium filtered ICAP (mg/L)	15/20	4.7	0.60	2.0	*d*	*d*
Sodium ICAP (mg/L)	20/20	4.7	0.52	1.4	*d*	*d*
Sodium filtered ICAP (mg/L)	20/20	4.6	0.51	1.5	*d*	*d*
Strontium ICAP (mg/L)	20/20	0.040	0.0097	0.016	*d*	*d*
Strontium filtered ICAP (mg/L)	20/20	0.089	0.0093	0.020	*d*	*d*
Uranium filtered fluorimetric (mg/L)	3/20	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	2/20	0.014	0.0064	0.010	*d*	*d*
Zinc ICAP (mg/L)	20/20	0.12	0.0063	0.029	5	0
Zinc filtered ICAP (mg/L)	19/20	0.049	0.0020	0.012	5	0
Conductivity, field measurement (μmhos/cm)	*d*/24	460	230	300	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/24	11	5.9	7.9	*d*	*d*
pH, field measurement (standard units)	*d*/24	8.4	6.9	7.7	6.5/8.5	0
Redox, field measurement (mV)	*d*/24	280	20	200	*d*	*d*
Water temperature, field measurement (°C)	*d*/24	19	13	15	30.5	0
Alkalinity-HCO_3 (mg/L)	20/20	270	130	160	*d*	*d*
Chemical oxygen demand (mg/L)	3/20	23	5.0	11	*d*	*d*
Conductivity (μmhos/cm)	20/20	440	200	300	*d*	*d*
Dissolved solids (mg/L)	20/20	260	130	170	500	0
pH (standard units)	*d*/20	8.2	6.8	7.8	6.5/8.5	0
Total organic carbon (mg/L)	11/20	16	1.0	3.9	*d*	*d*
Total organic halide (μg/L)	12/20	59	12	30	*d*	*d*

Table 5.22 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Total suspended solids (mg/L)	18/20	320	2.0	37	*d*	*d*
Turbidity (NTU)	20/20	160	2.4	21	1	20
Gross alpha (pCi/L)	9/20	36	1.8	6.0	15	1
Gross beta (pCi/L)	11/20	45	2.3	7.7	50	0
1,1,1-Trichloroethane (μg/L)	4/20	2.0J	0.60J	~1.4	200	0
Methylene chloride (μg/L)	7/20	2.0BJ	1.0BJ	~1.7	*d*	*d*
Toluene (μg/L)	3/20	0.70BJ	0.50BJ	~0.63	1000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.23. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Rogers Quarry

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	16/16	90	1.3	22	250	0
Fluoride (mg/L)	14/16	0.90	0.20	0.50	4	0
Nitrate nitrogen (mg/L)	4/16	9.3	2.4	5.5	10	0
Sulfate (mg/L)	16/16	76	17	34	250	0
Aluminum ICAP (mg/L)	10/16	1.6	0.022	0.26	0.2	2
Aluminum filtered ICAP (mg/L)	13/16	0.89	0.023	0.11	0.2	1
Arsenic filtered ICAP (mg/L)	1/16	0.061	0.061	0.061	0.05	1
Barium ICAP (mg/L)	16/16	0.25	0.021	0.10	1	0
Barium filtered ICAP (mg/L)	16/16	0.25	0.021	0.10	1	0
Beryllium ICAP (mg/L)	4/16	0.0005	0.0003	0.0004	*d*	*d*
Beryllium filtered ICAP (mg/L)	3/16	0.0005	0.0003	0.0004	*d*	*d*
Boron ICAP (mg/L)	16/16	0.63	0.010	0.22	*d*	*d*
Boron filtered ICAP (mg/L)	16/16	0.61	0.024	0.22	*d*	*d*
Calcium ICAP (mg/L)	16/16	120	17	72	*d*	*d*
Calcium filtered ICAP (mg/L)	16/16	120	16	68	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/16	0.0073	0.0073	0.0073	*d*	*d*
Copper ICAP (mg/L)	5/16	0.0089	0.0046	0.0069	1	0
Copper filtered ICAP (mg/L)	5/16	0.017	0.0057	0.0098	1	0
Iron ICAP (mg/L)	16/16	1.8	0.021	0.46	0.3	7
Iron filtered ICAP (mg/L)	15/16	1.0	0.013	0.34	0.3	5
Magnesium ICAP (mg/L)	16/16	36	7.6	20	*d*	*d*
Magnesium filtered ICAP (mg/L)	16/16	35	7.6	21	*d*	*d*
Manganese ICAP (mg/L)	15/16	0.71	0.0012	0.11	0.05	7
Manganese filtered ICAP (mg/L)	14/16	0.16	0.0015	0.055	0.05	6
Nickel filtered ICAP (mg/L)	1/16	0.010	0.010	0.010	*d*	*d*
Potassium ICAP (mg/L)	15/16	16	1.4	3.0	*d*	*d*
Potassium filtered ICAP (mg/L)	16/16	15	1.5	3.1	*d*	*d*
Selenium filtered ICAP (mg/L)	1/16	0.054	0.054	0.054	0.01	1
Silver filtered ICAP (mg/L)	2/16	0.093	0.0080	0.051	0.05	1
Sodium ICAP (mg/L)	16/16	100	1.6	36	*d*	*d*
Sodium filtered ICAP (mg/L)	16/16	100	1.5	36	*d*	*d*
Strontium ICAP (mg/L)	16/16	2.5	0.064	1.0	*d*	*d*
Strontium filtered ICAP (mg/L)	16/16	2.4	0.16	1.1	*d*	*d*
Uranium fluorimetric (mg/L)	1/16	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	1/16	0.0010	0.0010	0.0010	0.02	0
Zinc ICAP (mg/L)	15/16	0.077	0.0024	0.017	5	0
Zinc filtered ICAP (mg/L)	14/16	0.039	0.0021	0.011	5	0
Conductivity, field measurement (µmhos/cm)	*d*/16	840	400	590	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/16	7.6	0.40	2.9	*d*	*d*
pH, field measurement (standard units)	*d*/16	8.2	6.8	7.4	6.5/8.5	0
Redox, field measurement (mV)	*d*/16	220	−270	−81	*d*	*d*
Water temperature, field measurement (°C)	*d*/16	23	11	16	30.5	0
Alkalinity-HCO_3 (mg/L)	16/16	420	160	270	*d*	*d*
Conductivity (µmhos/cm)	16/16	910	380	630	*d*	*d*
Dissolved solids (mg/L)	16/16	550	230	380	500	4
pH (standard units)	*d*/16	8.4	7.0	7.6	6.5/8.5	0
Total suspended solids (mg/L)	9/16	19	1.0	6.0	*d*	*d*
Turbidity (NTU)	16/16	27	0.40	7.7	1	13
Gross alpha (pCi/L)	5/16	7.3	2.0	3.4	15	0
Gross beta (pCi/L)	12/16	58	2.5	10	50	1

Table 5.23 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,1,2,2-Tetrachloroethane (µg/L)	1/16	1.0J	1.0J	~1.0	*d*	*d*
2-Butanone (µg/L)	4/16	14B	12B	~13	*d*	*d*
2-Hexanone (µg/L)	1/16	3.0J	3.0J	~3.0	*d*	*d*
4-Methyl-2-pentanone (µg/L)	3/16	3.0J	1.0J	~1.7	*d*	*d*
Acetone (µg/L)	3/16	7.0BJ	2.0BJ	~3.7	*d*	*d*
Bis(2-ethylhexyl)thalate (µg/L)	3/16	2.0	1.0	1.7	*d*	*d*
Di-n-butylthalate (µg/L)	4/16	0.80	0.20	0.50	*d*	*d*
Diethylthalate (µg/L)	4/16	0.70	0.30	0.40	*d*	*d*
Ethylbenzene (µg/L)	1/16	2.0J	2.0J	~2.0	700	0
Methylene chloride (µg/L)	2/16	2.0BJ	2.0BJ	~2.0	*d*	*d*
Phenol (µg/L)	1/16	0.90	0.90	0.90	*d*	*d*
Tetrachloroethene (µg/L)	1/16	1.0J	1.0J	~1.0	5	0
Toluene (µg/L)	1/16	1.0J	1.0J	~1.0	1000	0
Trichloroethene (µg/L)	1/16	1.0J	1.0J	~1.0	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.24. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
Chestnut Ridge Sediment Disposal Basin

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	19/32	3.0	1.0	1.9	250	0
Fluoride (mg/L)	8/32	1.0	0.10	0.51	4	0
Nitrate nitrogen (mg/L)	7/32	0.30	0.20	0.26	10	0
Sulfate (mg/L)	29/32	190	1.0	33	250	0
Aluminum ICAP (mg/L)	28/32	12	0.022	1.3	0.2	17
Aluminum filtered ICAP (mg/L)	16/32	4.5	0.022	0.37	0.2	4
Barium ICAP (mg/L)	32/32	0.049	0.0082	0.023	1	0
Barium filtered ICAP (mg/L)	32/32	0.11	0.0072	0.021	1	0
Beryllium ICAP (mg/L)	10/32	0.0046	0.0003	0.0010	*d*	*d*
Beryllium filtered ICAP (mg/L)	3/32	0.0014	0.0003	0.0007	*d*	*d*
Boron ICAP (mg/L)	30/32	0.076	0.0043	0.020	*d*	*d*
Boron filtered ICAP (mg/L)	29/32	0.029	0.0072	0.017	*d*	*d*
Calcium ICAP (mg/L)	32/32	160	21	50	*d*	*d*
Calcium filtered ICAP (mg/L)	32/32	73	17	41	*d*	*d*
Chromium AAS (mg/L)	6/32	0.022	0.010	0.016	0.05	0
Chromium filtered AAS (mg/L)	2/32	0.014	0.012	0.013	0.05	0
Cobalt ICAP (mg/L)	2/32	0.0088	0.0075	0.0081	*d*	*d*
Copper ICAP (mg/L)	13/32	0.048	0.0043	0.014	1	0
Copper filtered ICAP (mg/L)	8/32	0.015	0.0042	0.0088	1	0
Iron ICAP (mg/L)	32/32	23	0.069	1.7	0.3	23
Iron filtered ICAP (mg/L)	29/32	7.7	0.0058	0.41	0.3	3
Lead AAS (mg/L)	11/32	0.068	0.0041	0.022	0.05	2
Lead filtered AAS (mg/L)	3/32	0.022	0.0042	0.011	0.05	0
Magnesium ICAP (mg/L)	32/32	93	12	28	*d*	*d*
Magnesium filtered ICAP (mg/L)	32/32	42	11	24	*d*	*d*
Manganese ICAP (mg/L)	31/32	0.74	0.0015	0.069	0.05	9
Manganese filtered ICAP (mg/L)	22/32	1.4	0.0010	0.083	0.05	2
Molybdenum ICAP (mg/L)	1/32	0.011	0.011	0.011	*d*	*d*
Molybdenum filtered ICAP (mg/L)	2/32	0.014	0.010	0.012	*d*	*d*
Nickel ICAP (mg/L)	8/32	0.058	0.013	0.021	*d*	*d*
Nickel filtered ICAP (mg/L)	7/32	0.020	0.011	0.016	*d*	*d*
Potassium ICAP (mg/L)	32/32	7.4	0.62	3.4	*d*	*d*
Potassium filtered ICAP (mg/L)	32/32	6.2	0.74	3.3	*d*	*d*
Selenium ICAP (mg/L)	1/32	0.053	0.053	0.053	0.01	1
Sodium ICAP (mg/L)	32/32	8.3	0.47	2.5	*d*	*d*
Sodium filtered ICAP (mg/L)	32/32	8.2	0.25	2.6	*d*	*d*
Strontium ICAP (mg/L)	32/32	3.0	0.016	0.39	*d*	*d*
Strontium filtered ICAP (mg/L)	32/32	3.1	0.014	0.39	*d*	*d*
Uranium fluorimetric (mg/L)	19/32	0.019	0.0010	0.0032	0.02	0
Uranium filtered fluorimetric (mg/L)	21/32	0.0050	0.0010	0.0017	0.02	0
Vanadium ICAP (mg/L)	6/32	0.045	0.0067	0.017	*d*	*d*
Vanadium filtered ICAP (mg/L)	2/32	0.015	0.0053	0.010	*d*	*d*
Zinc ICAP (mg/L)	30/32	0.36	0.0022	0.038	5	0
Zinc filtered ICAP (mg/L)	30/32	0.12	0.0034	0.015	5	0
Conductivity, field measurement (μmhos/cm)	*d*/32	680	190	380	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/32	8.7	0.40	5.5	*d*	*d*
pH, field measurement (standard units)	*d*/32	11	6.7	7.9	6.5/8.5	5
Redox, field measurement (mV)	*d*/32	320	−210	140	*d*	*d*
Water temperature, field measurement (°C)	*d*/32	19	11	15	30.5	0

Table 5.24 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-CO_3 (mg/L)	6/32	120	4.0	26	*d*	*d*
Alkalinity-HCO_3 (mg/L)	32/32	360	40	180	*d*	*d*
Conductivity (µmhos/cm)	32/32	700	220	410	*d*	*d*
Conductivity, Rep. 2 (µmhos/cm)	32/32	700	220	410	*d*	*d*
Conductivity, Rep. 3 (µmhos/cm)	32/32	700	220	410	*d*	*d*
Conductivity, Rep. 4 (µmhos/cm)	32/32	700	210	410	*d*	*d*
Dissolved solids (mg/L)	32/32	480	130	250	500	0
pH (standard units)	*d*/32	9.9	7.3	8.0	6.5/8.5	4
pH, Rep. 2 (standard units)	*d*/32	9.9	7.3	8.0	6.5/8.5	5
pH, Rep. 3 (standard units)	*d*/32	9.9	7.3	8.0	6.5/8.5	4
pH, Rep. 4 (standard units)	*d*/32	9.9	7.3	8.0	6.5/8.5	5
Phenols (mg/L)	1/32	0.050	0.050	0.050	*d*	*d*
Total organic carbon (mg/L)	17/32	60	1.0	8.9	*d*	*d*
Total organic carbon, Rep. 2 (mg/L)	21/32	69	1.0	7.4	*d*	*d*
Total organic carbon, Rep. 3 (mg/L)	23/32	68	1.0	6.1	*d*	*d*
Total organic carbon, Rep. 4 (mg/L)	24/32	110	1.0	7.3	*d*	*d*
Total organic halide(µg/L)	11/32	44	10	22	*d*	*d*
Total organic halide, Rep. 2 (µg/L)	9/32	33	10	18	*d*	*d*
Total organic halide, Rep. 3 (µg/L)	9/31	29	11	16	*d*	*d*
Total organic halide, Rep. 4 (µg/L)	11/30	36	12	17	*d*	*d*
Total suspended solids (mg/L)	30/32	8100	1.0	430	*d*	*d*
Turbidity (NTU)	32/32	4000	3.4	210	1	32
Gross alpha (pCi/L)	21/32	17	1.6	3.9	15	1
Gross beta (pCi/L)	19/32	27	2.7	7.5	50	0
2-Butanone (µg/L)	2/32	16B	16B	~16	*d*	*d*
4-Methyl-2-pentanone (µg/L)	7/32	6.0DJ	1.0BJ	~2.3	*d*	*d*
Acetone (µg/L)	5/32	8.0BJ	3.0BJ	~5.4	*d*	*d*
Bis (2-ethylhexyl)phthalate (µg/L)	4/32	2.0BJ	0.60BJ	~1.6	*d*	*d*
Di-N-butylphthalate (µg/L)	6/32	0.60BJ	0.20BJ	~0.30	*d*	*d*
Diethylphthalate (µg/L)	3/32	0.60BJ	0.20J	~0.43	*d*	*d*
Methylene chloride (µg/L)	5/32	2.0BJ	2.0BJ	~2.0	*d*	*d*
Toluene (µg/L)	3/32	0.60BJ	0.50BJ	~0.57	1000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.25. Constituents in groundwater at the Y-12 Plant site

Chestnut Ridge Hydrogeologic Regime
United Nuclear Site

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	23/24	18	1.0	8.6	250	0
Nitrate nitrogen (mg/L)	23/24	1.3	0.20	0.90	10	0
Sulfate (mg/L)	17/24	6.6	1.0	3.6	250	0
Aluminum ICAP (mg/L)	19/24	0.87	0.022	0.21	0.2	5
Aluminum filtered ICAP (mg/L)	12/24	0.42	0.021	0.074	0.2	1
Barium ICAP (mg/L)	24/24	0.031	0.0061	0.016	1	0
Barium filtered ICAP (mg/L)	24/24	0.028	0.0030	0.014	1	0
Boron ICAP (mg/L)	21/24	0.036	0.0049	0.015	*d*	*d*
Boron filtered ICAP (mg/L)	21/24	0.037	0.0047	0.013	*d*	*d*
Calcium ICAP (mg/L)	24/24	59	27	42	*d*	*d*
Calcium filtered ICAP (mg/L)	24/24	60	4.1	40	*d*	*d*
Chromium AAS (mg/L)	8/24	1.5	0.011	0.22	0.05	2
Cobalt ICAP (mg/L)	1/24	0.018	0.018	0.018	*d*	*d*
Copper ICAP (mg/L)	4/24	0.021	0.0051	0.012	1	0
Copper filtered ICAP (mg/L)	5/24	0.013	0.0045	0.0085	1	0
Iron ICAP (mg/L)	21/24	19	0.0071	1.2	0.3	8
Iron filtered ICAP (mg/L)	14/24	0.89	0.0055	0.12	0.3	2
Lead AAS (mg/L)	2/24	0.0072	0.0055	0.0064	0.05	0
Lead filtered AAS (mg/L)	1/24	0.0055	0.0055	0.0055	0.05	0
Magnesium ICAP (mg/L)	24/24	34	15	23	*d*	*d*
Magnesium filtered ICAP (mg/L)	24/24	34	1.2	23	*d*	*d*
Manganese ICAP (mg/L)	17/24	0.33	0.0010	0.031	0.05	2
Manganese filtered ICAP (mg/L)	9/24	0.016	0.0011	0.0067	0.05	0
Nickel ICAP (mg/L)	10/24	0.46	0.010	0.12	*d*	*d*
Nickel filtered ICAP (mg/L)	10/24	0.19	0.011	0.079	*d*	*d*
Potassium ICAP (mg/L)	22/24	1.6	0.60	0.97	*d*	*d*
Potassium filtered ICAP (mg/L)	20/24	1.8	0.66	1.0	*d*	*d*
Sodium ICAP (mg/L)	24/24	9.5	0.48	3.9	*d*	*d*
Sodium filtered ICAP (mg/L)	24/24	9.9	0.50	3.9	*d*	*d*
Strontium ICAP (mg/L)	24/24	0.026	0.0094	0.016	*d*	*d*
Strontium filtered ICAP (mg/L)	24/24	0.024	0.0088	0.015		
Uranium fluorimetric (mg/L)	4/24	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	4/24	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	1/24	0.0081	0.0081	0.0081	*d*	*d*
Zinc ICAP (mg/L)	24/24	0.022	0.0028	0.0090	5	0
Zinc filtered ICAP (mg/L)	22/24	0.022	0.0031	0.0088	5	0
Conductivity, field measurement (μmhos/cm)	*d*/24	490	210	370	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/24	9.2	1.2	5.5	*d*	*d*
pH, field measurement (standard units)	*d*/24	8.2	7.1	7.6	6.5/8.5	0
Redox, field measurement (mV)	*d*/24	290	88	190	*d*	*d*
Water temperature, field measurement (°C)	*d*/24	23	12	15	30.5	0
Alkalinity-HCO_3 (mg/L)	24/24	270	130	200	*d*	*d*
Conductivity (μmhos/cm)	24/24	550	260	400	*d*	*d*
Dissolved solids (mg/L)	24/24	320	120	210	500	0
(standard units)	*d*/24	8.1	7.3	7.7	6.5/8.5	0
Total suspended solids (mg/L)	16/24	63	1.0	14	*d*	*d*
Turbidity (NTU)	24/24	120	0.40	11	1	21

Table 5.25 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Uranium-234 (pCi/L)	6/24	2.4	1.3	1.5	20	0
Uranium-238 (pCi/L)	2/24	1.9	1.0	1.5	24	0
Gross alpha (pCi/L)	8/24	4.4	2.0	2.7	15	0
Gross beta (pCi/L)	11/24	19	2.5	5.1	50	0
2-Butanone (μg/L)	3/24	13	3.0BJ	~7.3	*d*	*d*
4-Methyl-2-pentanone (μg/L)	5/24	2.0BJ	1.0BJ	~1.6	*d*	*d*
Acetone (μg/L)	5/24	9.0BJ	2.0BJ	~4.6	*d*	*d*
Carbon disulfide (μg/L)	2/24	1.0BJ	1.0BJ	~1.0	*d*	*d*
Chloroform (μg/L)	4/24	1.0J	0.90J	~0.98	100	0
Ethylbenzene (μg/L)	1/24	1.0J	1.0J	~1.0	700	0
Methylene chloride (μg/L)	2/24	1.0BJ	1.0BJ	~1.0	*d*	*d*
Xylenes (μg/L)	2/24	1.0BJ	1.0BJ	~1.0	10,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.26. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Background

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	24/28	67	2.6	17	250	0
Fluoride (mg/L)	22/28	0.30	0.10	0.18	4	0
Nitrate nitrogen (mg/L)	5/28	3.9	0.50	1.2	10	0
Sulfate (mg/L)	28/28	190	1.6	34	250	0
Aluminum ICAP (mg/L)	28/28	26	0.043	1.4	0.2	16
Aluminum filtered ICAP (mg/L)	15/28	27	0.027	1.8	0.2	1
Arsenic ICAP (mg/L)	2/28	0.064	0.060	0.062	0.05	2
Arsenic filtered ICAP (mg/L)	1/28	0.063	0.063	0.063	0.05	1
Barium ICAP (mg/L)	28/28	0.37	0.027	0.18	1	0
Barium filtered ICAP (mg/L)	28/28	0.33	0.025	0.16	1	0
Beryllium ICAP (mg/L)	1/28	0.0011	0.0011	0.0011	*d*	*d*
Beryllium filtered ICAP (mg/L)	1/28	0.0011	0.0011	0.0011	*d*	*d*
Boron ICAP (mg/L)	28/28	0.63	0.0093	0.050	*d*	*d*
Boron filtered ICAP (mg/L)	28/28	0.64	0.011	0.051	*d*	*d*
Cadmium AAS (mg/L)	2/28	0.0086	0.0020	0.0053	0.005	1
Cadmium filtered AAS (mg/L)	1/28	0.0097	0.0097	0.0097	0.005	1
Calcium ICAP (mg/L)	28/28	150	44	85	*d*	*d*
Calcium filtered ICAP (mg/L)	28/28	160	41	80	*d*	*d*
Chromium AAS (mg/L)	8/28	0.30	0.011	0.078	0.05	3
Cobalt ICAP (mg/L)	4/28	0.023	0.0053	0.010	*d*	*d*
Cobalt filtered ICAP (mg/L)	2/28	0.020	0.0058	0.013	*d*	*d*
Copper ICAP (mg/L)	12/28	0.038	0.0040	0.0086	1	0
Copper filtered ICAP (mg/L)	9/28	0.58	0.0045	0.075	1	0
Iron ICAP (mg/L)	28/28	38	0.077	2.8	0.3	19
Iron filtered ICAP (mg/L)	23/28	36	0.0056	2.0	0.3	6
Lead AAS (mg/L)	1/28	0.016	0.016	0.016	0.05	0
Magnesium ICAP (mg/L)	28/28	46	5.8	16	*d*	*d*
Magnesium filtered ICAP (mg/L)	28/28	47	5.6	16	*d*	*d*
Manganese ICAP (mg/L)	28/28	2.7	0.0075	0.50	0.05	16
Manganese filtered ICAP (mg/L)	28/28	2.6	0.0012	0.45	0.05	9
Mercury CVAA (mg/L)	4/28	0.0024	0.0002	0.0008	0.002	1
Mercury filtered CVAA (mg/L)	1/28	0.0005	0.0005	0.0005	0.002	0
Nickel ICAP (mg/L)	7/28	0.21	0.014	0.092	*d*	*d*
Nickel filtered ICAP (mg/L)	10/28	0.13	0.010	0.058	*d*	*d*
Potassium ICAP (mg/L)	28/28	8.6	1.4	2.4	*d*	*d*
Potassium filtered ICAP (mg/L)	28/28	8.6	1.1	2.3	*d*	*d*
Silver ICAP (mg/L)	1/28	0.0062	0.0062	0.0062	0.05	0
Sodium ICAP (mg/L)	28/28	28	6.9	15	*d*	*d*
Sodium filtered ICAP (mg/L)	28/28	28	6.4	15	*d*	*d*
Strontium ICAP (mg/L)	28/28	0.49	0.079	0.25	*d*	*d*
Strontium filtered ICAP (mg/L)	28/28	0.56	0.079	0.24	*d*	*d*
Uranium fluorimetric (mg/L)	10/28	0.0020	0.0010	0.0011	0.02	0
Uranium filtered fluorimetric (mg/L)	13/28	0.0080	0.0010	0.0022	0.02	0
Vanadium ICAP (mg/L)	2/28	0.031	0.0055	0.018	*d*	*d*
Vanadium filtered ICAP (mg/L)	1/28	0.031	0.031	0.031	*d*	*d*
Zinc ICAP (mg/L)	28/28	0.14	0.0042	0.022	5	0
Zinc filtered ICAP (mg/L)	27/28	0.19	0.0031	0.022	5	0
Conductivity, field measurement (μmhos/cm)	*d*/28	1100	310	550	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/28	13	0.60	4.1	*d*	*d*
pH, field measurement (standard units)	*d*/28	7.9	6.1	7.1	6.5/8.5	1
Redox, field measurement (mV)	*d*/28	260	−230	110	*d*	*d*
Water temperature, field measurement (°C)	*d*/28	23	8.2	17	30.5	0

Table 5.26 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-HCO_3 (mg/L)	28/28	430	140	250	*d*	*d*
Conductivity (μmhos/cm)	28/28	1100	370	570	*d*	*d*
Dissolved solids (mg/L)	28/28	750	220	370	500	4
pH (standard units)	*d*/28	8.1	6.7	7.4	6.5/8.5	0
Total petroleum hydrocarbons (mg/L)	3/3	0.010	0.010	0.010	1	0
Total suspended solids (mg/L)	28/28	1900	2.0	150	1	0
Turbidity (NTU)	28/28	900	2.0	72	1	28
Gross alpha (pCi/L)	9/28	69	1.6	10	15	1
Gross beta (pCi/L)	13/28	240	2.8	23	50	1
1,1,1-Trichloroethane (μg/L)	3/28	2.0BJ	2.0BJ	~2.0	200	0
1,1-Dichloroethane (μg/L)	2/28	2.0J	2.0J	~2.0	*d*	*d*
1,2-Dichloroethene (μg/L)	4/28	33	17	25	70	0
4-Methyl-2-pentanone (μg/L)	4/28	3.0BJ	2.0BJ	~2.5	*d*	*d*
Acetone (μg/L)	6/28	94B	4.0BJ	~27	*d*	*d*
Methylene chloride (μg/L)	6/28	2.0BJ	1.0BJ	~1.3	*d*	*d*
Tetrachloroethene (μg/L)	4/28	5.0	2.0J	~3.5	5	0
Trichloroethene (μg/L)	4/28	5.0	2.0J	~3.8	5	0
Vinyl chloride (μg/L)	3/28	3.0J	2.0J	~2.3	2	1

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.27. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Beta-4 Security Pit

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	8/8	4.3	2.1	3.7	250	0
Fluoride (mg/L)	4/8	0.20	0.10	0.15	4	0
Sulfate (mg/L)	8/8	22	9.1	13	250	0
Aluminum ICAP (mg/L)	8/8	20	0.75	6.9	0.2	8
Aluminum filtered ICAP (mg/L)	6/8	0.27	0.073	0.12	0.2	1
Barium ICAP (mg/L)	8/8	0.66	0.29	0.37	1	0
Barium filtered ICAP (mg/L)	8/8	0.29	0.16	0.21	1	0
Beryllium ICAP (mg/L)	3/8	0.0008	0.0003	0.0005	*d*	*d*
Beryllium filtered ICAP (mg/L)	1/8	0.0003	0.0003	0.0003	*d*	*d*
Boron ICAP (mg/L)	8/8	0.082	0.0084	0.037	*d*	*d*
Boron filtered ICAP (mg/L)	8/8	0.95	0.011	0.26	*d*	*d*
Calcium ICAP (mg/L)	8/8	83	66	74	*d*	*d*
Calcium filtered ICAP (mg/L)	8/8	83	57	70	*d*	*d*
Chromium AAS (mg/L)	6/8	0.11	0.015	0.041	0.05	1
Cobalt ICAP (mg/L)	4/8	0.023	0.0056	0.011	*d*	*d*
Copper ICAP (mg/L)	6/8	0.065	0.0063	0.024	1	0
Copper filtered ICAP (mg/L)	4/8	0.016	0.0046	0.0086	1	0
Iron ICAP (mg/L)	8/8	24	0.82	8.0	0.3	8
Iron filtered ICAP (mg/L)	7/8	0.21	0.0051	0.063	0.3	0
Lead AAS (mg/L)	4/8	0.0082	0.0042	0.0059	0.05	0
Magnesium ICAP (mg/L)	8/8	10	6.1	7.5	*d*	*d*
Magnesium filtered ICAP (mg/L)	8/8	6.7	5.3	5.8	*d*	*d*
Manganese ICAP (mg/L)	8/8	2.0	0.32	0.91	0.05	8
Manganese filtered ICAP (mg/L)	8/8	0.23	0.018	0.062	0.05	2
Nickel ICAP (mg/L)	5/8	0.032	0.014	0.019	*d*	*d*
Nickel filtered ICAP (mg/L)	1/8	0.012	0.012	0.012	*d*	*d*
Potassium ICAP (mg/L)	8/8	7.0	1.0	3.3	*d*	*d*
Potassium filtered ICAP (mg/L)	8/8	1.8	0.62	1.2	*d*	*d*
Sodium ICAP (mg/L)	8/8	7.0	5.5	6.4	*d*	*d*
Sodium filtered ICAP (mg/L)	8/8	8.4	5.6	6.6	*d*	*d*
Strontium ICAP (mg/L)	8/8	0.17	0.13	0.15	*d*	*d*
Strontium filtered ICAP (mg/L)	8/8	0.18	0.12	0.15	*d*	*d*
Uranium fluorimetric (mg/L)	5/8	0.011	0.0010	0.0038	0.02	0
Uranium filtered fluorimetric (mg/L)	4/8	0.031	0.0010	0.0085	0.02	1
Vanadium ICAP (mg/L)	5/8	0.020	0.0066	0.012	*d*	*d*
Zinc ICAP (mg/L)	8/8	0.23	0.0068	0.055	5	0
Zinc filtered ICAP (mg/L)	7/8	0.15	0.0045	0.042	5	0
Conductivity, field measurement (μmhos/cm)	*d*/8	450	350	410	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/8	3.9	0.80	2.5	*d*	*d*
pH, field measurement (standard units)	*d*/8	7.0	6.4	6.7	6.5/8.5	1
Redox, field measurement (mV)	*d*/8	270	190	240	*d*	*d*
Water temperature, field measurement (°C)	*d*/8	21	9.7	18	30.5	0
Alkalinity-HCO_3 (mg/L)	8/8	390	180	230	*d*	*d*
Conductivity (μmhos/cm)	8/8	460	370	420	*d*	*d*
Dissolved solids (mg/L)	8/8	320	260	290	500	0
pH (standard units)	*d*/8	8.1	6.8	7.2	6.5/8.5	0
Total suspended solids (mg/L)	8/8	480	18	170	*d*	*d*
Turbidity (NTU)	8/8	300	13	97	1	8

Table 5.27 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	6/8	12	2.8	7.8	15	0
Gross beta (pCi/L)	8/8	26	3.7	14	50	0
Methylene chloride (μg/L)	2/8	2.0BJ	2.0BJ	~2.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.28. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Exit Pathway–Traverse J

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	6/6	18	10	14	250	0
Fluoride (mg/L)	3/6	0.20	0.10	0.17	4	0
Sulfate (mg/L)	6/6	21	9.6	15	250	0
Aluminum ICAP (mg/L)	5/6	3.2	0.026	0.69	0.2	1
Aluminum filtered ICAP (mg/L)	2/6	0.028	0.026	0.027	0.2	0
Barium ICAP (mg/L)	6/6	0.28	0.0049	0.14	1	0
Barium filtered ICAP (mg/L)	6/6	0.27	0.0071	0.14	1	0
Boron ICAP (mg/L)	6/6	0.056	0.023	0.039	*d*	*d*
Boron filtered ICAP (mg/L)	6/6	0.10	0.026	0.046	*d*	*d*
Calcium ICAP (mg/L)	6/6	120	18	70	*d*	*d*
Calcium filtered ICAP (mg/L)	6/6	130	17	70	*d*	*d*
Copper ICAP (mg/L)	2/6	0.0048	0.0045	0.0046	1	0
Iron ICAP (mg/L)	6/6	8.7	0.067	3.3	0.3	4
Iron filtered ICAP (mg/L)	6/6	0.47	0.010	0.096	0.3	1
Lead AAS (mg/L)	2/6	0.015	0.0088	0.012	0.05	0
Magnesium ICAP (mg/L)	6/6	20	8.1	13	*d*	*d*
Magnesium filtered ICAP (mg/L)	6/6	20	8.4	13	*d*	*d*
Manganese ICAP (mg/L)	6/6	0.40	0.21	0.28	0.05	6
Manganese filtered ICAP (mg/L)	6/6	0.28	0.16	0.23	0.05	6
Molybdenum ICAP (mg/L)	1/6	0.014	0.014	0.014	*d*	*d*
Molybdenum filtered ICAP (mg/L)	1/6	0.018	0.018	0.018	*d*	*d*
Potassium ICAP (mg/L)	6/6	7.2	2.0	3.6	*d*	*d*
Potassium filtered ICAP (mg/L)	6/6	6.9	2.0	3.0	*d*	*d*
Sodium ICAP (mg/L)	6/6	8.4	3.3	5.1	*d*	*d*
Sodium filtered ICAP (mg/L)	6/6	16	3.4	6.8	*d*	*d*
Strontium ICAP (mg/L)	6/6	0.26	0.045	0.16	*d*	*d*
Strontium filtered ICAP (mg/L)	6/6	0.25	0.041	0.16	*d*	*d*
Zinc ICAP (mg/L)	6/6	0.014	0.0047	0.0087	5	0
Zinc filtered ICAP (mg/L)	6/6	0.0086	0.0042	0.0066	5	0
Conductivity, field measurement (μmhos/cm)	*d*/6	600	260	440	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/6	2.2	0.50	1.2	*d*	*d*
pH, field measurement (standard units)	*d*/6	8.8	6.8	7.4	6.5/8.5	1
Redox, field measurement (mV)	*d*/6	170	−110	28	*d*	*d*
Water temperature, field measurement (°C)	*d*/6	18	14	15	30.5	0
Alkalinity-HCO_3 (mg/L)	6/6	300	110	210	*d*	*d*
Conductivity (μmhos/cm)	6/6	620	300	470	*d*	*d*
Dissolved solids (mg/L)	6/6	410	160	280	500	0
pH (standard units)	*d*/6	8.3	7.3	7.7	6.5/8.5	0
Total suspended solids (mg/L)	6/6	31	2.0	16	*d*	*d*
Turbidity (NTU)	6/6	39	2.8	16	1	6
Gross alpha (pCi/L)	2/6	3.6	2.4	3.0	15	0
Gross beta (pCi/L)	4/6	6.1	2.2	4.3	50	0

Table 5.28 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Acetone (µg/L)	1/6	15	15	15	*d*	*d*
Carbon tetrachloride (µg/L)	1/6	67	67	67	5	1
Chloroform (µg/L)	3/6	27	12	22	100	0
Methylene chloride (µg/L)	4/6	5.0	2.0BJ	~3.0	*d*	*d*
Tetrachloroethene (µg/L)	3/6	4.0J	2.0J	~3.0	5	0
Toluene (µg/L)	1/6	0.70BJ	0.70BJ	~0.70	1000	0
Trichloroethene (µg/L)	1/6	1.0J	1.0J	~1.0	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.29. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid E-1

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	9.4	2.6	6.0	250	0
Fluoride (mg/L)	4/4	0.20	0.10	0.18	4	0
Sulfate (mg/L)	4/4	12	8.7	10	250	0
Aluminum ICAP (mg/L)	4/4	86	0.037	23	0.2	2
Aluminum filtered ICAP (mg/L)	2/4	0.073	0.036	0.054	0.2	0
Barium ICAP (mg/L)	4/4	1.3	0.28	0.56	1	1
Barium filtered ICAP (mg/L)	4/4	0.28	0.15	0.21	1	0
Beryllium ICAP (mg/L)	2/4	0.0052	0.0004	0.0028	*d*	*d*
Boron ICAP (mg/L)	4/4	0.089	0.016	0.055	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.058	0.021	0.039	*d*	*d*
Calcium ICAP (mg/L)	4/4	120	47	79	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	94	45	69	*d*	*d*
Chromium AAS (mg/L)	2/4	0.18	0.065	0.12	0.05	2
Cobalt ICAP (mg/L)	2/4	0.071	0.010	0.041	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/4	0.0064	0.0064	0.0064	*d*	*d*
Copper ICAP (mg/L)	3/4	0.052	0.0071	0.023	1	0
Copper filtered ICAP (mg/L)	2/4	0.0066	0.0040	0.0053	1	0
Iron ICAP (mg/L)	4/4	120	0.16	31	0.3	3
Iron filtered ICAP (mg/L)	4/4	0.095	0.0091	0.059	0.3	0
Lead AAS (mg/L)	2/4	0.071	0.020	0.046	0.05	1
Magnesium ICAP (mg/L)	4/4	23	5.9	11	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	9.3	5.8	7.5	*d*	*d*
Manganese ICAP (mg/L)	4/4	2.3	0.083	0.78	0.05	4
Manganese filtered ICAP (mg/L)	4/4	0.53	0.079	0.27	0.05	4
Nickel ICAP (mg/L)	1/4	0.13	0.13	0.13	*d*	*d*
Potassium ICAP (mg/L)	4/4	18	2.0	6.1	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	2.2	1.1	1.7	*d*	*d*
Sodium ICAP (mg/L)	4/4	26	8.2	17	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	26	8.1	17	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.46	0.14	0.31	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.46	0.13	0.29		
Uranium fluorimetric (mg/L)	2/4	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	1/4	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	2/4	0.12	0.0091	0.065	*d*	*d*
Zinc ICAP (mg/L)	4/4	0.43	0.011	0.12	5	0
Zinc filtered ICAP (mg/L)	4/4	0.031	0.0042	0.018	5	0
Conductivity, field measurement (μmhos/cm)	*d*/4	510	350	420	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	2.8	1.2	1.7	*d*	*d*
pH, field measurement (standard units)	*d*/4	7.5	6.7	7.2	6.5/8.5	0
Redox, field measurement (mV)	*d*/4	170	120	150	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	20	17	19	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	280	180	230	*d*	*d*
Conductivity (μmhos/cm)	4/4	570	310	450	*d*	*d*
Dissolved solids (mg/L)	4/4	460	220	320	500	0
pH (standard units)	*d*/4	7.8	7.2	7.5	6.5/8.5	0
Total suspended solids (mg/L)	4/4	3,600	6.0	1100	*d*	*d*
Turbidity (NTU)	4/4	2,000	4.0	550	1	4
Gross alpha (pCi/L)	2/4	43	4.6	24	15	1
Gross beta (pCi/L)	3/4	48	3.0	19	50	0

Table 5.29 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
2-Butanone (µg/L)	1/4	4.0BJ	4.0BJ	~4.0	*d*	*d*
4-Methyl-2-pentanone (µg/L)	1/4	3.0BJ	3.0BJ	~3.0	*d*	*d*
Acetone (µg/L)	1/4	10B	10B	~10	*d*	*d*
Carbon disulfide (µg/L)	1/4	1.0BJ	1.0BJ	~1.0	*d*	*d*
Methylene chloride (µg/L)	3/4	2.0BJ	1.0BJ	~1.7	*d*	*d*
Xylenes (µg/L)	1/4	1.0BJ	1.0BJ	~1.0	10,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.30. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid G-1

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	17	13	15	250	0
Fluoride (mg/L)	2/4	0.10	0.10	0.10	4	0
Sulfate (mg/L)	4/4	22	17	19	250	0
Aluminum ICAP (mg/L)	4/4	8.6	0.061	2.3	0.2	2
Aluminum filtered ICAP (mg/L)	2/4	0.061	0.033	0.047	0.2	0
Barium ICAP (mg/L)	4/4	0.20	0.11	0.13	1	0
Barium filtered ICAP (mg/L)	4/4	0.11	0.096	0.10	1	0
Boron ICAP (mg/L)	4/4	0.044	0.034	0.038	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.035	0.026	0.032	*d*	*d*
Calcium ICAP (mg/L)	4/4	78	62	68	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	71	60	65	*d*	*d*
Chromium AAS (mg/L)	1/4	0.017	0.017	0.017	0.05	0
Cobalt ICAP (mg/L)	1/4	0.0099	0.0099	0.0099	*d*	*d*
Iron ICAP (mg/L)	4/4	15	0.30	4.2	0.3	3
Iron filtered ICAP (mg/L)	4/4	0.30	0.11	0.21	0.3	0
Lead AAS (mg/L)	1/4	0.0081	0.0081	0.0081	0.05	0
Magnesium ICAP (mg/L)	4/4	12	8.3	9.5	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	9.5	7.7	8.6	*d*	*d*
Manganese ICAP (mg/L)	4/4	0.57	0.20	0.32	0.05	4
Manganese filtered ICAP (mg/L)	4/4	0.32	0.20	0.26	0.05	4
Nickel ICAP (mg/L)	2/4	0.023	0.012	0.017	*d*	*d*
Potassium ICAP (mg/L)	4/4	4.0	1.7	2.7	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	2.6	1.6	2.1	*d*	*d*
Silver ICAP (mg/L)	1/4	0.0062	0.0062	0.0062	0.05	0
Sodium ICAP (mg/L)	4/4	13	9.8	11	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	14	9.1	11	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.47	0.20	0.34	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.47	0.20	0.32	*d*	*d*
Uranium fluorimetric (mg/L)	3/4	0.0060	0.0010	0.0027	0.02	0
Uranium filtered fluorimetric (mg/L)	1/4	0.0040	0.0040	0.0040	0.02	0
Vanadium ICAP (mg/L)	1/4	0.019	0.019	0.019	*d*	*d*
Zinc ICAP (mg/L)	4/4	0.13	0.0053	0.043	5	0
Zinc filtered ICAP (mg/L)	4/4	0.070	0.0048	0.027	5	0
Conductivity, field measurement (µmhos/cm)	*d*/4	470	430	450	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	7.5	0.70	3.0	*d*	*d*
pH, field measurement (standard units)	*d*/4	7.4	7.3	7.3	6.5/8.5	0
Redox, field measurement (mV)	*d*/4	72	–45	7.0	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	20	17	19	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	200	190	190	*d*	*d*
Conductivity (µmhos/cm)	4/4	460	440	450	*d*	*d*
Dissolved solids (mg/L)	4/4	310	270	290	500	0
pH (standard units)	*d*/4	7.4	7.3	7.4	6.5/8.5	0
Total suspended solids (mg/L)	4/4	460	2.0	150	*d*	*d*
Turbidity (NTU)	4/4	380	2.6	160	1	4
Gross alpha (pCi/L)	3/4	5.7	2.6	4.6	15	0
Gross beta (pCi/L)	4/4	29	3.2	12	50	0
Methylene chloride (µg/L)	3/4	2.0BJ	1.0J	~1.7	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.31. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid G-2

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	150	11	77	250	0
Nitrate nitrogen (mg/L)	3/4	0.63	0.20	0.36	10	0
Sulfate (mg/L)	4/4	17	11	14	250	0
Aluminum ICAP (mg/L)	4/4	0.61	0.026	0.21	0.2	1
Aluminum filtered ICAP (mg/L)	3/4	0.033	0.023	0.030	0.2	0
Arsenic ICAP (mg/L)	1/4	0.055	0.055	0.055	0.05	1
Arsenic filtered ICAP (mg/L)	1/4	0.051	0.051	0.051	0.05	1
Barium ICAP (mg/L)	4/4	0.44	0.064	0.25	1	0
Barium filtered ICAP (mg/L)	4/4	0.45	0.060	0.25	1	0
Boron ICAP (mg/L)	4/4	0.023	0.014	0.018	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.044	0.017	0.027	*d*	*d*
Calcium ICAP (mg/L)	4/4	110	27	69	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	110	30	70	*d*	*d*
Chromium AAS (mg/L)	3/4	0.21	0.014	0.081	0.05	1
Copper ICAP (mg/L)	1/4	0.012	0.012	0.012	1	0
Iron ICAP (mg/L)	4/4	0.60	0.094	0.29	0.3	2
Iron filtered ICAP (mg/L)	4/4	0.015	0.0072	0.011	0.3	0
Magnesium ICAP (mg/L)	4/4	12	2.6	7.3	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	13	2.7	7.6	*d*	*d*
Manganese ICAP (mg/L)	4/4	0.044	0.013	0.032	0.05	0
Manganese filtered ICAP (mg/L)	4/4	0.039	0.0075	0.022	0.05	0
Nickel ICAP (mg/L)	2/4	0.020	0.019	0.019	*d*	*d*
Nickel filtered ICAP (mg/L)	3/4	0.035	0.010	0.022	*d*	*d*
Potassium ICAP (mg/L)	2/4	1.9	1.5	1.7	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	2.3	0.62	1.3	*d*	*d*
Sodium ICAP (mg/L)	4/4	8.9	5.5	7.0	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	9.2	5.8	7.2	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.27	0.042	0.15	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.29	0.047	0.16	*d*	*d*
Uranium fluorimetric (mg/L)	2/4	0.0020	0.0010	0.0015	0.02	*d*
Uranium filtered fluorimetric (mg/L)	1/4	0.0030	0.0030	0.0030	0.02	*d*
Zinc ICAP (mg/L)	4/4	0.071	0.0079	0.031	5	0
Zinc filtered ICAP (mg/L)	4/4	0.065	0.0039	0.026	5	0
Conductivity, field measurement (µmhos/cm)	*d*/4	710	210	450	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	7.5	3.0	5.0	*d*	*d*
pH, field measurement (standard units)	*d*/4	7.8	6.8	7.4	6.5/8.5	0
Redox, field measurement (mV)	*d*/4	180	92	150	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	22	17	20	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	160	72	110	*d*	*d*
Conductivity (µmhos/cm)	4/4	780	210	490	*d*	*d*
Dissolved solids (mg/L)	4/4	510	140	330	500	2
pH (standard units)	*d*/4	7.7	7.0	7.4	6.5/8.5	0
Total suspended solids (mg/L)	4/4	28	2.0	9.8	*d*	*d*
Turbidity (NTU)	4/4	34	2.0	12	1	4
Gross alpha (pCi/L)	2/4	3.0	2.1	2.6	15	0
Gross beta (pCi/L)	2/4	4.5	4.4	4.5	50	0

Table 5.31 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
2-Hexanone (µg/L)	1/4	1.0J	1.0J	~1.0	*d*	*d*
4-Methyl-2-pentanone (µg/L)	2/4	3.0BJ	2.0BJ	~2.5	*d*	*d*
Acetone (µg/L)	1/4	2.0BJ	2.0BJ	~2.0	*d*	*d*
Methylene chloride (µg/L)	1/4	1.0J	1.0J	~1.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.32. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid J-1

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	34	6.0	19	250	0
Fluoride (mg/L)	2/4	0.60	0.40	0.50	4	0
Sulfate (mg/L)	4/4	41	16	26	250	0
Aluminum ICAP (mg/L)	4/4	4.9	0.041	2.3	0.2	3
Aluminum filtered ICAP (mg/L)	3/4	0.044	0.025	0.032	0.2	0
Barium ICAP (mg/L)	4/4	0.16	0.11	0.14	1	0
Barium filtered ICAP (mg/L)	4/4	0.15	0.080	0.11	1	0
Beryllium ICAP (mg/L)	2/4	0.0003	0.0003	0.0003	*d*	*d*
Boron ICAP (mg/L)	4/4	0.12	0.014	0.073	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.11	0.020	0.069	*d*	*d*
Calcium ICAP (mg/L)	4/4	28	20	25	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	29	15	24	*d*	*d*
Chromium AAS (mg/L)	2/4	0.016	0.015	0.016	0.05	0
Cobalt ICAP (mg/L)	2/4	0.011	0.0092	0.010	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/4	0.0088	0.0088	0.0088	*d*	*d*
Copper ICAP (mg/L)	1/4	0.0070	0.0070	0.0070	1	0
Copper filtered ICAP (mg/L)	1/4	0.0044	0.0044	0.0044	1	0
Iron ICAP (mg/L)	4/4	7.3	0.094	3.5	0.3	3
Iron filtered ICAP (mg/L)	4/4	0.74	0.019	0.24	0.3	1
Magnesium ICAP (mg/L)	4/4	5.8	4.7	5.5	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	5.8	4.0	5.1	*d*	*d*
Manganese ICAP (mg/L)	4/4	1.6	0.033	0.69	0.05	2
Manganese filtered ICAP (mg/L)	4/4	1.7	0.016	0.69	0.05	2
Mercury filtered CVAA (mg/L)	1/4	0.0002	0.0002	0.0002	0.002	0
Nickel ICAP (mg/L)	2/4	0.022	0.013	0.017	*d*	*d*
Nickel filtered ICAP (mg/L)	1/4	0.015	0.015	0.015	*d*	*d*
Potassium ICAP (mg/L)	4/4	2.9	2.3	2.7	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	3.0	1.1	2.1	*d*	*d*
Sodium ICAP (mg/L)	4/4	70	16	42	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	68	17	42	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.80	0.090	0.40	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.77	0.088	0.36	*d*	*d*
Uranium fluorimetric (mg/L)	1/4	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	1/4	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	1/4	0.0079	0.0079	0.0079	*d*	*d*
Zinc ICAP (mg/L)	4/4	0.037	0.013	0.027	5	0
Zinc filtered ICAP (mg/L)	3/4	0.037	0.0084	0.019	5	0
Conductivity, field measurement (μmhos/cm)	*d*/4	460	290	380	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	5.1	0.50	2.4	*d*	*d*
pH, field measurement (standard units)	*d*/4	8.1	5.2	6.6	6.5/8.5	2
Redox, field measurement (mV)	*d*/4	110	−56	28	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	19	17	18	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	210	53	130	*d*	*d*
Conductivity (μmhos/cm)	4/4	460	290	370	*d*	*d*
Dissolved solids (mg/L)	4/4	300	92	190	500	0
pH (standard units)	*d*/4	8.3	6.1	7.2	6.5/8.5	2
Total suspended solids (mg/L)	3/4	340	9.0	190	*d*	*d*
Turbidity (NTU)	4/4	200	7.3	120	1	4

Table 5.32 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	1/4	4.3	4.3	4.3	15	0
Gross beta (pCi/L)	3/4	9.7	3.8	6.8	50	0
4-Methyl-2-pentanone (µg/L)	1/4	1.0BJ	1.0BJ	~1.0	*d*	*d*
Acetone (µg/L)	1/4	3.0BJ	3.0BJ	~3.0	*d*	*d*
Methylene chloride (µg/L)	1/4	1.0BJ	1.0BJ	~1.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.33. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid J-2

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	5.0	2.5	3.8	250	0
Nitrate nitrogen (mg/L)	1/4	0.57	0.57	0.57	10	0
Sulfate (mg/L)	4/4	12	7.7	9.8	250	0
Aluminum ICAP (mg/L)	4/4	22	0.029	5.9	0.2	2
Aluminum filtered ICAP (mg/L)	4/4	0.19	0.021	0.065	0.2	0
Barium ICAP (mg/L)	4/4	0.65	0.20	0.32	1	0
Barium filtered ICAP (mg/L)	4/4	0.24	0.17	0.20	1	0
Beryllium ICAP (mg/L)	1/4	0.0011	0.0011	0.0011	*d*	*d*
Boron ICAP (mg/L)	4/4	0.044	0.025	0.034	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.086	0.011	0.047	*d*	*d*
Calcium ICAP (mg/L)	4/4	59	32	51	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	57	25	46	*d*	*d*
Chromium AAS (mg/L)	1/4	0.036	0.036	0.036	0.05	0
Cobalt ICAP (mg/L)	1/4	0.016	0.016	0.016	*d*	*d*
Copper ICAP (mg/L)	2/4	0.027	0.0049	0.016	1	0
Iron ICAP (mg/L)	4/4	26	0.17	7.0	0.3	2
Iron filtered ICAP (mg/L)	4/4	0.73	0.033	0.27	0.3	1
Lead AAS (mg/L)	1/4	0.024	0.024	0.024	0.05	0
Magnesium ICAP (mg/L)	4/4	14	7.4	9.8	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	9.0	6.3	8.0	*d*	*d*
Manganese ICAP (mg/L)	4/4	1.8	0.033	0.92	0.05	2
Manganese filtered ICAP (mg/L)	4/4	1.4	0.031	0.58	0.05	2
Nickel ICAP (mg/L)	3/4	0.037	0.014	0.024	*d*	*d*
Nickel filtered ICAP (mg/L)	1/4	0.011	0.011	0.011	*d*	*d*
Potassium ICAP (mg/L)	4/4	5.1	1.6	2.6	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	12	1.3	4.2	*d*	*d*
Selenium filtered ICAP (mg/L)	1/4	0.55	0.55	0.55	0.01	1
Silver filtered ICAP (mg/L)	1/4	0.076	0.076	0.076	0.05	1
Sodium ICAP (mg/L)	4/4	11	4.5	8.4	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	10	4.3	7.8	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.38	0.12	0.26	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.33	0.10	0.22	*d*	*d*
Uranium fluorimetric (mg/L)	2/4	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	1/4	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	1/4	0.025	0.025	0.025	*d*	*d*
Zinc ICAP (mg/L)	4/4	0.081	0.0089	0.037	5	0
Zinc filtered ICAP (mg/L)	4/4	0.028	0.0054	0.012	5	0
Conductivity, field measurement (µmhos/cm)	*d*/4	390	360	370	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	8.9	0.40	3.5	*d*	*d*
pH, field measurement (standard units)	*d*/4	7.5	7.3	7.4	6.5/8.5	0
Redox, field measurement (mV)	*d*/4	–16	–130	–78	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	23	17	19	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	210	170	190	*d*	*d*
Conductivity (µmhos/cm)	4/4	410	330	370	*d*	*d*
Dissolved solids (mg/L)	4/4	250	110	200	500	0
pH (standard units)	*d*/4	7.8	7.4	7.7	6.5/8.5	0
Total suspended solids (mg/L)	3/4	880	36	330	*d*	*d*
Turbidity (NTU)	4/4	540	1.8	140	1	4

Table 5.33 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	1/4	7.9	7.9	7.9	15	0
Gross beta (pCi/L)	3/4	23	2.3	10	50	0
4-Methyl-2-pentanone (μg/L)	2/4	2.0BJ	1.0BJ	~1.5	*d*	*d*
Acetone (μg/L)	2/4	4.0BJ	2.0BJ	~3.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.34. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid J-3

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	44	9.2	26	250	0
Sulfate (mg/L)	4/4	4.7	3.1	3.9	250	0
Aluminum ICAP (mg/L)	3/4	0.87	0.085	0.40	0.2	2
Aluminum filtered ICAP (mg/L)	1/4	0.031	0.031	0.031	0.2	0
Barium ICAP (mg/L)	4/4	0.52	0.14	0.33	1	0
Barium filtered ICAP (mg/L)	4/4	0.51	0.13	0.32	1	0
Boron ICAP (mg/L)	4/4	0.036	0.013	0.025	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.035	0.0091	0.021	*d*	*d*
Calcium ICAP (mg/L)	4/4	55	33	46	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	55	33	47	*d*	*d*
Cobalt ICAP (mg/L)	2/4	0.0074	0.0067	0.0070	*d*	*d*
Cobalt filtered ICAP (mg/L)	2/4	0.0054	0.0054	0.0054	*d*	*d*
Copper filtered ICAP (mg/L)	1/4	0.010	0.010	0.010	1	0
Iron ICAP (mg/L)	4/4	3.9	0.15	1.9	0.3	3
Iron filtered ICAP (mg/L)	4/4	3.6	0.15	1.6	0.3	2
Magnesium ICAP (mg/L)	4/4	9.3	3.8	6.6	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	9.3	3.8	6.6	*d*	*d*
Manganese ICAP (mg/L)	4/4	2.8	0.012	1.2	0.05	2
Manganese filtered ICAP (mg/L)	4/4	2.9	0.012	1.3	0.05	2
Nickel ICAP (mg/L)	2/4	0.029	0.027	0.028	*d*	*d*
Nickel filtered ICAP (mg/L)	2/4	0.029	0.026	0.027	*d*	*d*
Potassium ICAP (mg/L)	4/4	3.1	1.7	2.5	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	3.0	1.6	2.3	*d*	*d*
Sodium ICAP (mg/L)	4/4	8.0	7.5	7.8	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	8.1	7.7	7.9	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.42	0.083	0.25	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.41	0.082	0.25	*d*	*d*
Zinc ICAP (mg/L)	4/4	0.013	0.0054	0.0095	5	0
Zinc filtered ICAP (mg/L)	4/4	0.025	0.0070	0.013	5	0
Conductivity, field measurement (µmhos/cm)	*d*/4	380	260	320	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	1.4	0.40	0.85	*d*	*d*
pH, field measurement (standard units)	*d*/4	7.5	5.5	6.5	6.5/8.5	2
Redox, field measurement (mV)	*d*/4	23	−94	−34	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	22	18	20	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	190	74	140	*d*	*d*
Conductivity (µmhos/cm)	4/4	390	280	340	*d*	*d*
Dissolved solids (mg/L)	4/4	250	170	210	500	0
pH (standard units)	*d*/4	7.8	5.9	6.8	6.5/8.5	2
Total suspended solids (mg/L)	4/4	28	2.0	15	*d*	*d*
Turbidity (NTU)	4/4	11	0.70	4.7	1	3
Gross alpha (pCi/L)	2/4	3.9	2.2	3.0	15	0
Gross beta (pCi/L)	3/4	5.6	3.9	4.9	50	0
Acetone (µg/L)	2/4	1400	84	740	*d*	*d*
Methylene chloride (µg/L)	3/4	2.0BJ	1.0BJ	~1.7	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.35. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid K-1

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	9/9	12	3.2	6.8	250	0
Fluoride (mg/L)	2/9	0.10	0.10	0.10	4	0
Nitrate nitrogen (mg/L)	2/9	0.72	0.60	0.66	10	0
Sulfate (mg/L)	9/9	27	10	22	250	0
Aluminum ICAP (mg/L)	6/9	9.9	0.044	1.8	0.2	3
Aluminum filtered ICAP (mg/L)	3/9	0.059	0.029	0.041	0.2	0
Barium ICAP (mg/L)	9/9	0.17	0.079	0.13	1	0
Barium filtered ICAP (mg/L)	9/9	0.17	0.082	0.13	1	0
Beryllium ICAP (mg/L)	1/9	0.0004	0.0004	0.0004	*d*	*d*
Boron ICAP (mg/L)	9/9	0.082	0.015	0.056	*d*	*d*
Boron filtered ICAP (mg/L)	9/9	0.099	0.014	0.062	*d*	*d*
Calcium ICAP (mg/L)	9/9	54	12	39	*d*	*d*
Calcium filtered ICAP (mg/L)	9/9	54	15	39	*d*	*d*
Chromium AAS (mg/L)	1/9	0.040	0.040	0.040	0.05	0
Cobalt ICAP (mg/L)	1/9	0.0083	0.0083	0.0083	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/9	0.0050	0.0050	0.0050	*d*	*d*
Copper ICAP (mg/L)	3/9	0.0069	0.0061	0.0064	1	0
Copper filtered ICAP (mg/L)	3/9	0.0074	0.0045	0.0060	1	0
Iron ICAP (mg/L)	9/9	6.2	0.17	1.1	0.3	4
Iron filtered ICAP (mg/L)	9/9	0.44	0.018	0.15	0.3	1
Lead AAS (mg/L)	1/9	0.0050	0.0050	0.0050	0.05	0
Magnesium ICAP (mg/L)	9/9	9.0	3.9	7.2	*d*	*d*
Magnesium filtered ICAP (mg/L)	9/9	8.8	4.5	7.1	*d*	*d*
Manganese ICAP (mg/L)	9/9	0.86	0.048	0.30	0.05	8
Manganese filtered ICAP (mg/L)	9/9	0.91	0.060	0.30	0.05	9
Nickel ICAP (mg/L)	4/9	0.031	0.011	0.019	*d*	*d*
Nickel filtered ICAP (mg/L)	4/9	0.019	0.010	0.013	*d*	*d*
Potassium ICAP (mg/L)	9/9	5.7	1.6	3.2	*d*	*d*
Potassium filtered ICAP (mg/L)	9/9	5.0	1.0	2.8	*d*	*d*
Selenium ICAP (mg/L)	1/9	0.052	0.052	0.052	0.01	1
Sodium ICAP (mg/L)	9/9	35	5.9	20	*d*	*d*
Sodium filtered ICAP (mg/L)	9/9	37	5.5	19	*d*	*d*
Strontium ICAP (mg/L)	9/9	0.89	0.048	0.48	*d*	*d*
Strontium filtered ICAP (mg/L)	9/9	0.89	0.059	0.49	*d*	*d*
Uranium fluorimetric (mg/L)	2/9	0.0020	0.0020	0.0020	0.02	0
Uranium filtered fluorimetric (mg/L)	1/9	0.0020	0.0020	0.0020	0.02	0
Vanadium ICAP (mg/L)	1/9	0.0093	0.0093	0.0093	*d*	*d*
Zinc ICAP (mg/L)	9/9	0.090	0.0046	0.033	5	0
Zinc filtered ICAP (mg/L)	8/9	0.20	0.0069	0.049	5	0
Conductivity, field measurement (μmhos/cm)	*d*/9	640	170	350	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/9	5.4	0.40	2.8	*d*	*d*
pH, field measurement (standard units)	*d*/9	7.4	5.2	6.7	6.5/8.5	3
Redox, field measurement (mV)	*d*/9	230	−100	35	*d*	*d*
Water temperature, field measurement (°C)	*d*/9	21	16	19	30.5	0
Alkalinity-HCO_3 (mg/L)	9/9	240	28	140	*d*	*d*
Conductivity (μmhos/cm)	9/9	440	150	340	*d*	*d*
Dissolved solids (mg/L)	9/9	340	100	250	500	0
pH (standard units)	*d*/9	7.7	6.0	7.0	6.5/8.5	3
Total suspended solids (mg/L)	6/9	8000	3.0	1800	*d*	*d*
Turbidity (NTU)	9/9	3300	1.1	410	1	9

Table 5.35 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Gross alpha (pCi/L)	2/9	39	1.7	20	15	1
Gross beta (pCi/L)	6/9	34	2.5	8.8	50	0
4-Methyl-2-pentanone (μg/L)	2/9	2.0BJ	2.0BJ	~2.0	*d*	*d*
Acetone (μg/L)	3/9	31	3.0BJ	13	*d*	*d*
Chloroform (μg/L)	1/9	1.0J	1.0J	~1.0	100	0
Methylene chloride (μg/L)	1/9	2.0BJ	2.0BJ	~2.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.36. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid K-2

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	6/6	44	6.2	22	250	0
Fluoride (mg/L)	4/6	0.10	0.10	0.10	4	0
Sulfate (mg/L)	6/6	56	23	37	250	0
Aluminum ICAP (mg/L)	5/6	1.2	0.028	0.65	0.2	4
Aluminum filtered ICAP (mg/L)	2/6	0.059	0.028	0.044	0.2	0
Barium ICAP (mg/L)	6/6	0.28	0.13	0.18	1	0
Barium filtered ICAP (mg/L)	6/6	0.21	0.12	0.16	1	0
Boron ICAP (mg/L)	6/6	0.071	0.017	0.039	*d*	*d*
Boron filtered ICAP (mg/L)	6/6	0.081	0.020	0.048	*d*	*d*
Calcium ICAP (mg/L)	6/6	130	58	97	*d*	*d*
Calcium filtered ICAP (mg/L)	6/6	120	58	88	*d*	*d*
Chromium AAS (mg/L)	3/6	0.053	0.012	0.027	0.05	1
Copper ICAP (mg/L)	2/6	0.017	0.0097	0.013	1	0
Copper filtered ICAP (mg/L)	1/6	0.0046	0.0046	0.0046	1	0
Iron ICAP (mg/L)	6/6	1.5	0.11	0.71	0.3	3
Iron filtered ICAP (mg/L)	6/6	0.12	0.0076	0.061	0.3	0
Lead AAS (mg/L)	1/6	0.011	0.011	0.011	0.05	0
Magnesium ICAP (mg/L)	6/6	11	9.3	10	*d*	*d*
Magnesium filtered ICAP (mg/L)	6/6	11	8.2	9.7	*d*	*d*
Manganese ICAP (mg/L)	6/6	0.38	0.015	0.20	0.05	4
Manganese filtered ICAP (mg/L)	6/6	0.57	0.014	0.22	0.05	4
Potassium ICAP (mg/L)	6/6	2.3	0.79	1.6	*d*	*d*
Potassium filtered ICAP (mg/L)	5/6	2.6	1.5	1.9	*d*	*d*
Selenium ICAP (mg/L)	1/6	0.061	0.061	0.061	0.01	1
Sodium ICAP (mg/L)	6/6	27	8.4	16	*d*	*d*
Sodium filtered ICAP (mg/L)	6/6	26	9.4	15	*d*	*d*
Strontium ICAP (mg/L)	6/6	0.62	0.22	0.36	*d*	*d*
Strontium filtered ICAP (mg/L)	6/6	0.63	0.20	0.35	*d*	*d*
Uranium fluorimetric (mg/L)	4/6	0.0010	0.0010	0.0010	0.02	0
Uranium filtered fluorimetric (mg/L)	4/6	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	2/6	0.0077	0.0069	0.0073	*d*	*d*
Zinc ICAP (mg/L)	6/6	0.019	0.0033	0.011	5	0
Zinc filtered ICAP (mg/L)	6/6	0.088	0.0031	0.023	5	0
Conductivity, field measurement (μmhos/cm)	*d*/6	720	420	550	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/6	4.9	0.30	2.6	*d*	*d*
pH, field measurement (standard units)	*d*/6	7.5	7.2	7.4	6.5/8.5	0
Redox, field measurement (mV)	*d*/6	150	−17	41	*d*	*d*
Water temperature, field measurement (°C)	*d*/6	21	16	18	30.5	0
Alkalinity-HCO_3 (mg/L)	6/6	280	200	230	*d*	*d*
Conductivity (μmhos/cm)	6/6	710	430	540	*d*	*d*
Dissolved solids (mg/L)	6/6	490	270	370	500	0
pH (standard units)	*d*/6	7.6	7.3	7.5	6.5/8.5	0
Total suspended solids (mg/L)	5/6	490	3.0	200	*d*	*d*
Turbidity (NTU)	6/6	230	0.80	100	1	5
Gross alpha (pCi/L)	4/6	8.5	4.7	6.5	15	0
Gross beta (pCi/L)	5/6	14	2.2	8.1	50	0
Methylene chloride (μg/L)	3/6	2.0BJ	1.0BJ	~1.7	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.37. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Grid K-3

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	2/2	5.1	4.4	4.7	250	0
Sulfate (mg/L)	2/2	15	15	15	250	0
Aluminum filtered ICAP (mg/L)	1/2	0.024	0.024	0.024	0.2	0
Barium ICAP (mg/L)	2/2	0.74	0.73	0.73	1	0
Barium filtered ICAP (mg/L)	2/2	0.79	0.70	0.74	1	0
Boron ICAP (mg/L)	2/2	0.11	0.10	0.10	*d*	*d*
Boron filtered ICAP (mg/L)	2/2	0.11	0.11	0.11	*d*	*d*
Calcium ICAP (mg/L)	2/2	85	74	80	*d*	*d*
Calcium filtered ICAP (mg/L)	2/2	83	75	79	*d*	*d*
Iron ICAP (mg/L)	2/2	0.24	0.22	0.23	0.3	0
Iron filtered ICAP (mg/L)	2/2	0.22	0.21	0.21	0.3	0
Magnesium ICAP (mg/L)	2/2	12	12	12	*d*	*d*
Magnesium filtered ICAP (mg/L)	2/2	12	12	12	*d*	*d*
Manganese ICAP (mg/L)	2/2	0.044	0.041	0.043	0.05	0
Manganese filtered ICAP (mg/L)	2/2	0.042	0.042	0.042	0.05	0
Potassium ICAP (mg/L)	2/2	5.2	5.0	5.1	*d*	*d*
Potassium filtered ICAP (mg/L)	2/2	5.3	5.2	5.3	*d*	*d*
Selenium ICAP (mg/L)	1/2	0.056	0.056	0.056	0.01	1
Sodium ICAP (mg/L)	2/2	6.8	5.8	6.3	*d*	*d*
Sodium filtered ICAP (mg/L)	2/2	6.5	6.2	6.4	*d*	*d*
Strontium ICAP (mg/L)	2/2	0.79	0.76	0.77	*d*	*d*
Strontium filtered ICAP (mg/L)	2/2	0.84	0.73	0.78	*d*	*d*
Zinc ICAP (mg/L)	1/2	0.0047	0.0047	0.0047	5	0
Zinc filtered ICAP (mg/L)	1/2	0.0059	0.0059	0.0059	5	0
Conductivity, field measurement (µmhos/cm)	*d*/2	490	450	470	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/2	0.90	0.40	0.65	*d*	*d*
pH, field measurement (standard units)	*d*/2	7.5	7.2	7.3	6.5/8.5	0
Redox, field measurement (mV)	*d*/2	34	18	26	*d*	*d*
Water temperature, field measurement (°C)	*d*/2	17	16	16	30.5	0
Alkalinity-HCO_3 (mg/L)	2/2	240	240	240	*d*	*d*
Conductivity (µmhos/cm)	2/2	500	490	490	*d*	*d*
Dissolved solids (mg/L)	2/2	300	290	300	500	0
pH (standard units)	*d*/2	7.5	7.4	7.4	6.5/8.5	0
Total suspended solids (mg/L)	1/2	1.0	1.0	1.0	*d*	*d*
Turbidity (NTU)	2/2	3.0	2.7	2.8	1	2
Gross alpha (pCi/L)	1/2	2.4	2.4	2.4	15	0
Gross beta (pCi/L)	1/2	6.0	6.0	6.0	50	0
Methylene chloride (µg/L)	1/2	2.0BJ	2.0BJ	~2.0	*d*	*d*

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.38. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
J-Primary

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	4/4	46	23	34	250	0
Fluoride (mg/L)	1/4	0.20	0.20	0.20	4	0
Sulfate (mg/L)	4/4	13	1.5	7.2	250	0
Aluminum ICAP (mg/L)	4/4	2.5	0.30	1.1	0.2	4
Aluminum filtered ICAP (mg/L)	3/4	0.041	0.031	0.036	0.2	0
Barium ICAP (mg/L)	4/4	0.62	0.098	0.35	1	0
Barium filtered ICAP (mg/L)	4/4	0.58	0.099	0.34	1	0
Boron ICAP (mg/L)	4/4	0.12	0.031	0.075	*d*	*d*
Boron filtered ICAP (mg/L)	4/4	0.12	0.030	0.073	*d*	*d*
Calcium ICAP (mg/L)	4/4	120	72	95	*d*	*d*
Calcium filtered ICAP (mg/L)	4/4	120	73	95	*d*	*d*
Copper filtered ICAP (mg/L)	1/4	0.0099	0.0099	0.0099	1	0
Iron ICAP (mg/L)	4/4	17	1.4	8.3	0.3	4
Iron filtered ICAP (mg/L)	4/4	17	0.11	7.1	0.3	2
Lead AAS (mg/L)	2/4	0.010	0.0075	0.0087	0.05	0
Magnesium ICAP (mg/L)	4/4	24	10	17	*d*	*d*
Magnesium filtered ICAP (mg/L)	4/4	23	11	17	*d*	*d*
Manganese ICAP (mg/L)	4/4	1.2	0.37	0.73	0.05	4
Manganese filtered ICAP (mg/L)	4/4	1.2	0.30	0.72	0.05	4
Nickel filtered ICAP (mg/L)	2/4	0.013	0.011	0.012	*d*	*d*
Potassium ICAP (mg/L)	4/4	4.4	1.2	2.8	*d*	*d*
Potassium filtered ICAP (mg/L)	4/4	4.2	1.1	2.5	*d*	*d*
Sodium ICAP (mg/L)	4/4	8.8	7.4	8.1	*d*	*d*
Sodium filtered ICAP (mg/L)	4/4	8.6	7.4	8.2	*d*	*d*
Strontium ICAP (mg/L)	4/4	0.76	0.21	0.48	*d*	*d*
Strontium filtered ICAP (mg/L)	4/4	0.75	0.22	0.48	*d*	*d*
Zinc ICAP (mg/L)	4/4	0.040	0.0022	0.015	5	0
Zinc filtered ICAP (mg/L)	4/4	0.021	0.0056	0.012	5	0
Conductivity, field measurement (μmhos/cm)	*d*/4	780	540	650	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/4	2.7	0.60	1.3	*d*	*d*
pH, field measurement (standard units)	*d*/4	7.3	6.4	6.9	6.5/8.5	1
Redox, field measurement (mV)	*d*/4	5.0	–95	–40	*d*	*d*
Water temperature, field measurement (°C)	*d*/4	22	17	20	30.5	0
Alkalinity-HCO_3 (mg/L)	4/4	300	260	280	*d*	*d*
Conductivity (μmhos/cm)	4/4	700	570	640	*d*	*d*
Dissolved solids (mg/L)	4/4	420	310	370	500	0
pH (standard units)	*d*/4	7.7	7.0	7.3	6.5/8.5	0
Total suspended solids (mg/L)	4/4	65	19	41	*d*	*d*
Turbidity (NTU)	4/4	52	19	38	1	4
Gross alpha (pCi/L)	2/4	2.9	2.8	2.8	15	0
Gross beta (pCi/L)	3/4	6.0	2.4	4.2	50	0

Table 5.38 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,1,1-Trichloroethane (µg/L)	1/4	5.0	5.0	5.0	200	0
1,1-Dichloroethane (µg/L)	1/4	1.0J	1.0J	~1.0	*d*	*d*
1,1-Dichloroethene (µg/L)	2/4	9.0	2.0J	~5.5	7	1
1,2-Dichloroethene (µg/L)	4/4	260	80	~140	70	4
Methylene chloride (µg/L)	2/4	2.0BJ	1.0BJ	~1.5	*d*	*d*
Tetrachloroethene (µg/L)	4/4	1000D	10	~430	5	4
Toluene (µg/L)	2/4	0.70BJ	0.70BJ	~0.70	1000	0
Trichloroethene (µg/L)	4/4	38D	4.0J	~21	5	2
Vinyl chloride (µg/L)	3/4	92	5.0J	~44	2	3

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.39. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
New Hope Pond

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	52/52	180	2.0	40	250	0
Fluoride (mg/L)	40/52	2.5	0.10	0.36	4	0
Nitrate nitrogen (mg/L)	35/52	5.0	0.20	1.1	10	0
Sulfate (mg/L)	52/52	50	4.2	18	250	0
Aluminum ICAP (mg/L)	46/52	27	0.021	1.1	0.2	19
Aluminum filtered ICAP (mg/L)	36/52	0.48	0.020	0.057	0.2	1
Barium ICAP (mg/L)	52/52	0.55	0.030	0.16	1	0
Barium filtered ICAP (mg/L)	52/52	0.53	0.025	0.15	1	0
Beryllium ICAP (mg/L)	5/52	0.0033	0.0005	0.0012	*d*	*d*
Beryllium filtered ICAP (mg/L)	2/52	0.0014	0.0003	0.0008	*d*	*d*
Boron ICAP (mg/L)	52/52	1.1	0.0068	0.14	*d*	*d*
Boron filtered ICAP (mg/L)	52/52	0.86	0.0099	0.15	*d*	*d*
Cadmium AAS (mg/L)	1/52	0.016	0.016	0.016	0.005	1
Cadmium filtered AAS (mg/L)	2/52	0.0037	0.0021	0.0029	0.005	0
Calcium ICAP (mg/L)	52/52	110	1.0	60	*d*	*d*
Calcium filtered ICAP (mg/L)	52/52	110	1.0	58	*d*	*d*
Chromium AAS (mg/L)	11/52	1.5	0.010	0.24	0.05	6
Cobalt ICAP (mg/L)	4/52	0.029	0.0051	0.013	*d*	*d*
Cobalt filtered ICAP (mg/L)	4/52	0.012	0.0055	0.0073	*d*	*d*
Copper ICAP (mg/L)	17/52	0.038	0.0046	0.011	1	0
Copper filtered ICAP (mg/L)	11/52	0.018	0.0046	0.0071	1	0
Iron ICAP (mg/L)	49/52	22	0.0075	1.5	0.3	30
Iron filtered ICAP (mg/L)	44/52	2.7	0.0050	0.33	0.3	14
Lead AAS (mg/L)	7/52	0.064	0.0043	0.018	0.05	1
Magnesium ICAP (mg/L)	52/52	53	0.23	18	*d*	*d*
Magnesium filtered ICAP (mg/L)	52/52	31	0.24	18	*d*	*d*
Manganese ICAP (mg/L)	48/52	0.69	0.0013	0.16	0.05	23
Manganese filtered ICAP (mg/L)	40/52	0.55	0.0012	0.16	0.05	19
Mercury CVAA (mg/L)	1/52	0.0002	0.0002	0.0002	0.002	0
Molybdenum ICAP (mg/L)	1/52	0.011	0.011	0.011	*d*	*d*
Molybdenum filtered ICAP (mg/L)	1/52	0.015	0.015	0.015	*d*	*d*
Nickel ICAP (mg/L)	13/52	0.98	0.012	0.22	*d*	*d*
Nickel filtered ICAP (mg/L)	9/52	1.0	0.011	0.30	*d*	*d*
Potassium ICAP (mg/L)	51/52	13	0.82	3.2	*d*	*d*
Potassium filtered ICAP (mg/L)	51/52	12	1.2	3.0	*d*	*d*
Selenium ICAP (mg/L)	1/52	0.051	0.051	0.051	0.01	1
Selenium filtered ICAP (mg/L)	1/52	0.052	0.052	0.052	0.01	1
Sodium ICAP (mg/L)	52/52	190	1.2	34	*d*	*d*
Sodium filtered ICAP (mg/L)	52/52	180	1.2	34	*d*	*d*
Strontium ICAP (mg/L)	52/52	0.58	0.032	0.25	*d*	*d*
Strontium filtered ICAP (mg/L)	52/52	0.58	0.031	0.25	*d*	*d*
Uranium fluorimetric (mg/L)	21/52	0.18	0.0010	0.035	0.02	4
Uranium filtered fluorimetric (mg/L)	21/52	0.18	0.0010	0.034	0.02	4
Vanadium ICAP (mg/L)	3/52	0.045	0.0057	0.019	*d*	*d*
Zinc ICAP (mg/L)	49/52	0.26	0.0025	0.026	5	0
Zinc filtered ICAP (mg/L)	50/52	0.15	0.0024	0.016	5	0
Conductivity, field measurement (μmhos/cm)	*d*/52	830	270	560	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/52	9.8	0.30	2.6	*d*	*d*
pH, field measurement (standard units)	*d*/52	9.2	6.5	7.5	6.5/8.5	4
Redox, field measurement (mV)	*d*/52	210	−190	87	*d*	*d*
Water temperature, field measurement (°C)	*d*/52	22.0	11	17	30.5	0

Table 5.39 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-CO_3 (mg/L)	4/52	48	42	46	*d*	*d*
Alkalinity-HCO_3 (mg/L)	52/52	340	160	230	*d*	*d*
Conductivity (μmhos/cm)	52/52	960	320	590	*d*	*d*
Dissolved solids (mg/L)	52/52	630	180	350	500	3
pH (standard units)	*d*/52	9.1	7.0	7.6	6.5/8.5	4
Total suspended solids (mg/L)	43/52	680	1.0	37	*d*	*d*
Turbidity (NTU)	52/52	600	0.30	32	1	44
Gross alpha (pCi/L)	23/52	76	1.6	15	15	5
Gross beta (pCi/L)	34/52	69	2.3	14	50	2
1,1,1-Trichloroethane (μg/L)	2/52	1.0BJ	1.0BJ	~1.0	200	0
1,1-Dichloroethane (μg/L)	4/52	3.0J	2.0J	~2.5	*d*	*d*
1,1-Dichloroethene (μg/L)	4/52	2.0J	1.0J	~1.3	7	0
1,2-Dichloroethene (μg/L)	9/52	110	1.0J	~53	70	4
2-Butanone (μg/L)	2/52	10B	1.0BJ	~5.5	*d*	*d*
4-Methyl-2-pentanone (μg/L)	8/52	630D	1.0BJ	~160	*d*	*d*
Acetone (μg/L)	6/52	50BDJ	2.0BJ	~13	*d*	*d*
Bromomethane (μg/L)	1/52	1.0J	1.0J	~1.0	*d*	*d*
Carbon disulfide (μg/L)	1/52	1.0BJ	1.0BJ	~1.0	*d*	*d*
Carbon tetrachloride (μg/L)	32/52	6,700D	2.0J	~1600	5	29
Chloroform (μg/L)	36/52	1,300D	1.0J	~180	100	12
Chloromethane (μg/L)	1/52	19DJ	19DJ	~19	*d*	*d*
Ethylbenzene (μg/L)	1/52	1.0J	1.0J	~1.0	700	0
Methylene chloride (μg/L)	19/52	65BDJ	1.0BJ	~13	*d*	*d*
Tetrachloroethene (μg/L)	23/52	390D	2.0J	~110	5	22
Toluene (μg/L)	1/52	25DJ	25DJ	~25	1,000	0
Trichloroethene (μg/L)	15/52	130	1.0J	~41	5	10
Vinyl chloride (μg/L)	1/52	2J	2.0J	~2.0	2	0
Xylenes (μg/L)	1/52	1.0BJ	1.0BJ	~1.0	10,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.40. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Rust Garage Area

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	7/7	170	20	66	250	0
Fluoride (mg/L)	7/7	0.40	0.10	0.24	4	0
Nitrate nitrogen (mg/L)	4/7	1.3	0.90	1.1	10	0
Sulfate (mg/L)	7/7	36	7.6	19	250	0
Aluminum ICAP (mg/L)	7/7	7.7	0.82	2.9	0.2	7
Aluminum filtered ICAP (mg/L)	5/7	3.7	0.060	1.7	0.2	4
Barium ICAP (mg/L)	7/7	0.59	0.066	0.24	1	0
Barium filtered ICAP (mg/L)	7/7	0.75	0.027	0.29	1	0
Beryllium ICAP (mg/L)	6/7	0.0039	0.0004	0.0016	*d*	*d*
Beryllium filtered ICAP (mg/L)	4/7	0.0049	0.0004	0.0028	*d*	*d*
Boron ICAP (mg/L)	7/7	0.092	0.020	0.054	*d*	*d*
Boron filtered ICAP (mg/L)	7/7	0.10	0.021	0.061	*d*	*d*
Calcium ICAP (mg/L)	7/7	39	5.1	19	*d*	*d*
Calcium filtered ICAP (mg/L)	7/7	45	6.9	20	*d*	*d*
Chromium AAS (mg/L)	4/7	0.078	0.011	0.044	0.05	2
Chromium filtered AAS (mg/L)	1/7	0.032	0.032	0.032	0.05	0
Cobalt ICAP (mg/L)	5/7	0.21	0.0091	0.094	*d*	*d*
Cobalt filtered ICAP (mg/L)	4/7	0.25	0.0060	0.16	*d*	*d*
Copper ICAP (mg/L)	4/7	0.011	0.0046	0.0077	1	0
Copper filtered ICAP (mg/L)	4/7	0.027	0.0069	0.014	1	0
Iron ICAP (mg/L)	7/7	7.0	0.094	2.1	0.3	5
Iron filtered ICAP (mg/L)	6/7	3.6	0.0057	0.62	0.3	1
Lead AAS (mg/L)	2/7	0.0098	0.0052	0.0075	0.05	0
Magnesium ICAP (mg/L)	7/7	14	5.2	8.5	*d*	*d*
Magnesium filtered ICAP (mg/L)	7/7	19	4.4	10	*d*	*d*
Manganese ICAP (mg/L)	7/7	6.2	0.089	2.4	0.05	7
Manganese filtered ICAP (mg/L)	7/7	7.7	0.0089	2.9	0.05	4
Mercury CVAA (mg/L)	2/7	0.0003	0.0002	0.0003	0.002	0
Molybdenum ICAP (mg/L)	1/7	0.012	0.012	0.012	*d*	*d*
Nickel ICAP (mg/L)	6/7	0.11	0.017	0.051	*d*	*d*
Nickel filtered ICAP (mg/L)	4/7	0.15	0.012	0.090	*d*	*d*
Potassium ICAP (mg/L)	7/7	3.6	0.91	2.1	*d*	*d*
Potassium filtered ICAP (mg/L)	7/7	2.9	0.91	1.7	*d*	*d*
Sodium ICAP (mg/L)	7/7	24	6.8	14	*d*	*d*
Sodium filtered ICAP (mg/L)	7/7	29	6.7	16	*d*	*d*
Strontium ICAP (mg/L)	7/7	0.13	0.047	0.075	*d*	*d*
Strontium filtered ICAP (mg/L)	7/7	0.15	0.053	0.084	*d*	*d*
Uranium fluorimetric (mg/L)	4/7	0.014	0.0080	0.011	0.02	0
Uranium filtered fluorimetric (mg/L)	4/7	0.016	0.0010	0.0072	0.02	0
Vanadium ICAP (mg/L)	2/7	0.0097	0.0073	0.0085	*d*	*d*
Zinc ICAP (mg/L)	7/7	0.13	0.011	0.056	5	0
Zinc filtered ICAP (mg/L)	7/7	0.17	0.0044	0.066	5	0
Conductivity, field measurement (μmhos/cm)	*d*/7	380	240	310	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/7	6.2	1.7	3.1	*d*	*d*
pH, field measurement (standard units)	*d*/7	6.1	4.1	5.2	6.5/8.5	7
Redox, field measurement (mV)	*d*/7	290	150	220	*d*	*d*
Water temperature, field measurement (°C)	*d*/7	24	14	19	30.5	0
Alkalinity-HCO_3 (mg/L)	6/7	83	2.0	38	*d*	*d*
Conductivity (μmhos/cm)	7/7	540	220	320	*d*	*d*
Dissolved solids (mg/L)	7/7	320	150	220	500	0

Table 5.40 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
pH (standard units)	*d*/7	6.1	4.4	5.4	6.5/8.5	7
Total petroleum hydrocarbons (mg/L)	4/5	56	0.0020	14	1	1
Total suspended solids (mg/L)	7/7	420	10	110	*d*	*d*
Turbidity (NTU)	7/7	150	10	47	1	7
Gross alpha (pCi/L)	7/7	20	1.7	9.2	15	2
Gross beta (pCi/L)	7/7	33	3.2	12	50	0
1,1-Dichloroethene (µg/L)	2/7	2.0J	2.0J	~2.0	7	0
Benzene (µg/L)	3/7	21,000D	8,800D	~13,000	5	3
Ethylbenzene (µg/L)	3/7	3,400D	3,000D	~3,200	700	3
Methylene chloride (µg/L)	1/7	2.0BJ	2.0BJ	~2.0	*d*	*d*
Styrene (µg/L)	1/7	270DJ	270DJ	~270	100	1
Tetrachloroethene (µg/L)	1/7	1.0J	1.0J	~1.0	5	0
Toluene (µg/L)	3/7	42,000D	28,000D	~35,000	1,000	3
Vinyl acetate (µg/L)	1/7	260DJ	260DJ	~260	*d*	*d*
Xylenes (µg/L)	3/7	22,000D	17,000D	~19,000	10,000	3

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.41. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
S2 Site

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	12/12	12	1.7	6.4	250	0
Fluoride (mg/L)	8/12	1.5	0.20	0.80	4	0
Nitrate nitrogen (mg/L)	12/12	83	0.90	20	10	4
Sulfate (mg/L)	12/12	21	4.6	11	250	0
Aluminum ICAP (mg/L)	11/12	6.8	0.049	2.6	0.2	10
Aluminum filtered ICAP (mg/L)	7/12	0.69	0.023	0.16	0.2	1
Barium ICAP (mg/L)	12/12	0.14	0.014	0.060	1	0
Barium filtered ICAP (mg/L)	12/12	0.13	0.014	0.050	1	0
Beryllium ICAP (mg/L)	7/12	0.0018	0.0006	0.0010	*d*	*d*
Beryllium filtered ICAP (mg/L)	3/12	0.0006	0.0003	0.0004	*d*	*d*
Boron ICAP (mg/L)	11/12	0.094	0.015	0.041	*d*	*d*
Boron filtered ICAP (mg/L)	12/12	0.089	0.0085	0.033	*d*	*d*
Cadmium AAS (mg/L)	4/12	0.24	0.089	0.16	0.005	4
Cadmium filtered AAS (mg/L)	4/12	0.25	0.082	0.17	0.005	4
Calcium ICAP (mg/L)	12/12	140	19	65	*d*	*d*
Calcium filtered ICAP (mg/L)	12/12	130	20	64	*d*	*d*
Chromium AAS (mg/L)	10/12	0.032	0.011	0.017	0.05	0
Chromium filtered AAS (mg/L)	1/12	0.015	0.015	0.015	0.05	0
Cobalt ICAP (mg/L)	5/12	0.046	0.0059	0.028	*d*	*d*
Cobalt filtered ICAP (mg/L)	4/12	0.043	0.0057	0.025	*d*	*d*
Copper ICAP (mg/L)	9/12	0.76	0.0042	0.31	1	0
Copper filtered ICAP (mg/L)	7/12	0.55	0.0045	0.22	1	0
Iron ICAP (mg/L)	12/12	8.0	0.060	2.8	0.3	10
Iron filtered ICAP (mg/L)	7/12	1.1	0.0069	0.18	0.3	1
Lead AAS (mg/L)	9/12	0.053	0.0041	0.023	0.05	1
Lead filtered AAS (mg/L)	1/12	0.0041	0.0041	0.0041	0.05	0
Magnesium ICAP (mg/L)	12/12	31	11	22	*d*	*d*
Magnesium filtered ICAP (mg/L)	12/12	28	12	21	*d*	*d*
Manganese ICAP (mg/L)	12/12	5.9	0.0018	1.4	0.05	7
Manganese filtered ICAP (mg/L)	8/12	5.9	0.0017	1.9	0.05	4
Mercury CVAA (mg/L)	6/12	0.0004	0.0002	0.0003	0.002	0
Mercury filtered CVAA (mg/L)	1/12	0.0003	0.0003	0.0003	0.002	0
Nickel ICAP (mg/L)	5/12	0.072	0.018	0.035	*d*	*d*
Nickel filtered ICAP (mg/L)	5/12	0.060	0.019	0.034	*d*	*d*
Potassium ICAP (mg/L)	12/12	3.9	1.1	2.3	*d*	*d*
Potassium filtered ICAP (mg/L)	12/12	3.8	0.75	1.9	*d*	*d*
Sodium ICAP (mg/L)	12/12	20	3.4	8.9	*d*	*d*
Sodium filtered ICAP (mg/L)	12/12	20	3.4	9.7	*d*	*d*
Strontium ICAP (mg/L)	12/12	0.22	0.015	0.072	*d*	*d*
Strontium filtered ICAP (mg/L)	12/12	0.22	0.016	0.073	*d*	*d*
Uranium fluorimetric (mg/L)	5/12	0.0080	0.0010	0.0062	0.02	0
Uranium filtered fluorimetric (mg/L)	5/12	0.0050	0.0010	0.0036	0.02	0
Vanadium ICAP (mg/L)	4/12	0.013	0.0053	0.0090	*d*	*d*
Zinc ICAP (mg/L)	12/12	0.14	0.0088	0.052	5	0
Zinc filtered ICAP (mg/L)	11/12	0.12	0.0039	0.037	5	0
Conductivity, field measurement (μmhos/cm)	*d*/12	1000	200	570	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/12	14	0.30	4.2	*d*	*d*
pH, field measurement (standard units)	*d*/12	7.8	6.1	7.1	6.5/8.5	1
Redox, field measurement (mV)	*d*/12	280	110	210	*d*	*d*
Water temperature, field measurement (°C)	*d*/12	20	12	15	30.5	0

Table 5.41 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-HCO_3 (mg/L)	12/12	250	120	190	*d*	*d*
Conductivity (μmhos/cm)	12/12	1100	280	610	*d*	*d*
Dissolved solids (mg/L)	12/12	660	140	380	500	4
pH (standard units)	*d*/12	8.2	6.6	7.4	6.5/8.5	0
Total suspended solids (mg/L)	11/12	680	4.0	160	*d*	*d*
Turbidity (NTU)	12/12	700	1.1	120	1	12
Gross alpha (pCi/L)	6/12	28	2.1	11	15	2
Gross beta (pCi/L)	8/12	39	3.2	15	50	0
1,2-Dichloroethene (μg/L)	4/12	12	2.0J	~5.7	70	0
4-Methyl-2-pentanone (μg/L)	1/12	2.0BJ	2.0BJ	~2.0	*d*	*d*
Acetone (μg/L)	2/12	29B	2.0BJ	~16	*d*	*d*
Carbon tetrachloride (μg/L)	4/12	9.0DJ	5.0	~6.8	5	3
Chloroform (μg/L)	10/12	8.0	1.0J	~3.6	100	0
Methylene chloride (μg/L)	3/12	2.0BJ	1.0BJ	~1.7	*d*	*d*
Tetrachloroethene (μg/L)	6/12	230D	0.70J	~110	5	3
Trichloroethene (μg/L)	5/12	110	0.90J	~55	5	4

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.42. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
S3 Ponds

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	16/16	30	2.0	9.7	250	0
Fluoride (mg/L)	8/16	0.20	0.10	0.15	4	0
Nitrate nitrogen (mg/L)	16/16	6.0	0.52	1.5	10	0
Sulfate (mg/L)	16/16	35	4.0	17	250	0
Aluminum ICAP (mg/L)	15/16	8.6	0.029	1.1	0.2	11
Aluminum filtered ICAP (mg/L)	13/16	1.5	0.035	0.43	0.2	5
Barium ICAP (mg/L)	16/16	0.097	0.0081	0.045	1	0
Barium filtered ICAP (mg/L)	16/16	0.11	0.0052	0.040	1	0
Beryllium ICAP (mg/L)	1/16	0.0009	0.0009	0.0009	*d*	*d*
Beryllium filtered ICAP (mg/L)	1/16	0.0005	0.0005	0.0005	*d*	*d*
Boron ICAP (mg/L)	16/16	0.25	0.036	0.11	*d*	*d*
Boron filtered ICAP (mg/L)	16/16	0.21	0.023	0.098	*d*	*d*
Cadmium AAS (mg/L)	4/16	0.018	0.015	0.016	0.005	4
Calcium ICAP (mg/L)	16/16	340	20	85	*d*	*d*
Calcium filtered ICAP (mg/L)	16/16	340	14	85	*d*	*d*
Chromium AAS (mg/L)	5/16	0.030	0.012	0.017	0.05	0
Cobalt ICAP (mg/L)	2/16	0.017	0.0067	0.012	*d*	*d*
Cobalt filtered ICAP (mg/L)	1/16	0.017	0.017	0.017	*d*	*d*
Copper ICAP (mg/L)	9/16	0.017	0.0042	0.0070	1	0
Copper filtered ICAP (mg/L)	5/16	0.0083	0.0052	0.0060	1	0
Iron ICAP (mg/L)	16/16	7.8	0.022	1.1	0.3	8
Iron filtered ICAP (mg/L)	14/16	1.8	0.0081	0.36	0.3	6
Lead AAS (mg/L)	1/16	0.0090	0.0090	0.0090	0.05	0
Lead filtered AAS (mg/L)	1/16	0.0047	0.0047	0.0047	0.05	0
Magnesium ICAP (mg/L)	16/16	9.6	1.6	5.2	*d*	*d*
Magnesium filtered ICAP (mg/L)	16/16	9.0	0.027	4.2	*d*	*d*
Manganese ICAP (mg/L)	14/16	1.9	0.0016	0.86	0.05	8
Manganese filtered ICAP (mg/L)	13/16	2.3	0.0016	0.97	0.05	8
Nickel ICAP (mg/L)	1/16	0.013	0.013	0.013	*d*	*d*
Nickel filtered ICAP (mg/L)	1/16	0.014	0.014	0.014	*d*	*d*
Potassium ICAP (mg/L)	16/16	43	1.1	11	*d*	*d*
Potassium filtered ICAP (mg/L)	16/16	54	1.2	13	*d*	*d*
Selenium filtered ICAP (mg/L)	1/16	0.056	0.056	0.056	0.01	1
Sodium ICAP (mg/L)	16/16	20	2.9	8.0	*d*	*d*
Sodium filtered ICAP (mg/L)	16/16	20	3.1	8.3	*d*	*d*
Strontium ICAP (mg/L)	16/16	0.70	0.037	0.18	*d*	*d*
Strontium filtered ICAP (mg/L)	16/16	0.73	0.035	0.19	*d*	*d*
Uranium fluorimetric (mg/L)	3/16	0.0020	0.0010	0.0017	0.02	0
Uranium filtered fluorimetric (mg/L)	5/16	0.0020	0.0010	0.0012	0.02	0
Vanadium ICAP (mg/L)	3/16	0.013	0.0061	0.0086	*d*	*d*
Vanadium filtered ICAP (mg/L)	3/16	0.0095	0.0050	0.0068	*d*	*d*
Zinc ICAP (mg/L)	14/16	0.080	0.0041	0.019	5	0
Zinc filtered ICAP (mg/L)	15/16	0.045	0.0032	0.014	5	0
Conductivity, field measurement (μmhos/cm)	*d*/16	780	120	340	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/16	8.8	0.40	2.4	*d*	*d*
pH, field measurement (standard units)	*d*/16	10	5.5	7.7	6.5/8.5	12
Redox, field measurement (mV)	*d*/16	240	−25	93	*d*	*d*
Water temperature, field measurement (°C)	*d*/16	26	14	17	30.5	0
Alkalinity-CO_3 (mg/L)	5/16	38	4.0	12	*d*	*d*
Alkalinity-HCO_3 (mg/L)	16/16	280	30	130	*d*	*d*

Table 5.42 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Conductivity (μmhos/cm)	16/16	680	150	320	*d*	*d*
Dissolved solids (mg/L)	16/16	390	76	180	500	0
pH (standard units)	*d*/16	11	5.8	7.8	6.5/8.5	8
Total suspended solids (mg/L)	13/16	6,000	2.0	480	*d*	*d*
Turbidity (NTU)	16/16	64	0.36	13	1	10
Gross alpha (pCi/L)	8/16	13	1.5	4.6	15	0
Gross beta (pCi/L)	12/16	39	2.4	21	50	0
1,1,1-Trichloroethane (μg/L)	4/16	19DJ	1.0DJ	~6.0	200	0
1,1,2-Trichloroethane (μg/L)	3/16	21BDJ	3.0BDJ	~11	*d*	*d*
1,1-Dichloroethene (μg/L)	2/16	22DJ	2.0DJ	~12	7	1
1,2-Dichloroethane (μg/L)	1/16	8.0DJ	8.0DJ	~8.0	5	1
1,2-Dichloroethene (μg/L)	16/16	980D	6.0	~300	70	7
2-Butanone (μg/L)	2/16	36BDJ	13BDJ	~25	*d*	*d*
4-Methyl-2-pentanone (μg/L)	5/16	16BDJ	2.0BJ	~8.0	*d*	*d*
Acetone (μg/L)	6/16	93BD	2.0BJ	~27	*d*	*d*
Carbon disulfide (μg/L)	2/16	10BDJ	2.0BDJ	~6.0	*d*	*d*
Ethylbenzene (μg/L)	2/16	12DJ	3.0DJ	~7.5	700	0
Methylene chloride (μg/L)	9/16	110BD	1.0BJ	~20	*d*	*d*
Tetrachloroethene (μg/L)	15/16	840D	2.0J	~290	5	11
Trichloroethene (μg/L)	16/16	320D	1.0J	~110	5	11
Vinyl chloride (μg/L)	4/16	11	2.0J	~5.0	2	3
Xylenes (μg/L)	2/16	10BDJ	2.0BDJ	~6.0	10,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.43. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
U.S. Geological Survey Sites

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	29/32	410	1.0	50	250	4
Fluoride (mg/L)	24/32	2.7	0.10	0.85	4	0
Nitrate nitrogen (mg/L)	12/32	0.90	0.29	0.62	10	0
Sulfate (mg/L)	31/32	110	2.6	35	250	0
Aluminum ICAP (mg/L)	21/32	53	0.021	8.0	0.2	8
Aluminum filtered ICAP (mg/L)	19/32	0.44	0.021	0.067	0.2	1
Barium ICAP (mg/L)	32/32	0.65	0.0070	0.14	1	0
Barium filtered ICAP (mg/L)	32/32	0.28	0.0044	0.074	1	0
Beryllium ICAP (mg/L)	7/32	0.0095	0.0003	0.0040	*d*	*d*
Beryllium filtered ICAP (mg/L)	2/32	0.0003	0.0003	0.0003	*d*	*d*
Boron ICAP (mg/L)	32/32	1.9	0.015	0.45	*d*	*d*
Boron filtered ICAP (mg/L)	32/32	1.8	0.010	0.43	*d*	*d*
Cadmium AAS (mg/L)	2/32	0.011	0.0021	0.0066	0.005	1
Calcium ICAP (mg/L)	32/32	140	1.4	54	*d*	*d*
Calcium filtered ICAP (mg/L)	32/32	82	1.1	46	*d*	*d*
Chromium AAS (mg/L)	9/32	0.72	0.012	0.18	0.05	8
Cobalt ICAP (mg/L)	8/32	0.069	0.0065	0.027	*d*	*d*
Cobalt filtered ICAP (mg/L)	3/32	0.011	0.0061	0.0088	*d*	*d*
Copper ICAP (mg/L)	13/32	0.097	0.0047	0.030	1	0
Copper filtered ICAP (mg/L)	8/32	0.046	0.0041	0.011	1	0
Iron ICAP (mg/L)	32/32	130	0.074	12	0.3	22
Iron filtered ICAP (mg/L)	30/32	11	0.0085	1.1	0.3	11
Lead AAS (mg/L)	11/32	1.2	0.0096	0.22	0.05	8
Magnesium ICAP (mg/L)	32/32	72	0.45	20	*d*	*d*
Magnesium filtered ICAP (mg/L)	32/32	37	0.43	16	*d*	*d*
Manganese ICAP (mg/L)	29/32	8.4	0.0012	0.84	0.05	11
Manganese filtered ICAP (mg/L)	27/32	1.3	0.0011	0.16	0.05	4
Mercury CVAA (mg/L)	3/32	0.0015	0.0003	0.0007	0.002	0
Nickel ICAP (mg/L)	6/32	0.098	0.014	0.040	*d*	*d*
Nickel filtered ICAP (mg/L)	1/32	0.010	0.010	0.010	*d*	*d*
Potassium ICAP (mg/L)	32/32	26	2.1	4.9	*d*	*d*
Potassium filtered ICAP (mg/L)	32/32	7.9	1.6	3.6	*d*	*d*
Selenium ICAP (mg/L)	1/32	0.053	0.053	0.053	0.01	1
Silver ICAP (mg/L)	1/32	0.025	0.025	0.025	0.05	0
Silver filtered ICAP (mg/L)	3/32	0.011	0.0061	0.0077	0.05	0
Sodium ICAP (mg/L)	32/32	450	1.2	85	*d*	*d*
Sodium filtered ICAP (mg/L)	32/32	450	1.2	84	*d*	*d*
Strontium ICAP (mg/L)	32/32	1.4	0.068	0.44	*d*	*d*
Strontium filtered ICAP (mg/L)	32/32	1.4	0.053	0.43	*d*	*d*
Uranium fluorimetric (mg/L)	6/32	0.0030	0.0010	0.0013	0.02	0
Uranium filtered fluorimetric (mg/L)	3/32	0.0010	0.0010	0.0010	0.02	0
Vanadium ICAP (mg/L)	8/32	0.10	0.012	0.046	*d*	*d*
Vanadium filtered ICAP (mg/L)	2/32	0.0073	0.0060	0.0067	*d*	*d*
Zinc ICAP (mg/L)	31/32	3.0	0.0030	0.42	5	0
Zinc filtered ICAP (mg/L)	29/32	1.7	0.0030	0.20	5	0
Conductivity, field measurement (μmhos/cm)	*d*/32	1900	280	660	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/32	7.8	0.30	2.3	*d*	*d*
pH, field measurement (standard units)	*d*/32	9.7	6.6	7.8	6.5/8.5	7
Redox, field measurement (mV)	*d*/32	240	−130	−5.6	*d*	*d*
Water temperature, field measurement (°C)	*d*/32	20	12	15	30.5	0

Table 5.43 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Alkalinity-CO_3 (mg/L)	8/32	110	26	60	*d*	*d*
Alkalinity-HCO_3 (mg/L)	32/32	510	93	270	*d*	*d*
Conductivity (μmhos/cm)	32/32	1900	150	710	*d*	*d*
Dissolved solids (mg/L)	32/32	1100	110	410	500	7
pH (standard units)	*d*/32	9.5	6.5	7.8	6.5/8.5	8
Total suspended solids (mg/L)	25/32	6000	1.0	610	*d*	*d*
Turbidity (NTU)	32/32	2800	0.50	320	1	29
Gross alpha (pCi/L)	11/32	100	2.3	28	15	4
Gross beta (pCi/L)	19/32	210	2.7	27	50	2
1,2-Dichloropropane (μg/L)	1/32	2.0J	2.0J	~2.0	5	0
4-Methyl-2-pentanone (μg/L)	3/32	4.0J	0.40J	~1.8	*d*	*d*
Acetone (μg/L)	1/32	75	75	75	*d*	*d*
Carbon tetrachloride (μg/L)	4/32	120	6.0	67	5	4
Chloroform (μg/L)	5/32	31	7.0	17	100	0
Methylene chloride (μg/L)	7/32	10B	1.0BJ	~3.1	*d*	*d*
Tetrachloroethene (μg/L)	8/32	9.0	2.0J	~4.6	5	2
Toluene (μg/L)	4/32	12	0.70BJ	~3.6	1000	0
Trichloroethene (μg/L)	8/32	4.0J	1.0J	~2.6	5	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.44. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Underground Storage Tank Program

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	67/71	330	2.0	47	250	4
Fluoride (mg/L)	42/71	1.4	0.10	0.36	4	0
Nitrate nitrogen (mg/L)	29/71	6,400	0.24	690	10	8
Sulfate (mg/L)	58/71	73	1.2	17	250	0
Aluminum ICAP (mg/L)	68/71	37	0.022	2.3	0.2	46
Aluminum filtered ICAP (mg/L)	49/71	0.45	0.021	0.11	0.2	12
Arsenic ICAP (mg/L)	4/71	0.061	0.052	0.056	0.05	4
Arsenic filtered ICAP (mg/L)	1/71	0.062	0.062	0.062	0.05	1
Barium ICAP (mg/L)	71/71	33	0.024	1.8	1	4
Barium filtered ICAP (mg/L)	71/71	25	0.017	1.4	1	4
Beryllium ICAP (mg/L)	21/71	0.0028	0.0003	0.0007	*d*	*d*
Beryllium filtered ICAP (mg/L)	10/71	0.0011	0.0003	0.0006	*d*	*d*
Boron ICAP (mg/L)	66/71	0.11	0.012	0.044	*d*	*d*
Boron filtered ICAP (mg/L)	68/71	1.9	0.0055	0.066	*d*	*d*
Cadmium AAS (mg/L)	9/71	0.015	0.0021	0.0075	0.005	4
Cadmium filtered AAS (mg/L)	7/71	0.010	0.0022	0.0052	0.005	3
Calcium ICAP (mg/L)	71/71	6,500	1.5	400	*d*	*d*
Calcium filtered ICAP (mg/L)	71/71	5,700	1.4	350	*d*	*d*
Chromium AAS (mg/L)	31/71	12	0.011	0.79	0.05	20
Chromium filtered AAS (mg/L)	3/71	0.031	0.021	0.026	0.05	0
Cobalt ICAP (mg/L)	36/71	0.13	0.0052	0.035	*d*	*d*
Cobalt filtered ICAP (mg/L)	29/71	0.11	0.0050	0.034	*d*	*d*
Copper ICAP (mg/L)	35/71	1.4	0.0042	0.066	1	1
Copper filtered ICAP (mg/L)	26/71	0.58	0.0043	0.053	1	0
Iron ICAP (mg/L)	71/71	75	0.048	6.0	0.3	62
Iron filtered ICAP (mg/L)	67/71	12	0.0087	1.7	0.3	42
Lead AAS (mg/L)	19/71	0.14	0.0042	0.025	0.05	3
Magnesium ICAP (mg/L)	71/71	460	1.7	33	*d*	*d*
Magnesium filtered ICAP (mg/L)	71/71	370	1.5	28	*d*	*d*
Manganese ICAP (mg/L)	71/71	25	0.018	2.9	0.05	69
Manganese filtered ICAP (mg/L)	71/71	27	0.011	2.9	0.05	68
Mercury CVAA (mg/L)	4/71	0.0013	0.0003	0.0006	0.002	0
Mercury filtered CVAA (mg/L)	1/71	0.0003	0.0003	0.0003	0.002	0
Molybdenum ICAP (mg/L)	4/71	0.028	0.011	0.018	*d*	*d*
Molybdenum filtered ICAP (mg/L)	4/71	0.017	0.011	0.014	*d*	*d*
Nickel ICAP (mg/L)	41/71	1.6	0.011	0.33	*d*	*d*
Nickel filtered ICAP (mg/L)	36/71	1.4	0.010	0.29	*d*	*d*
Potassium ICAP (mg/L)	67/71	18	0.95	4.5	*d*	*d*
Potassium filtered ICAP (mg/L)	68/71	100	0.75	5.4	*d*	*d*
Selenium filtered ICAP (mg/L)	3/71	0.065	0.052	0.060	0.01	3
Silver ICAP (mg/L)	1/71	0.0071	0.0071	0.0071	0.05	0
Silver filtered ICAP (mg/L)	2/71	0.079	0.0067	0.043	0.05	1
Sodium ICAP (mg/L)	71/71	120	2.9	18	*d*	*d*
Sodium filtered ICAP (mg/L)	71/71	87	2.8	17	*d*	*d*
Strontium ICAP (mg/L)	71/71	16	0.011	1.0	*d*	*d*
Strontium filtered ICAP (mg/L)	71/71	12	0.010	0.84	*d*	*d*
Uranium fluorimetric (mg/L)	45/71	0.11	0.0010	0.010	0.02	5
Uranium filtered fluorimetric (mg/L)	44/71	0.10	0.0010	0.0094	0.02	4
Vanadium ICAP (mg/L)	12/71	0.086	0.0057	0.022	*d*	*d*
Zinc ICAP (mg/L)	67/71	2.3	0.0054	0.11	5	0
Zinc filtered ICAP (mg/L)	68/71	1.4	0.0023	0.069	5	0

Table 5.44 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Conductivity, field measurement (µmhos/cm)	*d*/71	27,000	69	1,800	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/71	8.1	0.30	2.8	*d*	*d*
pH, field measurement (standard units)	*d*/71	8.5	4.3	6.4	6.5/8.5	29
Redox, field measurement (mV)	*d*/71	250	−230	39	*d*	*d*
Water temperature, field measurement (°C)	*d*/71	25	13	18	30.5	0
Alkalinity-CO_3 (mg/L)	1/71	2.0	2.0	2.0	*d*	*d*
Alkalinity-HCO_3 (mg/L)	71/71	460	11	200	*d*	*d*
Conductivity (µmhos/cm)	71/71	29,000	65	1,700	*d*	*d*
Dissolved solids (mg/L)	71/71	34,000	52	2,000	500	19
pH (standard units)	*d*/71	8.4	4.9	6.6	6.5/8.5	18
Total petroleum hydrocarbons (mg/L)	54/54	31	0.0000	2.4	1	*d*
Total suspended solids (mg/L)	66/71	19,000	1.0	740	*d*	*d*
Turbidity (NTU)	71/71	200,000	0.50	3,200	1	69
99-Technetium (pCi/L)	2/3	7,900	2,700	5,300	4,000	0
Gross alpha (pCi/L)	47/71	550	0.62	33	15	12
Gross beta (pCi/L)	58/71	710	2.2	73	50	10
Strontium (pCi/L)	2/3	59	31	45	8	2
1,1,1-Trichloroethane (µg/L)	1/71	2.0J	2.0J	J~2.0	200	0
1,1,2-Trichloroethane (µg/L)	2/71	2.0J	1.0J	J~1.5	*d*	*d*
1,1-Dichloroethane (µg/L)	2/71	8.0DJ	4.0J	~6.0	*d*	*d*
1,1-Dichloroethene (µg/L)	6/71	3,300D	1.0J	~1,400	7	4
1,2-Dichloroethane (µg/L)	9/71	1,400D	11DJ	~430	5	9
1,2-Dichloroethene (µg/L)	12/71	510D	2.0J	~150	70	5
2-Butanone (µg/L)	3/71	38DJ	1.0J	~24	*d*	*d*
2-Hexanone (µg/L)	7/71	430DJ	6.0J	~140	*d*	*d*
4-Methyl-2-pentanone (µg/L)	15/71	910BDJ	1.0BJ	~120	*d*	*d*
Acetone (µg/L)	12/71	630BDJ	1.0J	~89	*d*	*d*
Benzene (µg/L)	37/71	20,000D	1.0	~2,700	5	27
Bromoform (µg/L)	4/71	3.0J	2.0J	~2.5	100	0
Carbon disulfide (µg/L)	1/71	3.0BJ	3.0BJ	~3.0	*d*	*d*
Chloroethane (µg/L)	1/71	11	11	11	200	0
Chloroform (µg/L)	4/71	40	30	34	100	0
Chloromethane (µg/L)	4/71	1,100D	94DJ	~490	*d*	*d*
Ethylbenzene (µg/L)	27/71	1,400D	2.0J	~480	700	12
Methylene chloride (µg/L)	21/71	190BDJ	1.0BJ	~35	*d*	*d*
Styrene (µg/L)	3/71	53DJ	4.0J	~25	100	0
Tetrachloroethene (µg/L)	14/71	170DJ	5.0	~62	5	12
Toluene (µg/L)	32/71	12,000D	0.70BJ	~1,300	1,000	10
Trichloroethene (µg/L)	17/71	15,000D	1.0J	~3,300	5	15
Vinyl acetate (µg/L)	9/71	2,200D	1.0J	~380	*d*	*d*
Vinyl chloride (µg/L)	4/71	66D	5.0J	~28	2	4
Xylenes (µg/L)	31/71	43,000D	3.0J	~3,100	10,000	1

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.45. Constituents in groundwater at the Y-12 Plant site

Upper East Fork Poplar Creek Hydrogeologic Regime
Waste Coolant Facility Area

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Chloride (mg/L)	8/8	21	6.0	13	250	0
Fluoride (mg/L)	2/8	0.10	0.10	0.10	4	0
Nitrate nitrogen (mg/L)	4/8	0.45	0.26	0.39	10	0
Sulfate (mg/L)	8/8	15	5.3	10	250	0
Aluminum ICAP (mg/L)	8/8	1.1	0.030	0.48	0.2	6
Aluminum filtered ICAP (mg/L)	6/8	0.67	0.020	0.15	0.2	1
Barium ICAP (mg/L)	8/8	0.33	0.18	0.25	1	0
Barium filtered ICAP (mg/L)	8/8	0.27	0.16	0.19	1	0
Boron ICAP (mg/L)	8/8	0.14	0.0091	0.042	*d*	*d*
Boron filtered ICAP (mg/L)	8/8	0.065	0.0057	0.029	*d*	*d*
Cadmium AAS (mg/L)	2/8	0.0033	0.0021	0.0027	0.005	0
Cadmium filtered AAS (mg/L)	2/8	0.0042	0.0021	0.0032	0.005	0
Calcium ICAP (mg/L)	8/8	110	79	91	*d*	*d*
Calcium filtered ICAP (mg/L)	8/8	110	68	88	*d*	*d*
Copper ICAP (mg/L)	4/8	0.015	0.0072	0.0098	1	0
Copper filtered ICAP (mg/L)	6/8	0.020	0.0050	0.0095	1	0
Iron ICAP (mg/L)	8/8	1.5	0.0088	0.60	0.3	5
Iron filtered ICAP (mg/L)	6/8	0.85	0.0091	0.16	0.3	1
Magnesium ICAP (mg/L)	8/8	11	8.8	9.4	*d*	*d*
Magnesium filtered ICAP (mg/L)	8/8	15	7.4	9.9	*d*	*d*
Manganese ICAP (mg/L)	8/8	0.39	0.11	0.19	0.05	8
Manganese filtered ICAP (mg/L)	8/8	0.47	0.033	0.14	0.05	6
Nickel ICAP (mg/L)	1/8	0.015	0.015	0.015	*d*	*d*
Nickel filtered ICAP (mg/L)	2/8	0.014	0.013	0.013	*d*	*d*
Potassium ICAP (mg/L)	8/8	23	1.8	4.8	*d*	*d*
Potassium filtered ICAP (mg/L)	8/8	4.9	1.8	2.4	*d*	*d*
Silver ICAP (mg/L)	1/8	0.19	0.19	0.19	0.05	1
Sodium ICAP (mg/L)	8/8	6.4	4.0	5.2	*d*	*d*
Sodium filtered ICAP (mg/L)	8/8	5.5	3.6	4.3	*d*	*d*
Strontium ICAP (mg/L)	8/8	0.24	0.20	0.23	*d*	*d*
Strontium filtered ICAP (mg/L)	8/8	0.24	0.18	0.21	*d*	*d*
Uranium fluorimetric (mg/L)	7/8	0.0020	0.0010	0.0016	0.02	0
Uranium filtered fluorimetric (mg/L)	7/8	0.0040	0.0010	0.0019	0.02	0
Zinc ICAP (mg/L)	8/8	0.055	0.0084	0.024	5	0
Zinc filtered ICAP (mg/L)	7/8	0.26	0.0037	0.075	5	0
Conductivity, field measurement (μmhos/cm)	*d*/8	550	470	500	*d*	*d*
Dissolved oxygen, field measurement (ppm)	*d*/8	4.9	1.1	2.5	*d*	*d*
pH, field measurement (standard units)	*d*/8	7.3	6.2	6.7	6.5/8.5	1
Redox, field measurement (MV)	*d*/8	260	180	220	*d*	*d*
Water temperature, field measurement (°C)	*d*/8	19	15	18	30.5	0
Alkalinity-HCO_3 (mg/L)	8/8	250	230	240	*d*	*d*
Conductivity (μmhos/cm)	8/8	550	500	520	*d*	*d*
Dissolved solids (mg/L)	8/8	330	250	300	500	0
pH (standard units)	*d*/8	7.4	7.0	7.2	6.5/8.5	0
Total suspended solids (mg/L)	8/8	24	2.0	9.1	*d*	*d*
Turbidity (NTU)	8/8	19	3.0	8.5	1	8
Gross alpha (pCi/L)	2/8	3.2	2.9	3.0	15	0
Gross beta (pCi/L)	4/8	6.8	2.7	4.5	50	0

Table 5.45 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
1,1,1-Trichloroethane (µg/L)	4/8	490D	300DJ	~410	200	4
1,1-Dichloroethane (µg/L)	4/8	220D	160DJ	~190	*d*	*d*
1,1-Dichloroethene (µg/L)	4/8	380D	1.0J	~250	7	3
1,2-Dichloroethene (µg/L)	4/8	13,000D	10,000D	~11,000	70	4
2-Butanone (µg/L)	1/8	3.0BJ	3.0BJ	~3.0	*d*	*d*
4-Methyl-2-pentanone (µg/L)	3/8	230BDJ	2.0BJ	~130	*d*	*d*
Acetone (µg/L)	3/8	700BDJ	7.0BJ	~370	*d*	*d*
Carbon disulfide (µg/L)	2/8	110BDJ	1.0BJ	~56	*d*	*d*
Chloroform (µg/L)	1/8	4.0DJ	4.0DJ	~4.0	100	0
Ethylbenzene (µg/L)	1/8	140DJ	140DJ	~140	700	0
Methylene chloride (µg/L)	4/8	120BDJ	2.0BJ	~59	*d*	*d*
Tetrachloroethene (µg/L)	6/8	1,100BD	2.0J	~650	5	5
Trichloroethene (µg/L)	5/8	1,400D	1.0J	~960	5	4
Vinyl chloride (µg/L)	4/8	350D	190DJ	~260	2	4
Xylenes (µg/L)	2/8	110BDJ	1.0BJ	~56	10,000	0

[a]The data qualifiers J = the value is estimated, B = the parameter was also found in the laboratory blank, and D = the sample required dilution and reanalysis.

[b]The ~ prefix indicates that qualified values were used in the calculation of the mean.

[c]See Table 5.1.

[d]Not applicable.

Table 5.46. Constituents in Waste Area Grouping (WAG) 1 groundwater at ORNL, January 13–February 24, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	23/23	95	1.4	20*	250	0[3]
Fluoride	15/23	3.6	<0.10	~0.60*	4	0[2]
Nitrate	3/23	8.0	<1.0	~1.6*	10	0[2]
Sulfate (as SO_4)	22/23	110	<1.0	~34*	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Bis(2-chloroisopropyl) ether	1/23	U10	J0.10	~9.6*	*d*	[*d*]
N-Nitrosodi-n-propylamine	1/23	U10	J8.0	~9.9*	*d*	[*d*]
Pyrene	1/23	U10	J0	~9.6*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	23/23	1.1	0.22	0.47*	*d*	[*d*]
Dissolved oxygen (ppm)	23/23	12	1.9	5.7*	*d*	[*d*]
Redox (mV)	23/23	170	−81	100*	*d*	[*d*]
Temperature (°C)	23/23	19	4.6	14*	30.5	0[1]
Turbidity (JTU)	23/23	1,000	40	380*	1	23[2]
pH (standard units)	23/23	9.0	6.7	7.3*	(6.5, 8.5)	1[3]
Metals, filtered (mg/L)						
Aluminum	7/23	0.074	<0.050	~0.055*	0.2	0[3]
Antimony	1/23	0.012	<0.0050	~0.0053*	*d*	[*d*]
Barium	23/23	0.27	0.0015	0.097*	1	0[2]
Boron	6/23	1.0	<0.080	~0.18*	*d*	[*d*]
Calcium	23/23	130	0.94	79*	*d*	[*d*]
Chromium	15/23	0.017	<0.0040	~0.0069*	0.05	0[1]
Copper	8/23	0.035	<0.0070	~0.0096*	1	0[3]
Iron	9/23	14	<0.050	~1.8*	0.3	7[3]
Magnesium	23/23	29	0.43	16*	*d*	[*d*]
Manganese	13/23	5.2	<0.0010	~0.88*	0.05	9[3]
Nickel	7/23	0.024	<0.0040	~0.0059*	*d*	[d]
Potassium	23/23	7.3	0.36	2.0*	*d*	[*d*]
Silicon	23/23	7.5	2.6	4.7*	*d*	[*d*]
Sodium	18/23	270	<5.0	~37*	*d*	[*d*]
Strontium	1/1	0.24	0.24	0.24	*d*	[*d*]
Vanadium	1/23	0.0020	<0.0020	~0.0020*	*d*	[*d*]
Metals, unfiltered (mg/L)						
Aluminum	12/23	0.85	<0.050	~0.16*	0.2	5[3]
Barium	23/23	0.30	0.012	0.11*	1	0[2]
Boron	6/23	1.1	<0.080	~0.19*	*d*	[*d*]
Calcium	23/23	160	1.2	83*	*d*	[*d*]
Chromium	17/23	0.033	<0.0040	~0.0088*	0.05	0[1]
Iron	17/23	16	<0.050	~2.1*	0.3	11[3]
Magnesium	23/23	29	0.47	17*	*d*	[*d*]
Manganese	23/23	6.6	0.0015	0.96*	0.05	11[3]
Nickel	9/23	0.024	<0.0040	~0.0063*	*d*	[*d*]
Potassium	23/23	7.6	0.29	1.7*	*d*	[*d*]
Silicon	23/23	8.4	2.7	5.0*	*d*	[*d*]
Sodium	19/23	280	<5.0	~38*	*d*	[*d*]
Strontium	1/1	0.23	0.23	0.23	*d*	[*d*]
Vanadium	3/23	0.0025	<0.0020	~0.0020*	*d*	[*d*]
Zinc	3/23	0.039	<0.0050	~0.0069*	5	0[3]

Table 5.46 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Others, filtered						
Alkalinity (mg/L)	23/23	470	110	290*	*d*	[*d*]
Total dissolved solids (mg/L)	23/23	700	180	410*	500	7[1]
Others, unfiltered						
Alkalinity (mg/L)	23/23	470	110	290*	*d*	[*d*]
Total organic carbon (mg/L)	23/23	6.6	0.88	2.6*	*d*	[*d*]
Total organic halides (μg/L)	10/23	190	<5.0	~22*	*d*	[*d*]
Total suspended solids (mg/L)	13/23	34	<5.0	~11*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	2/23	24*	–22	4.6*	200	0[4]
^{137}Cs	2/23	22	–27	3.6*	120	0[4]
Gross alpha	13/23	300*	–0.62	15	15	1[2]
Gross beta	15/23	13,000*	–4.1	580	50	3[2]
^{3}H	19/23	30,000*	–2,300	3,700*	20,000	1[2]
Total rad Sr	14/23	7,800*	0.27	350	8	7[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{137}Cs	4/23	43*	–30	4.7	120	0[4]
Gross alpha	13/23	300*	–0.65	15	15	1[2]
Gross beta	20/23	14,000*	1.6	620	50	3[2]
^{3}H	19/23	27,000*	–2,200	4,000*	20,000	1[2]
Total rad Sr	13/23	8,400*	–0.41	380	8	5[2]
Volatile organics, unfiltered (μg/L)						
Acetone	7/23	B34	JB3.0	~9.9*	*d*	[*d*]
Benzene	4/23	8.0	J1.0	~5.0*	5	2[1]
Carbon disulfide	5/23	13	JB2.0	~5.0*	*d*	[*d*]
Chloroform	2/23	8.0	U5.0	~5.1*	100	0[2]
Methylene chloride	4/23	7.0	JB1.0	~4.7*	*d*	[*d*]
Styrene	2/23	U5.0	J1.0	~4.7*	100	0[2]
Trichloroethene	2/23	J5.0	J4.0	~5.0*	5	0[1]
Vinyl chloride	1/23	22	U10	~11*	2	23[1]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	3/3	9.2	2.4	5.3	250	0[3]
Fluoride	2/3	0.60	0.20	~0.37*	4	0[2]
Nitrate	2/3	5.6	<1.0	~2.7	10	0[2]
Sulfate (as SO_4)	3/3	41	19	33*	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	3/3	0.47	0.32	0.38*	*d*	[*d*]
Dissolved oxygen (ppm)	3/3	8.3	7.5	8.0*	*d*	[*d*]
Redox (mV)	3/3	160	3.3	99	*d*	[*d*]
Temperature (°C)	3/3	13	13	13*	30.5	0[1]
Turbidity (JTU)	3/3	130	76	98*	1	3[2]
pH (standard units)	3/3	7.9	7.3	7.6*	(6.5, 8.5)	0[3]

Table 5.46 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Metals, filtered (mg/L)						
Aluminum	3/3	0.076	0.054	0.064*	0.2	0[3]
Barium	3/3	0.21	0.050	0.13	1	0[2]
Boron	1/3	0.20	<0.080	~0.12*	*d*	[*d*]
Calcium	3/3	110	37	77*	*d*	[*d*]
Chromium	3/3	0.010	0.0056	0.0078*	0.05	0[1]
Copper	2/3	0.012	<0.0070	~0.0097*	1	0[3]
Magnesium	3/3	28	15	22*	*d*	[*d*]
Manganese	2/3	0.0031	<0.0010	~0.0021*	0.05	0[3]
Nickel	2/3	0.0048	<0.0040	~0.0043*	*d*	[*d*]
Potassium	3/3	1.8	1.1	1.4*	*d*	[*d*]
Silicon	3/3	6.9	4.2	5.3*	*d*	[*d*]
Sodium	2/3	29	<5.0	~14	*d*	[*d*]
Metals, unfiltered (mg/L)						
Barium	3/3	0.23	0.059	0.14	1	0[2]
Boron	1/3	0.21	<0.080	~0.12	*d*	[*d*]
Calcium	3/3	110	41	82*	*d*	[*d*]
Chromium	3/3	0.010	0.0068	0.0086*	0.05	0[1]
Magnesium	3/3	30	17	24*	*d*	[*d*]
Manganese	3/3	0.0053	0.0034	0.0045*	0.05	0[3]
Potassium	3/3	1.1	0.86	0.94*	*d*	[*d*]
Silicon	3/3	7.3	4.5	5.5*	*d*	[*d*]
Sodium	2/3	33	<5.0	~16	*d*	[*d*]
Vanadium	1/3	0.0025	<0.0020	~0.0022*	*d*	[*d*]
Zinc	1/3	0.0072	<0.0050	~0.0057*	5	0[3]
Others, filtered (mg/L)						
Alkalinity	3/3	340	250	280*	*d*	[*d*]
Total dissolved solids	3/3	400	290	340*	500	0[1]
Others, unfiltered (mg/L)						
Alkalinity	3/3	350	240	280*	*d*	[*d*]
Total organic carbon	3/3	2.0	1.1	1.4*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{137}Cs	1/3	5.4*	−1.4	1.3	120	0[4]
Gross beta	2/3	6.8*	1.1	4.9	50	0[2]
^{3}H	2/3	4,900*	− 810	2,200	20,000	0[2]
Total rad Sr	1/3	4.9*	2.7	3.7*	8	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	1/3	6.2*	0.27	3.3	200	0[4]
^{137}Cs	1/3	6.8*	−2.2	3.3	120	0[4]
Gross alpha	1/3	3.2*	0.73	1.9	15	0[2]
Gross beta	2/3	12*	3.2	6.5	50	0[2]
^{3}H	2/3	3,800*	−54	2,200	20,000	0[2]
Total rad Sr	1/3	4.6*	0.54	2.8	8	0[2]

Table 5.46 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Volatile organics, unfiltered (µg/L)						
1,1,1-Trichloroethane	1/3	U5.0	J3.0	~4.3*	200	0[1]
Acetone	3/3	B91	JB4.0	~34	*d*	[*d*]
Benzene	2/3	6.0	J1.0	~4.0	5	1[1]
Carbon disulfide	3/3	32	JB2.0	~13	*d*	[*d*]
Styrene	1/3	U5.0	J2.0	~4.0*	100	0[2]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141–National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143–National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.47. Constituents in Waste Area Grouping (WAG) 2 groundwater at ORNL, June 18–July 9, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	8/8	30	1.1	11*	250	0[3]
Fluoride	1/8	2.8	<0.10	~0.44	4	0[2]
Nitrate	1/8	1.1	<1.0	~1.0*	10	0[2]
Sulfate (as SO_4)	7/8	23	<1.0	~10*	250	0[3]
Base neutral/acid extractable organics, unfiltered (μg/L)						
Diethyl phthalate	1/8	U10	JB3.0	~9.1*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	10/10	0.64	0.11	0.40*	*d*	[*d*]
Dissolved oxygen (ppm)	10/10	10	5.8	7.7*	*d*	[*d*]
Redox (mV)	2/2	180	180	180*	*d*	[*d*]
Temperature (°C)	10/10	17	13	15*	30.5	0[1]
Turbidity (JTU)	10/10	2,300	310	630*	1	10[2]
pH (standard units)	10/10	9.4	6.5	7.4*	(6.5, 8.5)	2[3]
Metals, filtered (mg/L)						
Aluminum	5/8	0.39	<0.050	~0.10*	0.2	1[3]
Antimony	3/8	0.0093	<0.0050	~0.0058*	*d*	[*d*]
Arsenic	2/8	0.031	<0.010	~0.013*	0.05	0[1]
Barium	8/8	0.93	0.024	0.28*	1	0[2]
Boron	3/8	1.1	<0.080	~0.22	*d*	[*d*]
Calcium	8/8	130	0.77	62*	*d*	[*d*]
Chromium	4/8	0.011	<0.0040	~0.0062*	0.05	0[1]
Copper	1/8	0.014	<0.0070	~0.0078*	1	0[3]
Iron	5/8	23	<0.050	~5.2	0.3	3[3]
Magnesium	8/8	24	0.24	9.5*	*d*	[*d*]
Manganese	7/8	1.1	<0.0010	~0.21	0.05	4[3]
Nickel	4/8	0.17	<0.0040	~0.026	*d*	[*d*]
Potassium	8/8	2.5	0.63	1.4*	*d*	[*d*]
Silicon	8/8	10	3.6	7.0*	*d*	[*d*]
Sodium	7/8	220	<5.0	~61*	*d*	[*d*]
Vanadium	1/8	0.0028	<0.0020	~0.0021*	*d*	[*d*]
Metals, unfiltered (mg/L)						
Aluminum	7/8	3.7	<0.050	~0.62	0.2	2[3]
Arsenic	3/8	0.28	<0.010	~0.053	0.05	2[1]
Barium	8/8	0.92	0.033	0.32*	1	0[2]
Boron	3/8	1.1	<0.080	~0.23	*d*	[*d*]
Calcium	8/8	130	1.0	60*	*d*	[*d*]
Chromium	5/8	1.0	<0.0040	~0.13	0.05	1[1]
Cobalt	2/8	0.012	<0.0040	~0.0051*	*d*	[*d*]
Copper	5/8	0.013	<0.0070	~0.0085*	1	0[3]
Iron	8/8	28	0.087	8.6*	0.3	7[3]
Magnesium	8/8	23	0.25	9.4*	*d*	[*d*]
Manganese	8/8	1.1	0.0059	0.23	0.05	6[3]
Nickel	3/8	0.20	<0.0040	~0.030	*d*	[*d*]
Potassium	8/8	3.5	0.72	1.9*	*d*	[*d*]
Silicon	8/8	11	3.5	8.0*	*d*	[*d*]
Sodium	7/8	220	<5.0	~59*	*d*	[*d*]
Vanadium	1/8	0.0051	<0.0020	~0.0024*	*d*	[*d*]
Zinc	3/8	0.013	<0.0050	~0.0068*	5	0[3]

Table 5.47 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Others, filtered						
Alkalinity (mg/L)	8/8	460	120	300*	*d*	[*d*]
Total dissolved solids (mg/L)	8/8	520	130	350*	500	1[1]
Others, unfiltered						
Alkalinity (mg/L)	10/10	460	120	280*	*d*	[*d*]
Ammonia (mg/L)	8/8	8.3	0.070	1.3	*d*	[*d*]
Total organic carbon (mg/L)	6/8	3.4	<0.50	~1.1*	*d*	[*d*]
Total suspended solids (mg/L)	7/8	190	2.0	~42	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	1/10	350*	−23	34	200	1[4]
^{137}Cs	1/10	11	−5.0	1.4	120	0[4]
Gross alpha	7/10	14*	−0.11	5.1*	15	0[2]
Gross beta	7/8	1,400*	−0.54	180	50	1[2]
^{3}H	6/10	300,000*	−540	59,000	20,000	4[2]
Total rad Sr	2/10	810*	−0.54	82	8	1[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	3/8	13*	−4.3	3.0	200	0[4]
Gross alpha	7/8	11*	1.6	5.7*	15	0[2]
Gross beta	5/8	1,600*	−0.27	200	50	1[2]
H-3	5/8	300,000*	−540	73,000	20,000	3[2]
Total rad Sr	5/8	860*	−0.81	110	8	1[2]
Volatile organics, unfiltered (µg/L)						
1,1-Dichloroethene	1/10	44	U5.0	~8.9*	7	1[1]
Acetone	2/10	U10	6.0	~9.3*	*d*	[*d*]
Benzene	2/10	49	3.0	~9.2*	5	1[1]
Carbon disulfide	2/10	18	U5.0	~7.1*	*d*	[*d*]
Chlorobenzene	1/10	50	U5.0	~9.5*	100	0[2]
Methylene chloride	2/10	U5.0	3.0	~4.6*	*d*	[*d*]
Toluene	1/10	47	U5.0	~9.2*	1,000	0[2]
Trichloroethene	1/10	48	U5.0	~9.3*	5	1[1]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	12/12	7.4	1.6	3.6*	250	0[3]
Fluoride	2/12	0.70	<0.10	~0.17*	4	0[2]
Nitrate	1/12	11	<1.0	~1.8*	10	1[2]
Sulfate (as SO_4)	12/12	100	9.6	35*	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Diethyl phthalate	4/12	U10	J3.0	~8.2*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	10/10	0.54	0.30	0.41*	*d*	[*d*]
Dissolved oxygen (ppm)	10/10	13	6.8	9.3*	*d*	[*d*]
Temperature (°C)	10/10	16	13	14*	30.5	0[1]
Turbidity (JTU)	10/10	680	440	490*	1	10[2]
pH (standard units)	10/10	9.2	6.3	7.3*	(6.5,8.5)	2[3]

Table 5.47 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Metals, filtered (mg/L)						
Aluminum	5/12	0.33	<0.050	~0.076*	0.2	1[3]
Antimony	2/12	0.0061	<0.0050	~0.0052*	*d*	[*d*]
Barium	12/12	0.63	0.035	0.18*	1	0[2]
Boron	6/12	0.85	<0.080	~0.18*	*d*	[*d*]
Cadmium	1/12	0.0065	<0.0050	~0.0051*	0.005	1[2]
Calcium	12/12	120	1.2	60*	*d*	[*d*]
Chromium	8/12	0.016	<0.0040	~0.0070*	0.05	0[1]
Cobalt	2/12	0.028	<0.0040	~0.0063*	*d*	[*d*]
Copper	1/12	0.0093	<0.0070	~0.0072*	1	0[3]
Iron	6/12	1.8	<0.050	~0.29*	0.3	2[3]
Magnesium	12/12	27	0.34	13*	*d*	[*d*]
Manganese	12/12	7.8	0.0070	0.79	0.05	7[3]
Nickel	5/12	0.024	<0.0040	~0.0070*	*d*	[*d*]
Potassium	12/12	6.0	0.55	2.7*	*d*	[*d*]
Silicon	12/12	9.9	3.2	7.1*	*d*	[*d*]
Sodium	11/12	200	<5.0	~48*	*d*	[d]
Vanadium	1/12	0.0022	<0.0020	~0.0020*	*d*	[*d*]
Zinc	1/12	0.017	<0.0050	~0.0060*	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	9/12	1.3	<0.050	~0.27*	0.2	4[3]
Barium	12/12	0.60	0.034	0.18*	1	0[2]
Boron	6/12	0.88	<0.080	~0.18*	*d*	[*d*]
Cadmium	1/12	0.010	<0.0050	~0.0054*	0.005	1[2]
Calcium	12/12	130	1.3	58*	*d*	[*d*]
Chromium	9/12	0.014	<0.0040	~0.0069*	0.05	0[1]
Cobalt	2/12	0.024	<0.0040	~0.0060*	*d*	[*d*]
Copper	3/12	0.0085	<0.0070	~0.0072*	1	0[3]
Iron	10/12	3.4	<0.050	~0.60*	0.3	6[3]
Magnesium	12/12	26	0.50	12*	*d*	[*d*]
Manganese	12/12	7.4	0.0064	0.76	0.05	8[3]
Mercury	1/12	0.000050	<0.000050	~0.000050	0.002	0[1]
Nickel	4/12	0.026	<0.0040	~0.0067*	*d*	[*d*]
Potassium	12/12	6.1	1.6	2.9*	*d*	[*d*]
Silicon	12/12	9.6	4.4	7.3*	*d*	[*d*]
Silver	1/12	0.020	<0.0050	~0.0063*	0.05	0[1]
Sodium	11/12	190	<5.0	~47*	*d*	[*d*]
Vanadium	1/12	0.0022	<0.0020	~0.0020*	*d*	[*d*]
Others, filtered						
Alkalinity (mg/L)	12/12	400	120	260*	*d*	[*d*]
Total dissolved solids (mg/L)	12/12	490	180	360*	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	10/10	400	120	270*	*d*	[*d*]
Ammonia (mg/L)	12/12	0.45	0.050	0.17*	*d*	[*d*]
Sulfide, total (mg/L)	2/12	1.0	<1.0	~1.0	*d*	[*d*]
Total organic carbon (mg/L)	12/12	1.6	0.70	1.0*	*d*	[*d*]
Total suspended solids (mg/L)	6/12	37	2.0	~9.4*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	1/10	4.9	–6.2	1.1	200	0[4]
^{137}Cs	1/10	6.5*	–2.4	0.76	20	0[4]
Gross alpha	7/10	8.9*	–0.68	3.5*	15	0[2]
Gross beta	10/12	970*	1.1	89	50	1[2]
^{3}H	4/10	220,000*	–3,200	22,000	20,000	1[2]
Total rad Sr	4/10	6.2*	–1.0	2.6*	8	0[2]

Table 5.47 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	1/12	430*	−1.4	37	200	1[4]
Gross alpha	11/12	21*	1.1	6.3*	15	1[2]
Gross beta	10/12	1,200*	0.27	110	50	1[2]
^{3}H	5/12	220,000*	−3,000	21,000	20,000	2[2]
Total rad Sr	4/12	8.4*	−2.7	2.8*	8	1[2]
Volatile organics, unfiltered (µg/L)						
Acetone	5/10	U10	JB1.0	~7.2*	*d*	[*d*]
Benzene	3/10	U5.0	JB1.0	~3.8*	5	0[1]
Carbon disulfide	6/10	B22	JB2.0	~8.3*	*d*	[*d*]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.48. Constituents in Waste Area Grouping (WAG) 3 groundwater at ORNL, August 21–September 10, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	11/11	420	2.2	93*	250	2[3]
Fluoride	1/11	4.1	<0.10	~0.46	4	1[2]
Nitrate	1/11	1.2	<1.0	~1.0*	10	0[2]
Sulfate (as SO_4)	11/11	120	3.2	44*	250	0[3]
Base neutral/acid extractable organics, unfiltered (μg/L)						
Bis(2-ethylhexyl) phthalate	1/11	U10	B1.0	~9.2*	*d*	[*d*]
N-Nitrosodiphenylamine	3/11	U10	B2.0	~7.8*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	11/11	1.3	0.33	0.69*	*d*	[*d*]
Dissolved oxygen (ppm)	10/10	10	5.8	7.7*	*d*	[*d*]
Redox (mV)	10/10	630	22	480*	*d*	[*d*]
Temperature (°C)	11/11	16	14	15*	30.5	0[1]
Turbidity (JTU)	10/10	46	2.1	20*	1	10[2]
pH (standard units)	11/11	11	7.0	7.8*	(6.5, 8.5)	1[3]
Metals, filtered (mg/L)						
Aluminum	1/11	0.75	<0.050	~0.11	0.2	1[3]
Antimony	2/11	0.0061	<0.0050	~0.0052*	*d*	[*d*]
Arsenic	2/11	0.023	<0.010	~0.012*	0.05	0[1]
Barium	11/11	0.65	0.0086	0.17*	1	0[2]
Boron	8/11	2.0	<0.080	~0.50*	*d*	[*d*]
Calcium	11/11	160	0.85	110*	*d*	[*d*]
Chromium	2/11	0.0089	<0.0040	~0.0045*	0.05	0[1]
Cobalt	1/11	0.0089	<0.0040	~0.0044*	*d*	[*d*]
Copper	1/11	0.016	<0.0070	~0.0078*	1	0[3]
Iron	6/11	2.5	<0.050	~0.48*	0.3	4[3]
Magnesium	11/11	54	0.20	24*	*d*	[*d*]
Manganese	11/11	1.7	0.0021	0.29	0.05	5[3]
Nickel	1/11	0.014	<0.010	~0.010*	*d*	[*d*]
Potassium	11/11	8.9	1.7	3.5*	*d*	[*d*]
Selenium	2/11	0.0068	<0.0050	~0.0052*	0.01	0[1]
Silicon	11/11	39	4.7	8.8*	*d*	[*d*]
Sodium	11/11	250	3.2	54*	*d*	[*d*]
Vanadium	11/11	0.046	0.0021	0.0071*	*d*	[*d*]
Zinc	5/11	0.021	<0.0050	~0.0071*	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	3/11	2.3	<0.050	~0.31	0.2	3[3]
Arsenic	1/11	0.020	<0.010	~0.011*	0.05	0[1]
Barium	11/11	0.64	0.015	0.17*	1	0[2]
Boron	8/11	2.0	<0.080	~0.50*	*d*	[*d*]
Calcium	11/11	160	1.2	110*	*d*	[*d*]
Chromium	1/11	0.011	<0.0040	~0.0046*	0.05	0[1]
Cobalt	1/11	0.0049	<0.0040	~0.0041*	*d*	[*d*]
Copper	1/11	0.023	<0.0070	~0.0084*	1	0[3]
Iron	9/11	3.3	<0.050	~0.87*	0.3	6[3]
Magnesium	11/11	54	0.58	24*	*d*	[*d*]
Manganese	11/11	1.7	0.0043	0.30	0.05	5[3]
Nickel	1/11	0.019	<0.010	~0.011*	*d*	[*d*]
Potassium	11/11	9.4	1.7	3.7*	*d*	[*d*]

Table 5.48 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Silicon	11/11	45	4.9	9.5*	*d*	[*d*]
Sodium	11/11	270	3.4	57*	*d*	[*d*]
Vanadium	1/11	0.051	<0.0020	~0.0064	*d*	[*d*]
Zinc	5/11	0.020	<0.0050	~0.0084*	5	0[3]
Others, filtered						
Alkalinity (mg/L)	11/11	520	240	350*	*d*	[*d*]
Total dissolved solids (mg/L)	11/11	700	89	450*	500	5[1]
Others, unfiltered						
Alkalinity (mg/L)	11/11	510	240	350*	*d*	[*d*]
Phenolics, total recoverable (mg/L)	1/11	0.041	<0.0010	~0.0046	*d*	[*d*]
Total organic carbon (mg/L)	11/11	5.9	0.63	1.6*	*d*	[*d*]
Total organic halides (μg/L)	3/11	110	<5.0	~26*	*d*	[*d*]
Total suspended solids (mg/L)	3/11	52	<5.0	~9.4*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{137}Cs	1/11	6.8*	−1.1	0.52	120	0[4]
Gross alpha	10/11	17*	0.70	6.8*	15	2[2]
Gross beta	10/11	970*	1.9	160	50	4[2]
^{3}H	10/11	30,000*	27	3,600	20,000	1[2]
Total rad Sr	6/11	590*	-0.30	88	8	4[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{137}Cs	1/11	38	−4.3	4.3	120	0[4]
Gross alpha	9/11	41*	−0.16	9.5*	15	2[2]
Gross beta	10/11	970*	2.7*	150	50	4[2]
^{3}H	9/11	30,000*	110	3,500	20,000	1[2]
Total rad Sr	7/11	620*	−1.3	91	8	5[2]
Volatile organics, unfiltered (μg/L)						
1,2-Dichloroethene	3/11	12	J3.0	~5.4*	70	0[2]
Benzene	1/11	U5.0	J3.0	~4.8*	5	0[1]
Trichloroethene	1/11	10	U5.0	~5.5*	5	1[1]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	3/3	2.3	1.9	2.1*	250	0[3]
Nitrate	1/3	1.1	<1.0	~1.0*	10	0[2]
Sulfate (as SO_4)	3/3	18	7.9	12*	*250*	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	3/3	0.44	0.18	0.32*	*d*	[*d*]
Dissolved oxygen (ppm)	3/3	9.3	9.0	9.2*	*d*	[*d*]
Redox (mV)	3/3	630	390	490*	*d*	[*d*]
Temperature (°C)	3/3	17	14	15*	30.5	0[1]
Turbidity (JTU)	3/3	53	6.3	29	1	3[2]
pH (standard units)	3/3	7.9	6.8	7.4*	(6.5, 8.5)	0[3]
Metals, filtered (mg/L)						
Barium	3/3	0.047	0.018	0.030*	1	0[2]
Calcium	3/3	130	64	99*	*d*	[*d*]
Cobalt	1/3	0.0047	<0.0040	~0.0042*	*d*	[*d*]
Iron	1/3	1.2	<0.050	~0.43	0.3	1[3]
Magnesium	3/3	14	3.0	7.4	*d*	[*d*]

Table 5.48 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Manganese	3/3	0.22	0.0034	0.11	0.05	2[3]
Potassium	3/3	1.5	0.82	1.1*	*d*	[*d*]
Silicon	3/3	5.3	2.6	4.2*	*d*	[*d*]
Sodium	3/3	2.3	1.6	1.8*	*d*	[*d*]
Vanadium	2/3	0.0049	<0.0020	~0.0034*	*d*	[*d*]
Zinc	1/3	0.0079	<0.0050	~0.0060*	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	3/3	0.23	0.19	0.21*	0.2	2[3]
Barium	3/3	0.046	0.018	0.030*	1	0[2]
Calcium	3/3	120	59	95*	*d*	[*d*]
Iron	3/3	1.4	0.23	0.63	0.3	2[3]
Magnesium	3/3	14	2.8	7.1	*d*	[*d*]
Manganese	3/3	0.20	0.0048	0.10	0.05	2[3]
Potassium	3/3	1.9	0.79	1.2*	*d*	[*d*]
Silicon	3/3	5.4	2.9	4.5*	*d*	[*d*]
Silver	1/3	0.0079	<0.0050	~0.0060*	0.05	0[1]
Sodium	3/3	2.2	1.6	1.8*	*d*	[*d*]
Vanadium	1/3	0.0040	<0.0020	~0.0027*	*d*	[*d*]
Zinc	2/3	0.0053	<0.0050	~0.0052*	5	0[3]
Others, filtered (mg/L)						
Alkalinity	3/3	360	190	280*	*d*	[*d*]
Total dissolved solids	3/3	400	260	330*	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	3/3	370	190	280*	*d*	[*d*]
Total organic carbon (mg/L)	3/3	1.8	0.53	1.2*	*d*	[*d*]
Total organic halides (μg/L)	1/3	25	<5.0	~12	*d*	[*d*]
Total suspended solids (mg/L)	1/3	21	<5.0	~10	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
Gross alpha	2/3	3.5*	1.1	2.2*	15	0[2]
Gross beta	3/3	7.8*	3.5*	5.0*	50	0[2]
^{3}H	3/3	1,200*	650*	1,000*	20,000	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	1/3	3.2*	–4.9	–0.63	200	0[4]
Gross alpha	3/3	7.6*	1.3*	3.4	15	0[2]
Gross beta	2/3	5.9*	2.7	4.7*	50	0[2]
^{3}H	3/3	1,100*	650*	930*	20,000	0[2]
Volatile organics, unfiltered (μg/L)						
Carbon disulfide	1/3	U5.0	J2.0	~4.0*	*d*	[*d*]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.49. Constituents in Waste Area Grouping (WAG) 4 groundwater at ORNL, October 26–November 23, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Bromide	3/11	1.9	<1.0	~1.1*	*d*	[*d*]
Chloride	11/11	270	3.2	65*	250	1[3]
Fluoride	2/11	6.2	<0.10	~0.92	4	1[2]
Nitrate	1/11	27	<0.10	~3.2	10	1[2]
Phosphate	1/11	<3.0	<0.30	~1.3*	*d*	[*d*]
Sulfate (as SO_4)	9/11	310	<1.0	~74*	250	1[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	11/11	1.4	0.34	0.76*	*d*	[*d*]
Dissolved oxygen (ppm)	11/11	9.5	6.2	7.3*	*d*	[*d*]
Redox (mV)	11/11	600	290	410*	*d*	[*d*]
Temperature (°C)	11/11	17	13	15*	30.5	0[1]
Turbidity (JTU)	11/11	340	6.3	50	1	11[2]
pH (standard units)	11/11	9.2	6.8	7.8*	(6.5, 8.5)	3[3]
Metals, filtered (mg/L)						
Aluminum	3/11	0.14	<0.050	~0.060*	0.2	0[3]
Antimony	1/11	0.0065	<0.0050	~0.0051*	*d*	[*d*]
Barium	11/11	0.58	0.017	0.16*	1	0[2]
Boron	6/11	0.65	<0.080	~0.23*	*d*	[*d*]
Calcium	11/11	130	1.5	63*	*d*	[*d*]
Iron	8/11	23	<0.050	~2.8	0.3	5[3]
Magnesium	11/11	30	0.22	14*	*d*	[*d*]
Manganese	11/11	3.5	0.0027	0.51	0.05	7[3]
Nickel	4/11	0.14	<0.010	~0.044*	*d*	[*d*]
Potassium	11/11	4.6	1.7	2.9*	*d*	[*d*]
Selenium	2/11	0.0078	<0.0050	~0.0054*	0.01	0[1]
Silicon	11/11	16	4.1	8.7*	*d*	[*d*]
Sodium	11/11	380	9.4	110*	*d*	[*d*]
Vanadium	2/11	0.0037	<0.0020	~0.0023*	*d*	[*d*]
Zinc	2/11	0.012	<0.0050	~0.0062*	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	5/11	0.55	<0.050	~0.10*	0.2	1[3]
Barium	11/11	0.56	0.019	0.15*	1	0[2]
Boron	6/11	0.60	<0.080	~0.22*	*d*	[*d*]
Calcium	11/11	130	1.5	61*	*d*	[*d*]
Chromium	2/11	0.0083	<0.0040	~0.0047*	0.05	0[1]
Iron	11/11	23	0.13	2.9	0.3	6[3]
Magnesium	11/11	29	0.26	13*	*d*	[*d*]
Manganese	11/11	3.4	0.0037	0.49	0.05	7[3]
Nickel	5/11	0.14	<0.010	~0.043*	*d*	[*d*]
Potassium	11/11	4.7	1.4	2.8*	*d*	[*d*]
Silicon	11/11	14	4.0	8.2*	*d*	[*d*]
Sodium	11/11	380	8.9	110*	*d*	[*d*]
Vanadium	1/11	0.0041	<0.0020	~0.0022*	*d*	[*d*]
Zinc	10/11	0.057	<0.0050	~0.017*	5	0[3]
Others, filtered						
Alkalinity (mg/L)	11/11	510	120	330*	*d*	[*d*]
Total dissolved solids (mg/L)	11/11	970	240	520*	500	6[1]

Table 5.49 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Others, unfiltered						
Alkalinity (mg/L)	11/11	500	120	340*	*d*	[*d*]
Total organic carbon (mg/L)	10/11	11	<0.50	~2.0*	*d*	[*d*]
Total organic halides (μg/L)	3/11	1,100	<5.0	~140	*d*	[*d*]
Total suspended solids (mg/L)	3/11	36	<5.0	~8.6*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	1/11	3.0*	–1.9	0.39	200	0[4]
^{137}Cs	1/11	2.6*	–0.27	0.83*	120	0[4]
Gross alpha	11/11	110*	2.5*	17*	15	3[2]
Gross beta	11/11	1,100*	5.4*	120	50	3[2]
^{3}H	9/11	7,600,000*	–460	1,300,000	20,000	6[2]
Total rad Sr	2/11	760*	–1.2	71	8	2[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	1/11	5.4*	–0.54	1.4*	200	0[4]
^{137}Cs	1/11	12*	–1.6	1.1	120	0[4]
Gross alpha	11/11	160*	3.0*	23	15	3[2]
Gross beta	10/11	1,400*	5.9*	140	50	1[2]
^{3}H	10/11	7,800,000*	–430	1,300,000	20,000	6[2]
Total rad Sr	4/11	860*	–1.1	83	8	2[2]
Volatile organics, unfiltered (μg/L)						
1,1,1-Trichloroethane	1/11	U5.0	J2.0	~4.7*	200	0[1]
1,1-Dichloroethene	2/11	10	U5.0	~5.8*	7	2[1]
1,2-Dichloroethane	1/11	7.0	U5.0	~5.2*	5	1[1]
1,2-Dichloroethene	2/11	Y930	U5.0	~160	70	2[2]
Acetone	1/11	B17	U10	~11*	*d*	[*d*]
Carbon disulfide	2/11	U5.0	J2.0	~4.6*	*d*	[*d*]
Trichloroethene	2/11	140	U5.0	~22	5	2[1]
Vinyl chloride	2/11	Y1,000	U10	~120	2	11[1]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	4/4	2.9	2.0	2.5*	250	0[3]
Sulfate (as SO_4)	4/4	55	16	27*	250	0[3]
Base neutral/acid extractable organics, unfiltered (μg/L)						
Di-n-butylphthalate	1/4	U10	B2.0	~8.0*	*d*	[*d*]
N-Nitrosodiphenylamine	1/4	U10	B4.0	~8.5*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.46	0.060	0.24*	*d*	[*d*]
Dissolved oxygen (ppm)	4/4	9.4	6.8	8.1*	*d*	[*d*]
Redox (mV)	4/4	520	430	460*	*d*	[*d*]
Temperature (°C)	4/4	15	15	15*	30.5	0[1]
Turbidity (JTU)	4/4	120	6.3	45	1	4[2]
pH (standard units)	4/4	7.6	6.9	7.2*	(6.5, 8.5)	0[3]
Metals, filtered (mg/L)						
Barium	4/4	0.22	0.038	0.15*	1	0[2]
Calcium	4/4	61	14	38*	*d*	[*d*]
Iron	3/4	8.8	<0.050	~4.2	0.3	2[3]
Magnesium	4/4	12	7.4	10*	*d*	[*d*]
Manganese	4/4	3.2	0.51	1.7*	0.05	4[3]
Potassium	4/4	4.3	1.4	2.8*	*d*	[*d*]
Silicon	4/4	19	14	16*	*d*	[*d*]
Sodium	4/4	21	7.3	12*	*d*	[*d*]
Vanadium	1/4	0.0021	<0.0020	~0.0020*	*d*	[*d*]
Zinc	1/4	0.016	<0.0050	~0.0078*	5	0[3]

Table 5.49 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Metals, unfiltered (mg/L)						
Aluminum	2/4	0.39	<0.050	~0.15	0.2	1[3]
Barium	4/4	0.22	0.044	0.15*	1	0[2]
Calcium	4/4	60	14	36*	*d*	[*d*]
Iron	4/4	8.5	0.16	4.3	0.3	3[3]
Magnesium	4/4	12	6.1	9.2*	*d*	[*d*]
Manganese	4/4	2.7	0.48	1.5*	0.05	4[3]
Potassium	4/4	4.2	0.90	2.6*	*d*	[*d*]
Silicon	4/4	17	12	14*	*d*	[*d*]
Sodium	4/4	21	6.2	11*	*d*	[*d*]
Zinc	4/4	0.044	0.012	0.023*	5	0[3]
Others, filtered						
Alkalinity (mg/L)	4/4	210	80	140*	*d*	[*d*]
Total dissolved solids (mg/L)	4/4	270	150	210*	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	4/4	200	83	140*	*d*	[*d*]
Total organic carbon (mg/L)	2/4	0.55	<0.50	~0.51*	*d*	[*d*]
Total suspended solids (mg/L)	2/4	34	<5.0	~12	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	1/4	3.8*	–0.27	1.1	200	0[4]
Gross beta	2/4	7.6*	1.1	3.5*	50	0[2]
^{3}H	2/4	730*	–140	320	20,000	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
Gross alpha	1/4	1.9*	0.41	0.97*	15	0[2]
Gross beta	4/4	4.9*	3.2*	4.5*	50	0[2]
^{3}H	1/4	970*	–320	240	20,000	0[2]
Total rad Sr	1/4	4.3*	0.49	2.0*	8	0[2]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141–National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143–National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.50. Constituents in Waste Area Grouping (WAG) 5 groundwater at ORNL, September 23–October 21, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	20/20	37	1.5	13*	250	0[3]
Sulfate (as SO_4)	19/20	320	<2.0	~48*	250	1[3]
Base neutral/acid extractable organics, unfiltered (ug/L)						
Bis(2-chloroethyl) ether	1/20	U10	J2.0	~9.6*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	20/20	0.74	0.16	0.45*	*d*	[*d*]
Dissolved oxygen (ppm)	20/20	10	5.1	7.7*	*d*	[*d*]
Redox (mV)	20/20	640	370	480*	*d*	[*d*]
Temperature (°C)	20/20	19	12	15*	30.5	0[1]
Turbidity (JTU)	20/20	710	8.4	240*	1	20[2]
pH (standard units)	20/20	8.4	6.0	7.1*	(6.5, 8.5)	5[3]
Metals, filtered (mg/L)						
Barium	20/20	1.0	0.018	0.28*	1	0[2]
Boron	9/20	1.5	<0.080	~0.21*	*d*	[*d*]
Calcium	20/20	190	1.8	100*	*d*	[*d*]
Iron	12/20	2.5	<0.050	~0.44*	0.3	8[3]
Magnesium	20/20	41	0.71	18*	*d*	[*d*]
Manganese	19/20	1.5	<0.0010	~0.30*	0.05	11[3]
Nickel	4/20	0.030	<0.010	~0.012*	*d*	[*d*]
Potassium	20/20	8.7	1.2	2.4*	*d*	[*d*]
Silicon	20/20	14	2.4	9.0*	*d*	[*d*]
Sodium	20/20	140	4.5	23*	*d*	[*d*]
Vanadium	4/20	0.0023	<0.0020	~0.0020*	*d*	[*d*]
Zinc	4/20	0.012	<0.0050	~0.0055*	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	8/20	1.2	<0.050	~0.22*	0.2	5[3]
Barium	20/20	0.91	0.017	0.28*	1	0[2]
Boron	9/20	1.4	<0.080	~0.20*	*d*	[*d*]
Calcium	20/20	170	2.1	95*	*d*	[*d*]
Chromium	1/20	0.0065	<0.0040	~0.0041*	0.05	0[1]
Cobalt	1/20	0.0068	<0.0040	~0.0041*	*d*	[*d*]
Iron	20/20	2.5	0.088	0.78*	0.3	14[3]
Magnesium	20/20	38	0.76	17*	*d*	[*d*]
Manganese	20/20	1.5	0.0061	0.31*	0.05	13[3]
Nickel	8/20	0.035	<0.010	~0.014*	*d*	[*d*]
Potassium	20/20	8.2	1.4	2.4*	*d*	[*d*]
Silicon	20/20	14	2.4	8.7*	*d*	[*d*]
Sodium	20/20	140	5.0	22*	*d*	[*d*]
Vanadium	4/20	0.0027	<0.0020	~0.0021*	*d*	[*d*]
Zinc	20/20	0.028	0.0086	0.016*	5	0[3]
Others, filtered						
Alkalinity (mg/L)	20/20	550	5.5	310*	*d*	[*d*]
Total dissolved solids (mg/L)	20/20	710	190	400*	500	5[1]

Table 5.50 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Others, unfiltered						
Alkalinity (mg/L)	20/20	550	5.7	310*	*d*	[*d*]
Phenolics, total recoverable (mg/L)	1/20	0.016	<0.0010	~0.0018*	*d*	[*d*]
Total organic carbon (mg/L)	20/20	8.7	0.75	2.1*	*d*	[*d*]
Total organic halides (ug/L)	4/20	680	<5.0	~49	*d*	[*d*]
Total suspended solids (mg/L)	7/20	77	<5.0	~13*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
Co-60	3/20	30*	−2.7	2.2	200	0[4]
Cs-137	2/20	5.9*	−2.2	0.73*	120	0[4]
Gross alpha	12/20	25*	−1.1	3.5*	15	1[2]
Gross beta	16/20	1,600*	1.1	160	50	4[2]
H-3	17/20	240,000,000*	240	18,000,000	20,000	12[2]
Total rad Sr	8/20	890*	−1.2	79	8	5[2]
Radionuclides, unfiltered (pCi/L)[e]						
Co-60	5/20	35*	−1.1	3.2*	200	0[4]
Cs-137	3/20	13*	−2.2	1.5*	120	0[4]
Gross alpha	10/20	27*	−0.14	3.4*	15	1[2]
Gross beta	16/20	1,400*	−0.81	160*	50	4[2]
H-3	17/20	240,000,000*	38	18,000,000	20,000	12[2]
Total rad Sr	9/20	590*	−1.3	69*	8	5[2]
Volatile organics, unfiltered (ug/L)						
1,1-Dichloroethane	4/20	5.0	J1.0	~4.7*	*d*	[*d*]
1,1-Dichloroethene	1/20	5.0	U5.0	~5.0	7	0[1]
1,2-Dichloroethane	1/20	U5.0	J4.0	~5.0*	5	0[1]
1,2-Dichloroethene	6/20	Y5,200	U5.0	~280	70	3[2]
Acetone	1/20	U10	JB6.0	~9.8*	*d*	[*d*]
Benzene	2/20	33	J1.0	~6.2*	5	1[1]
Carbon disulfide	2/20	9.0	J3.0	~5.1*	*d*	[*d*]
Chloroethane	1/20	U10	J2.0	~9.6*	200	0[2]
Tetrachloroethene	1/20	U5.0	J2.0	~4.9*	5	0[2]
Toluene	1/20	U5.0	J1.0	~4.8*	1,000	0[2]
Trichloroethene	5/20	26	J3.0	~7.0*	5	3[1]
Vinyl chloride	5/20	Y6,400	J8.0	~330	2	20[1]
Xylene, total	1/20	U5.0	J2.0	~4.9*	10,000	0[2]
		Upgradient Wells				
Anions, unfiltered (mg/L)						
Chloride	2/2	3.2	1.7	2.4	250	0[3]
Nitrate	1/2	<1.0	0.47	~0.74	10	0[2]
Phosphate	1/2	<1.0	0.77	~0.89*	*d*	[*d*]
Sulfate (as SO_4)	2/2	20	7.3	14	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	2/2	0.33	0.23	0.28	*d*	[*d*]
Dissolved oxygen (ppm)	2/2	8.5	8.4	8.5*	*d*	[*d*]
Redox (mV)	2/2	650	550	600*	*d*	[*d*]
Temperature (°C)	2/2	15	15	15*	30.5	0[1]
Turbidity (JTU)	2/2	19	8.4	14	1	2[2]
pH (standard units)	2/2	7.5	7.2	7.4*	(6.5, 8.5)	0[3]

Table 5.50 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Metals, filtered (mg/L)						
Barium	2/2	0.14	0.13	0.13*	1	0[2]
Calcium	2/2	79	76	77*	*d*	[*d*]
Magnesium	2/2	11	3.3	7.1	*d*	[*d*]
Manganese	2/2	0.024	0.0084	0.016	0.05	0[3]
Potassium	2/2	1.3	0.52	0.89	*d*	[*d*]
Silicon	2/2	12	7.8	10	*d*	[*d*]
Sodium	2/2	7.2	6.0	6.6*	*d*	[*d*]
Metals, unfiltered (mg/L)						
Aluminum	1/2	0.17	<0.050	~0.11	0.2	0[3]
Barium	2/2	0.14	0.14	0.14*	1	0[2]
Calcium	2/2	72	70	71*	*d*	[*d*]
Iron	2/2	0.26	0.070	0.17	0.3	0[3]
Magnesium	2/2	10	3.2	6.7	*d*	[*d*]
Manganese	2/2	0.060	0.0070	0.033	0.05	1[3]
Potassium	2/2	1.4	0.79	1.1	*d*	[*d*]
Silicon	2/2	12	7.6	9.6	*d*	[*d*]
Sodium	2/2	7.2	6.0	6.6*	*d*	[*d*]
Zinc	2/2	0.046	0.017	0.031	5	0[3]
Others, filtered						
Alkalinity (mg/L)	2/2	230	220	220*	*d*	[*d*]
Total dissolved solids (mg/L)	2/2	260	230	250*	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	2/2	230	210	220*	*d*	[*d*]
Total organic carbon (mg/L)	2/2	1.2	0.93	1.0*	*d*	[*d*]
Total suspended solids (mg/L)	1/2	43	<5.0	~24	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
Gross alpha	1/2	1.5*	0.32	0.91	15	0[2]
Gross beta	1/2	3.0*	0.54	1.8	50	0[2]
Total rad Sr	1/2	14*	0.59	7.3	8	1[2]
Radionuclides, unfiltered (pCi/L)[e]						
Gross beta	1/2	3.8*	1.4	2.6	50	0[2]
H-3	1/2	810*	410	610	20,000	0[2]
Total rad Sr	1/2	2.5*	–0.054	1.2	8	0[2]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.51. Constituents in Waste Area Grouping (WAG) 6 groundwater at ORNL semiannual assessment wells, February 27–March 31 and July 15–August 14, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Field measurements, unfiltered						
Conductivity (mS/cm)	18/18	0.41	0.010	0.18*	*d*	[*d*]
Dissolved oxygen (ppm)	18/18	8.7	3.7	6.0*	*d*	[*d*]
Redox (mV)	18/18	460	150	280*	*d*	[*d*]
Temperature (°C)	18/18	17	12	15*	30.5	0[1]
Turbidity (JTU)	18/18	140	8.4	56*	1	18[2]
pH (standard units)	18/18	7.9	4.6	6.4*	(6.5, 8.5)	8[3]
Others, unfiltered						
Alkalinity (mg/L)	9/9	280	6.0	130*	*d*	[*d*]
Total organic carbon (mg/L)	7/9	8.1	<0.50	~1.7*	*d*	[*d*]
Total organic halides (μg/L)	1/9	10	<5.0	~5.7*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	1/9	4.1*	–0.81	0.96	200	0[4]
^{137}Cs	1/9	6.5*	–1.9	0.60	120	0[4]
Gross alpha	3/18	4.3*	–1.3	0.93*	15	0[2]
Gross beta	3/9	35*	1.1	6.7	50	0[2]
^{3}H	12/18	32,000*	–1,100	8,700*	80,000	0[4]
Total rad Sr	4/9	4.3*	–0.27	2.0*	8	0[2]
Volatile organics, unfiltered (μg/L)						
1,1,1-Trichloroethane	1/9	U5.0	J2.0	~4.7*	200	0[1]
Acetone	1/9	B38	U10	~13*	*d*	[*d*]
Carbon disulfide	1/9	U5.0	J2.0	~4.7*	*d*	[*d*]
		Upgradient wells				
Field measurements, unfiltered						
Conductivity (mS/cm)	14/14	0.78	0.010	0.31*	*d*	[*d*]
Dissolved oxygen (ppm)	14/14	11	4.7	7.2*	*d*	[*d*]
Redox (mV)	14/14	430	130	270*	*d*	[*d*]
Temperature (°C)	14/14	16	12	14*	30.5	0[1]
Turbidity (JTU)	14/14	980	4.2	240*	1	14[2]
pH (standard units)	14/14	8.8	5.2	7.3*	(6.5, 8.5)	4[3]
Others, unfiltered						
Alkalinity (mg/L)	7/7	430	7.5	210*	*d*	[*d*]
Total organic carbon (mg/L)	6/7	2.5	0.50	~1.3*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	2/7	7.8*	–6.2	1.0	200	0[4]
^{137}Cs	2/7	26*	–1.1	5.5	120	0[4]
Gross alpha	7/14	4.1*	–1.0	1.2*	15	0[2]
Gross beta	3/7	11*	1.6	4.6*	50	0[2]
^{3}H	3/14	760*	–380	210*	80,000	0[4]
Total rad Sr	2/7	8.1*	–1.4	3.0*	40	0[4]

Table 5.51 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Volatile organics, unfiltered (µg/L)						
Acetone	1/7	21	U10	~12*	*d*	[*d*]
Benzene	1/7	U5.0	J1.0	~4.4*	5	0[1]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.52. Constituents in Solid Waste Storage Area (SWSA) 6 groundwater at ORNL quarterly assessment wells, February 27–March 31, July 15–August 14, and November 30–December 16, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Field measurements, unfiltered						
Conductivity (mS/cm)	32/32	0.89	0.17	0.49*	*d*	[*d*]
Dissolved oxygen (ppm)	32/32	9.2	4.8	7.0*	*d*	[*d*]
Redox (mV)	32/32	690	120	360*	*d*	[*d*]
Temperature (°C)	32/32	16	10	14*	30.5	0[1]
Turbidity (JTU)	32/32	440	6.3	65*	1	32[2]
pH (standard units)	32/32	7.9	6.7	7.3*	(6.5, 8.5)	0[3]
Others, unfiltered						
Alkalinity (mg/L)	32/32	450	160.0	320*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	9/32	760*	–22	72*	200	4[4]
^{137}Cs	3/32	27	–24	0.77	120	0[4]
Gross alpha	17/32	7.3*	–0.76	2.0*	15	0[2]
^{3}H	32/32	1,800,000*	2,400*	430,000*	80,000	22[4]
Total rad Sr	16/32	10*	–1.7	2.4*	8	0[2]
Volatile organics, unfiltered (µg/L)						
1,2-Dichloroethane	4/32	10	U5.0	~5.4*	5	4[1]
1,2-Dichloroethene	6/32	7.0	J4.0	~5.1*	70	0[2]
Acetone	1/32	B21	U10	~10*	*d*	[*d*]
Benzene	2/32	U5.0	J2.0	~4.8*	5	0[1]
Bromodichloromethane	1/32	U5.0	J2.0	~4.9*	100	0[2]
Carbon disulfide	5/32	31	J2.0	~6.8*	*d*	[*d*]
Carbon tetrachloride	4/32	42	U5.0	~9.2*	5	4[1]
Chloroform	9/32	40	J1.0	~8.7*	100	0[2]
Methylene chloride	3/32	9.0	J3.0	~5.0*	*d*	[*d*]
Styrene	1/32	8.0	U5.0	~5.1*	100	0[2]
Trichloroethene	8/32	Y200	J4.0	~28*	5	4[1]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.53. Constituents in Waste Area Grouping (WAG) 7 groundwater at ORNL, April 22–May 13, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	14/14	110	1.0	22*	250	0[3]
Fluoride	2/14	8.0	<0.10	~0.80	4	1[2]
Nitrate	10/14	1,900	<0.10	~140	10	2[2]
Sulfate (as SO_4)	14/14	730	8.0	160*	250	3[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	14/14	3.3	0.15	0.82*	*d*	[*d*]
Dissolved oxygen (ppm)	14/14	9.8	6.9	8.0*	*d*	[*d*]
Redox (mV)	14/14	250	140	170*	*d*	[*d*]
Temperature (°C)	14/14	15	11	13*	30.5	0[1]
Turbidity (JTU)	14/14	100	8.4	35*	1	14[2]
pH (standard units)	14/14	9.1	7.0	7.7*	(6.5, 8.5)	1[3]
Metals, filtered (mg/L)						
Aluminum	9/14	0.23	<0.050	~0.072*	0.2	1[3]
Barium	14/14	0.23	0.011	0.10*	1	0[2]
Boron	4/14	0.42	<0.080	~0.14*	*d*	[*d*]
Calcium	14/14	330	3.1	91*	*d*	[*d*]
Chromium	11/14	0.018	<0.0040	~0.0094*	0.05	0[1]
Cobalt	2/14	0.036	<0.0040	~0.0083*	*d*	[*d*]
Copper	14/14	0.030	0.0071	0.018*	1	0[3]
Iron	5/14	8.4	<0.050	~0.67	0.3	1[3]
Lead	1/14	0.025	<0.020	~0.020*	0.05	0[1]
Magnesium	14/14	110	0.77	22*	*d*	[*d*]
Manganese	14/14	1.5	0.0013	0.20*	0.05	5[3]
Nickel	13/14	0.39	<0.0040	~0.046	*d*	[*d*]
Potassium	14/14	9.0	1.1	3.1*	*d*	[*d*]
Selenium	2/14	0.020	<0.0050	~0.0061*	0.01	1[1]
Silicon	14/14	12	4.4	7.0*	*d*	[*d*]
Sodium	12/14	660	<5.0	~120*	*d*	[*d*]
Vanadium	2/14	0.0056	<0.0020	~0.0023*	*d*	[*d*]
Zinc	1/14	0.0079	<0.0050	~0.0052*	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	10/14	4.8	<0.050	~1.3*	0.2	8[3]
Barium	14/14	0.21	0.012	0.10*	1	0[2]
Beryllium	4/14	0.0011	<0.0010	~0.0010*	*d*	[*d*]
Boron	4/14	0.39	<0.080	~0.14*	*d*	[*d*]
Calcium	14/14	330	3.1	89*	*d*	[*d*]
Chromium	11/14	0.037	<0.0040	~0.014*	0.05	0[1]
Cobalt	3/14	0.031	<0.0040	~0.0079*	*d*	[*d*]
Copper	2/14	0.010	<0.0070	~0.0074*	1	0[3]
Iron	14/14	11	0.051	2.1*	0.3	8[3]
Lead	1/14	0.028	<0.020	~0.021*	0.05	0[1]
Magnesium	14/14	110	0.80	21*	*d*	[*d*]
Manganese	14/14	1.4	0.0063	0.24*	0.05	6[3]
Nickel	11/14	0.38	<0.0040	~0.043	*d*	[*d*]
Potassium	14/14	9.7	0.70	3.3*	*d*	[*d*]
Silicon	14/14	13	4.6	8.4*	*d*	[*d*]
Silver	1/14	0.011	<0.0050	~0.0054*	0.05	0[1]
Sodium	12/14	610	<5.0	~110*	*d*	[*d*]
Vanadium	5/14	0.0062	<0.0020	~0.0027*	*d*	[*d*]
Zinc	7/14	0.020	<0.0050	~0.0082*	5	0[3]

Table 5.53 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value[c]	Number of values exceeding reference [ref][c]
Others, filtered						
Alkalinity (mg/L)	14/14	640	58	290*	*d*	[*d*]
Total dissolved solids (mg/L)	14/14	3,500	280	780*	500	6[1]
Others, unfiltered						
Alkalinity (mg/L)	14/14	640	60	290*	*d*	[*d*]
Total organic carbon (mg/L)	14/14	2.5	0.50	~1.2*	*d*	[*d*]
Total organic halides (μg/L)	1/14	100	<5.0	~12	*d*	[*d*]
Total suspended solids (mg/L)	9/14	130	2.0	~36*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{60}Co	4/14	540*	−4.9	43	200	1[4]
^{137}Cs	3/14	21*	−2.2	3.3*	120	0[4]
Gross alpha	6/14	140*	0.54	12	15	1[2]
Gross beta	13/14	3,000*	4.3	370	50	6[2]
^{3}H	8/14	890,000*	−2,100	110,000	20,000	4[2]
^{99}Tc	4/4	7,600*	26*	2,000	4,000	1[4]
Total rad Sr	10/14	8.6*	−0.92	4.1*	8	1[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	3/14	540*	−0.81	44	200	1[4]
^{137}Cs	4/14	38*	−0.27	6.2*	120	0[4]
Gross alpha	8/14	140*	−2.4	14	15	2[2]
Gross beta	14/14	5,100*	6.2*	460	50	7[2]
^{3}H	9/14	890,000*	−2,300	110,000	20,000	4[2]
Total rad Sr	6/14	5.9*	−1.4	2.4*	8	0[2]
Volatile organics, unfiltered (μg/L)						
Benzene	1/14	U5.0	J3.0	~4.9*	5	0[1]
Carbon disulfide	1/14	17	U5.0	~5.9*	*d*	[*d*]
Styrene	1/14	U5.0	J1.0	~4.7*	100	0[2]
Trichloroethene	1/14	U5.0	J3.0	~4.9*	5	0[1]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	2/2	4.1	0.90	2.5	250	0[3]
Fluoride	1/2	0.10	<0.10	~0.10	4	0[2]
Sulfate (as SO_4)	2/2	84	6.4	45	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	2/2	0.35	0.030	0.19	*d*	[*d*]
Dissolved oxygen (ppm)	2/2	11	7.9	9.3*	*d*	[*d*]
Redox (mV)	2/2	180	160	170*	*d*	[*d*]
Temperature (°C)	2/2	14	14	14*	30.5	0[1]
Turbidity (JTU)	2/2	120	2.1	59	1	2[2]
pH (standard units)	2/2	7.8	5.5	6.6	(6.5, 8.5)	1[3]
Metals, filtered (mg/L)						
Aluminum	2/2	0.069	0.061	0.065*	0.2	0[3]
Barium	2/2	0.054	0.037	0.045	1	0[2]
Calcium	2/2	45	1.1	23	*d*	[*d*]
Chromium	1/2	0.0058	<0.0040	~0.0049	0.05	0[1]
Cobalt	1/2	0.0047	<0.0040	~0.0044*	*d*	[*d*]
Copper	2/2	0.024	0.020	0.022*	1	0[3]
Magnesium	2/2	9.0	1.9	5.4	*d*	[*d*]

Table 5.53 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Manganese	2/2	0.58	0.038	0.31	0.05	1[3]
Nickel	2/2	0.019	0.0066	0.013	d	[d]
Potassium	2/2	4.7	0.70	2.7	d	[d]
Silicon	2/2	11	9.5	10*	d	[d]
Sodium	1/2	70	<5.0	~38	d	[d]
Vanadium	1/2	0.0023	<0.0020	~0.0021*	d	[d]
Zinc	1/2	0.0095	<0.0050	~0.0072	5	0[3]
Metals, unfiltered (mg/L)						
Aluminum	1/2	0.39	<0.050	~0.22	0.2	1[3]
Barium	2/2	0.060	0.033	0.046	1	0[2]
Calcium	2/2	41	1.2	21	d	[d]
Chromium	1/2	0.0043	<0.0040	~0.0042*	0.05	0[1]
Cobalt	1/2	0.0047	<0.0040	~0.0044*	d	[d]
Copper	1/2	0.0082	<0.0070	~0.0076*	1	0[3]
Iron	2/2	0.50	0.29	0.39	0.3	1[3]
Magnesium	2/2	7.9	2.1	5.0	d	[d]
Manganese	2/2	0.53	0.046	0.29	0.05	1[3]
Nickel	1/2	0.013	<0.0040	~0.0086	d	[d]
Potassium	2/2	4.2	0.60	2.4	d	[d]
Silicon	2/2	9.7	9.5	9.6*	d	[d]
Sodium	1/2	62	<5.0	~33	d	[d]
Zinc	2/2	0.0095	0.0080	0.0087*	5	0[3]
Others, filtered						
Alkalinity (mg/L)	2/2	210	14	110	d	[d]
Total dissolved solids (mg/L)	2/2	360	54	210	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	2/2	210	13	110	d	[d]
Total organic carbon (mg/L)	2/2	1.3	0.58	0.95	d	[d]
Total suspended solids (mg/L)	1/2	17	<5.0	~11	d	[d]
Radionuclides, filtered (pCi/L)[e]						
^{137}Cs	1/2	3.5*	3.5	3.5	120	0[4]
Gross alpha	2/2	2.5*	1.9*	2.2*	15	0[2]
Gross beta	2/2	65*	19*	42	50	1[2]
^{3}H	1/2	730*	27	380	20,000	0[2]
Total rad Sr	1/2	6.5*	1.4	3.9	8	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{137}Cs	1/2	6.5*	1.1	3.8	120	0[4]
Gross alpha	2/2	3.5*	2.3*	2.9	15	0[2]
Gross beta	2/2	41*	15*	28	50	0[2]
^{3}H	1/2	700*	350	530	20,000	0[2]
Total rad Sr	1/2	4.3*	1.9	3.1	8	0[2]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

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3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.54. Constituents in Waste Area Groupings (WAGs) 8 and 9 groundwater at ORNL, May 27–June 12, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	9/9	8.3	3.8	5.3*	250	0[3]
Fluoride	3/9	1.5	<0.10	~0.29*	4	0[2]
Nitrate	2/9	4.4	<0.50	~1.1*	10	0[2]
Sulfate (as SO_4)	9/9	280	8.6	63*	250	1[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Benzyl butyl phthalate	1/9	U10	J2.0	~9.1*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	9/9	0.63	0.046	0.36*	*d*	[*d*]
Dissolved oxygen (ppm)	9/9	15	3.1	7.8*	*d*	[*d*]
Temperature (°C)	9/9	16	14	15*	30.5	0[1]
Turbidity (JTU)	9/9	570	19	350*	1	9[2]
pH (standard units)	9/9	9.2	5.0	7.0*	(6.5, 8.5)	4[3]
Metals, filtered (mg/L)						
Aluminum	3/9	0.19	<0.050	~0.066*	0.2	0[3]
Antimony	1/9	0.0056	<0.0050	~0.0051*	*d*	[*d*]
Arsenic	1/9	0.015	<0.010	~0.011*	0.05	0[1]
Barium	9/9	0.20	0.027	0.10*	1	0[2]
Boron	3/9	0.74	<0.080	~0.17*	*d*	[*d*]
Calcium	9/9	120	1.3	51*	*d*	[*d*]
Chromium	8/9	0.015	<0.0040	~0.0088*	0.05	0[1]
Cobalt	1/9	0.019	<0.0040	~0.0057*	*d*	[*d*]
Copper	5/9	0.025	<0.0070	~0.010*	1	0[3]
Iron	9/9	25	0.051	3.5	0.3	3[3]
Magnesium	9/9	24	0.14	14*	*d*	[*d*]
Manganese	9/9	3.2	0.0051	0.72*	0.05	6[3]
Mercury	1/9	0.00019	<0.000050	~0.000066*	0.002	0[1]
Nickel	5/9	0.0080	<0.0040	~0.0051*	*d*	[*d*]
Potassium	9/9	5.1	1.8	2.9*	*d*	[*d*]
Silicon	9/9	16	3.0	7.7*	*d*	[*d*]
Sodium	9/9	210	5.7	48*	*d*	[*d*]
Strontium	1/1	1.6	1.6	1.6	*d*	[*d*]
Vanadium	2/9	0.0052	<0.0020	~0.0025*	*d*	[*d*]
Metals, unfiltered (mg/L)						
Aluminum	7/9	1.3	<0.050	~0.33*	0.2	4[3]
Barium	9/9	0.21	0.035	0.11*	1	0[2]
Boron	3/9	0.74	<0.080	~0.17*	*d*	[*d*]
Calcium	9/9	110	1.5	48*	*d*	[*d*]
Chromium	8/9	0.013	<0.0040	~0.0084*	0.05	0[1]
Cobalt	1/9	0.015	<0.0040	~0.0053*	*d*	[*d*]
Copper	1/9	0.0091	<0.0070	~0.0072*	1	0[3]
Iron	9/9	25	0.060	3.7	0.3	4[3]
Magnesium	9/9	23	0.15	13*	*d*	[*d*]
Manganese	9/9	3.0	0.0090	0.68*	0.05	6[3]
Nickel	3/9	0.0073	<0.0040	~0.0046*	*d*	[*d*]
Potassium	9/9	5.0	1.5	2.5*	*d*	[*d*]
Selenium	1/9	0.0064	<0.0050	~0.0052*	0.01	0[1]
Silicon	9/9	18	3.1	7.9*	*d*	[*d*]
Silver	1/9	0.0051	<0.0050	~0.0050*	0.05	0[1]
Sodium	8/9	200	<5.0	~46*	*d*	[*d*]

Table 5.54 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Strontium	1/1	1.6	1.6	1.6	*d*	[*d*]
Thallium	1/9	0.0051	<0.0050	~0.0050*	*d*	[*d*]
Vanadium	3/9	0.0033	<0.0020	~0.0022*	*d*	[*d*]
Zinc	2/9	0.0081	<0.0050	~0.0057*	5	[*d*]
Others, filtered						
Alkalinity (mg/L)	9/9	350	85	200*	*d*	[*d*]
Total dissolved solids (mg/L)	9/9	600	140	340*	500	2[1]
Others, unfiltered						
Alkalinity (mg/L)	9/9	350	85	200*	*d*	[*d*]
Total organic carbon (mg/L)	4/9	1.0	<0.50	~0.66*	*d*	[*d*]
Total organic halides (µg/L)	1/9	23	<5.0	~7.0*	*d*	[*d*]
Total suspended solids (mg/L)	6/9	48	2.0	~15*	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{137}Cs	2/9	12*	–0.27	2.8*	120	0[4]
Gross alpha	6/9	6.8*	0.054	2.2*	15	0[2]
Gross beta	7/9	2,100*	2.4	550*	50	4[2]
^{3}H	3/9	57,000*	–890	6,500	20,000	1[2]
Total rad Sr	7/9	1,100*	0.27	290*	8	3[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	1/9	3.8*	–3.0	0.21	200	0[4]
^{137}Cs	3/9	14*	0.27	3.7*	120	0[4]
Gross alpha	7/9	6.5*	–0.27	3.2*	15	0[2]
Gross beta	6/9	1,700*	1.6	500*	50	4[2]
^{3}H	3/9	57,000*	–810	6,400	20,000	1[2]
Total rad Sr	6/9	920*	–0.54	260*	8	3[2]
Volatile organics, unfiltered (µg/L)						
1,2-Dichloroethene	1/9	11	U5.0	~5.7*	70	0[2]
Toluene	1/9	U5.0	J2.0	~4.7*	1,000	0[2]
Trichloroethene	1/9	6.0	U5.0	~5.1*	5	1[1]
Xylene, total	1/9	J5.0	U5.0	~5.0	10,000	0[2]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	2/2	4.8	3.7	4.3*	250	0[3]
Fluoride	1/2	0.10	<0.10	~0.10	4	0[2]
Sulfate (as SO_4)	2/2	120	27	73	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Benzyl butyl phthalate	1/2	B15	U10	~13	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	2/2	0.30	0.27	0.28*	*d*	[*d*]
Dissolved oxygen (ppm)	2/2	9.2	8.1	8.7*	*d*	[*d*]
Redox (mV)	1/1	150	150	150	*d*	[*d*]
Temperature (°C)	2/2	14	13	13*	30.5	0[1]
Turbidity (JTU)	2/2	38	8.4	23	1	2[2]
pH (standard units)	2/2	8.5	7.0	7.8*	(6.5, 8.5)	0[3]
Metals, filtered (mg/L)						
Barium	2/2	0.092	0.030	0.061	1	0[2]
Boron	1/2	0.32	<0.080	~0.20	*d*	[*d*]
Calcium	2/2	50	17	34	*d*	[*d*]
Chromium	1/2	0.013	<0.0040	~0.0084	0.05	0[1]

Table 5.54 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Copper	2/2	0.016	0.011	0.014	1	0[3]
Iron	1/2	4.9	<0.050	~2.5	0.3	1[3]
Magnesium	2/2	21	4.1	12	*d*	[*d*]
Manganese	2/2	4.5	0.055	2.3	0.05	2[3]
Nickel	1/2	0.0091	<0.0040	~0.0066	*d*	[*d*]
Potassium	2/2	6.5	4.2	5.4	*d*	[*d*]
Silicon	2/2	14	6.3	9.9	*d*	[*d*]
Sodium	2/2	74	14	44	*d*	[*d*]
Metals, unfiltered (mg/L)						
Aluminum	2/2	0.87	0.49	0.68	0.2	2[3]
Barium	2/2	0.095	0.039	0.067	1	0[2]
Boron	1/2	0.33	<0.080	~0.20	*d*	[*d*]
Calcium	2/2	47	17	32	*d*	[*d*]
Chromium	1/2	0.013	<0.0040	~0.0086	0.05	0[1]
Iron	2/2	5.7	0.34	3.0	0.3	2[3]
Magnesium	2/2	20	4.1	12	*d*	[*d*]
Manganese	2/2	4.1	0.064	2.1	0.05	2[3]
Nickel	2/2	0.0045	0.0042	0.0043*	*d*	[*d*]
Potassium	2/2	3.4	2.6	3.0*	*d*	[*d*]
Silicon	2/2	14	7.3	11	*d*	[*d*]
Sodium	2/2	68	8.9	38	*d*	[*d*]
Others, filtered						
Alkalinity (mg/L)	2/2	170	120	140	*d*	[*d*]
Total dissolved solids (mg/L)	2/2	390	250	320	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	2/2	170	110	140	*d*	[*d*]
Total suspended solids (mg/L)	2/2	22	11	17	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
^{137}Cs	1/2	62*	–0.27	31	120	0[4]
Gross alpha	1/2	3.2*	0.32	1.8	15	0[2]
Gross beta	2/2	57*	6.8*	32	50	1[2]
Total rad Sr	2/2	7.3*	6.2*	6.8*	8	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{137}Cs	1/2	30*	0.81	15	120	0[4]
Gross alpha	2/2	32*	2.7*	18	15	1[2]
Gross beta	2/2	650*	4.6*	330	50	1[2]
Total rad Sr	2/2	5.1*	4.9*	5.0*	8	0[2]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.55. Constituents in Waste Area Grouping (WAG) 17 groundwater at ORNL, April 7–14, 1992

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
		Downgradient wells				
Anions, unfiltered (mg/L)						
Chloride	4/4	21	3.0	12*	250	0[3]
Fluoride	2/4	0.40	<0.10	~0.18	4	0[2]
Nitrate	2/4	5.3	<0.20	~1.7	10	0[2]
Sulfate (as SO_4)	4/4	51	26	38*	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.59	0.22	0.46*	*d*	[*d*]
Dissolved oxygen (ppm)	4/4	6.0	4.4	5.0*	*d*	[*d*]
Redox (mV)	4/4	190	160	170*	*d*	[*d*]
Temperature (°C)	4/4	17	12	15*	30.5	0[1]
Turbidity (JTU)	4/4	19	8.4	13*	1	4[2]
pH (standard units)	4/4	7.2	6.9	7.1*	(6.5, 8.5)	0[3]
Metals, filtered (mg/L)						
Barium	4/4	0.17	0.026	0.092*	1	0[2]
Boron	1/4	0.085	<0.080	~0.081*	*d*	[*d*]
Calcium	4/4	120	70	100*	*d*	[*d*]
Chromium	3/4	0.011	<0.0040	~0.0081*	0.05	0[1]
Copper	2/4	0.013	<0.0070	~0.0098*	1	0[3]
Iron	1/4	0.21	<0.050	~0.090	0.3	0[3]
Magnesium	4/4	38	6.8	25*	*d*	[*d*]
Manganese	3/4	0.19	<0.0010	~0.060	0.05	1[3]
Nickel	1/4	0.0097	<0.0040	~0.0054*	*d*	[*d*]
Potassium	4/4	2.4	0.70	1.6*	*d*	[*d*]
Silicon	4/4	6.8	2.0	4.6*	*d*	[*d*]
Sodium	3/4	15	<5.0	~9.0*	*d*	[*d*]
Metals, unfiltered (mg/L)						
Barium	4/4	0.17	0.026	0.094*	1	0[2]
Boron	1/4	0.10	<0.080	~0.086*	*d*	[*d*]
Calcium	4/4	130	66	100*	*d*	[*d*]
Chromium	3/4	0.021	<0.0040	~0.011*	0.05	0[1]
Iron	2/4	0.23	<0.050	~0.095	0.3	0[3]
Magnesium	4/4	40	6.3	25*	*d*	[*d*]
Manganese	4/4	0.18	0.0031	0.061	0.05	1[3]
Nickel	1/4	0.013	<0.0040	~0.0063*	*d*	[*d*]
Potassium	4/4	1.9	0.60	1.4*	*d*	[*d*]
Silicon	4/4	6.8	2.0	4.7*	*d*	[*d*]
Sodium	3/4	15	<5.0	~9.2*	*d*	[*d*]
Vanadium	1/4	0.0022	<0.0020	~0.0021*	*d*	[*d*]
Others, filtered						
Alkalinity (mg/L)	4/4	430	170	320*	*d*	[*d*]
Total dissolved solids (mg/L)	4/4	520	240	430*	500	1[1]
Others, unfiltered						
Alkalinity (mg/L)	4/4	430	170	320*	*d*	[*d*]
Total organic carbon (mg/L)	4/4	3.3	1.7	2.5*	*d*	[*d*]
Total organic halides (μg/L)	3/4	8,300	<5.0	~2,100	*d*	[*d*]

Table 5.55 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Radionuclides, filtered (pCi/L)[e]						
60Co	1/4	3.0	–1.6	1.5	200	0[4]
Gross alpha	3/4	7.8*	–0.14	3.9*	15	0[2]
Gross beta	3/4	10*	–3.2	5.8	50	0[2]
^{3}H	4/4	12,000*	3,500*	7,100*	20,000	0[2]
Total rad Sr	1/4	2.0*	–0.54	1.2	8	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
Gross alpha	4/4	21*	3.5*	8.9	15	1[2]
Gross beta	4/4	14*	8.1*	11*	50	0[2]
^{3}H	4/4	8,600*	2,700*	5,900*	20,000	0[2]
Total rad Sr	1/4	3.2*	–0.62	2.0	8	0[2]
Volatile organics, unfiltered (µg/L)						
1,1-Dichloroethene	1/4	22	U5.0	~9.3	7	1[1]
1,2-Dichloroethene	2/4	Y2,700	U5.0	~680	70	1[2]
Benzene	1/4	B18	U5.0	~8.3*	5	1[1]
Tetrachloroethene	1/4	14	U5.0	~7.3*	5	1[2]
Trichloroethene	3/4	Y13,000	U5.0	~3,200	5	2[1]
Vinyl chloride	1/4	160	U10	~48	2	4[1]
		Upgradient wells				
Anions, unfiltered (mg/L)						
Chloride	4/4	45	1.7	14	250	0[3]
Fluoride	1/4	0.20	<0.10	~0.13*	4	0[2]
Nitrate	2/4	1.2	<1.0	~1.1*	10	0[2]
Sulfate (as SO_4)	4/4	60	12	33*	250	0[3]
Base neutral/acid extractable organics, unfiltered (µg/L)						
Diethyl phthalate	1/4	U10	J1.0	~7.8*	*d*	[*d*]
Field measurements, unfiltered						
Conductivity (mS/cm)	4/4	0.63	0.33	0.47*	*d*	[*d*]
Dissolved oxygen (ppm)	4/4	10	4.6	6.9*	*d*	[*d*]
Redox (mV)	4/4	190	130	160*	*d*	[*d*]
Temperature (°C)	4/4	14	12	14*	30.5	0[1]
Turbidity (JTU)	4/4	130	29	68*	1	4[2]
pH (standard units)	4/4	7.6	6.6	7.1*	(6.5, 8.5)	0[3]
Metals, filtered (mg/L)						
Barium	4/4	0.10	0.021	0.061*	1	0[2]
Boron	1/4	0.12	<0.080	~0.090*	*d*	[*d*]
Calcium	4/4	160	53	110*	*d*	[*d*]
Chromium	3/4	0.0082	<0.0040	~0.0061*	0.05	0[1]
Copper	3/4	0.032	<0.0070	~0.018*	1	0[3]
Iron	1/4	0.11	<0.050	~0.065*	0.3	0[3]
Magnesium	4/4	38	6.5	24*	*d*	[*d*]
Manganese	3/4	0.017	<0.0010	~0.0070	0.05	0[3]
Potassium	4/4	3.0	0.60	1.9*	*d*	[*d*]
Silicon	4/4	8.3	3.9	6.0*	*d*	[*d*]
Sodium	4/4	11	5.2	7.7*	*d*	[*d*]

Table 5.55 (continued)

Analyte	Number detected/ number of samples	Max[a]	Min[a]	Av[b]	Reference value	Number of values exceeding reference [ref][c]
Metals, unfiltered (mg/L)						
Barium	4/4	0.11	0.028	0.064*	1	0[2]
Boron	1/4	0.15	<0.080	~0.097*	*d*	[*d*]
Calcium	4/4	170	53	110*	*d*	[*d*]
Chromium	3/4	0.0091	<0.0040	~0.0073*	0.05	0[1]
Iron	3/4	0.24	<0.050	~0.13*	0.3	0[3]
Magnesium	4/4	39	6.7	24*	*d*	[*d*]
Manganese	4/4	0.027	0.0018	0.010	0.05	0[3]
Potassium	4/4	2.6	0.44	1.5*	*d*	[*d*]
Silicon	4/4	8.5	4.1	6.2*	*d*	[*d*]
Sodium	3/4	12	<5.0	~7.8*	*d*	[*d*]
Others, filtered						
Alkalinity (mg/L)	4/4	390	250	320*	*d*	[*d*]
Total dissolved solids (mg/L)	4/4	500	320	420*	500	0[1]
Others, unfiltered						
Alkalinity (mg/L)	4/4	390	250	320*	*d*	[*d*]
Total organic carbon (mg/L)	4/4	2.4	1.5	1.8*	*d*	[*d*]
Total suspended solids (mg/L)	1/4	49	<5.0	~16	*d*	[*d*]
Radionuclides, filtered (pCi/L)[e]						
Gross alpha	4/4	23*	1.4*	8.1	15	1[2]
Gross beta	4/4	18*	4.1*	9.1*	50	0[2]
^{3}H	4/4	13,000*	1,700*	7,000*	20,000	0[2]
Total rad Sr	1/4	3.8*	0.27	2.0*	8	0[2]
Radionuclides, unfiltered (pCi/L)[e]						
^{137}Cs	1/4	43*	–5.4	15	120	0[4]
Gross alpha	4/4	19*	3.0*	10*	15	1[2]
Gross beta	4/4	15*	3.8*	11*	50	0[2]
^{3}H	4/4	14,000*	1,700*	7,100*	20,000	0[2]
Total rad Sr	1/4	5.7*	0.81	2.6*	8	0[2]
Volatile organics, unfiltered (µg/L)						
Acetone	1/4	B11	U10	~10*	*d*	[*d*]

[a]Prefixes J, B, E, Y, U, or < mean that the value was estimated, found in the laboratory blank, exceeded the calibration range, exceeded the calibration range and was diluted and reanalyzed, was not detected at that level, or was not quantified at that level, respectively. Radionuclide values that are significantly greater than zero are identified by an *.

[b]Average concentrations significantly greater than zero are identified by an *. The ~ prefix indicates that estimated and/or undetected values were used in the calculation of the average.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria, as amended.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G, as amended.
3. 40CFR Part 143—National Secondary Drinking Water Regulations, as amended.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.56. Constituents in Well Grouping 1 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference[c]
		Max[a]	Min[a]	Av[b]		
		Field measurements				
Conductivity, µmho/cm	*d*/46	1889	180	940.74	*d*	*d*
Dissolved oxygen, ppm	*d*/46	7.4	0.4	3.28	*d*	*d*
Redox, mv	*d*/46	242	−116	71.72	*d*	*d*
Temperature, °C	*d*/46	21.8	10.5	15.57	30.5	0
pH, standard units	*d*/46	7.8	5.6	6.65	6.5–8.5	12
		Metals, filtered (mg/L)				
Aluminum	27/29	0.4	0.024	0.097	0.2	2
Antimony	4/29	B0.048	B0.036	0.041	*d*	*d*
Barium	29/29	0.40	0.016	0.13	2	0
Cadmium	12/29	0.0078	B0.0026	0.0048	0.005	5
Calcium	29/29	196	12.6	106.5	*d*	*d*
Chromium	14/29	0.054	0.012	0.033	0.05	2
Cobalt	9/29	B0.044	0.0051	0.022	*d*	*d*
Copper	15/29	0.032	B0.010	0.019	1	0
Iron	25/29	21	B0.011	4.90	0.3	14
Magnesium	29/29	37	3.3	16.67	*d*	*d*
Manganese	29/29	20.2	0.0034	7.27	0.05	21
Molybdenum	2/29	0.012	0.011	0.01	d	*d*
Nickel	6/29	0.039	B0.02	0.026	*d*	*d*
Potassium	29/29	5.24	1.4	2.79	*d*	*d*
Silicon	13/13	7.4	3	4.82	*d*	*d*
Silver	14/29	0.043	0.014	0.029	0.1P	0
Sodium	29/29	116	1.5	39.04	*d*	*d*
Vanadium	11/29	B0.029	B0.013	0.019	*d*	*d*
Zinc	11/29	0.088	B0.0051	0.026	5	0
		Metals, unfiltered (mg/L)				
Aluminum	29/29	N7.84	0.02	1.137	0.2	19
Antimony	5/29	B0.057	B0.0359	0.0448	*d*	*d*
Barium	29/29	0.4	0.019	0.1397	2	0
Cadmium	14/29	0.0077	B0.0022	0.0046	0.005	4
Calcium	29/29	187	19	107	*d*	*d*
Chromium	15/29	0.054	0.0133	0.036	0.05	3
Cobalt	10/29	0.056	B0.011	0.028	*d*	*d*
Copper	14/29	0.1	0.0053	0.0216	1	0
Iron	28/29	42.6	0.0077	8.5442	0.3	26
Magnesium	29/29	41	3.4	16.1	*d*	*d*
Manganese	29/29	22.2	0.0055	7.3687	0.05	24
Molybdenum	2/29	0.015	0.011	0.0129	*d*	*d*
Nickel	9/29	1.9	B0.0202	0.23	*d*	*d*
Potassium	29/29	5.2	1.5	3.0	*d*	*d*
Silicon	13/13	8	3.1	5.2	*d*	*d*
Silver	14/29	0.043	0.013	0.027	0.05	0
Sodium	29/29	103	P1.5	37.7	*d*	*d*
Vanadium	13/29	B0.034	B0.0133	0.0213	*d*	*d*
Zinc	19/29	0.4	0.0022	0.038	5	0
		Radiochemistry, filtered				
Alpha activity, pCi/L	*d*/38	46.8	−1.84	0.033	15	1
Beta activity, pCi/L	*d*/38	160	0.132	5.411	50	2
^{99}Tc, pCi/L	*d*/38	236	−993	7	4,000	0
Uranium, total, µg/L	*d*/25	3.23	0.096	0.263	20	0

Table 5.56 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Radiochemistry, unfiltered						
Alpha activity, pCi/L	*d*/41	90.6	−0.803	0.134	15	4
Beta activity, pCi/L	*d*/41	379	−0.69	10.19	50	3
^{99}Tc, pCi/L	*d*/41	1,650	−1,000	7	4,000	0
Uranium, total, µg/L	*d*/29	4.34	0.077	0.37	20	0
Semivolatile organics, unfiltered (µg/L)						
Diethylphthalate	1/38	32	32	32	*d*	*d*
bis(2-Ethylhexyl)phthalate	2/38	J11	J3	7	*d*	*d*
Semivolatile organics, tentatively identified compounds, unfiltered (µg/L)						
2-Pentanone, 4-hydroxy-4-methy	5/5	JA15	JA9	13	*d*	*d*
Spectrochemistry, filtered (mg/L)						
Arsenic	5/29	0.0071	0.005	0.0062	0.05	0
Spectrochemistry, unfiltered (mg/L)						
Arsenic	13/29	s0.0134	B0.0024	0.0064	0.05	0
Lead	10/29	0.0114	B0.0021	0.0058	0.05	0
Volatile organics, unfiltered (µg/L)						
1,1,1-Trichloroethane	9/38	150	8	43	200	0
1,1,2-Trichloroethane	4/38	J4	J2	3	*d*	*d*
1,1-Dichloroethane	15/38	D1,200	JD4	293	*d*	*d*
1,1-Dichloroethene	15/38	D650	5	167	7	12
1,2-Dichloroethane	7/38	18	J1	7	5	2
1,2-Dichloroethene, total	25/38	D3,000	J1	963	70	15
2-Butanone	7/38	JD300	J1	92	*d*	*d*
2-Hexanone	2/38	J2	JB1	2	*d*	*d*
4-Methyl-2-pentanone	5/38	JB6	JB1	3	*d*	*d*
Acetone	27/38	B15	JB2	6	*d*	*d*
Bromoform	1/38	J5	J5	5	100	0
Chloroethane	4/38	J6	J1	3	200	0
Chloroform	2/38	J1	J1	1	100	0
Methylene chloride	26/38	JD190	JB1	16	*d*	*d*
Tetrachloroethene	13/38	D910	J1	205	5	6
Toluene	16/38	B6	JB1	2	1,000	0
Trichloroethene	23/38	D15,000	J1	2,049	5	18
Vinyl chloride	16/38	D480	J1	184	2	14
Volatile organics, tentatively identified compounds, unfiltered (µgL)						
Freon-113	2/2	J1,300	J1,100	1,200	*d*	*d*
Wet chemistry, filtered						
Uranium, fluorometric, mg/L	3/13	0.004	0.002	0.0027	0.02	0
Dissolved solids, mg/L	41/41	1,308	81	606	500	28

Table 5.56 (continued)

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Wet chemistry, unfiltered						
Chloride, mg/L	26/26	408	2.9	114.03	250	7
Conductivity, μmho/cm	*d*/155	1,643	145	834	*d*	*d*
Fluoride, mg/L	11/38	0.28	0.1	0.15	4	0
Nitrate, mg/L	13/38	1.49	0.27	0.796	10	0
Sulfate, mg/L	25/26	276	4	79	250	1
Suspended solids, mg/L	40/41	6,480	2	221	*d*	*d*
Total organic carbon, mg/L	74/103	29.1	1	4.64	*d*	*d*
Total organic halide, μg/L	59/104	14.38	0.0105	2.7527	*d*	*d*
Turbidity, NTU	41/41	1,500	1.7	72.22	1	41
Uranium, fluorometric, mg/L	3/13	0.002	0.002	0.002	*d*	*d*
pH, standard units	*d*/159	8.1	5.99	6.824	6.5–8.5	32

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.57. Constituents in Well Grouping 5 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Field measurements						
Conductivity, µmho/cm	*d*/1	626	626	626	*d*	*d*
Dissolved oxygen, ppm	*d*/1	8.6	8.6	8.6	*d*	*d*
Redox, mv	*d*/1	44	44	44	*d*	*d*
Temperature, °C	*d*/1	18.2	18.2	18.2	30.5	0
pH, standard units	*d*/1	7.1	7.1	7.1	6.5–8.5	0
Radiochemistry, filtered (pCi/L)						
Alpha activity	*d*/1	0.817	0.817	0.817	15	0
Beta activity	*d*/1	2.51	2.51	2.51	50	0
^{99}Tc	*d*/1	1440	1440	1440	4000	0
Radiochemistry, unfiltered (pCi/L)						
Alpha activity	*d*/1	14.6	14.6	14.6	15	0
Beta activity	*d*/1	71.6	71.6	71.6	50	1
^{99}Tc	*d*/1	1290	1290	1290	4000	0
Volatile organics, unfiltered (µg/L)						
1,1-Dichloroethane	1/1	J1	J1	1	*d*	*d*
1,2-Dichloroethene (total)	1/1	46	46	46	70	0
Chloromethane	1/1	J2	J2	2	*d*	*d*
Trichloroethene	1/1	40	40	40	5	1
Wet chemistry, filtered						
Uranium fluorometric, mg/L	1/1	0.001	0.001	0.001	0.02	0
Wet chemistry, unfiltered						
Conductivity, µmho/cm	*d*/4	546	532	538.5	*d*	*d*
Fluoride SIE, mg/L	1/1	0.5	0.5	0.5	4	0
Uranium fluorometric, mg/L	1/1	0.001	0.001	0.001	0.02	0
pH, standard units	*d*/4	7.5	7.46	7.478	6.5–8.5	0

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.58. Constituents in Well Grouping 6 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
		Field measurements				
Conductivity, µmho/cm	*d*/6	735	374	469	*d*	*d*
Dissolved oxygen, ppm	*d*/6	6.3	1.8	3.72	*d*	*d*
Redox, mv	*d*/6	262	−185	75	*d*	*d*
Temperature, °C	*d*/6	19.7	17.9	18.47	30.5	0
pH, standard units	*d*/6	10.3	5.2	8.12	6.5–8.5	4
		Metals, filtered (mg/L)				
Aluminum	6/6	2.9	0.051	0.8697	0.2	4
Barium	6/6	0.39	0.013	0.117	2	0
Beryllium	3/6	0.0018	0.0003	0.0008	*d*	*d*
Calcium	6/6	51	11	30	*d*	*d*
Copper	5/6	0.01	0.0064	0.0076	1	0
Iron	5/6	3.7	0.009	1.1466	0.3	2
Magnesium	6/6	25	1.8	10.6	*d*	*d*
Manganese	4/6	0.26	0.0011	0.1378	0.05	3
Nickel	2/6	0.13	0.014	0.072	*d*	*d*
Potassium	6/6	10	2.5	5.82	*d*	*d*
Silicon	6/6	10	1.1	5.43	*d*	*d*
Sodium	6/6	68	3.3	22.52	*d*	*d*
Vanadium	1/6	0.0082	0.0082	0.0082	*d*	*d*
Zinc	6/6	0.17	0.0048	0.0411	5	0
		Metals, unfiltered (mg/L)				
Aluminum	6/6	370	0.46	63.845	0.2	6
Barium	6/6	3.7	0.017	0.7075	2	1
Beryllium	3/6	0.064	0.0021	0.0231	*d*	*d*
Cadmium	4/6	0.18	0.0081	0.053	0.005	4
Calcium	6/6	510	11	109	*d*	*d*
Chromium	4/6	0.79	0.016	0.2253	0.05	2
Cobalt	3/6	0.36	0.0054	0.1249	*d*	*d*
Copper	6/6	1.5	0.0049	0.2582	1	1
Iron	6/6	510	0.15	87.355	0.3	4
Magnesium	6/6	330	2.3	61.08	*d*	*d*
Manganese	6/6	32	0.037	5.5957	0.05	4
Molybdenum	1/6	0.012	0.012	0.012	*d*	*d*
Nickel	5/6	2.4	0.011	0.519	*d*	*d*
Potassium	6/6	88	2.9	19.3	*d*	*d*
Silicon	6/6	220	1.9	41.25	*d*	*d*
Sodium	6/6	70	2.2	23.78	*d*	*d*
Vanadium	3/6	0.68	0.0053	0.2354	*d*	*d*
Zinc	6/6	5.6	0.016	0.995	5	1
		Radiochemistry, filtered (pCi/L)				
Alpha activity	*d*/6	6.81	0.615	2.1521	15	0
Beta activity	*d*/6	42.7	2.65	13.587	50	0
^{99}Tc	*d*/6	1700	1470	1538	4000	0
		Radiochemistry, unfiltered (pCi/L)				
Alpha activity	*d*/6	52.9	−0.158	2.4575	5	2
Beta activity	*d*/6	107	1.58	20.576	50	3
^{99}Tc	*d*/6	1720	139	1310	4000	0
^{234}U	*d*/6	4.56	0	0.198	*d*	*d*
^{235}U	*d*/6	4.56	0	0.192	*d*	*d*
^{238}U	*d*/6	13.9	0	0.60	*d*	*d*

Table 5.58 (continued)

Analyte[a]	Number detected/ number of samples[b]	Detected results			Reference value[c]	Number of values exceeding reference
		Max[c]	Min[c]	Av[d]		
		Spectrochemistry, filtered (mg/L)				
Lead	1/6	0.0062	0.0062	0.0062	0.05	0
		Spectrochemistry, unfiltered (mg/L)				
Arsenic	2/6	0.011	0.0099	0.0105	0.05	0
Lead	5/6	0.81	0.0043	0.1756	0.05	2
Mercury	2/6	0.0009	0.0006	0.0008	0.002	0
		Volatile organics, unfiltered (µg/L)				
1,1,1-Trichloroethane	2/6	J3	J1	2	200	0
1,1-Dichloroethene	1/6	J2	J2	2	7	0
1,2-Dichloroethene	4/6	18	9	13	70	0
1,2-Dichloropropane	1/6	48	48	48	5	1
Benzene	3/6	JB1	JB1	1	5	0
Carbon tetrachloride	1/6	J4	J4	4	5	0
Chloroform	3/6	18	J1	10	100	0
Methylene chloride	1/6	JB1	JB1	1	*d*	*d*
Tetrachloroethene	2/6	J2	J2	2	5	0
Toluene	1/6	J1	J1	1	1000	0
Trichloroethene	5/6	BD1000	JB2	239	5	2
Vinyl chloride	2/6	17	15	16	2	2
		Volatile organics, tentatively identified compounds, unfiltered (µg/L)				
Bromofluorobenzene	1/1	JY70	JY70	70	*d*	*d*
Chloropropene	3/3	J74	JY45	64	*d*	*d*
Freon 113	1/1	J11	J11	11	*d*	*d*
		Wet chemistry, filtered (mg/L)				
Uranium fluorometric	2/6	0.01	0.002	0.006	0.02	0
		Wet chemistry, unfiltered				
Conductivity, µmho/cm	*d*/24	614	296	390	*d*	*d*
Fluoride SIE, mg/L	5/6	9	0.2	4.3	4	2
Uranium fluorometric, mg/L	1/6	0.007	0.007	0.007	0.02	0
pH, standard units	*d*/24	10.79	5.3	8.399	6.5–8.5	14

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.59. Constituents in Well Grouping 8 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
		Field measurements				
Conductivity, µmho/cm	*d*/5	961	500	703	*d*	*d*
Dissolved oxygen, ppm	*d*/5	3.5	2	2.9	*d*	*d*
Redox, mv	*d*/5	192	–203	–10.4	*d*	*d*
Temperature, °C	*d*/5	18.1	16	17.16	30.5	0
pH, standard units	*d*/5	9.6	6.6	7.54	6.5–8.5	1
		Radiochemistry, filtered (pCi/L)				
Alpha activity	*d*/5	2.3	0.218	1.0305	15	0
Beta activity	*d*/5	24.3	1.21	11.838	50	0
^{99}Tc	*d*/5	2950	s344	1318	4000	0
		Radiochemistry, unfiltered (pCi/L)				
Alpha activity	*d*/5	2.04	–0.23	0.919	15	0
Beta activity	*d*/5	13.4	–0.871	7.4259	50	0
^{99}Tc	*d*/5	2280	1060	1297	4000	0
		Volatile organics, unfiltered (µg/L)				
Benzene	3/5	JB3	JB1	2	5	0
Carbon tetrachloride	3/5	JB1	JB1	1	5	0
Methylene chloride	2/5	JB1	JB1	1	*d*	*d*
		Wet chemistry, filtered (mg/L)				
Uranium fluorometric	1/5	0.1	0.1	0.1	0.02	1
		Wet chemistry, unfiltered				
Conductivity, µmho/cm	*d*/20	796	281	552	*d*	*d*
Fluoride SIE, mg/L	5/5	1.8	0.1	0.6	4	0
pH, standard units	*d*/20	9.54	6.96	7.751	6.5–8.5	4

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.60. Constituents in Well Grouping 9 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Field measurements						
Conductivity, µmho/cm	*d*/24	1284	198	551	*d*	*d*
Dissolved oxygen, ppm	*d*/24	8.1	1.1	3.9	*d*	*d*
Redox, mv	*d*/24	388	–74	188	*d*	*d*
Temperature, °C	*d*/24	22.2	17	19.05	30.5	0
pH, standard units	*d*/24	8.5	5.9	7.14	6.5–8.5	4
Radiochemistry, filtered (pCi/L)						
Alpha activity	*d*/24	6.76	–0.367	1.4687	15	0
Beta activity	*d*/24	64	0.424	7.2671	50	1
^{99}Tc	*d*/24	1370	–129	555	4000	0
Radiochemistry, unfiltered (pCi/L)						
Alpha activity	*d*/24	106	–1.13	2.465	15	2
Beta activity	*d*/24	1450	0.766	9.3972	50	2
^{99}Tc	*d*/24	1430	–257	567	4000	0
Volatile organics, unfiltered (µg/L)						
1,1,1-Trichloroethane	1/24	J1	J1	1	200	0
1,2-Dichloroethene (total)	1/24	5	5	5	70	0
Chloroform	4/24	21	J0.6	6.05	100	0
Methylene chloride	1/24	JB1	JB1	1	d	*d*
Trichloroethene	3/24	15	J2	6	5	1
Wet chemistry, filtered (mg/L)						
Uranium fluorometric	12/24	0.007	0.001	0.0027	0.02	0
Wet chemistry, unfiltered						
Conductivity, µmho/cm	*d*/96	1348	173	528	*d*	*d*
Fluoride SIE, mg/L	16/24	0.7	0.1	0.26	4	0
Uranium fluorometric, mg/L	15/24	0.008	0.001	0.0029	0.02	0
pH, standard units	*d*/96	9	6.5	7.54	6.5–8.5	14

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.61. Constituents in Well Grouping 10 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Field measurements						
Conductivity, μmho/cm	*d*/4	185	35	122	*d*	*d*
Dissolved oxygen, ppm	*d*/4	10.7	4.7	8.9	*d*	*d*
Redox, mv	*d*/4	304	204	260	*d*	*d*
Temperature, °C	*d*/4	14	13.3	13.7	30.5	0
pH, standard units	*d*/4	7.8	4.1	5.9	6.5–8.5	3
Radiochemistry, filtered						
Alpha activity, pCi/L	*d*/5	5.57	−0.385	0.0932	15	0
Beta activity, pCi/L	*d*/6	220	1.74	3.842	50	3
^{99}Tc, pCi/L	*d*/6	257	2.21	32.258	4000	0
Uranium, μg/L	*d*/5	1.43	0.0776	0.0917	20	0
Radiochemistry, unfiltered						
Alpha activity, pCi/L	*d*/5	23.6	0.533	4.3266	15	2
Beta activity, pCi/L	*d*/5	211	6.37	11.246	50	4
^{99}Tc, pCi/L	*d*/5	284	5.01	63.124	4000	0
Uranium, μg/L	*d*/5	5.27	0.223	0.3113	20	0
Volatile organics, unfiltered (μg/L)						
1,1,1-Trichloroethane	3/4	D2200	28	846	200	2
1,1,2-Trichloroethane	2/4	10	J2	6	*d*	*d*
1,1-Dichloroethane	2/4	40	6	23	*d*	*d*
1,1-Dichloroethene	3/4	D1200	27	459	7	3
1,2-Dichloroethene (total)	3/4	19	J1	8	70	0
2-Butanone	2/4	J1	J1	1	*d*	*d*
Acetone	4/4	B10	JB7	8	*d*	*d*
Benzene	1/4	J3	J3	3	5	0
Carbon tetrachloride	3/4	D250	6	90	5	3
Chloroethane	4/4	10	J2	5	200	0
Chloroform	4/4	46	J2	13	100	0
Chloromethane	2/4	J2	J1	1.5	*d*	*d*
Methylene chloride	4/4	B12	B9	11	*d*	*d*
Tetrachloroethene	3/4	34	J1	13	5	1
Trichloroethene	4/4	D3100	89	1455	5	4
Volatile organics, tentatively identified compounds, unfiltered (μg/L)						
Freon 113	3/3	J69	J43	54	*d*	*d*
Wet chemistry, unfiltered						
Conductivity, μmho/cm	*d*/17	119	18.1	80.83	*d*	*d*
Fluoride, mg/L	1/4	1.7	1.7	1.7	4	0
pH, standard units	*d*/17	8.36	6.01	6.759	6.5–8.5	9

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.62. Constituents in Well Grouping 12 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
		Field measurements				
Conductivity, µmho\cm	*d*/6	2260	56	1039	*d*	*d*
Dissolved oxygen, ppm	*d*/6	6.1	1.2	2.97	*d*	*d*
Redox, mV	*d*/6	103	–72	11	*d*	*d*
Temperature, °C	*d*/6	19.9	16.9	17.97	30.5	0
pH, standard units	*d*/6	6.6	4.9	5.93	6.5–8.5	5
		Radiochemistry, filtered (pCi/L)				
Alpha activity	*d*/6	0	–5.28	–0.491	15	0
Beta activity	*d*/6	14.1	0.781	2.0851	50	0
^{99}Tc	*d*/6	–299	–4900	–2230	4000	0
		Radiochemistry, unfiltered (pCi/L)				
Alpha activity	*d*/6	36.8	–1.79	–0.293	15	1
Beta activity	*d*/6	98.1	1.65	3.912	50	1
^{99}Tc	*d*/6	831	–5780	–3215	4000	0
		Volatile organics, unfiltered (µg/L)				
2-Butanone	1/6	J12	J12	12	*d*	*d*
		Wet chemistry, unfiltered				
Conductivity, µmho/cm	*d*/24	2390	53	1034	*d*	*d*
Fluoride SIE, mg/L	4/6	0.4	0.1	0.23	4	0
Uranium fluorometric, mg/L	1/6	0.01	0.01	0.01	0.02	0
pH, standard units	*d*/24	6.8	4.9	6.029	6.5–8.5	16

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.63. Constituents in Well Grouping 13 groundwater at the K-25 Site, 1992

Parameter	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference
		Max[a]	Min[a]	Av[b]		
Field measurements						
Conductivity, µmho/cm	*d*/6	453	259	342	*d*	*d*
Dissolved oxygen, ppm	*d*/6	6.7	4.3	5.3	*d*	*d*
Redox, mV	*d*/6	214	86	172	*d*	*d*
Temperature, °C	*d*/6	17.5	15.6	16.3	30.5	0
pH, standard units	*d*/6	7	6.1	6.72	6.5–8.5	1
Radiochemistry, filtered (pCi/L)						
Alpha activity	*d*/6	3.02	–0.463	0.9828	15	0
Beta activity	*d*/6	26.7	2.94	6.771	50	0
^{99}Tc	*d*/6	–284	–1220	–694	4000	0
Radiochemistry, unfiltered (pCi/L)						
Alpha activity	*d*/6	37.4	1.38	3.143	15	1
Beta activity	*d*/6	73	4.46	10.109	50	1
^{99}Tc	*d*/6	–161	–961	–480	4000	0
Volatile organics, unfiltered (µg/L)						
Carbon tetrachloride	1/6	J2	J2	2	5	0
Methylene chloride	1/6	JB1	JB1	1	*d*	*d*
Wet chemistry, filtered (mg/L)						
Uranium fluorometric	2/6	0.001	0.001	0.001	0.02	0
Wet chemistry, unfiltered						
Conductivity, µmho/cm	*d*/24	493	251	359	*d*	*d*
Fluoride SIE, mg/L	4/6	0.2	0.1	0.15	4	0
Uranium fluorometric, mg/L	3/6	0.003	0.001	0.002	0.02	0
pH, standard units	*d*/24	7.3	6.8	7.05	6.5–8.5	0

[a]The minimum and maximum detected results are listed with their laboratory analytical qualifiers.

A, aldol condensation product; B, parameter found in blank as well as sample; D, the compound identified at a secondary dilution factor; J, estimated value (usually below the detection limit); P, element pH > 2; S, reported value determined by the Method of Standard Additions; Y, indistinguishable isomer in tentatively identified compound; s, spike recovery is not within limits; N, spiked sample recovery is not within control limits.

[b]The average radiochemistry results and their associated limits of error were calculated using optimally weighted mean and variance estimates by combining independent measurements with unequal errors, as documented in *Radiation Detection and Measurement* by Glenn F. Knoll, New York: John Wiley and Sons (1979), pp. 137–139. For the non-radiochemistry parameters the average listed is the usual unweighted arithmetic mean of all detected results.

[c]See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40 CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40 CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

Table 5.64. Summary of constituents detected in off-site residential groundwater during 1992

Analyte	Number detected/ number of samples	Detected values			Reference value[c]	Number of values exceeding reference [ref][c]
		Max[a]	Min[a]	Av[b]		
Anions, unfiltered (mg/L)						
Chloride	36/36	79	1.0	6.4*	250	0[3]
Fluoride	2/36	7.3	7.2	7.3*	4	2[2]
Nitrate	22/36	9.8	1.0	3.1*	10	0[2]
Sulfate (as SO_4)	36/36	62	0.60	12*	250	0[3]
Field measurements, unfiltered						
Conductivity (mS/cm)	36/36	1.9	0	0.64*	*d*	[*d*]
Temperature (°C)	36/36	24	4.4	15*	30.5	0[1]
pH (standard units)	36/36	8.6	7.0	7.4*	(6.5, 8.5)	1[3]
Metals, unfiltered (mg/L)						
Barium	36/36	0.38	0.0036	0.082*	1	0[2]
Calcium	36/36	99	1.5	46*	*d*	[*d*]
Chromium	12/36	0.015	0.0044	0.0094*	0.05	0[1]
Copper	20/36	0.064	0.0035	0.016*	1	0[3]
Iron	13/36	0.80	0.055	0.19*	0.3	1[3]
Lead	3/36	0.0077	0.0060	0.0069*	0.05	0[1]
Magnesium	36/36	36	0.58	14*	*d*	[*d*]
Manganese	26/36	0.32	0.0060	0.022	0.05	2[3]
Mercury	1/36	0.000060	0.00060	0.000060	0.002	0[1]
Nickel	3/36	0.0044	0.0043	0.0043*	*d*	[*d*]
Sodium	24/36	450	0.53	42*	*d*	[*d*]
Uranium	23/36	0.0026	0.00010	0.00082*	*d*	[*d*]
Vanadium	3/36	0.0014	0.0012	0.0013*	*d*	[*d*]
Zinc	30/36	0.88	0.0055	0.15*	5	0[3]
Others, unfiltered						
Total hardness (mg/L)	1/1	300	300	300	*d*	[*d*]
Radionuclides, unfiltered (pCi/L)[e]						
^{60}Co	2/36	38*	22*	30	200	0[4]
Gross alpha	15/36	5.7*	1.4*	2.4*	15	0[2]
Gross beta	17/36	18*	3.0*	6.8*	50	0[2]
^{99}Tc	5/36	32*	2.1*	8.6	4000	0[4]
Total rad Sr	11/36	6.2*	2.1*	3.5*	8	0[2]
Volatile organics, unfiltered (µg/L)						
Chloroform	1/35	10	10	10	100	0[2]

[a] An asterisk (*) follows a radionuclide value that is significantly greater than zero.

[b] An asterisk (*) follows a mean that is significantly greater than zero.

[c] See Table 5.1. If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d] Not applicable.

[e] Multiply pCi/L by 0.037 to convert to Bq/L.

Table 5.65. Summary of constituents detected in off-site residential local tap water during 1992

Analyte	Number detected/ number of samples	Detected results			Reference value[c]	Number of values exceeding reference[c]
		Max[a]	Min[a]	Av[b]		
Anions, unfiltered (mg/L)						
Chloride	2/2	11	7.8	9.3*	250	0[3]
Fluoride	1/2	1.1	1.1	1.1	4	0[2]
Nitrate	2/2	2.4	2.4	2.4	10	0[2]
Sulfate (as SO_4)	2/2	24	23	24*	250	0[3]
Metals, unfiltered (mg/L)						
Barium	2/2	0.028	0.028	0.028	1	0[2]
Calcium	2/2	35	35	35	*d*	[*d*]
Copper	1/2	0.026	0.026	0.026	1	0[3]
Magnesium	2/2	9.0	8.7	8.9*	*d*	[*d*]
Manganese	2/2	0.0017	0.00080	0.0013	0.05	0[3]
Sodium	2/2	5.1	4.2	4.7*	*d*	[*d*]
Uranium	1/2	0.00015	0.00015	0.00015	*d*	[*d*]
Zinc	2/2	0.16	0.013	0.087	5	0[3]
Radionuclides, unfiltered (pCi/L)[e]						
Gross alpha	1/2	2.4*	2.4*	2.4	15	0[2]

[a]An asterisk (*) follows a radionuclide value that is significantly greater than zero.

[b]An asterisk (*) follows a mean that is significantly greater than zero.

[c]If a reference limit exists, the source is coded as:

1. Rules of Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Chapter 1200-4-3, General Water Quality Criteria.
2. 40CFR Part 141—National Primary Drinking Water Regulations, Subparts B and G.
3. 40CFR Part 143—National Secondary Drinking Water Regulations.
4. DOE Order 5400.5, Chapter III, Derived Concentration Guides for Air and Water.

[d]Not applicable.

[e]Multiply pCi/L by 0.037 to convert to Bq/L.

6. BIOLOGICAL MONITORING

Table 6.1. 1992 concentration of total radioactive Sr in raw milk

Station[a]	Number detected/ number of samples	Detected concentration (pCi/L)			
		Max	Min	Av	Standard error[b]
		Immediate environs			
1	5/6	3.8	1.3	2.2[c]	0.43
2	8/9	4.9	1.4	2.6[c]	0.42
3	10/11	6.5	0.59	3.1[c]	0.60
4	12/12	8.1	0.59	4.5[c]	0.65
8	7/8	5.4	1.5	3.3[c]	0.54
Network summary	42/46	8.1	0.59	3.3[c]	0.29

[a]See Fig. 6.1 in Vol. 1 for sampling locations.
[b]Standard error of the mean.
[c]Average is significantly greater than zero at the 95% confidence level.

Table 6.2. 1992 tissue concentration in Clinch River bluegill at CRK 84[a]

Analyte	Number detected/ number of samples	Concentration			
		Max[b]	Min[b]	Av[c]	Standard error[d]
Metals (mg/kg wet wt)					
Antimony, total	0/6	<0.93	<0.46	~0.61*	0.080
Arsenic, total	5/6	0.99	0.60	~0.83*	0.060
Beryllium, total	0/6	<0.19	<0.091	~0.12*	0.017
Cadmium, total	0/6	<0.37	<0.18	~0.25*	0.031
Chromium, total	0/6	<0.93	<0.46	~0.61*	0.080
Copper, total	0/6	<0.93	<0.46	~0.61*	0.080
Lead, total	0/6	<0.93	<0.46	~0.61*	0.080
Mercury, total	6/6	0.096	0.035	0.065*	0.0089
Nickel, total	0/6	<0.93	<0.46	~0.61*	0.080
Selenium, total	4/6	<0.93	<0.49	~0.72*	0.068
Silver, total	0/6	<0.37	<0.18	~0.25*	0.031
Thallium, total	0/6	<0.020	<0.020	~0.020	0
Uranium, total	0/6	<0.0030	<0.0030	~0.0030	0
Zinc, total	6/6	11	7.9	9.9*	0.47
Pesticides (µg/kg wet wt)					
4,4'-DDD	0/6	U120	U70	~90*	7.0
4,4'-DDE	0/6	U120	U70	~90*	7.0
4,4'-DDT	0/6	U120	U70	~90*	7.0
Aldrin	0/6	U58	U35	~45*	3.4
Alpha-BHC	0/6	U58	U35	~45*	3.4
Alpha-Chlordane	0/6	U580	U350	~450*	34
Beta-BHC	0/6	U58	U35	~45*	3.4
Delta-BHC	0/6	U58	U35	~45*	3.4
Dieldrin	0/6	U120	U70	~90*	7.0
Endosulfan I	0/6	U58	U35	~45*	3.4
Endosulfan II	0/6	U120	U70	~90*	7.0
Endosulfan sulfate	0/6	U120	U70	~90*	7.0
Endrin	0/6	U120	U70	~90*	7.0
Endrin ketone	0/6	U120	U70	~90*	7.0
Gamma-BHC (Lindane)	0/6	U58	U35	~45*	3.4
Gamma-Chlordane	0/6	U580	U350	~450*	34
Heptachlor	6/6	J8.8	J1.8	~5.1*	1.2
Heptachlor epoxide	0/6	U58	U35	~45*	3.4
Methoxychlor	0/6	U580	U350	~450*	34
Toxaphene	0/6	U1,200	U700	~900*	69
PCBs (µg/kg wet wt)					
Aroclor-1016	0/6	U580	U350	~450*	34
Aroclor-1221	0/6	U580	U350	~450*	34
Aroclor-1232	0/6	U580	U350	~450*	34
Aroclor-1242	3/6	U580	J52	~280*	95
Aroclor-1248	0/6	U580	U350	~450*	34
Aroclor-1254	5/6	U780	J22	~160	130
Aroclor-1260	0/6	U1,200	U700	~900*	69
Radionuclides (pCi/g ash wt)[e]					
^{60}Co	0/3	0.19	0.11	0.14*	0.027
^{137}Cs	2/3	0.54*	–0.027	0.35	0.19
Total rad Sr	0/3	0.41	0.11	0.21	0.099
Radionuclides (pCi/g wet wt)[e]					
^{60}Co	0/3	0.0016	0.00098	0.0012*	0.00020
^{137}Cs	2/3	0.0051*	–0.00025	0.0032	0.0017
Total rad Sr	0/3	0.0037	0.00092	0.0019	0.00091

[a]See Fig. 6.2 in Vol. 1.

[b]Prefix "J" means the value was estimated (usually below the detection limit). Prefix "U" or "<" means the value was below the analytical detection limit (undetected). Prefix "B" means the analyte was found in the laboratory blank as well as the sample.

[c]Average concentrations significantly greater than zero are identified by an *. Prefix ~ means the estimated and/or undetected values were used in the calculation of the average.

[d]Standard error of the mean.

[e]Individual concentrations significantly greater than zero are identified by an *. Multiply pCi/g by 37 to convert to Bq/kg.

Table 6.3. 1992 tissue concentration in Clinch River bluegill at CRK 80[a]

Analyte	Number detected/ number of samples	Concentration			
		Max[b]	Min[b]	Av[c]	Standard error[d]
Metals (mg/kg wet wt)					
Antimony, total	0/6	<0.54	<0.41	~0.48*	0.023
Arsenic, total	6/6	1.1	0.55	0.84*	0.074
Beryllium, total	0/6	<0.11	<0.083	~0.097*	0.0047
Cadmium, total	0/6	<0.22	<0.17	~0.20*	0.0089
Chromium, total	0/6	<0.54	<0.41	~0.48*	0.023
Copper, total	0/6	<0.54	<0.41	~0.48*	0.023
Lead, total	0/6	<0.54	<0.41	~0.48*	0.023
Mercury, total	6/6	0.075	0.031	0.050*	0.0059
Nickel, total	0/6	<0.54	<0.41	~0.48*	0.023
Selenium, total	6/6	1.0	0.58	0.77*	0.068
Silver, total	0/6	<0.22	<0.17	~0.20*	0.0089
Thallium, total	0/6	<0.020	<0.020	~0.020	0
Uranium, total	0/6	<0.0030	<0.0030	~0.0030	0
Zinc, total	6/6	12	8.2	10*	0.52
Pesticides (µg/kg wet wt)					
4,4'-DDD	0/6	U91	U77	~85*	1.9
4,4'-DDE	0/6	U91	U77	~85*	1.9
4,4'-DDT	0/6	U91	U77	~85*	1.9
Aldrin	0/6	U46	U38	~43*	1.1
Alpha-BHC	0/6	U46	U38	~43*	1.1
Alpha-Chlordane	0/6	U460	U380	~430*	10
Beta-BHC	0/6	U46	U38	~43*	1.1
Delta-BHC	0/6	U46	U38	~43*	1.1
Dieldrin	0/6	U91	U77	~85*	1.9
Endosulfan I	0/6	U46	U38	~43*	1.1
Endosulfan II	0/6	U91	U77	~85*	1.9
Endosulfan sulfate	0/6	U91	U77	~85*	1.9
Endrin	0/6	U91	U77	~85*	1.9
Endrin ketone	0/6	U91	U77	~85*	1.9
Gamma-BHC (Lindane)	0/6	U46	U38	~43*	1.1
Gamma-Chlordane	0/6	U460	U380	~430*	10
Heptachlor	6/6	J6.4	J1.3	~2.9*	0.76
Heptachlor epoxide	0/6	U46	U38	~43*	1.1
Methoxychlor	0/6	U460	U380	~430*	10
Toxaphene	0/6	U910	U770	~850*	20
PCBs (µg/kg wet wt)					
Aroclor-1016	0/6	U460	U380	~430*	10
Aroclor-1221	0/6	U460	U380	~430*	10
Aroclor-1232	0/6	U460	U380	~430*	10
Aroclor-1242	0/6	U460	U380	~430*	10
Aroclor-1248	0/6	U460	U380	~430*	10
Aroclor-1254	3/6	U910	J28	~450*	190
Aroclor-1260	0/6	U910	U770	~850*	20
Radionuclides (pCi/g ash wt)[e]					
^{60}Co	0/3	–0.027	–0.22	–0.099	0.059
^{137}Cs	1/3	0.46*	–0.027	0.18	0.14
Total rad Sr	0/3	0.41	–0.11	0.13	0.15
Radionuclides (pCi/g wet wt)[e]					
^{60}Co	0/3	–0.00028	–0.0022	–0.0010	0.00061
^{137}Cs	1/3	0.0047*	–0.00028	0.0018	0.0015
Total rad Sr	0/3	0.0041	–0.0011	0.0013	0.0015

[a]See Fig. 6.2 in Vol. 1.

[b]Prefix "J" means the value was estimated (usually below the detection limit). Prefix "U" or "<" means the value was below the analytical detection limit (undetected). Prefix "B" means the analyte was found in the laboratory blank as well as the sample.

[c]Average concentrations significantly greater than zero are identified by an *. Prefix ~ means the estimated and/or undetected values were used in the calculation of the average.

[d]Standard error of the mean.

[e]Individual concentrations significantly greater than zero are identified by an *. Multiply pCi/g by 37 to convert to Bq/kg.

Table 6.4. 1992 tissue concentration in Clinch River bluegill at CRK 66[a]

Analyte	Number detected/ number of samples	Concentration			
		Max[b]	Min[b]	Av[c]	Standard error[d]
Metals (mg/kg wet wt)					
Antimony, total	0/6	<0.56	<0.44	~0.48*	0.017
Arsenic, total	2/6	1.1	<0.44	~0.70*	0.13
Beryllium, total	0/6	<0.11	<0.087	~0.096*	0.0033
Cadmium, total	0/6	<0.22	<0.17	~0.19*	0.0070
Chromium, total	0/6	<0.56	<0.44	~0.48*	0.017
Copper, total	0/6	<0.56	<0.44	~0.48*	0.017
Lead, total	0/6	<0.56	<0.44	~0.48*	0.017
Mercury, total	6/6	0.065	0.042	0.054*	0.0035
Nickel, total	0/6	<0.56	<0.44	~0.48*	0.017
Selenium, total	2/6	0.88	<0.44	~0.60*	0.071
Silver, total	0/6	<0.22	<0.17	~0.19*	0.0070
Thallium, total	0/6	<0.020	<0.020	~0.020	0
Uranium, total	0/6	<0.0030	<0.0030	~0.0030	0
Zinc, total	2/6	9.8	<0.44	~3.4	1.9
Pesticides (µg/kg wet wt)					
4,4'-DDD	0/6	U91	U66	~83*	3.9
4,4'-DDE	0/6	U91	U66	~83*	3.9
4,4'-DDT	0/6	U91	U66	~83*	3.9
Aldrin	0/6	U46	U33	~42*	2.0
Alpha-BHC	0/6	U46	U33	~42*	2.0
Alpha-Chlordane	0/6	U460	U330	~420*	20
Beta-BHC	0/6	U46	U33	~42*	2.0
Delta-BHC	0/6	U46	U33	~42*	2.0
Dieldrin	0/6	U91	U66	~83*	3.9
Endosulfan I	0/6	U46	U33	~42*	2.0
Endosulfan II	0/6	U91	U66	~83*	3.9
Endosulfan sulfate	0/6	U91	U66	~83*	3.9
Endrin	0/6	U91	U66	~83*	3.9
Endrin ketone	0/6	U91	U66	~83*	3.9
Gamma-BHC (Lindane)	0/6	U46	U33	~42*	2.0
Gamma-Chlordane	0/6	U460	U330	~420*	20
Heptachlor	6/6	J5.5	J2.7	~3.7*	0.40
Heptachlor epoxide	0/6	U46	U33	~42*	2.0
Methoxychlor	0/6	U460	U330	~420*	20
Toxaphene	0/6	U910	U660	~830*	39
PCBs (µg/kg wet wt)					
Aroclor-1016	0/6	U460	U330	~420*	20
Aroclor-1221	0/6	U460	U330	~420*	20
Aroclor-1232	0/6	U460	U330	~420*	20
Aroclor-1242	0/6	U460	U330	~420*	20
Aroclor-1248	0/6	U460	U330	~420*	20
Aroclor-1254	4/6	U890	B28	~330	180
Aroclor-1260	0/6	U910	U660	~830*	39
Radionuclides (pCi/g ash wt)[e]					
^{60}Co	0/3	0.081	–0.16	–0.0090	0.077
^{137}Cs	0/3	0.24	–0.11	0.11	0.11
Total rad Sr	0/3	0.51	0.16	0.28	0.12
Radionuclides (pCi/g wet wt)[e]					
^{60}Co	0/3	0.00072	–0.0015	–0.00011	0.00070
^{137}Cs	0/3	0.0023	–0.00092	0.0010	0.00098
Total rad Sr	0/3	0.0044	0.0014	0.0024	0.00097

[a]See Fig. 6.2 in Vol. 1.

[b]Prefix "J" means the value was estimated (usually below the detection limit). Prefix "U" or "<" means the value was below the analytical detection limit (undetected). Prefix "B" means the analyte was found in the laboratory blank as well as the sample.

[c]Average concentrations significantly greater than zero are identified by an *. Prefix ~ means the estimated and/or undetected values were used in the calculation of the average.

[d]Standard error of the mean.

[e]Individual concentrations significantly greater than zero are identified by an *. Multiply pCi/g by 37 to convert to Bq/kg.

Table 6.5. 1992 tissue concentration in Clinch River bluegill at CRK 32[a]

Analyte	Number detected/ number of samples	Concentration			
		Max[b]	Min[b]	Av[c]	Standard error[d]
Metals (mg/kg wet wt)					
Antimony, total	0/6	<0.48	<0.44	~0.46*	0.0060
Arsenic, total	6/6	0.31	0.056	0.16*	0.048
Beryllium, total	0/6	<0.095	<0.089	~0.093*	0.0011
Cadmium, total	0/6	<0.19	<0.18	~0.19*	0.0021
Chromium, total	0/6	<0.48	<0.44	~0.46*	0.0060
Copper, total	1/6	0.51	<0.44	~0.47*	0.010
Lead, total	6/6	0.38	0.020	0.084	0.060
Mercury, total	6/6	0.076	0.021	0.049*	0.011
Nickel, total	0/6	<0.48	<0.44	~0.46*	0.0060
Selenium, total	6/6	0.56	0.48	0.52*	0.014
Silver, total	0/6	<0.19	<0.18	~0.19*	0.0021
Thallium, total	0/6	<0.020	<0.020	~0.020	0
Uranium, total	0/6	<0.0030	<0.0030	~0.0030	0
Zinc, total	6/6	16	9.3	13*	0.95
Pesticides (µg/kg wet wt)					
4,4'-DDD	0/6	U100	U72	~85*	4.9
4,4'-DDE	0/6	U100	U72	~85*	4.9
4,4'-DDT	6/6	J20	J2.8	~8.4*	2.7
Aldrin	0/6	U51	U36	~42*	2.5
Alpha-BHC	0/6	U51	U36	~42*	2.5
Alpha-Chlordane	0/6	U510	U360	~420*	25
Beta-BHC	0/6	U51	U36	~42*	2.5
Delta-BHC	0/6	U51	U36	~42*	2.5
Dieldrin	0/6	U100	U72	~85*	4.9
Endosulfan I	0/6	U51	U36	~42*	2.5
Endosulfan II	0/6	U100	U72	~85*	4.9
Endosulfan sulfate	0/6	U100	U72	~85*	4.9
Endrin	0/6	U100	U72	~85*	4.9
Endrin ketone	0/6	U100	U72	~85*	4.9
Gamma-BHC (Lindane)	0/6	U51	U36	~42*	2.5
Gamma-Chlordane	0/6	U510	U360	~420*	25
Heptachlor	2/6	U51	J1.7	~31*	7.5
Heptachlor epoxide	0/6	U51	U36	~42*	2.5
Methoxychlor	0/6	U510	U360	~420*	25
Toxaphene	0/6	U1,000	U720	~850*	49
PCBs (µg/kg wet wt)					
Aroclor-1016	0/6	U510	U360	~420*	25
Aroclor-1221	0/6	U510	U360	~420*	25
Aroclor-1232	0/6	U510	U360	~420*	25
Aroclor-1242	0/6	U510	U360	~420*	25
Aroclor-1248	0/6	U510	U360	~420*	25
Aroclor-1254	0/6	U1,000	U720	~850*	49
Aroclor-1260	2/6	U960	J29	~570*	170
Radionuclides (pCi/g ash wt)[e]					
^{60}Co	0/3	0.35	−0.22	0.054	0.16
^{137}Cs	3/3	2.0*	1.9*	2.0*	0.016
Total rad Sr	3/3	0.49*	0.38*	0.42*	0.032
Radionuclides (pCi/g wet wt)[e]					
^{60}Co	0/3	0.0037	−0.0018	0.00073	0.0016
^{137}Cs	3/3	0.023*	0.016*	0.020*	0.0019
Total rad Sr	3/3	0.0047*	0.0039*	0.0042*	0.00024

[a]See Fig. 6.2 in Vol. 1.

[b]Prefix "J" means the value was estimated (usually below the detection limit). Prefix "U" or "<" means the value was below the analytical detection limit (undetected). Prefix "B" means the analyte was found in the laboratory blank as well as the sample.

[c]Average concentrations significantly greater than zero are identified by an *. Prefix ~ means the estimated and/or undetected values were used in the calculation of the average.

[d]Standard error of the mean.

[e]Individual concentrations significantly greater than zero are identified by an *. Multiply pCi/g by 37 to convert to Bq/kg.

Table 6.6. 1992 tissue concentration in Clinch River bluegill at CRK 16[a]

Analyte	Number detected/ number of samples	Concentration			
		Max[b]	Min[b]	Av[c]	Standard error[d]
Metals (mg/kg wet wt)					
Antimony, total	0/6	<0.76	<0.46	~0.52*	0.049
Arsenic, total	6/6	0.10	0.055	0.071*	0.0071
Beryllium, total	0/6	<0.15	<0.093	~0.10*	0.0093
Cadmium, total	0/6	<0.30	<0.19	~0.21*	0.018
Chromium, total	0/6	<0.76	<0.46	~0.52*	0.049
Copper, total	0/6	<0.76	<0.46	~0.52*	0.049
Lead, total	1/6	0.025	<0.020	~0.021*	0.00083
Mercury, total	6/6	0.53	0.14	0.28*	0.063
Nickel, total	0/6	<0.76	<0.46	~0.52*	0.049
Selenium, total	6/6	0.53	0.33	0.43*	0.037
Silver, total	0/6	<0.30	<0.19	~0.21*	0.018
Thallium, total	0/6	<0.020	<0.020	~0.020	0
Uranium, total	0/6	<0.0030	<0.0030	~0.0030	0
Zinc, total	6/6	12	7.1	9.7*	0.76
Pesticides (µg/kg wet wt)					
4,4'-DDD	0/6	U96	U69	~80*	4.2
4,4'-DDE	0/6	U96	U69	~80*	4.2
4,4'-DDT	4/6	U96	J4.9	~34*	16
Aldrin	0/6	U48	U34	~40*	2.2
Alpha-BHC	0/6	U48	U34	~40*	2.2
Alpha-Chlordane	0/6	U480	U340	~400*	21
Beta-BHC	0/6	U48	U34	~40*	2.2
Delta-BHC	0/6	U48	U34	~40*	2.2
Dieldrin	0/6	U96	U69	~80*	4.2
Endosulfan I	0/6	U48	U34	~40*	2.2
Endosulfan II	0/6	U96	U69	~80*	4.2
Endosulfan sulfate	0/6	U96	U69	~80*	4.2
Endrin	0/6	U96	U69	~80*	4.2
Endrin ketone	0/6	U96	U69	~80*	4.2
Gamma-BHC (Lindane)	0/6	U48	U34	~40*	2.2
Gamma-Chlordane	0/6	U480	U340	~400*	21
Heptachlor	2/6	U48	J1.6	~27*	8.2
Heptachlor epoxide	0/6	U48	U34	~40*	2.2
Methoxychlor	0/6	U480	U340	~400*	21
Toxaphene	0/6	U960	U690	~800*	43
PCBs (µg/kg wet wt)					
Aroclor-1016	0/6	U480	U340	~400*	21
Aroclor-1221	0/6	U480	U340	~400*	21
Aroclor-1232	0/6	U480	U340	~400*	21
Aroclor-1242	0/6	U480	U340	~400*	21
Aroclor-1248	0/6	U480	U340	~400*	21
Aroclor-1254	0/6	U960	U690	~800*	43
Aroclor-1260	3/6	U960	J26	~400*	170
Radionuclides (pCi/g ash wt)[e]					
^{60}Co	0/3	0.027	–0.19	–0.11	0.068
^{137}Cs	3/3	3.5*	2.7*	3.2*	0.24
Total rad Sr	2/3	0.54*	0.32	0.41*	0.065
Radionuclides (pCi/g wet wt)[e]					
^{60}Co	0/3	0.00025	–0.0018	–0.0011	0.00066
^{137}Cs	3/3	0.034*	0.025*	0.030*	0.0029
Total rad Sr	2/3	0.0049*	0.0032	0.0039*	0.00052

[a]See Fig. 6.2 in Vol. 1.

[b]Prefix "J" means the value was estimated (usually below the detection limit). Prefix "U" or "<" means the value was below the analytical detection limit (undetected). Prefix "B" means the analyte was found in the laboratory blank as well as the sample.

[c]Average concentrations significantly greater than zero are identified by an *. Prefix ~ means the estimated and/or undetected values were used in the calculation of the average.

[d]Standard error of the mean.

[e]Individual concentrations significantly greater than zero are identified by an *. Multiply pCi/g by 37 to convert to Bq/kg.

Table 6.7. 1992 tissue concentration in Clinch River bluegill at PCK 2.2[a]

Analyte	Number detected/ number of samples	Concentration			
		Max[b]	Min[b]	Av[c]	Standard error[d]
Metals (mg/kg wet wt)					
Antimony, total	0/6	<0.50	<0.46	~0.49*	0.0062
Arsenic, total	3/6	0.11	<0.040	~0.066*	0.012
Beryllium, total	0/6	<0.10	<0.092	~0.097*	0.0013
Cadmium, total	0/6	<0.20	<0.18	~0.19*	0.0031
Chromium, total	0/6	<0.50	<0.46	~0.49*	0.0062
Copper, total	0/6	<0.50	<0.46	~0.49*	0.0062
Lead, total	3/6	0.12	<0.020	~0.038*	0.016
Mercury, total	6/6	0.41	0.033	0.11	0.060
Nickel, total	0/6	<0.50	<0.46	~0.49*	0.0062
Selenium, total	6/6	0.77	0.40	0.55*	0.054
Silver, total	0/6	<0.20	<0.18	~0.19*	0.0031
Thallium, total	0/6	<0.020	<0.020	~0.020	0
Uranium, total	0/6	<0.0030	<0.0030	~0.0030	0
Zinc, total	6/6	16	10	12*	0.88
Pesticides (µg/kg wet wt)					
4,4'-DDD	0/6	U83	U66	~78*	2.6
4,4'-DDE	0/6	U83	U66	~78*	2.6
4,4'-DDT	4/6	U83	J2.9	~30	16
Aldrin	0/6	U42	U33	~39*	1.4
Alpha-BHC	0/6	U42	U33	~39*	1.4
Alpha-Chlordane	0/6	U420	U330	~390*	13
Beta-BHC	0/6	U42	U33	~39*	1.4
Delta-BHC	0/6	U42	U33	~39*	1.4
Dieldrin	0/6	U83	U66	~78*	2.6
Endosulfan I	0/6	U42	U33	~39*	1.4
Endosulfan II	0/6	U83	U66	~78*	2.6
Endosulfan sulfate	0/6	U83	U66	~78*	2.6
Endrin	0/6	U83	U66	~78*	2.6
Endrin ketone	0/6	U83	U66	~78*	2.6
Gamma-BHC (Lindane)	0/6	U42	U33	~39*	1.4
Gamma-Chlordane	0/6	U420	U330	~390*	13
Heptachlor	2/6	U42	J1.0	~28*	7.9
Heptachlor epoxide	0/6	U42	U33	~39*	1.4
Methoxychlor	0/6	U420	U330	~390*	13
Toxaphene	0/6	U830	U660	~780*	27
PCBs (µg/kg wet wt)					
Aroclor-1016	0/6	U420	U330	~390*	13
Aroclor-1221	0/6	U420	U330	~390*	13
Aroclor-1232	0/6	U420	U330	~390*	13
Aroclor-1242	1/6	U420	J71	~330*	54
Aroclor-1248	0/6	U420	U330	~390*	13
Aroclor-1254	0/6	U830	U660	~780*	27
Aroclor-1260	3/6	U830	J25	~420*	170
Radionuclides (pCi/g ash wt)[e]					
^{60}Co	0/3	0.22	–0.11	0.054	0.094
^{137}Cs	3/3	11*	5.7*	8.6*	1.5
Total rad Sr	2/3	0.78*	0.30*	0.48*	0.15
Radionuclides (pCi/g wet wt)[e]					
^{60}Co	0/3	0.0026	–0.0014	0.00063	0.0012
^{137}Cs	3/3	0.13*	0.076*	0.11*	0.017
Total rad Sr	2/3	0.010*	0.0038*	0.0062	0.0021

[a]See Fig. 6.2 in Vol. 1.

[b]Prefix "J" means the value was estimated (usually below the detection limit). Prefix "U" or "<" means the value was below the analytical detection limit (undetected). Prefix "B" means the analyte was found in the laboratory blank as well as the sample.

[c]Average concentrations significantly greater than zero are identified by an *. Prefix ~ means the estimated and/or undetected values were used in the calculation of the average.

[d]Standard error of the mean.

[e]Individual concentrations significantly greater than zero are identified by an *. Multiply pCi/g by 37 to convert to Bq/kg.

7. SOIL AND SEDIMENT MONITORING

Table 7.1. 1992 results of soil analysis at the K-25 Site[a]

Sample Point[b]	Alpha	Beta	^{234}U	^{235}U	^{238}U	^{99}Tc	^{234m}Pa	^{234}Th	^{137}Cs	^{237}Np	^{238}Pu	^{239}Pu	U(μg/g)
S1	–5.1	–3.6	0.27	0.12	0.0	23	80	–4.9	0.71	–0.20	–0.20	–0.20	2.8
S2	2.1	63	0.63	0.37	0.38	16	102	27	0.60	–0.21	–0.21	–0.21	4.2
S3	–1.4	–1.4	0.0	0.060	0.0	–23	–33	–12	0.091	0.0	0.0	–0.22	1.9
S4	0.84	0.57	0.60	–0.079	0.36	37.0	–35.0	–12	0.30	0.63	0.0	0.21	3.3
S5	–1.8	1.4	0.59	0.19	0.30	57	–77	–2.1	–38.4	0.0	–0.25	0.0	3.9
S6	–3.6	–3.8	0.0	–0.075	0.0	57	–38	22	0.25	–0.26	–0.26	–0.26	2.9
S7	–3.3	–2.3	0.0	0.12	0.0	34	145	–12	0.31	–0.23	–0.23	–0.23	1.8

[a]See Fig. 7.1 in Vol. 1.
[b]Units are given in pCi/g unless otherwise indicated.

Table 7.2. ORNL 1992 concentration of PCB in sediment[a]

Analyte	Number detected/ number of samples	Concentration (μg/kg)			
		Max[b]	Min[b]	Av[c]	Standard error[d]
		Site 04—Confluence of Fifth Creek and White Oak Creek			
Aroclor-1016	0/4	U140	U80	~110	16
Aroclor-1221	0/4	U140	U80	~110	16
Aroclor-1232	0/4	U140	U80	~110	16
Aroclor-1242	0/4	U140	U80	~110	16
Aroclor-1248	0/4	U140	U80	~110	16
Aroclor-1254	4/4	J280	J60	~130	51
Aroclor-1260	2/4	U280	180	~230	25
		Site 06—Upstream of Weir at 7500 Road Bridge			
Aroclor-1016	0/4	U140	U80	~100	14
Aroclor-1221	0/4	U140	U80	~100	14
Aroclor-1232	0/4	U140	U80	~100	14
Aroclor-1242	0/4	U140	U80	~100	14
Aroclor-1248	0/4	U140	U80	~100	14
Aroclor-1254	4/4	1,400	790	1,000	140
Aroclor-1260	2/4	1,200	U140	~680	290
		Site 07—Upstream of Weir at Melton Branch			
Aroclor-1016	0/4	U140	U80	~110	16
Aroclor-1221	0/4	U140	U80	~110	16
Aroclor-1232	0/4	U140	U80	~110	16
Aroclor-1242	0/4	U140	U80	~110	16
Aroclor-1248	0/4	U140	U80	~110	16
Aroclor-1254	0/4	U280	U160	~210	31
Aroclor-1260	0/4	U280	U160	~210	31
		Site 08—Melton Hill Lake southeast of 7600			
Aroclor-1016	0/4	U120	U80	~97	9.8
Aroclor-1221	0/4	U120	U80	~97	9.8
Aroclor-1232	0/4	U120	U80	~97	9.8
Aroclor-1242	0/4	U120	U80	~97	9.8
Aroclor-1248	0/4	U120	U80	~97	9.8
Aroclor-1254	0/4	U240	U160	~190	20
Aroclor-1260	0/4	U240	U160	~190	20
		Site 09—Melton Hill Lake west of PCB Storage Areas 7652 and 7656			
Aroclor-1016	0/4	U110	U80	~95	8.6
Aroclor-1221	0/4	U110	U80	~95	8.6
Aroclor-1232	0/4	U110	U80	~95	8.6
Aroclor-1242	0/4	U110	U80	~95	8.6
Aroclor-1248	0/4	U110	U80	~95	8.6
Aroclor-1254	0/4	U230	U160	~190	17
Aroclor-1260	0/4	U230	U160	~190	17
		Site 10—White Oak Lake at Mouth of White Oak Creek			
Aroclor-1016	0/4	U4000	U110	~2100	1100
Aroclor-1221	0/4	U4000	U110	~2100	1100
Aroclor-1232	0/4	U4000	U110	~2100	1100
Aroclor-1242	0/4	U4000	U110	~2100	1100
Aroclor-1248	0/4	U4000	U110	~2100	1100
Aroclor-1254	3/4	U8000	590	~2600	1800
Aroclor-1260	4/4	J1600	390	~1000	290

Table 7.2 (continued)

Parameter	Number detected/ number of samples	Concentration (μg/L)			Standard error[d]
		Max[b]	Min[b]	Av[c]	
Site 11—Melton Hill Lake east of 7600 and south of 7709					
Aroclor-1016	0/4	U130	U80	~100	13
Aroclor-1221	0/4	U130	U80	~100	13
Aroclor-1232	0/4	U130	U80	~100	13
Aroclor-1242	0/4	U130	U80	~100	13
Aroclor-1248	0/4	U130	U80	~100	13
Aroclor-1254	2/4	U160	J80	~91	40
Aroclor-1260	0/4	U260	U160	~200	25
Site 12—Watts Bar Lake south of 7700, Tower Shielding Facility					
Aroclor-1016	0/4	U110	U80	~92	7.1
Aroclor-1221	0/4	U110	U80	~92	7.1
Aroclor-1232	0/4	U110	U80	~92	7.1
Aroclor-1242	0/4	U110	U80	~92	7.1
Aroclor-1248	0/4	U110	U80	~92	7.1
Aroclor-1254	2/4	U160	J19	~90	41
Aroclor-1260	0/4	U220	U160	~180	14
Site 13—White Oak Dam					
Aroclor-1016	0/4	U110	U80	~94	7.8
Aroclor-1221	0/4	U110	U80	~94	7.8
Aroclor-1232	0/4	U110	U80	~94	7.8
Aroclor-1242	0/4	U110	U80	~94	7.8
Aroclor-1248	0/4	U110	U80	~94	7.8
Aroclor-1254	2/4	U160	J21	~91	40
Aroclor-1260	0/4	U210	U160	~190	16
Site 14—Headwaters of White Oak Creek					
Aroclor-1016	0/4	U150	U80	~110	17
Aroclor-1221	0/4	U150	U80	~110	17
Aroclor-1232	0/4	U150	U80	~110	17
Aroclor-1242	0/4	U150	U80	~110	17
Aroclor-1248	0/4	U150	U80	~110	17
Aroclor-1254	2/4	U160	J41	~100	32
Aroclor-1260	0/4	U290	U160	~220	34

[a] See Figs. 7.3 and 7.4 in Vol. 1.
[b] Prefixes J or U mean that the value was estimated by the laboratory or was not detected at that level, respectively.
[c] The ~ prefix indicates that estimated values were used in the calculation of the average.
[d] Standard error of the mean.

Table 7.3. Concentration of radioactivity in sediment samples taken in the vicinity of the K-25 Site (pCi/g)[a]

Parameter	SS1	SS2	SS3	SS4	SS5	SS6	SS7	Max	Min	Av
Alpha	–4.74	–3.20	6.49	–3.75	–12.3	–3.51	–3.91	6.49	–12.3	–3.56
Beta	–2.31	0.127	43.8	–2.91	0.170	1.65	–2.77	43.8	–2.91	5.39
^{234}U	0.00	0.157	1.63	0.143	0.138	0.00	0.00	1.63	0.00	0.295
^{235}U	–0.004	0.629	1.05	2.48	0.396	0.463	0.206	2.48	–0.004	0.746
^{238}U	0.173	0.157	0.889	0.00	0.00	0.000	0.294	0.889	0.00	0.216
^{99}Tc	22.1	32.5	152	57.9	–39.3	31.3	49.2	152	–39.30	43.6
^{234m}Pa	–30.6	204	–25	–116	89.9	–24.4	168	204	–116.00	38.0
^{234}Th	–4.25	–12.40	–14.1	–3.44	3.67	1.23	12.7	12.7	–14.10	–2.37
^{137}Cs	0.378	0.319	–0.280	0.982	0.254	–0.299	0.152	0.982	–0.299	0.215
^{237}Np	–0.276	–0.251	0.714	–0.216	–0.255	0.00	–0.247	0.714	–0.276	–0.076
^{238}Pu	–0.276	–0.251	–0.238	–0.216	–0.255	0.00	–0.247	0.00	–0.276	–0.212
^{239}Pu	–0.276	–0.251	0.00	–0.216	–0.255	0.00	–0.247	0.00	–0.276	–0.178

[a]See Fig. 7.5 in Vol. 1.

Table 7.4. Concentration of constituents in sediment samples taken in the vicinity of the K-25 Site (μg/g)[a]

Parameter	SS1	SS2	SS3	SS4	SS5	SS6	SS7	Max	Min	Av
Uranium	2.3	3.1	15.0	2.4	1.6	2.2	1.4	15.0	1.4	4.0
Arsenic	1.4	1.2	8.8	11.0	3.1	1.5	6.7	11.0	1.2	4.8
Cadmium	0.1	0.1	0.4	0.2	0.2	0.2	0.8	0.8	0.1	0.3
Lead	5.5	4.6	25.0	24.0	12.0	5.8	101.0	101.0	4.6	25.4
Selenium	0.3	0.4	1.8	1.8	1.7	0.4	1.8	1.8	0.3	1.2
Thallium	0.6	0.7	3.7	3.5	3.4	0.8	3.6	3.7	0.6	2.3
Mercury	0.0	0.6	0.7	0.0	0.4	1.4	0.1	1.4	0.0	0.5
Aluminum	3,600.0	4,100.0	5,300.0	3,900.0	3,900.0	3,300.0	5,600.0	5,600.0	3,300.0	4,242.9
Antimony	48.0	40.0	27.0	41.0	4.2	28.0	41.0	48.0	4.2	32.7
Barium	40.0	44.0	29.0	61.0	27.0	33.0	57.0	61.0	27.0	41.6
Beryllium	1.0	0.7	0.7	0.9	0.2	0.6	1.4	1.4	0.2	0.8
Boron	4.2	3.2	5.5	8.3	1.5	3.3	9.9	9.9	1.5	5.1
Calcium	840.0	1,100.0	5,500.0	520.0	1,000.0	1.7	1,900.0	5,500.0	1.7	1,551.7
Chromium	9.7	8.0	36.0	57.0	4.7	9.5	51.0	57.0	4.7	25.1
Cobalt	9.6	9.0	10.0	9.0	2.8	4.4	28.0	28.0	2.8	10.4
Copper	19.0	13.0	29.0	8.9	4.0	6.1	3.3	29.0	3.3	11.9
Iron	7,400.0	8,300.0	12,000.0	31,000.0	6,500.0	8,100.0	29,000.0	31,000.0	6,500.0	14,614.3
Magnesium	630.0	750.0	2,400.0	380.0	640.0	960.0	740.0	2,400.0	380.0	928.6
Manganese	460.0	390.0	450.0	1,200.0	150.0	290.0	1,700.0	1,700.0	150.0	662.9
Molybdenum	9.7	8.0	5.5	8.3	0.5	5.5	8.2	9.7	0.5	6.5
Nickel	12.0	12.0	49.0	11.0	4.1	13.0	14.0	49.0	4.1	16.4
PCBs (Aroclor 1254)	*b*	*b*	5.12	*b*	0.2	*b*	*b*	5.12	0.2	2.6
Potassium	1,200.0	1,000.0	740.0	760.0	420.0	740.0	930.0	1,200.0	420.0	827.1
Silver	5.8	4.8	3.3	5.0	0.3	3.3	4.9	5.8	0.3	3.9
Sodium	41.0	38.0	35.0	22.0	26.0	30.0	56.0	56.0	22.0	35.4
Vanadium	5.9	7.5	16.0	51.0	7.4	6.6	33.0	51.0	5.9	18.2
Zinc	44.0	47.0	72.0	89.0	12.0	35.0	35.0	89.0	12.0	47.7

[a]See Fig. 7.5 in Vol. 1

[b]Not detected.

8. SPECIAL STUDIES

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

9. SOLID WASTE MANAGEMENT PROGRAM

Table 9.1. Y-12 Plant on-site waste treatment data for CY 1992

Waste	Quantity treated (kg)	Treatment method	Residue type
Sanitary/industrial—nonhazardous			
Liquid	1,268,498	*a*	Sludge
CPCF/PRTF wastewaters[b]	1,699,082	*a*	Sludge
Steam Plant wastewaters[b]	171,296,717	*a*	Sludge
Solid	1,784,108	Compaction	Solid
Hazardous			
Liquid	678,778	*c*	Sludge
BCBG Leachate[b]	1,895,504	*c*	Sludge
Low-level contaminated waste			
Liquid	578,960	*a, d*	Sludge
Solid[e]	154,408	Compaction	Solid
Mixed			
Liquid	1,593,221	*a*	Sludge

Note: The difference between a generated and treated quantity is accounted for; not all waste is treated in the same year of generation.

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

[b]These quantities are reported separately because of their large mass.

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

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

[e]This does not include material treated at the Uranium Chip Oxidation Facility.

Table 9.2. ORNL waste treatment data for CY 1992

Waste	Quantity treated (kg)	Treatment method	Residue
Hazardous	7797	Wastewater Treatment Plant (H06)	None
Hazardous	568	Evaporation	None

Table 9.3. K-25 Site on-site waste treatment data for CY 1992[a]

Waste	Quantity treated (kg)	Treatment/disposal method	Residue
Hazardous	75,146,522[b]	Neutralization Incineration	Sludge Ash
PCB[c]	137,733	Incineration	Sludge Ash

[a]Waste treatment data includes treatment of waste generated on-site and received from Y-12, X-10, Paducah, Portsmouth, RMI, Fernald, and TSD garage. May also include PCB/RCRA waste.

[b]This includes 8,420,000 kg of hydrogen softener blowdown wastewater and 64,959,001 kg K-1435 TSCA Incinerator waste water.

[c]Strictly PCB waste from on site, the Y-12 Plant, ORNL, the Portsmouth Gaseous Diffusion Plant, and the Paducah Gaseous Diffusion Plant.

Table 9.4. ORNL on-site waste disposal during CY 1992

Waste	Disposal method	Quantity
Sanitary		
Radiological, m^3	Buried, SWSA 6	100.4
Nonradiological, m^3	Buried, SLF II (Y-12)	7,225
Asbestos		
Radiological, kg	Buried, SWSA 6	35,229
Scrap metal		
Radiological, kg	Buried, SWSA 6	50,811

Table 9.5. Y-12 Plant off-site waste disposal for CY 1992

Waste	Disposal method	Quantity (kg)
PCB/RCRA liquid	Incineration	168,004
RCRA liquid	Incineration	6,821
Industrial/sanitary solids	Landfill burial	599,524
Low-level solids	Incineration	201,893

Table 9.6. ORNL off-site waste disposal for CY 1992

Waste	Disposal method	Quantity (kg)	Location
Asbestos	Landfilling	15,315	SLF-II, Y-12
Hazardous/PCB	Storage/incineration	18,095	K-25

Table 9.7. K-25 Site off-site waste disposal activities during CY 1992

Waste	Quantity	Ultimate disposal
Asbestos (nonrad)	290 yd^3	Y-12 landfill
Hazardous waste	0	Commercial disposal facility
Nonhazardous	952 tons	Y-12 landfill
PCBs	0	Commercial disposal facility
Tires	830	Sold through property sales
Lead acid batteries[a]	0	Sold through property sales
Paper (ADP cards, NC paper)	115 tons	Sold through property sales
Scrap metal[a]	0	Sold through property sales
Spent shells (brass)	5650 lb	Sold through property sales
Lead	6920 lb	Sold through property sales
Shotgun shells	8 lots	Sold through property sales
Furniture	130	Sold through property sales
File cabinets	138	Sold through property sales

[a]Moratorium stopped sales in May 1991.

Table 9.8. Waste placed in storage on-site at the Y-12 Plant in CY 1992

Waste	Quantity (kg)
Low-level	547,880
Mixed[a]	361,217
PCB	56,075
PCB/uranium	53,893
RCRA	234,287
Scrap metal	
Clean	1,016,051
Uranium-contaminated	1,221,902

[a]Includes wastes stored at the K-25 Site.

Table 9.9. Total waste in storage at the Y-12 Plant at the end of CY 1992

Waste	Quantity (kg)
Low-level	1,230,090
Mixed	8,340,789
Hazardous	235,492
PCB	318,554
PCB/uranium	3,796,980
Noncontaminated oils/solvents	351,476
Roofing materials	3,109,000
Scrap metal	
Clean	1,870,933
Uranium-contaminated	4,297,310

Table 9.10. Waste placed in storage at ORNL during CY 1992

Waste	Quantity
Hazardous, kg	53,151[a]
Mixed, kg	9,939
PCB, kg	
Radiological	8,581
Nonradiological	27,875
Transuranic, kg	
Contact handled	2,540
Remote handled	2,000
Low-level, m^3	675.9
Asbestos, kg	
Nonradiological	0
Radiological	0
Scrap metal, kg	
Nonradiological	24,164[b]
Radiological	24,623[c]

[a]Policy mixed waste.
[b]Scrap metal placed in storage because of "no rad added" issue.
[c]Scrap metal placed in temporary storage prior to disposal.

Table 9.11. Total waste in storage at ORNL at the end of CY 1992

Waste	Quantity
Hazardous, kg	120,693
Mixed, kg	136,278
PCB, kg	
Radiological	21,711
Nonradiological	31,551
Transuranic, m^3	
Contact handled	246,804
Remote handled	1,323,429
Low level, m^3	675.9
Scrap metal, kg	
Radiological	24,623

Table 9.12. Waste received and stored at the K-25 Site in CY 1992

Waste	Originator	Quantity (kg)
	Waste received from off site	
Hazardous[a]	Y-12 Plant	258,162
	Portsmouth	298,718
	Paducah	19,298
	Central Training Facility	4,237
	TSD Garage	2,640
	X-10 Site	29,374
PCB[b]	Y-12 Plant	247,268
	Portsmouth	217,416
	Paducah	32,658
	X-10 Site	2,212
	Elza Gate	10,225
	CWM[c]	18,981
	Waste placed in storage during 1992	
Hazardous[a]	K-25 Site	614,186
	Off-site	217,833
PCB[b]	K-25 Site	549,012
	Off-site	528,760

[a]Hazardous waste may include RCRA/PCB mixtures.
[b]PCB waste may include hazardous wastes.
[c]K-25 Site-generated waste shipped off site in 1991; returned to K-25 Site because of shutdown of Chemical Waste Management (CWM) incinerator.

Table 9.13. Total waste stored by the end of CY 1992

Waste	Originator	Quantity (kg)
	Waste received from off site	
Hazardous[a]	K-25 Site	37,576,716
	Off-site	1,358,028
PCB[b]	K-25 Site/off-site	4,795,500

[a]Hazardous waste may include RCRA/PCB mixtures.
[b]PCB waste may include hazardous wastes.

10. QUALITY ASSURANCE

Table 10.1. Example of inorganic QC results for sampling GW-640, Y-12 Plant, 1992

Parameter	GW-640	Field replicate	Field blank
Concentration (mg/L)			
Arsenic	<0.050	<0.050	*a*
Barium	0.055	0.25	*a*
Cadmium	<0.002	<0.002	*a*
Chromium	<0.01	<0.01	*a*
Lead	<0.004	<0.004	*a*
Selenium	<0.050	<0.050	*a*
Silver	<0.0060	0.01	*a*
Mercury	<0.0002	<0.0060	*a*
Aluminum	0.066	0.052	*a*
Antimony	<0.050	<0.050	*a*
Beryllium	<0.00030	<0.00030	*a*
Boron	0.0082	0.0040	*a*
Calcium	11	11	*a*
Cobalt	<0.0050	<0.0050	*a*
Copper	0.0046	<0.0056	*a*
Iron	0.038	0.037	*a*
Magnesium	1.2	1.2	*a*
Manganese	0.0075	0.0078	*a*
Molybdenum	<0.010	<0.010	*a*
Nickel	<0.010	<0.010	*a*
Potassium	0.74	0.85	*a*
Sodium	3.5	4.0	*a*
Strontium	0.039	0.039	*a*
Thorium	<0.20	<0.20	*a*
Vanadium	<0.0050	<0.0050	*a*
Zinc	<0.009	0.008[3]	*a*
Turbidity (NTU)	1.4	1.1	*a*
Chloride IC (mg/L)	1	1	*a*
Nitrate nitrogen (mg/L)	<0.2	<0.2	*a*
Sulfate (mg/L)	2	2	*a*
Fluoride FIA (mg/L)	<0.1	<0.1	*a*
Bicarbonate	42	41	*a*
Carbonate	<1	<1	*a*
pH (standard units)	6.6[b]	6.6[b]	*a*
Activity (pCi/L)[c]			
Alpha	0.287 ± 1.6	−0.144 ± 1.5	*a*
Beta	−7.54 ± 3.1	−5.66 ± 3.2	*a*
Dissolved solids	78	76	
Suspended solids (mg/L)	2.0	<1.0	*a*
U fluorometric (mg/L)	<0.001	<0.001	*a*
Conductivity (μmho/cm)	98	342.0	*a*
Alkalinity (mg/L)			
CO_3	<1.0	<1.0	*a*
HCO_3	217	216	*a*

[a]Not applicable.

[b]Sample received with expired holding time.

[c]The confidence interval is reported per the *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*, DOE/EH-0173T (January 1991), Chap. 7, Sect. 7.1.

Table 10.2. Example of organic QC data at GW-640, Y-12 Plant, 1992

Parameter	GW-640	Field duplicate	Field blank
	Volatile organic compounds (µg/L)		
Chloromethane	10 U[a]	10 U	10 U
Bromomethane	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Methylene chloride	5 U	5 U	5 U
Acetone	10 U	10 U	10 U
Carbon disulfide	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U
1,1,1-Trichloroethane	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U
Vinyl acetate	10 U	10 U	10 U
Bromodichloromethane	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
Trans-1,3-Dichloropropene	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Benzene	5 U	5 U	5 U
Cis-1,3-Dichloropropene	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
2-Hexanone	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U
Tetrachloroethene	5 U	5 U	5 U
Toluene	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Xylenes	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U
	Surrogate recovery (%)		
Toluene-D8	106.7	104.1	109.6
Bromofluorobenzene	90.8	97.3	98.0
1,2-Dichloroethane D-4	97.8	97.1	105.4

[a]U = compound analyzed for but not detected.

Table 10.3. K-25 Site environmental analysis procedures for NPDES

Parameter	Regulatory method	Lowest concentration reported[a]
Alkalinity, $CaCO_3$ (mg/L)	SM-403[b]	1
Gross alpha activity (pCi/L)	EPA-900.0	0.5
Gross beta activity (pCi/L)	EPA-900.0	2.0
^{241}Am and ^{244}Cm (pCi/L)		
^{241}Am	ACD-160066[c]	0.14
^{244}Cm	ACD-160066[c]	3.0
As and Se, graphite furnace-AA (mg/L)		
As	EPA-206.2	0.005
Se	EPA-270.2	0.005
Asbestos (fibers/L)		0.3×10^6
Biochemical oxygen demand, 5-d (mg/L)	EPA-405.1	5
Bromide, spectrophotometric (mg/L)	EPA-320.1	0.1
Chemical oxygen demand (low level) titration method (mg/L)	EPA-410.4	5
Chloride, titration, $HgNO_3$ (mg/L)	EPA-325.3	0.05
Anions, ion chromatograph (mg/L)[d]		
Chloride	EPA-300.0	1
Nitrate (N)	EPA-352.1	0.2
Sulfate	EPA-375.4	1
Phosphate (P)	EPA-365.1	1
$TRCl_2$, amperometric (mg/L)	EPA-330.1	0.05
Cr (VI), colorimetric (mg/L)	307B	0.01
Coliform bacteria, fecal (colonies/100 mL)	SM-9222D[e]	1
Color (color unit)	EPA-110.2	1
Conductance, specific (μmho/cm)	EPA-120.1	0.5
Cyanide, total (5-cm cell)	EPA-335.2	0.1
Dissolved oxygen, membrane electrode method (mg/L)	EPA-360.1	0.1
Fluoride (mg/L)	EPA-340.2	0.1
Gamma-ray emitters (pCi/L)	ACD-1667[c]	2.5
Hg, total (mg/L)	EPA-245.1	0.0002
Methylene-blue-active substances (mg/L)	EPA-425.1	0.05
^{237}Np (pCi/L)	ACD-1665[c]	2.0
N (mg/L)		
Ammonia, SIE	EPA-350.3	0.2
Kjeldahl (total), spectrophotometric	EPA-351.3	0.2
Kjeldahl (total), volumetric	EPA-351.3	0.2
Kjeldahl (total), SIE	EPA-351.4	0.2
Nitrate, brucine method	EPA-352.1	0.5
Nitrate-nitrite, Cd-Redn.	EPA-353.3	0.1
O&G, gravimetric (mg/L)	EPA-413.1	5
Pesticides (organochlorine), GC method (μg/L)		
Lindane	EPA-608[f]	0.01
Endrin	EPA-608[f]	0.05
Toxaphene	EPA-608[f]	1.0
Methoxychlor	EPA-608[f]	0.2
Phenols (mg/L)	EPA-420.1	0.05
pH, electrometric (standard units)	EPA-150.1	Nearest 0.1
Total activity (pCi/L)	ACD-160073[c]	60.0
Lead	EPA-239.2	0.004
Thallium	EPA-279.2	0.010
Cadmium	EPA-213.2	0.002

Table 10.3 (continued)

Parameter	Regulatory method	Lowest concentration reported[a]
Phosphorus (all forms), spectrophotometric (mg/L)	EPA-365.2	0.1
Pu isotopes (pCi/L)	ACD-1665[c]	1.0
PCBs, each (μg/L)	EPA-608	
Aroclor-1016		0.5
Aroclor-1221		0.5
Aroclor-1232		0.5
Aroclor-1242		0.5
Aroclor-1248		0.5
Aroclor-1254		0.5
Aroclor-1260		0.5
Priority pollutants, organic (base/neutral/acid), each (μg/L)	EPA-625	1.0[g]
Priority pollutants, organic (volatile, purgeable), each (μg/L)	EPA-624	1.0[h]
Solids (residue)		
Dissolved (mg/L)	EPA-160.1	10
Settleable [mL/(L·h)]	EPA-160.5	0.1
Total (mg/L)	EPA-160.3	1.0
Undissolved (mg/L)	EPA-160.2	1.0
Volatile (mg/L)	EPA-160.4	5
^{90}Sr (pCi/L)	ACD-160069[c]	4.0
Sulfate, turbidimetric method (mg/L)	EPA-375.4	5
^{99}Tc (pCi/L)	ACD-160069[c]	300
Th isotopes (pCi/L)	ACD-1665[c]	0.3
Th, spectrophotometric (mg/L)		2×10^{-3}
Total organic carbon, combustion or oxidation (mg/L)	EPA-415.1	1
Tritium (pCi/L)	ACD-160059[c]	5000
Turbidity (NTU)	EPA-180.1	0.1
U (total), fluorometric (mg/L)	ACD-183707[c]	1×10^{-3}
U isotopes (pCi/L)	ACD-1665[c]	0.5
U isotopic abundances (wt %)	ACD-2116[c]	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]Reference: *Standard Methods*, 16th ed., 1985.

[c]No regulatory method available for use, ACD procedure.

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

[e]References to *Standard Methods* for the 17th Edition, 1989.

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

[g]For 81 compounds.

[h]For 31 compounds.

Table 10.4. K-25 Site environmental analysis procedures for wastewater characterization and groundwater monitoring

Parameter	Regulatory method	Lowest concentration reported[a]
Alkalinity, $CaCO_3$ (mg/L)	SM-403[b]	1
Gross alpha activity (pCi/L)	EPA-900.0	1.0
Gross beta activity (pCi/L)	EPA-900.0	4.0
^{241}Am and ^{244}Cm (pCi/L)		
^{241}Am	ACD-160066[c]	3.0
^{244}Cm	ACD-160066[c]	3.0
Arsenic graphite furnace-AA (mg/L)	EPA-7060	0.005
Selenium, graphite furnace-AA (mg/L)	EPA-7740	0.005
Asbestos (fibers/L)		0.3×10^6
Biochemical oxygen demand, 5-d (mg/L)	EPA-405.1	5
Bromide, spectrophotometric (mg/L)	EPA-320.1	0.1
Chemical oxygen demand (low level) titration method (mg/L)	EPA-410.4	5
Chloride, titration, $HgNO_3$ (mg/L)	EPA-325.3	0.05
Anions, ion chromatograph (mg/L)[d]		
Chloride	EPA-300.0	1
Nitrate (N)	EPA-352.1	0.2
Sulfate	EPA-375.4	1
Phosphate (P)	EPA-365.1	1
$TRCl_2$, amperometric (mg/L)	EPA-330.1	0.05
Chromium (VI), colorimetric (mg/L)	SM-312B[b]	0.01
Coliform bacteria, fecal (colonies/100 mL)	SM-9222D[e]	1
Coliform bacteria, total (colonies/100 mL)	SM-9222B[e]	1
Color (color unit)	EPA-110.2	1
Conductance, specific (μmho/cm)	EPA-120.1	0.5
Cyanide, total (5-cm cell)	EPA-335.2	0.1
Dissolved oxygen, membrane electrode method (mg/L)	EPA-360.1	0.1
Fluoride (mg/L)	EPA-340.2	0.1
Gamma-ray emitters (pCi/L)		2.5
Herbicides (chlorinated phenoxy acid), GC method (μg/L)		
2,4-D	EPA-8080	<1.0
Silvex	EPA-8080	<0.1
Hg, total (mg/L)	EPA-7470	0.0002
Methylene-blue-active substances (mg/L)	EPA-425.1	0.05
^{237}Np (pCi/L)	ACD-1665[c]	1.0
Nitrogen (mg/L)		
Ammonia, SIE	EPA-350.3	0.2
Kjeldahl (total), spectrophotometric	EPA-351.3	0.2
Kjeldahl (total), volumetric	EPA-351.3	0.2
Kjeldahl (total), SIE	EPA-351.4	0.2
Nitrate, brucine method	EPA-352.1	0.5
Nitrate-nitrite, Cd-Redn.	EPA-353.3	0.1
N-nitrosomorpholine, spectrophotometric (mg/L)		0.1
O&G, gravimetric (mg/L)	EPA-413.1	5
Pesticides (organochlorine), GC method (μg/L)		
Lindane	EPA-8080	0.01
Endrin	EPA-8080	0.05
Toxaphene	EPA-8080	1.0
Methoxychlor	EPA-8080	0.2
Phenols (mg/L)	EPA-420.1	0.05
pH, electrometric (standard units)	EPA-9040	Nearest 0.1
Lead	EPA-7421	0.004
Thallium	EPA-7841	0.010
Cadmium	EPA-7131	0.002
Chromium	EPA-7191	0.010

Table 10.4 (continued)

Parameter	Regulatory method	Lowest concentration reported[a]
Phosphorus (all forms), spectrophotometric (mg/L)	EPA-365.2	0.1
Pu isotopes (pCi/L)		1.0
PCBs, each (μg/L)	EPA-8080	
Aroclor-1016		0.5
Aroclor-1221		0.5
Aroclor-1232		0.5
Aroclor-1242		0.5
Aroclor-1248		0.5
Aroclor-1254		0.5
Aroclor-1260		0.5
Priority pollutants, organic (base/neutral/acid), each (μg/L)	CLP Methodology & EPA-8270	Mostly 10–50[f]
Priority pollutants, organic (volatile, purgeable), each (μg/L)	CLP Methodology & EPA-8270	Mostly 10–30[g]
Solids (residue)		
Dissolved (mg/L)	EPA-160.1	10
Settleable [mL/(L·h)]	EPA-160.5	0.1
Total (mg/L)	EPA-160.3	1.0
Undissolved (mg/L)	EPA-160.2	1.0
Volatile (mg/L)	EPA-160.4	5
^{90}Sr (pCi/L)		4.0
Sulfate, turbidimetric method (mg/L)	EPA-375.4	5
^{99}Tc (pCi/L)	ACD-160069[c]	300
Th isotopes (pCi/L)	ACD-1665[c]	0.4
Th, spectrophotometric (mg/L)		2×10^{-3}
Total organic carbon, combustion or oxidation (mg/L)	EPA-415.1	1
Tritium (pCi/L)	ACD-160059[c]	5000
Turbidity (NTU)	EPA-180.1	0.1
U (total), fluorometric (mg/L)	ACD-183707[c]	1×10^{-3}
U isotopes (pCi/L)	ACD-210026[c]	0.5
U isotopic abundances (wt %)	ACD-2116[c]	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]Reference: *Standard Methods*, 16th ed., 1985.

[c]No regulatory method available for use.

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

[e]References to *Standard Methods* for the 17th Edition, 1989.

[f]For 81 compounds.

[g]For 31 compounds.

Table 10.5. K-25 Site atomic absorption and inductively coupled plasma environmental analysis procedures for waters

Element	Lowest concentration reported[a] (mg/L)			
	EPA 200 series/7000 series flame AA	EPA 200 series/7000 series graphite furnace AA	EPA -200.7 ICP	EPA-6010 ICP
Silver	*b*	0.01	0.01	0.006
Aluminum	*b*	*b*	0.10	0.02
Arsenic	*b*	0.005	0.05	0.05
Barium	*b*	*b*	0.10	0.001
Calcium	*b*	*b*	0.05	0.008
Cadmium	0.01	0.002	0.003	0.003
Chromium	0.05	0.01	0.010	0.010
Copper	*b*	*b*	0.004	0.004
Iron	*b*	*b*	0.05	0.005
Potassium	*b*	*b*	0.60	0.60
Lithium	*b*	*b*	0.004	0.004
Magnesium	*b*	*b*	0.02	0.003
Manganese	*b*	*b*	0.01	0.001
Molybdenum	*b*	*b*	0.01	0.01
Sodium	*b*	*b*	0.05	0.02
Nickel	0.05	*b*	0.05	0.01
Lead	0.10	0.004	0.05	0.05
Selenium	*b*	0.005	0.05	0.05
Zinc	*b*	*b*	0.02	0.002

[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 by this technique.

Table 10.6. K-25 Site environmental analysis procedures for air

Parameter	NIOSH[a] or EPA method	Lowest concentration reported[b]
Gross alpha, beta, air filters, radiochemistry (pCi/m^3)	EPA-900.0[c]	
Alpha		0.005
Beta		0.025
Fluoride, air, SIE (total μg)	EPA-340.2	0.2
Fluoride, stacks, SIE (mg/L)	EPA-340.2	0.1
Gamma-ray spec., air filters (pCi/filter)	ACD-1667[d]	30
Metals in air particulates atomic absorption (μg/sample)	ACD-100013[d]	For 48 metals, mostly 1–10
Air filters, radiochemistry (pCi/filter)		
Pu	ACD-1665[d]	0.04
^{90}Sr	ACD-160069[d]	0.8
^{99}Tc		300
Th alpha isotopes, radiochemistry (pCi/filter)	ACD-1665[d]	0.04
U, air filters, fluorometric (total μg)		0.05
U isotopes, air filters, radiochemistry (pCi/filter)	ACD-1665[d]	0.04
U, stack gases, spec./fluoro. (mg/L)		0.001
Dioctyl phthalate, air, GC method (mg/m^3)	NIOSH 5020	2
Isopropanol, air (mg/m^3)	NIOSH S64	180
Organic solvents, air, GC method (mg/sample)	NIOSH 1003	18 cpds; 0.01 to 1.0
PCBs, air, GC (total μg)	NIOSH 5503	0.2

[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 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.

[c] Drinking-water method adapted to air filters.

[d] K-25 Site Analytical Chemistry Department procedure.

Table 10.7. K-25 Site environmental analysis procedures for soil and sediment

Parameter	EPA method	Lowest concentration reported[a]
Fluoride (mg/L)		0.1
Gamma-ray spectrum analysis (pCi/kg)	ACD-1667[b]	1–50
Mercury (total), cold vapor absorption (mg/kg)	EPA-7471	0.025
Metals, atomic absorption	EPA-7000 Series	*c*
Metals, inductively coupled plasma-optical emission spectrometric (ICP-OES)	EPA-6010	*c*
Np, direct gamma spectrum	ACD-1665[b]	*b*
^{237}Np, radiochemical (pCi/kg)	ACD-1665[b]	20
Pu, radiochemical (pCi/kg)	ACD-1665[b]	20
PCBs, gas chromatographic (mg/kg)	EPA-8080	
Aroclor 1016		0.1
Aroclor 1221		0.1
Aroclor 1232		0.1
Aroclor 1242		0.1
Aroclor 1248		0.1
Aroclor 1254		0.1
Aroclor 1260		0.1
^{90}Sr, radiochemical (pCi/kg)		2000
^{99}Tc, radiochemical (pCi/kg)	ACD-160069[b]	3
Th, spectrophotometric (mg/kg)	ACD-1667[b]	3
Th (alpha-emitting) isotopes, radiochemical (pCi/kg)		1
U (total), fluorometric (mg/kg)		1
U (total and isotopic), isotope thermal ionization mass spectrometry (wt %)		10
U isotopes, radiochemical (pCi/kg)	ACD-1665[b]	1.0
Priority pollutants, organic (base, neutral, acid), each µg/kg	EPA-8270	1
Priority pollutants, organic (volatile, purgeable), each µg/kg	EPA-8270	1

[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]K-25 Site Analytical Chemistry Department procedure.

[c]See Table 10.5.

Table 10.8. CLP performance evaluation results, inorganics, ORNL, 1992

Scoring classification	Points deducted			
	1st quarter[a]	2nd quarter	3rd quarter	4th quarter
Duplicate precision	0.0	0.0	0.0	0.0
Matrix spikes	0.0	1.0	1.5	0.5
Water sample				
Identification	0.0	0.0	0.0	0.0
Quantitation	0.0	8.3	8.0	16.8
False positives and unmet CRDLs[b]	0.0	0.0	0.0	0.0
Soil sample				
Identification	0.0	0.0	0.0	0.0
Quantitation	0.0	2.6	0.0	2.5
False positives and unmet CRDLs[b]	0.0	0.0	0.0	0.0
Total points deducted	0.0	11.9	9.5	19.8
Laboratory score (%)	0.0	88.1	90.5	80.2

[a]PE samples not analyzed due to ICP instrument problems.
[b]Points deducted for false positive values and for not meeting the contract-required detection limits (CRDLs).

Table 10.9. CLP performance evaluation results, organics, ORNL, 1992

Scoring classification	Points deducted			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Number of TCL compounds not identified	6.4	20.0	8.6	0.0
Number of TCL compounds misquantified	12.8	5.0	17.2	38.8
Number of TCL contaminants	0.0	5.0	8.6	0.0
Number of non-TCL compounds not identified	0.0	0.0	2.2	0.0
Number of non-TCL contaminants	2.2	0.0	0.0	0.0
Total points deducted	21.4	30.0	36.7	38.8
Laboratory score (%)	78.6	70.0[a]	63.3[a]	61.2[a]

[a]Score less than 75% is unacceptable; response explaining deficiencies required.

Table 10.10. CLP performance evaluation results, inorganics, K-25 Site, 1992

Scoring classification	Points deducted			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Duplicate precision[a]	0	2	4	0
Matrix spikes[b]	2	3	7	2
Water sample				
Identification	0	0	0	0
Quantification	1	2	2	1
False positives and unmet CRDLs[c]	1	0	0	0
Soil sample				
Identification	0	0	1	0
Quantification	0	1	0	0
False positives and unmet CRDLs[c]	0	1	0	0
Total points deducted	11.5	12.5	16.2	3.9
Laboratory score (%)	88.5	87.5	83.8	96.1

[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).

Table 10.11. CLP performance evaluation results, organics, K-25 Site, 1992

Scoring classification	Points deducted			
	1st quarter	2nd quarter	3rd quarter[a]	4th quarter
Number of TCL[b] compounds not identified	0	0	0	0
Number of TCL compounds misquantified	6	2	3	5
Number of TCL contaminants	0	0	1	0
Number of non-TCL compounds not identified	0	0	1	0
Number of non-TCL contaminants	0	0	0	0
Total points deducted	19.2	10	19.4	22.3
Laboratory score %	80.8	90	80.6	77.7

[a]EPA did not evaluate any data.
[b]Target compound list.

Table 10.12. CLP performance evaluation results, organics, Y-12 Analytical Services, 1992

Scoring classification	Laboratory performance	
	3rd quarter	4th quarter
Water sample-1		
Number of elements not identified	0	0
Number of elements misquantified	1	2
Number of false positives	0	0
Number of matrix spikes out	0	0
Number of duplicates out	0	0
Water sample-2		
Number of elements not identified	0	0
Number of elements misquantified	1	1
Number of false positives	1	0
Number of matrix spikes out	0	0
Number of duplicates out	0	0
Soil sample		
Number of elements not identified	0	0
Number of elements misquantified	0	0
Number of false positives	0	0
Number of matrix spikes out	0	2
Number of duplicates out	0	0
Laboratory score (%)	29.9	90.5

Table 10.13. CLP performance evaluation results, inorganics, Y-12 Analytical Services, 1992

Scoring classification	Laboratory performance		
	1st quarter	2nd quarter	3rd quarter
Number of TCL[a] compounds not identified	0	0	0
Number of TCL compounds misquantified	3	0	6
Number of TCL contaminants	0	1	0
Number of non-TCL compounds not identified	0	2	0
Number of non-TCL contaminants	0	0	0
Laboratory score (%)	85.0	91.3	74.0

[a]Target compound list.

Table 10.14. Water supply performance evaluation study, WS-030, Y-12 Analytical Services Organization, 1992

Analytes	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
		Trace metals (μg/L)			
Antimony	2	11.0	8.20	5.50–11.8	Acceptable
Arsenic	1	26.8	25.2	20.4–28.6	Acceptable
Barium	1	918	921	820–990	Acceptable
Beryllium	2	8.37	8.47	6.90–9.47	Acceptable
Boron	2	1030	1000	950–1070	Acceptable
Cadmium	1	39.2	39.0	33.7–44.1	Acceptable
Chromium	1	198	200	177–222	Acceptable
Copper	1	564	570	513–627	Acceptable
Lead	1	5	4.26	2.96–5.98	Acceptable
Mercury	1	3.49	3.46	2.55–4.26	Acceptable
Nickel	2	38.7	39.5	33.2–43.9	Acceptable
Selenium	1	35	35.9	27.6–40.9	Acceptable
Silver	1	86.9	85.3	73.8–96.7	Acceptable
Thallium	2	5.75	5.3	3.84–6.65	Acceptable
		Nitrate/nitrite/fluoride, mg/L			
Nitrate as nitrogen	1	7.84	7.7	6.49–9.07	Acceptable
Nitrite as nitrogen	1	0.383	0.32	0.277–0.370	Unacceptable
Fluoride	1	8.2	7.9	7.11–8.69	Acceptable
		Insecticides (μg/L)			
Chlordane	3	2.82	4.2	2.63–5.28	Acceptable
Endrine	1	0.738	0.958	0.602–1.18	Acceptable
Lindane	1	1.309	1.38	0.824–1.77	Acceptable
Methoxychlor	1	0.016	34.2	19.3–45.3	Unacceptable
Toxaphene	2	4.83	2.8	1.57–3.46	Unacceptable
		Herbicides (μg/L)			
2,4-D	1	30.1	41.7	14.1–60.4	Acceptable
2,4,5-TP (Silvex)	1	10.1	14.6	7.75–18.4	Acceptable
		Trihalomethanes (μg/L)			
Bromodichloromethane	1	9.2	9.88	7.90–11.9	Acceptable
Bromoform	1	24.8	24.9	19.9–29.9	Acceptable
Chlorodieromomethane	1	32.1	36.2	29.0–43.4	Acceptable
Chloroform	1	8.0	8.74	6.99–10.5	Acceptable

Table 10.14 (continued)

Analytes	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True		
Volatile organic compounds (µg/L)					
Benzene	1	9.9	9.51	5.71–13.3	Acceptable
Carbon tetrachloride	1	5.8	6.46	3.88–9.04	Acceptable
Chlorobenzene	2	12.9	12.4	9.92–14.9	Acceptable
1,2-Dichlorobenzene	2	6.6	7.94	4.76–11.1	Acceptable
1,4-Dichlorobenzene	1	13.3	16.1	12.9–19.3	Acceptable
1,2-Dichloroethane	1	7.4	7.69	4.61–10.8	Acceptable
1,1-Dichloroethylene	1	14.9	14.2	11.4–17.0	Acceptable
Cis-1,2-Dichloroethylene	2	8.2	8.57	5.14–12.0	Acceptable
Trans-1,2-Dichloroethylene	2	6.6	6.62	3.97–9.27	Acceptable
1,2-Dichloropropane	2	10.1	10.9	8.72–13.1	Acceptable
Ethylbenzene	2	14.4	13.9	11.1–16.7	Acceptable
Styrene	2	17.6	17	13.6–20.4	Acceptable
Tetrachloroethylene	2	8.8	9.0	5.40–12.6	Acceptable
Toluene	2	8.1	8.02	4.81–11.2	Acceptable
1,1,1-Trichloroethane	1	6.1	7.13	4.28–9.98	Acceptable
Trichloroethylene	1	8.9	9.45	5.67–13.2	Acceptable
Vinyl chloride	1	6.1	5.48	3.29–7.67	Acceptable
Total xylenes	2	15.6	15.0	12.0–18.0	Acceptable
Bromobenzene	3	13.5	16.8	13.4–20.2	Acceptable
Bromochloromethane	3	13.0	13.5	10.8–16.2	Acceptable
Dibromomethane	3	16.4	18.6	14.9–22.3	Acceptable
1,1,1,2-Tetrachloroethane	3	13.5	14.3	11.4–17.2	Acceptable
1,2,4-Trichlorobenzene	3	7.4	13.5	10.8–16.2	Unacceptable
1,1,2-Trichloroethane	3	10.9	11.5	9.20–13.8	Acceptable
Miscellaneous analytes[a]					
Residual free chlorine	1	1.25	1.22	0.883–1.44	Acceptable
Turbidity (NTUs)	1	8.0	7.3	7.06–8.41	Acceptable
Total filterable residue	1	225	200	149–299	Acceptable
Calcium (mg $CaCO_3$/L)	1	99.2	100	92.9–110	Acceptable
pH, standard units	1	8.84	9.13	8.83–9.32	Acceptable
Alkalinity (mg $CaCO_3$/L)	1	26	25.0	23.0–29.3	Acceptable
Corrosivity[b]	1	0.32	0.598	0.163–0.9	Acceptable
Corrosivity[c]	1	12.2	12.5	12.0–12.8	Acceptable
Sodium	1	11.6	11.5	10.1–12.7	Acceptable
Sulfate	1	29.0	28.0	24.9–30.7	Acceptable
Total cyanide	1	0.138	0.14	0.0929–0.167	Acceptable

[a]Units = mg/L unless otherwise noted.

[b]Langelier Index at 20°C.

[c]Aggressive Index at 20°C.

Table 10.15. Water supply performance evaluation study, WS-029, ORNL, 1992

Analytes	Sample Number	Values		Acceptance limits	Performance evaluations
		Reported	True[a]		
		Trace metals, µg/L			
Lead	1	18.4	18.0	12.6–23.4	Acceptable
		Insecticides, µg/L			
Chloradane	3	0.826	0.833	0.458–1.21	Acceptable
Endrin	1	0.415	0.442	0.290–0.571	Acceptable
Heptachlor	4	0.264	0.370	0.204–0.536	Acceptable
Heptachlor epoxide	4	0.192	0.267	0.147–0.387	Acceptable
Lindane	1	0.185	0.220	0.121–0.319	Acceptable
Methoxychlor	1	6.14	5.21	2.87–7.55	Acceptable
Toxaphene	2	7.55	7.60	4.18–11.0	Acceptable
		Miscellaneous analyte, NTUs			
Turbidity	1	2.3	2.40	2.02–2.87	Acceptable

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

Table 10.16. Water supply performance evaluation study, WS-030, ORNL, 1992

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Trace metals, µg/L			
Antimony	2	7.60	8.20	5.50–11.8	Acceptable
Arsenic	1	24.0	25.2	20.4–28.6	Acceptable
Barium	1	911	921	820–990	Acceptable
Beryllium	2	8.70	8.47	6.90–9.47	Acceptable
Boron	2	1030	1000	950–1070	Acceptable
Calcium	1	41.0	39.0	33.7–44.1	Acceptable
Chromium	1	203	200	177–222	Acceptable
Copper	1	569	570	513–627	Acceptable
Lead	1	4.80	4.26	2.96–5.98	Acceptable
Mercury	1	3.40	3.46	2.55–4.26	Acceptable
Nickel	2	37.0	39.5	33.2–43.9	Acceptable
Selenium	1	30.0	35.9	27.6–40.9	Acceptable
Silver	1	85.0	85.3	73.8–96.7	Acceptable
Thallium	2	4.70	5.30	3.84–6.65	Acceptable
		Nitrate/nitrite/fluoride, mg/L			
Nitrate as nitrogen	1	7.21	7.70	6.49–9.07	Acceptable
Nitrite as nitrogen	1	0.277	0.320	0.277–0.370	Acceptable
Fluoride	1	7.86	7.90	7.11–8.69	Acceptable
		Insecticides, µg/L			
Chlordane	3	3.65	4.20	2.63–5.28	Acceptable
Endrin	1	2.42	0.958	0.602–1.18	Not Acceptable[b]
Heptachlor	4	0.976[c]	1.38	0.696–1.65	Acceptable
Heptachlor epoxide	4	0.680	0.850	0.543–1.04	Acceptable
Lindane	1	1.12	1.38	0.824–1.77	Acceptable
Methoxychlor	1	31.5	34.2	19.3–45.3	Acceptable
Toxaphene	2	1.35[c]	2.80	1.57–3.46	Not Acceptable[d]
		Herbicides, µg/L			
2,4-D	1	45.0	41.7	14.1–60.4	Acceptable
Silvex	1	13.4[c]	14.6	7.75–18.4	Acceptable
		Trihalomethanes, µg/L			
Bromodichloromethane	1	7.75	9.88	7.90–11.9	Not Acceptable[e]
Bromoform	1	21.5	24.9	19.9–29.9	Acceptable
Chlorodibromomethane	1	30.7	36.2	29.0–43.4	Acceptable
Chloroform	1	7.62	8.74	6.99–10.5	Acceptable
		Volatile organic compounds, µg/L			
Benzene	1	9.45	9.51	5.71–13.3	Acceptable
Carbon tetrachloride	1	5.30	6.46	3.88–9.04	Acceptable
Chlorobenzene	2	11.3	12.4	9.92–14.9	Acceptable
1,2-Dichlorobenzene	2	7.52	7.94	4.76–11.1	Acceptable
1,4-Dichlorobenzene	1	16.8	16.1	12.9–19.3	Acceptable
1,2-Dichloroethane	1	6.34	7.69	4.61–10.8	Acceptable
1,1-Dichloroethylen	1	14.6	14.2	11.4–17.0	Acceptable
C 1,2-Dichloroethylene	2	7.62	8.57	5.14–12.0	Acceptable
T 1,2-Dichloroethylene	2	6.06	6.62	3.97–9.27	Acceptable
1,2-Dichloropropane	2	10.1	10.9	8.72–13.1	Acceptable

Table 10.16 (continued)

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
Ethylbenzene	2	12.7	13.9	11.1–16.7	Acceptable
Styrene	2	115.9	17.0	13.6–20.4	Acceptable
Tetrachloroethylene	2	7.48	9.00	5.40–12.6	Acceptable
Toluene	2	7.29	8.02	4.81–11.2	Acceptable
1,1,1-Trichloroethane	1	6.16	7.13	4.28–9.98	Acceptable
Trichloroethylene	1	8.38	9.45	5.67–13.2	Acceptable
Vinyl chloride	1	7.66	5.48	3.29–7.67	Acceptable
Total xylenes	2	13.6	15.0	12.0–18.0	Acceptable
		Miscellaneous, mg/L (except as noted)			
Turbidity (NTUs)	1	7.10[c]	7.30	7.06–8.41	Acceptable
Total filterable residue	1	324[c]	200	149–299	Not Acceptable[f]
Calcuim (as $CaCO_3$)	1	98.6	100	92.9–110	Acceptable
pH (standard units)	1	9.20	9.13	8.83–9.32	Acceptable
Alkalinity (as $CaCO_3$)	1	25.5[c]	25.0	23.0–29.3	Acceptable
Sodium	1	11.2	11.5	10.1–12.7	Acceptable
Sulfate	1	24.4	28.0	24.9–30.7	Not Acceptable[g]
Total cyanide	1	0.125[c]	0.140	0.929–0.167	Acceptable

[a]Based upon theoretical calculations, or a reference value when necessary.
[b]Breakdown of sample caused low standard response and high sample bias.
[c]Signifiacnt general method bias is anticipated for this result.
[d]Special cause was a bad calibration curve.
[e]No obvious explanation found for low result.
[f]Special cause may have been contaminated glassware or insufficient mixing.
[g]Special cause was a faulty calibration.

Table 10.17. Water supply performance evaluation study for WS-029, K-25 Site, 1992

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Insecticides (μg/L)			
Chlordane	3	0.62	0.833	0.458–1.21	Acceptable
Lindane	1	0.26	0.220	0.121–0.319	Acceptable
		Trihalomethanes (μg/L)			
Bromodichlormethane	1	31.2	27.2	21.8–32.6	Acceptable
Bromoform	1	15.1	14.1	11.3–16.9	Acceptable
Chlorodibromomethane	1	14.1	13.5	10.8–16.2	Acceptable
Chloroform	1	37.1	34.9	27.9–41.9	Acceptable
Total trihalomethane	1	97.5	89.7	71.8–108	Acceptable
		Volatile organic compounds (μg/L)			
1,1-Dichloroethane	3	17.3	17.8	14.2–21.4	Acceptable
Dichloromethane	3	14.7	14.7	11.8–17.6	Acceptable
Cis-1,3-Dichloropropene	3	16	17.6	14.1–21.1	Acceptable
Trans-1,3-Dichloropropene	3	7.3	8.47	5.08–11.9	Acceptable
Hexachlorobutadiene	3	26.8	23.9	19.1–28.7	Acceptable
Napthalene	3	Unreported	18.9	15.1–22.7	Not acceptable

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

Table 10.18. Water supply performance evaluation study WS-030, K-25 Site, 1992

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
		Trace metals (µg/L)			
Antimony	2	<50.0	8.2	5.50–11.8	Unusable data[b]
Arsenic	1	25.1	25.2	20.4–28.6	Acceptable
Barium	1	943	921	820–990	Acceptable
Beryllium	2	8.07	8.47	6.90–9.47	Acceptable
Boron	2	1060	1000	950–1070	Acceptable
Cadmium	1	37.9	39	33.7–44.1	Acceptable
Chromium	1	215	200	177–222	Acceptable
Copper	1	611	570	513–627	Acceptable
Lead	1	3.97	4.26	2.96–5.98	Acceptable
Mercury	1	3.55	3.46	2.55–4.26	Acceptable
Nickel	2	46.7	39.5	33.2–43.9	Unacceptable[c]
Selenium	1	34.9	35.9	27.6–40.9	Acceptable
Silver	1	88.8	85.3	73.8–96.7	Acceptable
Thallium	2	5.71	5.3	3.84–6.65	Acceptable
		Nitrate/nitrite/fluoride (mg/L)			
Nitrate as nitrogen	1	7.235	7.7	6.49–9.07	Acceptable
Nitrite as nitrogen	1	0.264	0.32	0.277–0.370	Unacceptable[d]
Fluoride	1	8.51	7.9	7.11–8.69	Acceptable
		Insecticides (µg/L)			
Chlordane	3	2.6	4.2	2.63–5.28	Unacceptable[e]
Endrin	1	0.77	0.958	0.602–1.18	Acceptable
Heptachlor	4	0.87	1.38	0.696–1.65	Acceptable
Heptachlor epoxide	4	0.72	0.85	0.543–1.04	Acceptable
Lindane	1	1.1	1.38	0.824–1.77	Acceptable
Methoxychlor	1	33	34.2	19.3–45.3	Acceptable
Toxaphene	2	2.4	2.8	1.57–3.46	Acceptable
		Herbicides (µg/L)			
2,4-D	1	37	41.7	14.1–60.4	Acceptable
2,4,5-TP (Silvex)	1	8.3	14.6	7.75–18.4	Acceptable
		Trihalomethanes (µg/L)			
Bromodichloromethane	1	10.1	9.88	7.90–11.9	Acceptable
Bromoform	1	24.8	24.9	19.9–29.9	Acceptable
Chlorodibromomethane	1	36	36.2	29.0–43.4	Acceptable
Chloroform	1	9.1	8.74	6.99–10.5	Acceptable
		Volatile organic compounds (µg/L)			
Benzene	1	10.35	9.51	5.71–13.3	Acceptable
Chlorobenzene	2	12.99	12.4	9.92–14.9	Acceptable
Carbon tetrachloride	1	7.34	6.46	3.88–9.04	Acceptable
1,2-Dichlorobenzene	2	7.25	7.94	4.76–11.1	Acceptable
1,4-Dichlorobenzene	1	15.51	16.1	12.9–19.3	Acceptable
1,2-Dichloroethane	1	8.79	7.69	4.61–10.8	Acceptable
1,1-Dichloroethylene	1	18.83	14.2	11.4–17.0	Unacceptable[c]
Cis-1,2-Dichloroethylene	2	9.03	8.57	5.14–12.0	Acceptable
Trans-1,2 -Dichloroethylene	2	7.31	6.62	3.97–9.27	Acceptable

Table 10.18 (continued)

Parameter	Sample number	Values		Acceptance limits	Performance evaluation
		Reported	True[a]		
1,2-Dichloropropane	2	10.51	10.9	8.72–13.1	Acceptable
Ethlybenzene	2	16.01	13.9	11.1–16.7	Acceptable
Styrene	2	18.32	17	13.6–20.4	Acceptable
Tetrachlorethylene	2	9.97	9	5.40–12.6	Acceptable
Toluene	2	8.3	8.02	4.81–11.2	Acceptable
1,1,1-Trichloroethane	1	7.65	7.13	4.28–9.98	Acceptable
Trichloroethlyene	1	10.1	9.45	5.67–13.2	Acceptable
Vinyl chloride	1	6.33	5.48	3.29–7.67	Acceptable
Total xylenes	2	15.05	15	12.0–18.0	Acceptable
Bromobenzene	3	16.54	16.8	13.4–20.2	Acceptable
Bromochloromethane	3	Unreported	13.5	10.8–16.2	Unacceptable[f]
Dibromomethane	3	20.92	18.6	14.9–22.3	Acceptable
1,1,1,2-Tetrachlorethane	3	12.76	14.3	11.4–17.2	Acceptable
1,2,4-Trichlorbenzene	3	13.77	13.5	10.8–16.2	Acceptable
1,1,2-Trichloroethane	3	10.82	11.5	9.20–13.8	Acceptable
		Miscellaneous analytes[g]			
Residual free chlorine (mg/L)	1	1.1	1.22	0.883–1.44	Acceptable
Turbidity (NTUs)[h]	1	7.75	7.3	7.06–8.41	Acceptable
Total filterable residue	1	205	200	149–299	Acceptable
Calcium hardness	1	93	100	92.9–110	Acceptable
pH, standard units	1	9.08	9.13	8.83–9.32	Acceptable
Alkalinity	1	25	25	23.0–29.3	Acceptable
Sodium	1	11.7	11.5	10.1–12.7	Acceptable
Sulfate	1	27.41	28	24.9–30.7	Acceptable
Total cyanide	1	0.14	0.14	0.929–0.167	Acceptable

[a]Based on theoretic calculations or on a reference value when necessary.
[b]True value was less than instrument capabilities.
[c]No obvious cause for unacceptable result.
[d]Value reported was at the detection limit.
[e]Special cause was the use of aging standards.
[f]Data were omitted from final report.
[g]Units = mg/L unless otherwise noted.
[h]Significant general method bias is anticipated for this result.

Table 10.19. Water pollution performance evaluation study WP-028, ORNL, 1992

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Trace metals (μg/L)						
Aluminum	1	2,110	2,100	1790–2420	1870–2340	Acceptable
	2	974	950	778–1130	823–1090	Acceptable
Arsenic	1	93.0	100	71.8–127	78.7–120	Acceptable
	2	397	430	348–508	368–488	Acceptable
Beryllium	1	110	100	74.9–126	84.1–120	Acceptable
	2	45.2	40	30.0–50.9	32.6–48.2	Acceptable
Cadmium	1	254	250	210–290	220–280	Acceptable
	2	39.8	40	32.8–48.7	34.8–46.7	Acceptable
Cobalt	1	110	110	95.4–126	99.3–122	Acceptable
	2	368	370	322–414	334–403	Acceptable
Chromium	1	815	800	658–927	691–893	Acceptable
	2	327	315	266–371	279–358	Acceptable
Copper	1	812	790	714–877	735–856	Acceptable
	2	134	130	113–144	117–140	Acceptable
Iron	1	1,510	1,500	1310–1690	1360–1650	Acceptable
	2	554	540	471–613	489–595	Acceptable
Mercury	1	5.25	5.30	3.89–6.65	4.24–6.30	Acceptable
	2	0.31	0.330	.0869–0.620	0.154–0.552	Acceptable
Manganese	1	807	810	731–886	750–867	Acceptable
	2	111	110	94.1–125	97.9–121	Acceptable
Nickel	1	745	740	660–814	680–794	Acceptable
	2	2,280	2,200	1970–2410	2020–2360	Acceptable
Lead	1	558	550	474–623	493–604	Acceptable
	2	154	150	120–179	127–172	Acceptable
Selenium	1	12.0	14.0	6.59–18.8	8.11–17.3	Acceptable
	2	48.0	55.0	31.6–72.0	36.6–67.0	Acceptable
Vanadium	1	9,980	10,000	8530–11300	8890–11000	Acceptable
	2	6,080	6,000	5250–6690	5440–6510	Acceptable
Zinc	1	346	360	318–406	329–395	Acceptable
	2	1,420	1,400	1230–1570	1270–1520	Acceptable
Antimony	3	85.0	84.9	56.2–106	62.7–99.6	Acceptable
	4	39.0	39.1	24.7–50.6	28.1–47.2	Acceptable
Silver	3	111	1.03	0.652–1.40	0.748–1.30	Not Acceptable[b]
	4	24.0	10.6	8.45–12.6	8.98–12.1	Not Acceptable[c]
Thallium	3	29.0	33.9	25.9–41.8	28.0–39.7	Acceptable
	4	3.20	3.07	1.25–5.01	1.74–4.52	Acceptable
Molybdenum	3	4.99	4.79	2.04–7.64	2.83–6.85	Acceptable
	4	21.6	21.0	14.2–27.3	16.1–25.4	Acceptable
Strontium	3	83.3	80.9	64.9–96.7	69.2–92.4	Acceptable
	4	10.1	9.09	7.04–11.1	7.59–10.6	Acceptable
Titanium	3	147	150	125–171	131–165	Acceptable
	4	106	106	87.9–121	92.4–117	Acceptable
Minerals, mg/L (except as noted)						
pH (Units)	3	9.42	9.40	9.09–9.64	9.16–9.57	Acceptable
	4	6.78	6.80	6.63–6.96	6.67–6.92	Acceptable

Table 10.19 (continued)

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Spec. Cond.	1	538	545	487–570	498–560	Acceptable
(μmhos/cm)	2	735	742	660–810	679–791	Acceptable
TDS	1	329	316	217–370	236–351	Acceptable
	2	496	405	306–605	344–568	Acceptable
Total Hardness	1	147	151	136–164	140–160	Acceptable
	2	238	247	224–267	230–261	Acceptable
Calcium	1	6.02	6.00	5.03–6.84	5.26–6.61	Acceptable
	2	98.0	98.0	85.2–109	88.2–106	Acceptable
Magnesium	1	32.8	33.0	29.2–36.8	30.1–35.9	Acceptable
	2	0.56	0.600	0.465–0.741	0.500–0.706	Acceptable
Sodium	1	25.8	25.4	23.2–28.2	23.9–27.6	Acceptable
	2	25.2	24.4	21.9–27.0	22.5–26.4	Acceptable
Potassium	1	21.1	22.0	19.0–25.5	19.8–24.7	Acceptable
	2	11.9	12.0	10.3–13.9	10.7–13.5	Acceptable
Total Alkalinity	1	15.0	15.0	10.9–20.1	12.1–18.9	Acceptable
	2	35.0	36.0	30.8–41.4	32.1–40.1	Acceptable
Chloride	1	2.88	108	96.1–116	98.5–113	Not Acceptable[d]
Fluoride	2	1.29	0.140	.0851–0.240	0.100–0.189	Not Acceptable[d]
Sulfate	2	88.0	29.0	23.5–33.2	24.7–32.0	Not Acceptable[d]
			Nutrients, mg/L			
Ammonia as nitrogen	1	2.65	2.50	1.86–3.07	2.01–2.93	Acceptable
	2	14.26	14.0	11.2–16.6	11.8–16.0	Acceptable
Nitrate as nitrogen	1	15.5	15.0	12.1–17.6	12.8–16.9	Acceptable
	2	4.45	4.80	3.75–5.72	3.99–5.48	Acceptable
Orthophosphate	1	0.70	0.510	0.419–0.598	0.440–0.577	Not Acceptable[d]
	2	1.87	2.30	1.92–2.63	2.01–2.54	Not Acceptable[d]
Total phosphorous	3	0.97	0.940	0.704–1.14	0.756–1.09	Acceptable
	4	2.12	2.30	1.78–2.75	1.90–2.64	Acceptable
			Demand, mg/L			
TOC	1	26.5	22.2	18.8–26.1	19.7–25.1	Not Acceptable[e]
	2	43.8	39.1	33.2–45.4	34.8–43.8	Acceptable
5-Day BOD	1	32.1	36.0	20.7–51.4	24.5–47.6	Acceptable
	2	84.0	64.2	38.8–89.7	45.1–83.3	Check for Error[e]
			PCBs, μg/L			
Aroclor 1016/1242	2	1.97		D.L.–D.L.	D.L.–D.L.	Not Acceptable[f]
Aroclor 1254	1	9.37		D.L.–D.L.	D.L.–D.L.	Not Acceptable[f]
			PCBs in oil, mg/kg			
1016/1242	1	10.6	22.8	2.64–32.1	6.42–28.3	Acceptable
1260	2	13.96	17.6	2.58–27.5	5.79–24.3	Acceptable
			Pesticides, μg/L			
Chlordane	3	0.991	1.28	0.678–1.75	0.813–1.61	Acceptable
	4	5.37	7.21	3.85–9.24	4.54–8.55	Acceptable

Table 10.19 (continued)

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Aldrin	1	0.072	0.139	.0289–0.181	.0478–0.162	Acceptable
	2	0.301	0.516	0.124–0.699	0.196–0.627	Acceptable
Dieldrin	1	0.122	0.101	.0416–0.155	.0561–0.141	Acceptable
	2	0.532	0.464	0.236–0.660	0.290–0.606	Acceptable
DDD	1	0.257	0.200	.0875–0.298	0.114–0.271	Acceptable
	2	1.133	0.925	0.493–1.24	0.588–1.14	Acceptable
DDE	1	0.124	0.119	.0469–0.173	.0631–0.157	Acceptable
	2	0.598	0.615	0.295–0.850	0.366–0.779	Acceptable
DDT	1	0.286	0.175	.0645–0.283	.0923–0.255	Not Acceptable[f]
	2	1.118	0.850	0.436–1.20	0.533–1.10	Check for Error[f]
Heptachlor	1	0.142	0.200	.0637–0.282	.0916–0.254	Acceptable
	2	0.543	0.640	0.227–0.864	0.308–0.782	Acceptable
Heptachlor epoxide	1	0.064	0.081	.0390–0.113	.0484–0.104	Acceptable
	2	0.425	0.444	0.254–0.600	0.298–0.555	Acceptable
		Volatile halocarbons, µg/L				
1,2-dichloroethane	1	48.4	51.5	34.4–68.7	38.7–64.4	Acceptable
	2	11.4	12.2	8.27–16.7	9.35–15.7	Acceptable
Chloroform	1	53.0	57.8	37.4–75.8	42.2–71.0	Acceptable
	2	14.0	15.4	10.4–20.2	11.6–18.9	Acceptable
1,1,1-trichlorethane	1	39.0	43.6	23.8–60.3	28.3–55.7	Acceptable
	2	14.3	16.4	10.0–22.0	11.6–20.5	Acceptable
Trichloroethene	1	40.9	45.4	27.8–59.6	31.8–55.6	Acceptable
	2	10.1	12.1	8.24–15.9	9.19–14.9	Acceptable
Carbon tetrachloride	1	36.8	39.1	22.7–56.4	26.9–52.2	Acceptable
	2	15.5	18.4	11.4–25.3	13.2–23.6	Acceptable
Tetrachloroethene	1	48.2	53.5	31.8–71.4	36.8–66.4	Acceptable
	2	8.82	9.73	6.02–13.3	6.95–12.4	Acceptable
Bromodichloromethane	1	52.4	56.7	37.2–80.3	42.6–74.9	Acceptable
	2	9.09	10.9	7.94–14.5	8.76–13.7	Acceptable
Dibromochloromethane	1	33.8	37.8	26.1–49.9	29.0–46.9	Acceptable
	2	11.7	14.9	9.91–19.8	11.2–18.6	Acceptable
Bromoform	1	60.5	61.2	36.9–89.4	43.5–82.8	Acceptable
	2	9.85	13.4	7.47–19.2	8.96–17.7	Acceptable
Methylene chloride	1	47.9	48.4	25.3–70.7	31.0–65.0	Acceptable
	2	9.66	9.37	4.48–14.6	5.76–13.3	Acceptable
Chlorobenzene	1	36.5	38.2	25.8–50.0	28.9–46.9	Acceptable
	2	16.7	17.8	12.0–23.4	13.4–21.9	Acceptable
		Volatile aromatics, µg/L				
Benzene	1	16.4	16.7	11.5–22.1	12.8–20.7	Acceptable
	2	65.9	67.3	45.6–87.5	50.9–82.3	Acceptable
Ethylbenzene	1	13.1	14.2	8.97–18.9	10.2–17.7	Acceptable
	2	35.1	36.8	24.0–49.9	27.2–46.6	Acceptable
Toluene	1	10.5	11.5	7.68–15.1	8.63–14.2	Acceptable
	2	41.6	45.2	31.6–56.9	34.7–53.7	Acceptable
1,2-dichlorobenzene	1	17.0	13.9	9.57–17.8	10.6–16.7	Check for Error[f]
	2	58.6	48.2	32.8–62.1	36.6–58.3	Check for Error[f]

Table 10.19 (continued)

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
1,3-dichlorobenzene	1	14.3	14.0	9.49–17.9	10.6–16.8	Acceptable
	2	56.8	53.9	34.0–73.5	39.0–68.5	Acceptable
1,4-dichlorobenzene	1	17.3	15.7	10.7–20.7	12.0–19.4	Acceptable
	2	46.5	42.5	28.5–56.5	32.1–52.9	Acceptable
Miscellaneous parameters, mg/L						
Total cyanide	1	0.599	0.610	0.415–0.771	0.460–0.726	Acceptable
	2	0.177	0.180	0.117–0.233	0.132–0.218	Acceptable
Nonfilterable residue	1	24.5	25.0	16.3–30.3	18.1–28.6	Acceptable
	2	31.9	32.0	22.8–37.0	24.6–35.2	Acceptable
Oil and grease	1	19.7	19.0	8.01–25.6	10.2–23.3	Acceptable
	2	12.8	11.0	4.13–15.7	5.59–14.2	Acceptable
Total phenolics	1	0.185	0.207	0.103–0.312	0.130–0.285	Acceptable
	2	0.048	0.054	0.0235–0.0853	0.0314–0.0774	Acceptable

[a]Based upon theoretical calculations, or a reference value when necessary.
[b]Incorrect value reported. Correct value of 0.876 µg/L falls within acceptance limits.
[c]Incorrect value reported. Correct value of 10.2 µg/L falls within acceptance limits.
[d]Chromatograms showed small peak areas therefore producing unacceptable result.
[e]Special cause was a bad calibration curve.
[f]No special cause assigned.

Table 10.20. Water pollution performance evaluation study WP-029, ORNL, 1992

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Trace metals (μg/L)						
Aluminum	1	67.1	65.9	40.1–100	47.7–92.6	Acceptable
	2	560	548	435–645	462–619	Acceptable
Arsenic	1	139	140	113–168	120–161	Acceptable
	2	16.7	15.0	11.1–19.4	12.2–18.4	Acceptable
Beryllium	1	17.1	16.8	12.4–21.4	13.5–20.2	Acceptable
	2	636	609	497–714	525–686	Acceptable
Cadmium	1	17.3	16.8	12.2–21.5	13.4–20.4	Acceptable
	2	390	380	319–440	334–425	Acceptable
Cobalt	1	655	651	566–724	586–703	Acceptable
	2	13.5	13.3	9.54–17.0	10.5–16.0	Acceptable
Chromium	1	637	620	516–717	541–691	Acceptable
	2	8.45	8.11	3.37–12.3	4.49–11.2	Acceptable
Copper	1	6.8	6.33	3.68–8.58	4.30–7.97	Acceptable
	2	248	241	213–267	219–260	Acceptable
Iron	1	7.23	711	625–800	647–778	Not Acceptable[b]
	2	835	83.0	68.2–97.7	71.9–94.0	Not Acceptable[c]
Mercury	1	7.09	8.12	6.26–10.3	6.77–9.81	Acceptable
	2	12.36	13.0	9.49–16.9	10.4–15.9	Acceptable
Manganese	1	339	340	303–373	312–364	Acceptable
	2	30.7	30.6	25.7–35.6	26.9–34.3	Acceptable
Nickel	1	33.4	31.7	25.5–37.4	27.0–35.9	Acceptable
	2	571	569	498–632	515–616	Acceptable
Lead	1	940	959	831–1080	862–1050	Acceptable
	2	1490	1500	1300–1680	1350–1630	Acceptable
Selenium	1	5.86	6.01	3.28–8.06	3.88–7.46	Acceptable
	2	175	170	116–203	127–192	Acceptable
Vanadium	1	497	490	431–541	445–527	Acceptable
	2	39.6	38.2	30.6–46.8	32.7–44.7	Acceptable
Zinc	1	18.3	17.0	11.3–22.9	12.8–21.4	Acceptable
	2	649	612	536–689	555–670	Acceptable
Antimony	1	22.5	22.0	12.4–29.9	14.6–27.6	Acceptable
	2	155	146	96.6–182	107–171	Acceptable
Silver	1	5.67	5.59	4.20–7.01	4.56–6.66	Acceptable
	2	14.7	14.0	11.1–16.8	11.8–16.1	Acceptable
Thallium	1	4.92	5.30	3.45–7.01	3.92–6.54	Acceptable
	2	76.1	76.2	58.3–94.0	63.0–89.4	Acceptable
Molybdenum	1	50.1	49.0	38.0–61.2	41.0–58.2	Acceptable
	2	7.85	7.96	4.27–12.2	5.31–11.2	Acceptable
Strontium	1	13.1	12.9	10.1–15.4	10.8–14.7	Acceptable
	2	63.5	61.9	50.3–71.9	53.2–69.1	Acceptable
Titanium	1	211	214	185–237	192–230	Acceptable
	2	75.2	78.0	65.4–88.2	68.5–85.2	Acceptable
Minerals, mg/L (except as noted)						
pH (Units)	3	4.39	4.40	4.28–4.48	4.31–4.45	Acceptable
	4	7.93	8.00	7.76–8.21	7.81–8.16	Acceptable

Table 10.20 (continued)

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Spec. Cond. (mhos/cm)	1	186.3	182	162–199	167–194	Acceptable
	2	842	812	752–882	769–865	Acceptable
TDS	1	95	99.7	64.0–144	73.9–134	Acceptable
	2	447	459	342–572	370–543	Acceptable
Total Hardness	1	47.4	46.5	39.6–51.0	41.0–49.6	Acceptable
	2	230	221	203–237	207–233	Acceptable
Calcium	1	14.9	15.0	12.8–15.9	13.2–15.5	Acceptable
	2	49.7	49.0	44.7–54.1	45.9–53.0	Acceptable
Magnesium	1	2.53	2.48	2.07–2.90	2.17–2.79	Acceptable
	2	23.7	24.0	21.0–26.9	21.8–26.2	Acceptable
Sodium	1	9.66	9.68	8.19–11.3	8.59–10.9	Acceptable
	2	47.9	48.4	42.4–55.2	44.0–53.6	Acceptable
Potassium	2	32.9	34.0	29.1–38.9	30.3–37.6	Acceptable
Total Alkalinity	1	10.0	9.70	6.65–14.1	7.58–13.2	Acceptable
	2	53	54.0	47.2–62.0	49.0–60.1	Acceptable
Chloride	1	36	33.3	28.8–36.0	29.7–35.1	Check for Error[d]
	2	186.8	159	143–171	146–167	Not Acceptable[e]
Sulfate	1	17.2	17.0	13.2–20.2	14.1–19.4	Acceptable
	2	86.4	84.0	70.1–93.9	73.1–90.9	Acceptable
			Nutrients, mg/L			
Ammonia as nitrogen	1	0.93	0.960	0.658–1.25	0.729–1.18	Acceptable
	2	0.35	0.350	0.185–0.535	0.227–0.493	Acceptable
Nitrate as nitrogen	1	0.166	0.170	.0849–0.256	0.105–0.235	Acceptable
	2	1.311	1.30	1.00–1.59	1.07–1.52	Acceptable
Orthophosphate	1	0.0307	0.030	.0116–.0498	0.162–0.452	Acceptable
	2	0.705	0.670	0.555–0.779	0.582–0.752	Acceptable
Total phosphorous	3	3.1	7.02	5.20–7.72	5.50–7.42	Not Acceptable[f]
	4	0.250	0.713	0.512–0.802	0.546–0.767	Not Acceptable[g]
			Demand, mg/L			
TOC	1	109	120	100–142	105–136	Acceptable
	2	60.7	62.0	51.8–73.6	54.6–70.8	Acceptable
5-Day BOD	1	164	193	120–266	138–248	Acceptable
	2	152	99.6	61.1–138	70.7–128	Not Acceptable[h]
			PCBs, µg/L			
Aroclor 1248	2	1.496	1.76	0.538–2.74	0.816–2.46	Acceptable
Aroclor 1254	1	2.109	2.37	1.41–2.95	1.60–2.76	Acceptable
			PCBs in oil, mg/kg			
1016/1242	2	3.588	42.6	8.20–60.7	14.9–54.0	Not Acceptable[i]
1254	1	3.443	35.2	12.2–51.4	17.2–46.4	Not Acceptable[j]
			Pesticides, µg/L			
Chlordane	3	2.477	6.48	3.59–8.25	4.19–7.65	Not Acceptable[k]
	4	0.427	1.43	0.764–1.88	0.907–1.74	Not Acceptable[l]

Table 10.20 (continued)

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Aldrin	1	0.477	0.676	0.179–0.834	0.262–0.751	Acceptable
	2	0.099	0.126	.0254–0.176	.0446–0.157	Acceptable
Dieldrin	1	0.503	0.617	0.309–0.892	0.384–0.817	Acceptable
	2	0.131	0.137	.0650–0.200	.0823–0.183	Acceptable
DDD	1	0.686	0.777	0.431–1.05	0.510–0.973	Acceptable
	2	0.136	0.129	.0511–0.192	.0690–0.175	Acceptable
DDE	1	0.444	0.548	0.245–0.785	0.314–0.716	Acceptable
	2	0.085	0.087	.0352–0.124	.0465–0.112	Acceptable
DDT	1	0.578	0.674	0.353–0.856	0.416–0.792	Acceptable
	2	0.141	0.150	.0572–0.210	.0766–0.191	Acceptable
Heptachlor	1	0.371	0.486	0.168–0.657	0.231–0.594	Acceptable
	2	0.116	0.129	.0346–0.190	.0545–0.170	Acceptable
Heptachlor epoxide	1	0.451	0.571	0.312–0.722	0.364–0.670	Acceptable
	2	0.120	0.143	.0705–0.189	.0855–0.174	Acceptable
		Volatile halocarbons, µg/L				
1,2-dichloroethane	1	14.0	13.8	9.64–18.6	10.8–17.4	Acceptable
	2	59.1	58.5	40.8–76.1	45.3–71.6	Acceptable
Chloroform	1	7.80	8.40	5.60–11.2	6.32–10.5	Acceptable
	2	36.2	38.3	26.1–50.9	29.3–47.8	Acceptable
1,1,1-trichlorethane	1	11.8	12.6	7.58–17.0	8.77–15.8	Acceptable
	2	60.3	63.8	41.9–83.7	47.2–78.4	Acceptable
Trichloroethene	1	14.3	15.5	10.2–20.0	11.5–18.8	Acceptable
	2	50.3	53.3	36.1–67.2	40.1–63.3	Acceptable
Carbon tetrachloride	1	9.39	10.7	6.73–14.8	7.76–13.8	Acceptable
	2	52.8	54.5	34.2–77.3	39.6–71.9	Acceptable
Tetrachloroethene	1	14.1	14.9	9.77–19.5	11.0–18.3	Acceptable
	2	40.9	46.2	30.5–60.2	34.2–56.5	Acceptable
Bromodichloromethane	1	14.9	16.4	11.1–21.3	12.4–20.0	Acceptable
	2	61.7	62.9	43.6–82.9	48.6–77.9	Acceptable
Dibromochloromethane	1	10.7	12.5	8.09–16.6	9.17–15.6	Acceptable
	2	41.4	45.4	28.8–61.3	32.9–57.2	Acceptable
Bromoform	1	13.8	16.3	7.67–24.0	9.73–21.9	Acceptable
	2	34.8	37.7	22.7–52.3	26.4–48.6	Acceptable
Methylene chloride	1	13.7	12.8	6.66–19.0	8.22–17.4	Acceptable
	2	69.3	65.6	43.6–91.0	49.5–85.0	Acceptable
Chlorobenzene	1	9.59	10.3	6.92–13.5	7.76–12.7	Acceptable
	2	55.2	57.2	39.7–73.8	44.1–69.5	Acceptable
		Volatile aromatics, µg/L				
Benzene	1	41.4	43.9	30.0–59.0	33.6–55.4	Acceptable
	2	12.0	12.7	9.00–17.0	10.0–16.0	Acceptable
Ethylbenzene	1	43.2	47.7	31.4–64.3	35.6–60.2	Acceptable
	2	8.83	9.71	6.19–13.0	7.06–12.2	Acceptable
Toluene	1	56.4	59.7	42.1–76.7	46.5–72.3	Acceptable
	2	16.5	17.2	12.0–22.0	13.3–20.8	Acceptable
1,2-dichlorobenzene	1	52.7	57.1	36.9–74.5	41.7–69.7	Acceptable
	2	14.4	15.4	10.6–19.7	11.8–18.5	Acceptable

Table 10.20 (continued)

Analytes	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
1,3-dichlorobenzene	1	45.3	47.0	32.1–59.6	35.6–56.2	Acceptable
	2	16.1	16.5	11.4–21.2	12.6–19.9	Acceptable
1,4-dichlorobenzene	1	49.4	50.0	30.3–67.8	35.1–63.0	Acceptable
	2	13.7	13.3	9.91–17.8	10.9–16.8	Acceptable
		Miscellaneous parameters, mg/L				
Total cyanide	1	0.040	0.040	.0108–.0592	.0169–.0531	Acceptable
	2	0.358	0.350	0.206–0.461	0.239–0.429	Acceptable
Nonfilterable residue	1	14.9	18.0	9.17–19.8	10.5–18.4	Acceptable
	2	91.2	93.0	71.8–98.0	75.1–94.8	Acceptable
Oil and grease	1	66.4	72.0	43.7–84.3	48.8–79.2	Acceptable
	2	27.8	30.0	17.1–36.7	19.6–34.2	Acceptable
Total phenolics	1	1.070	1.06	0.572–1.55	0.697–1.42	Acceptable
	2	0.494	0.484	0.258–0.709	0.316–0.651	Acceptable

[a]Based upon theoretical calculations, or a reference value when necessary.
[b]Special cause was a transcription error. Correct value of 723 µg/L falls within the acceptance limits.
[c]Special cause was a transcription error. Correct value of 83.5 µg/L falls within the acceptance limits.
[d]Special cause was a faulty calibration.
[e]Special cause was a faulty calibration.
[f]Special cause was an incomplete digestion.
[g]Special cause was an incomplete digestion.
[h]Special cause was a transcription error. Correct value of 96 mg/L falls within the acceptance limits.
[i]Special cause was a missed dilution factor. Correct value of 35.9 mg/kg falls within the acceptance limits.
[j]Special cause was a missed dilution factor. Correct value of 34.4 mg/kg falls within the acceptance limits.
[k]Special cause was a faulty calibration.
[l]Special cause was a faulty calibration.

Table 10.21. Water pollution performance evaluation study WP-028, K-25 Site, 1992

Parameter	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
			Trace metals (µg/L)			
Aluminum	1	2,210	2,100	1,790–2,420	1,870–2,340	Acceptable
	2	1,030	950	778–1,130	823–1,090	Acceptable
Arsenic	1	94.5	100	71.8–127	78.7–120	Acceptable
	2	442	430	348–508	369–488	Acceptable
Beryllium	1	115	100	74.9–126	81.4–120	Acceptable
	2	49.6	40	30–50.9	32.6–48.2	Check for error
Cadmium	1	253	250	210–290	220–280	Acceptable
	2	40.5	40	32.8–48.7	34.8–46.7	Acceptable
Cobalt	1	112	110	95.4–126	99.3–122	Acceptable
	2	362	370	322–414	334–403	Acceptable
Chromium	1	789	800	658–927	691–893	Acceptable
	2	319	315	266–371	279–358	Acceptable
Copper	1	791	790	714–877	735–856	Acceptable
	2	131	130	113–144	117–140	Acceptable
Iron	1	1,480	1,500	1,310–1,690	1,360–1,650	Acceptable
	2	539	540	471–613	489–595	Acceptable
Mercury	1	3.06	5.3	3.89–6.55	4.24–6.30	Not acceptable[b]
	2	0.1	0.33	0.0869–0.620	0.154–0.522	Check for error[b]
Manganese	1	810	810	731–886	750–867	Acceptable
	2	111	110	94.1–125	97.9–121	Acceptable
Nickel	1	730	740	660–814	680–794	Acceptable
	2	2,200	2,200	1,970–2,410	2,020–2,360	Acceptable
Lead	1	530	550	474–623	493–604	Acceptable
	2	125	150	120–179	127–172	Check for error
Selenium	1	12.5	14	6.59–18.8	8.11–17.3	Acceptable
	2	50.4	55	31.6–72.0	36.6–67.0	Acceptable
Vanadium	1	9,980	10,000	8,530–11,300	8,890–11,000	Acceptable
	2	5,980	6,000	5,250–6,690	5,440–6,510	Acceptable
Zinc	1	354	360	318–406	329–395	Acceptable
	2	1,400	1,400	1,230–1,570	1,270–1,520	Acceptable
Antimony	3	86.5	84.9	56.2–106	62.7–99.6	Acceptable
	4	<50.0	39.1	24.7–50.6	28.1–47.2	Unusable data[c]
Silver	3	<6.00	1.03	0.652–1.40	0.748–1.30	Unusable data[c]
	4	9.65	10.6	8.45–12.6	8.98–12.1	Acceptable
Thallium	3	31.3	33.9	25.9–41.8	28.0–39.7	Acceptable
	4	2.29	3.07	1.25–5.01	1.74–4.52	Acceptable
Molybdenum	3	<10.0	4.79	2.04–7.64	2.83–6.85	Unusable data
	4	21.6	21	14.2–27.3	16.1–25.4	Acceptable
Strontium	3	79.4	80.9	64.9–96.7	69.2–92.4	Acceptable
	4	8.38	9.09	7.04–11.1	7.59–10.6	Acceptable
Titanium	3	149	150	125–171	131–165	Acceptable
	4	103	106	87.9–121	92.4–117	Acceptable
			Minerals[d]			
pH, standard units	3	9.48	9.4	9.09–9.64	9.16–9.57	Acceptable
pH, standard units	4	6.8	6.8	6.63–6.96	6.67–6.92	Acceptable
Specific conductivity (µmhos/cm at 25°C)	1	548	545	487–570	498–560	Acceptable
Specific conductivity (µmhos/cm at 25°C)	2	753	742	660–810	679–791	Acceptable
Total dissolved solids at 180°C	1	263	316	217–370	236–351	Acceptable
Total dissolved solids at 180°C	2	441	405	306–605	344–568	Acceptable
Total hardness (as $CaCO_3$)	1	140	151	136–164	140–160	Acceptable
Total hardness (as $CaCO_3$)	2	236	247	224–267	230–261	Acceptable

Table 10.21 (continued)

Parameter	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Total alkalinity	1	15	15	10.9–20.1	12.1–18.9	Acceptable
Total alkalinity	2	36	36	30.8–41.4	32.1–40.1	Acceptable
Chloride	1	107	108	96.1–116	98.5–113	Acceptable
Chloride	2	176	176	159–190	163–186	Acceptable
Fluoride	1	1.2	1.2	1.01–1.35	1.05–1.30	Acceptable
Fluoride	2	0.2	0.14	0.0851–0.204	0.100–0.189	Check for error
Sulfate	1	62.6	63	53.4–70.6	55.5–68.5	Acceptable
Sulfate	2	29	29	23.5–33.2	24.7–32.0	Acceptable
		Nutrients (mg/L)				
Ammonia-nitrogen	1	1.99	2.5	1.86–3.07	2.01–2.93	Check for error
Ammonia-nitrogen	2	12.6	14	11.2–16.6	11.8–16.0	Acceptable
Nitrate nitrogen	1	13.9	15	12.1–17.6	12.8–16.9	Acceptable
Nitrate nitrogen	2	4.33	4.8	3.75–5.72	3.99–5.48	Acceptable
Orthophosphate	1	0.5	0.51	0.419–0.598	0.440–0.577	Acceptable
Orthophosphate	2	2.26	2.3	1.92–2.63	2.01–2.54	Acceptable
Total phosphorus	1	1.22	0.94	0.704–1.14	0.756–1.09	Not acceptable[e]
Total phosphorus	2	2.27	2.3	1.78–2.75	1.90–2.64	Acceptable
		Demands (mg/L)				
COD	1	53.6	56.3	38.2–69.5	42.2–65.6	Acceptable
COD	2	93.9	98.8	75.4–117	80.7–112	Acceptable
TOC	1	23.2	22.2	18.8–26.1	19.7–25.1	Acceptable
TOC	2	38.4	39.1	33.2–45.4	34.8–43.8	Acceptable
		Miscellaneous parameters (mg/L)				
Total cyanide	1	0.56	0.61	0.415–0.771	0.460–0.726	Acceptable
Total cyanide	2	0.159	0.18	0.117–0.233	0.132–0.218	Acceptable
Non-filterable residue	1	23.8	25	16.3–30.3	18.1–28.6	Acceptable
Non-filterable residue	2	29	32	22.8–37.0	24.6–35.2	Acceptable
Oil and grease	1	15.1	19	8.01–25.6	10.2–23.3	Acceptable
Oil and grease	2	9.9	11	4.13–15.7	5.59–14.2	Acceptable
Total phenolics	1	0.203	0.207	0.103–0.312	0.130–0.285	Acceptable
Total phenolics	2	0.042	0.054	0.0235–0.0853	0.0314–0.0774	Acceptable
Total residual chlorine	1	0.84	0.44	0.224–0.608	0.275–0.557	Not acceptable[f]
Total residual chlorine	2	0.34	0.97	0.605–1.20	0.684–1.12	Not acceptable[f]

[a]Based on theoretical calculations or on a reference value when necessary.
[b]Refrigerator in which the samples were stored malfunctioned.
[c]True value was ower than the instrument capabilities.
[d]Units = mg/L unless otherwise noted.
[e]Reason for unacceptable result could not be determined.
[f]Data transposed.

Table 10.22. Water pollution performance evaluation study WP-029, K-25 Site, 1992

Parameter	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
			Trace metals (µg/L)			
Aluminum	1	69.3	65.9	40.1–100	47.7–92.6	Acceptable
	2	564	548	435–645	462–619	Acceptable
Arsenic	1	133	140	113–168	120–161	Acceptable
	2	14.7	15	11.1–19.4	12.2–18.4	Acceptable
Beryllium	1	16	16.8	12.4–21.4	13.5–20.2	Acceptable
	2	600	609	497–714	525–686	Acceptable
Cadmium	1	17.3	16.8	12.2–21.5	13.4–20.4	Acceptable
	2	392	380	319–440	334–425	Acceptable
Cobalt	1	659	651	566–724	586–703	Acceptable
	2	16.8	13.3	9.54–17.0	10.5–16.0	Check for error
Chromium	1	645	620	516–717	541–691	Acceptable
	2	9.01	8.11	3.37–12.3	4.49–11.2	Acceptable
Copper	1	6.34	6.33	3.68–8.58	4.30–7.97	Acceptable
	2	253	241	213–267	219–260	Acceptable
Iron	1	740	711	625–800	647–778	Acceptable
	2	86.2	83	68.2–97.7	71.9–94.0	Acceptable
Mercury	1	10	8.12	6.26–10.3	6.77–98.1	Check for error
	2	16	13	9.49–16.9	10.4–15.9	Check for error
Manganese	1	354	340	303–373	312–364	Acceptable
	2	32.3	30.6	25.7–35.6	26.9–34.3	Acceptable
Nickel	1	34.5	31.7	25.5–37.4	27.0–35.9	Acceptable
	2	599	569	498–632	515–616	Acceptable
Lead	1	969	959	831–1080	862–1050	Acceptable
	2	1560	1500	1300–1680	1350–1630	Acceptable
Selenium	1	5.39	6.01	3.28–8.06	3.88–7.46	Acceptable
	2	154	170	116–203	127–192	Acceptable
Vanadium	1	497	490	431–541	445–527	Acceptable
	2	38.9	38.2	30.6–46.8	32.7–44.7	Acceptable
Zinc	1	18.3	17	11.3–22.9	12.8–21.4	Acceptable
	2	620	612	536–689	555–670	Acceptable
Antimony	3	19.2	22	12.4–29.9	14.6–27.6	Acceptable
	4	139	146	96.6–182	107–171	Acceptable
Silver	3	5.84	5.59	4.20–7.01	4.56–6.66	Acceptable
	4	14.9	14	11.1–16.8	11.8–16.1	Acceptable
Thallium	3	4.6	5.3	3.45–7.01	3.92–6.54	Acceptable
	4	75.5	76.2	58.3–94.0	63.0–89.4	Acceptable
Molybdenum	3	52.9	49	38.0–61.2	41.0–58.2	Acceptable
	4	13.9	7.96	4.27–12.2	5.31–11.2	Not acceptable[b]
Strontium	3	12.4	12.9	10.1–15.4	10.8–14.7	Acceptable
	4	59.5	61.9	50.3–71.9	53.2–69.1	Acceptable
Titanium	3	212	214	185–237	192–230	Acceptable
	4	77.3	78	65.4–88.2	68.5–85.2	Acceptable
			Minerals[c]			
pH, standard units	3	4.37	4.4	4.28–4.48	4.31–4.45	Acceptable
pH, standard units	4	7.88	8	7.76–8.21	7.81–8.16	Acceptable
Specific conductivity (µmhos/cm at 25°C)	1	181	182	162–199	167–194	Acceptable
Specific conductivity (µmhos/cm at 25°C)	2	828	812	752–882	769–865	Acceptable
Total dissolved solids at 180°C	1	114	99.7	64.0–144	73.9–134	Acceptable
Total dissolved solids at 180°C	2	459	459	342–572	370–543	Acceptable
Total hardness (as $CaCO_3$)	1	37	46.5	39.6–51.0	41.0–49.6	Not acceptable[d]
Total hardness (as $CaCO_3$)	2	209	221	203–237	207–233	Acceptable

Table 10.22 (continued)

Parameter	Sample number	Values		Limits		Performance evaluation
		Reported	True[a]	Acceptable	Warning	
Calcium	1	15.5	15	12.8–15.9	13.2–15.5	Acceptable
Calcium	2	54.5	49	44.7–54.1	45.9–53.0	Not acceptable[e]
Magnesium	1	2.54	2.48	2.07–2.90	2.17–2.79	Acceptable
Magnesium	2	24.6	24	21.0–26.9	21.8–26.2	Acceptable
Sodium	1	9.92	9.68	8.19–11.3	8.59–10.9	Acceptable
Sodium	2	50.7	48.4	42.4–55.2	44.0–53.6	Acceptable
Potassium	1	6.41	6.3	5.16–7.32	5.44–7.05	Acceptable
Potassium	2	35.8	34	29.1–38.9	30.3–37.6	Acceptable
Total alkalinity	1	12	9.7	6.65–14.1	7.58–13.2	Acceptable
Total alkalinity	2	57	54	47.2–62.0	49.0–60.1	Acceptable
Chloride	1	31.6	33.3	28.8–36.0	29.7–35.1	Acceptable
Chloride	2	152.6	159	143–171	146–167	Acceptable
Fluoride	1	0.42	0.46	0.378–0.544	0.399–0.523	Acceptable
Fluoride	2	1.78	1.8	1.55–2.02	1.61–1.96	Acceptable
Sulfate	1	15	17	13.2–20.2	14.1–19.4	Acceptable
Sulfate	2	76.9	84	70.1–93.9	73.1–90.9	Acceptable
		Nutrients (mg/L)				
Ammonia-nitrogen	1	9.44	0.96	0.658–1.25	0.729–1.18	Not acceptable[e]
Ammonia-nitrogen	2	3.25	0.35	0.185–0.535	0.227–0.493	Not acceptable[e]
Nitrate nitrogen	1	0.154	0.17	0.0849–0.256	0.105–0.235	Acceptable
Nitrate nitrogen	2	1.22	1.3	1.00–1.59	1.07–1.52	Acceptable
Orthophosphate	1	0.04	0.03	0.0116–0.0498	0.0162–0.0452	Acceptable
Orthophosphate	2	0.66	0.67	0.555–0.779	0.582–0.752	Acceptable
Total phosphorus	1	5.76	7.02	5.20–7.72	5.50–7.42	Acceptable
Total phosphorus	2	0.72	0.713	0.512–0.802	0.546–0.767	Acceptable
		Demands (mg/L)				
COD	1	305	304	240–341	253–328	Acceptable
COD	2	148	157	122–179	129–172	Acceptable
TOC	1	118	120	100–142	105–136	Acceptable
TOC	2	62	62	51.8–73.6	54.6–70.8	Acceptable
5-day BOD	1	212.4	193	120–266	138–248	Acceptable
5-day BOD	2	94.3	99.6	61.1–138	70.7–128	Acceptable
		Miscellaneous parameters (mg/L)				
Total cyanide	1	0.036	0.04	0.0108–0.0592	0.169–0.0531	Acceptable
Total cyanide	2	0.295	0.35	0.206–0.461	0.239–0.429	Acceptable
Non-filterable residue	1	14	18	9.17–19.8	10.5–18.4	Acceptable
Non-filterable residue	2	76	93	71.8–98.0	75.1–94.8	Acceptable
Oil and grease	1	59.2	72	43.7–84.3	48.8–79.2	Acceptable
Oil and grease	2	24.1	30	17.1–36.7	19.6–34.2	Acceptable
Total phenolics	1	1.12	1.06	0.572–1.55	0.679–1.42	Acceptable
Total phenolics	2	0.517	0.484	0.258–0.709	0.316–0.651	Acceptable
Total residual chlorine	1	4.56	4.8	3.44–5.46	3.71–5.20	Acceptable
Total residual chlorine	2	1.72	1.8	1.23–2.12	1.35–2.00	Acceptable

[a]Based on theoretical calculations or on a reference value when necessary.
[b]Reason for unacceptable result could not be determined.
[c]Units = mg/L unless otherwise noted.
[d]Result attributed to the titrating solution.
[e]Unacceptable results caused by a calculation error.

Table 10.23. 1992 NIOSH/Proficiency Analytical Testing Program, Y-12 Analytical Services

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	Y-12		
Cadmium (mg)					
2/92	1	0.0099	0.0102	0.0084–0.0113	Acceptable
	2	0.0147	0.0148	0.0126–0.0169	Acceptable
	3	0.0190	0.0195	0.0165–0.0215	Acceptable
	4	0.0069	0.0075	0.0059–0.0079	Acceptable
5/92	1	0.0218	0.0226	0.0190–0.0245	Acceptable
	2	0.0178	0.0185	0.0154–0.0201	Acceptable
	3	0.0079	0.0081	0.0069–0.0090	Acceptable
	4	0.0118	0.0125	0.0103–0.0134	Acceptable
8/92	1	0.0050	0.0047	0.0043–0.0056	Acceptable
	2	0.0117	0.0111	0.0103–0.0131	Acceptable
	3	0.0158	0.0151	0.0141–0.0174	Acceptable
	4	0.0089	0.0085	0.0077–0.0101	Acceptable
11/92	1	0.0175	0.0192	0.0152–0.0197	Acceptable
	2	0.0098	0.0107	0.0085–0.0111	Acceptable
	3	0.0059	0.0065	0.0050–0.0067	Acceptable
	4	0.0136	0.0149	0.0120–0.0152	Acceptable
Chromium (mg)					
2/92	1	0.0744	0.0769	0.0619–0.868	Acceptable
	2	0.1713	0.1680	0.1392–0.2034	Acceptable
	3	0.1010	0.1000	0.0839–0.1181	Acceptable
	4	0.1470	0.1570	0.1209–0.1730	Acceptable
8/92	1	0.2177	0.2140	0.1648–0.2706	Acceptable
	2	0.1780	0.1740	0.1411–0.2149	Acceptable
	3	0.0748	0.0733	0.0605–0.0892	Acceptable
	4	0.1223	0.1220	0.0950–0.1497	Acceptable
Lead (mg)					
2/92	1	0.0494	0.0514	0.0431–0.0556	Acceptable
	2	0.0783	0.0789	0.0676–0.0889	Acceptable
	3	0.0304	0.0308	0.0266–0.0342	Acceptable
	4	0.0592	0.0644	0.0523–0.0662	Acceptable
5/92	1	0.0220	0.0224	0.0194–0.0246	Acceptable
	2	0.0376	0.0389	0.0326–0.0425	Acceptable
	3	0.0743	0.0759	0.0651–0.0835	Acceptable
	4	0.0474	0.0493	0.0416–0.0532	Acceptable
8/92	1	0.0489	0.0474	0.0423–0.0555	Acceptable
	2	0.0275	0.0256	0.0235–0.0315	Acceptable
	3	0.0650	0.0626	0.0555–0.0744	Acceptable
	4	0.0785	0.0757	0.0694–0.0876	Acceptable
11/92	1	0.0291	0.0316	0.0249–0.0333	Acceptable
	2	0.0734	0.0804	0.0650–0.0819	Acceptable
	3	0.0414	0.0455	0.0375–0.0454	Unacceptable
	4	0.0627	0.0678	0.0552–0.0701	Acceptable
Zinc (mg)					
5/92	1	0.0809	0.0841	0.0671–0.0946	Acceptable
	2	0.1142	0.1197	0.0987–0.1297	Acceptable
	3	0.1944	0.2024	0.1708–0.2180	Acceptable
	4	0.1536	0.1645	0.1330–0.1743	Acceptable
11/92	1	0.0745	0.0803	0.0617–0.0873	Acceptable
	2	0.1434	0.1547	0.1202–0.1665	Acceptable
	3	0.2067	0.2277	0.1724–0.2410	Acceptable
	4	0.1782	0.1927	0.1506–0.2058	Acceptable

Table 10.23 (continued)

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	Y-12		
Asbestos (F/mm^2)					
2/92	1	798.2000	462.4000	471.4–1210.5	Unacceptable
	2	495.8000	485.0000	282–769.6	Acceptable
	3	232.8000	198.6000	116.3–389.3	Acceptable
	4	356.9000	364.7000	197.6–562.8	Acceptable
5/92	1	245.0000	220.0000	67.5–533.2	Acceptable
	2	721.2000	750.0000	256.5–1420.8	Acceptable
	3	490.1000	456.3000	173.9–966.4	Acceptable
	4	279.4000	292.6000	85.7–584.3	Acceptable
8/92	1	383.3000	411.8000	205.8–615.6	Acceptable
	2	863.1000	833.5000	477.9–1361.2	Acceptable
	3	383.4000	375.4000	216.1–598.5	Acceptable
	4	572.2000	662.7000	296.4–938	Acceptable
11/92	1	645.9000	790.7000	256.2–1212.6	Acceptable
	2	382.1000	457.1000	138.3–747	Acceptable
	3	163.5000	184.6000	43.3–361	Acceptable
	4	412.9000	486.9000	168.1–765.9	Acceptable
1,1,1-Trichloroethane (mg)					
2/92	1	1.2040	1.2156	1.0431–1.3649	Acceptable
	2	1.0383	0.9213	0.9050–1.1717	Acceptable
	3	0.7410	0.7035	0.6171–0.8649	Acceptable
	4	0.5531	0.6604	0.4760–0.6301	Unacceptable
1,2-Dichloroethane (mg)					
5/92	1	0.6677	0.5867	0.5845–0.7509	Acceptable
	2	0.9456	0.4645	0.8224–1.0689	Unacceptable
	3	1.3341	0.2732	1.1725–1.4958	Unacceptable
	4	0.8177	0.7553	0.7201–0.9153	Acceptable
11/92	1	0.9175	0.9500	0.8186–1.0163	Acceptable
	2	1.2509	1.3250	1.0993–1.4025	Acceptable
	3	0.7604	0.7600	0.6758–0.8451	Acceptable
	4	0.5450	0.5610	0.4856–0.6044	Acceptable
Benzene (mg)					
8/92	1	0.0712	0.0712	0.0567–0.0856	Acceptable
	2	0.1218	0.1224	0.0992–0.1443	Acceptable
	3	0.2833	0.2782	0.2478–0.3188	Acceptable
	4	0.3492	0.3376	0.3022–0.3963	Acceptable
Carbon tetrachloride (mg)					
5/92	1	1.1665	1.5138	1.0430–1.2899	Unacceptable
	2	0.9414	2.0881	0.8224–1.0603	Unacceptable
	3	0.5328	3.0519	0.4693–0.5963	Unacceptable
	4	1.4562	1.9176	1.2728–1.6396	Unacceptable
11/92	1	0.8184	0.8680	0.7038–0.9330	Acceptable
	2	1.1169	1.1720	0.9583–1.2755	Acceptable
	3	0.5043	0.5100	0.4144–0.5941	Acceptable
	4	1.4787	1.5320	1.3242–1.6332	Acceptable
Chloroform (mg)					
5/92	1	1.0810	1.1635	0.9607–1.2013	Acceptable
	2	1.3012	1.3567	1.1538–1.4485	Acceptable
	3	0.8733	0.9483	0.7723–0.9744	Acceptable
	4	0.5675	0.6417	0.4989–0.6362	Unacceptable

Table 10.23 (continued)

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	Y-12		
Tetrachlorethylene (mg)					
2/92	1	1.0194	1.1223	0.9271–1.1117	Unacceptable
	2	0.5089	0.6013	0.4474–0.5704	Unacceptable
	3	0.6939	0.8035	0.6088–0.7785	Unacceptable
	4	1.1944	1.4685	1.0593–1.3295	Unacceptable
Toluene (mg)					
8/92	1	1.1285	1.1206	0.9752–1.2817	Acceptable
	2	0.8681	0.8640	0.7474–0.9888	Acceptable
	3	1.3345	1.3496	1.1827–1.4863	Acceptable
	4	0.4901	0.4918	0.4304–0.5499	Acceptable
Trichloroethylene (mg)					
2/92	1	0.5640	0.6182	0.5064–0.6217	Acceptable
	2	0.8668	0.7822	0.7836–0.9499	Unacceptable
	3	1.0966	1.0131	0.9851–1.2081	Acceptable
	4	0.8223	0.9456	0.7439–0.9007	Unacceptable
11/92	1	1.3639	1.4230	1.2166–1.5112	Acceptable
	2	0.7089	0.7250	0.6220–0.7959	Acceptable
	3	1.2642	1.2750	1.1189–1.4095	Acceptable
	4	0.4651	0.4670	0.4104–0.5198	Acceptable
O-xylene (mg)					
8/92	1	1.2442	1.2090	1.0554–1.4330	Acceptable
	2	1.5174	1.5108	1.3099–1.7250	Acceptable
	3	0.9121	0.9257	0.7732–1.0510	Acceptable
	4	0.6600	0.6760	0.5658–0.7541	Acceptable

Table 10.24. 1992 NIOSH/Proficiency Analytical Testing Program, K-25 Laboratory

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	K-25		
		Metals (mg)			
Cadmium					
2/92	1	0.0099	0.0058	0.0084–0.0113	Low[a]
	2	0.0147	0.0174	0.0126–0.0169	High[a]
	3	0.019	0.0138	0.0165–0.0215	Low[a]
	4	0.0069	0.0092	0.0059–0.0079	High[a]
8/92	1	0.005	0.005	0.0043–0.0056	Acceptable
	2	0.0117	0.011	0.0103–0.0131	Acceptable
	3	0.0158	0.016	0.0141–0.0174	Acceptable
	4	0.0089	0.0087	0.0077–0.0101	Acceptable
11/92	1	0.0175	0.0172	0.0152–0.0197	Acceptable
	2	0.0098	0.0096	0.0085–0.0111	Acceptable
	3	0.0059	0.0133	0.0050–0.0067	High[b]
	4	0.0136	0.0058	0.0120–0.0152	Low[b]
Chromium					
2/92	1	0.0744	0.1267	0.0619–0.0868	High[a]
	2	0.1713	0.0938	0.1392–0.2034	Low[a]
	3	0.101	0.1632	0.0839–0.1181	High[a]
	4	0.147	0.0704	0.1209–0.1730	Low[a]
8/92	1	0.2177	0.22	0.1648–0.2706	Acceptable
	2	0.178	0.18	0.1411–0.2149	Acceptable
	3	0.0748	0.076	0.0605–0.0892	Acceptable
	4	0.1223	0.12	0.0950–0.1497	Acceptable
Lead					
2/92	1	0.0494	0.0504	0.0431–0.0556	Acceptable
	2	0.0783	0.0281	0.0676–0.0889	Low[a]
	3	0.0304	0.0741	0.0266–0.0342	High[a]
	4	0.0592	0.0464	0.0523–0.0662	Low[a]
8/92	1	0.0489	0.05	0.0423–0.0555	Acceptable
	2	0.0275	0.027	0.0235–0.0315	Acceptable
	3	0.065	0.066	0.0555–0.0744	Acceptable
	4	0.0785	0.078	0.0694–0.0876	Acceptable
11/92	1	0.0291	0.0287	0.0249–0.0333	Acceptable
	2	0.0734	0.0728	0.0650–0.0819	Acceptable
	3	0.0414	0.0614	0.0375–0.0454	High[b]
	4	0.0627	0.0411	0.0552–0.0701	Low[b]
Zinc					
11/92	1	0.0745	0.0729	0.0617–0.0873	Acceptable
	2	0.1434	0.14	0.1202–0.1665	Acceptable
	3	0.2067	0.172	0.1724–0.2410	Low[b]
	4	0.1782	0.203	0.1506–0.2058	Acceptable
		Asbestos (F/mm^2)			
2/92	1	798.2	875.8	471.4–1210.5	Acceptable
	2	495.8	534	282–769.6	Acceptable
	3	232.8	321.6	116.3–389.3	Acceptable
	4	356.9	609.6	197.6–562.8	High[c]
5/92	1	245	300.7	67.5–533.2	Acceptable
	2	721.2	1057.3	256.5–1420.8	Acceptable
	3	490.1	652.9	173.9–966.4	Acceptable
	4	279.4	315.4	85.7–584.3	Acceptable
8/92	1	383.3	337.6	205.8–615.6	Acceptable
	2	863.1	926.7	477.9–1361.2	Acceptable
	3	383.4	444.5	216.1–598.5	Acceptable
	4	572.2	656	296.4–938	Acceptable

Table 10.24 (continued)

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	K-25		
11/92	1	645.9	945.8	256.2–1212.6	Acceptable
	2	382.1	419.1	138.3–747	Acceptable
	3	163.5	256	43.3–361	Acceptable
	4	412.9	458.6	168.1–765.9	Acceptable
		Organic solvents (mg)			
Benzene					
8/92	1	0.0712	0.0721	0.0567–0.0856	Acceptable
	2	0.1218	0.123	0.0992–0.1443	Acceptable
	3	0.2833	0.2853	0.2478–0.3188	Acceptable
	4	0.3492	0.3493	0.3022–0.3963	Acceptable
1, 1, 1–Trichlorethane					
2/92	1	1.204	1.2486	1.0431–1.3649	Acceptable
	2	1.0383	1.0724	0.9050–1.1717	Acceptable
	3	0.741	0.76	0.6171–0.8649	Acceptable
	4	0.5531	0.5505	0.4760–0.6301	Acceptable
Tetrachloroethylene					
2/92	1	1.0194	1.0136	0.9271–1.1117	Acceptable
	2	0.5089	0.5039	0.4474–0.5704	Acceptable
	3	0.6936	0.6722	0.6088–0.7785	Acceptable
	4	1.1944	1.1138	1.0593–1.3295	Acceptable
Trichloroethylene					
2/92	1	0.564	0.5581	0.5064–0.6217	Acceptable
	2	0.8668	0.8429	0.7836–0.9499	Acceptable
	3	1.0966	1.0476	0.9851–1.2081	Acceptable
	4	0.8223	0.7667	0.7439–0.9007	Acceptable
11/92	1	1.3639	1.2973	1.2166–1.5112	Acceptable
	2	0.7089	0.6799	0.6220–0.7959	Acceptable
	3	1.2642	1.2159	1.1189–1.4095	Acceptable
	4	0.4651	0.4498	0.4104–0.5198	Acceptable
Chloroform					
5/92	1	1.081	1.097	0.9607–1.2013	Acceptable
	2	1.3012	1.292	1.1538–1.4485	Acceptable
	3	0.8733	0.855	0.7723–0.9744	Acceptable
	4	0.5675	0.577	0.4989–0.6362	Acceptable
Carbon tetrachloride					
5/92	1	1.1665	1.176	1.0430–1.2899	Acceptable
	2	0.9414	0.935	0.8224–1.0603	Acceptable
	3	0.5328	0.52	0.4693–0.5963	Acceptable
	4	1.4562	1.431	1.2728–1.6396	Acceptable
11/92	1	0.8184	0.7881	0.7038–0.9330	Acceptable
	2	1.1169	1.0612	0.9583–1.2755	Acceptable
	3	0.5043	0.4953	0.4144–0.5941	Acceptable
	4	1.4787	1.3974	1.3242–1.6332	Acceptable
1, 2–Dichloroethane					
5/92	1	0.6677	0.673	0.5845–0.7509	Acceptable
	2	0.9456	0.932	0.8224–1.0689	Acceptable
	3	1.3341	1.286	1.1725–1.4958	Acceptable
	4	0.8177	0.814	0.7201–0.9153	Acceptable
11/92	1	0.9175	0.8783	0.8186–1.0163	Acceptable
	2	1.2509	1.1844	1.0993–1.4025	Acceptable
	3	0.7604	0.7367	0.6758–0.8451	Acceptable
	4	0.545	0.5257	0.4856–0.6044	Acceptable

Table 10.24 (continued)

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	K-25		
O-xylene					
8/92	1	1.2442	1.2052	1.0554–1.4330	Acceptable
	2	1.5174	1.4901	1.3099–1.7250	Acceptable
	3	0.9121	0.9156	0.7732–1.0510	Acceptable
	4	0.66	0.6578	0.5658–0.7541	Acceptable
Toluene					
8/92	1	1.285	1.0905	0.9752–1.2817	Acceptable
	2	0.8681	0.8422	0.7474–0.9888	Acceptable
	3	1.3345	1.3081	1.1827–1.4863	Acceptable
	4	0.4901	0.4837	0.4304–0.5499	Acceptable

[a]Data transposed on report form.
[b]Samples switched.
[c]Although the reading was high, it was consistent among three analyses.

Table 10.25. 1992 NIOSH/Proficiency Analytical Testing Program, ORNL

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	ORNL		
Cadmium (mg)					
2/92	1	0.0099	0.0103	0.0084–0.0113	Proficient
	2	0.0147	0.0160	0.0126–0.0169	Proficient
	3	0.0190	0.0201	0.0165–0.0215	Proficient
	4	0.0069	0.0074	0.0059–0.0079	Proficient
5/92	1	0.0218	0.0219	0.0190–0.0245	Proficient
	2	0.0178	0.0175	0.0154–0.0201	Proficient
	3	0.0079	0.0080	0.0069–0.0090	Proficient
	4	0.0118	0.0118	0.0103–0.0134	Proficient
8/92	1	0.0050	0.0051	0.0043–0.0056	Proficient
	2	0.0117	0.0122	0.0103–0.0131	Proficient
	3	0.0158	0.0167	0.0141–0.0174	Proficient
	4	0.0089	0.0094	0.0077–0.0101	Proficient
11/92	1	0.0175	0.0184	0.0152–0.0197	Proficient
	2	0.0098	0.0104	0.0085–0.0111	Proficient
	3	0.0059	0.0062	0.0050–0.0067	Proficient
	4	0.0136	0.0144	0.0120–0.0152	Proficient
Chromium (mg)					
2/92	1	0.0744	0.0782	0.0619–0.0868	Proficient
	2	0.1713	0.1870	0.1392–0.2034	Proficient
	3	0.1010	0.1070	0.0839–0.1181	Proficient
	4	0.1470	0.1620	0.1209–0.1730	Proficient
8/92	1	0.2177	0.2350	0.1648–0.2706	Proficient
	2	0.1780	0.1950	0.1411–0.2149	Proficient
	3	0.0748	0.0812	0.0605–0.0892	Proficient
	4	0.1223	0.1360	0.0950–0.1497	Proficient
Lead (mg)					
2/92	1	0.0494	0.0518	0.0431–0.0556	Proficient
	2	0.0783	0.0833	0.0676–0.0889	Proficient
	3	0.0304	0.0319	0.0266–0.0342	Proficient
	4	0.0592	0.0631	0.0523–0.0662	Proficient
5/92	1	0.0220	0.0218	0.0194–0.0246	Proficient
	2	0.0376	0.0392	0.0326–0.0425	Proficient
	3	0.0743	0.0757	0.0651–0.0835	Proficient
	4	0.0474	0.0500	0.0416–0.0532	Proficient
8/92	1	0.0489	0.0498	0.0423–0.0555	Proficient
	2	0.0275	0.0289	0.0235–0.0315	Proficient
	3	0.0650	0.0680	0.0555–0.0744	Proficient
	4	0.0785	0.0821	0.0694–0.0876	Proficient
11/92	1	0.0291	0.0280	0.0617–0.0873	Proficient
	2	0.0734	0.0732	0.1202–0.1665	Proficient
	3	0.0414	0.0432	0.1724–0.2410	Proficient
	4	0.0627	0.0629	0.1506–0.2058	Proficient

Table 10.25 (continued)

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	ORNL		
Zinc (mg)					
5/92	1	0.0809	0.0084	0.0671–0.0946	Low[a]
	2	0.1142	0.1150	0.0987–0.1297	Proficient
	3	0.1944	0.1970	0.1708–0.2180	Proficient
	4	0.1536	0.1570	0.1330–0.1743	Proficient
11/92	1	0.0745	0.0786	0.0617–0.0873	Proficient
	2	0.1434	0.1350	0.1202–0.1665	Proficient
	3	0.2067	0.1950	0.1724–0.2410	Proficient
	4	0.1782	0.1800	0.1506–0.2058	Proficient
Asbestos (F/mm^2)					
2/92	1	798.2	773.9	471.4–1210.5	Proficient
	2	495.8	541.4	282–769.6	Proficient
	3	232.8	252.3	116.3–389.3	Proficient
	4	356.9	584.8	197.6–562.8	High[b]
5/92	1	245	149	67.5–533.2	Proficient
	2	721.2	710.2	256.5–1420.8	Proficient
	3	490.1	630.9	173.9–966.4	Proficient
	4	279.4	382.2	85.7–584.3	Proficient
8/92	1	383.3	585.9	205.8–615.6	Proficient
	2	863.1	1009	477.9–1361.2	Proficient
	3	383.4	489.1	216.1–598.5	Proficient
	4	572.2	593	296.4–938	Proficient
11/92	1	645.9	562.2	256.2–1212.6	Proficient
	2	382.1	393.4	138.8–747	Proficient
	3	163.5	114.6	43.3–361	Proficient
	4	412.9	278.1	168.1–765.9	Proficient
1,1,1-trichloroethane (mg)					
2/92	1	1.2040	1.3229	1.0431–1.3649	Proficient
	2	1.0383	1.1235	0.9050–1.1717	Proficient
	3	0.7410	0.7973	0.6171–0.8649	Proficient
	4	0.5531	0.6081	0.4760–0.6301	Proficient
Tetrachloroethylene (mg)					
2/92	1	1.0194	1.0564	0.9271–1.1117	Proficient
	2	0.5089	0.5391	0.4474–0.5704	Proficient
	3	0.6936	0.7091	0.6088–0.7785	Proficient
	4	1.1944	1.2312	1.0593–1.3295	Proficient
Trichloroethylene (mg)					
2/92	1	0.5640	0.5704	0.5064–0.6217	Proficient
	2	0.8668	0.8713	0.7836–0.9499	Proficient
	3	1.0966	1.0797	0.9851–1.2081	Proficient
	4	0.8223	0.8278	0.7439–0.9007	Proficient
11/92	1	1.3639	1.2360	1.2166–1.5112	Proficient
	2	0.7089	0.7124	0.6220–0.7959	Proficient
	3	1.2642	1.2140	1.1189–1.4095	Proficient
	4	0.4651	0.4372	0.4104–0.5198	Proficient
Chloroform (mg)					
5/92	1	1.0810	1.1203	0.9607–1.2013	Proficient
	2	1.3012	1.4141	1.1538–1.4485	Proficient
	3	0.8733	0.8973	0.7723–0.9744	Proficient
	4	0.5675	0.6098	0.4989–0.6362	Proficient

Table 10.25 (continued)

Analysis and sample date	Sample	Values		Performance limits	Performance evaluation
		Reference	ORNL		
Carbon tetrachloride (mg)					
5/92	1	1.1665	1.220	1.0430–1.2899	Proficient
	2	0.9414	1.0413	0.8224–1.0603	Proficient
	3	0.5328	0.5625	0.4693–0.5963	Proficient
	4	1.4562	1.5337	1.2728–1.6396	Proficient
11/92	1	0.8184	0.7742	0.7038–0.9330	Proficient
	2	1.1169	1.1255	0.9583–1.2755	Proficient
	3	0.5043	0.4900	0.4144–0.5941	Proficient
	4	1.4784	1.4073	1.3242–1.6332	Proficient
1,2-dichloroethane (mg)					
5/92	1	0.6677	0.6906	0.5845–0.7509	Proficient
	2	0.9456	1.0240	0.8224–1.0689	Proficient
	3	1.3341	1.3542	1.1725–1.4958	Proficient
	4	0.8177	0.8656	0.7201–0.9153	Proficient
11/92	1	0.9175	0.8750	0.8186–1.0163	Proficient
	2	1.2509	1.2568	1.0993–1.4025	Proficient
	3	0.7604	0.7431	0.6758–0.8451	Proficient
	4	0.5450	0.5313	0.4856–0.6044	Proficient
Benzene (mg)					
8/92	1	0.0712	0.0775	0.0567–0.0856	Proficient
	2	0.1218	0.1251	0.0992–0.1443	Proficient
	3	0.2833	0.2879	0.2478–0.3188	Proficient
	4	0.3492	0.3639	0.3022–0.3963	Proficient
Oxylene (mg)					
8/92	1	1.2442	1.3096	1.0554–1.4330	Proficient
	2	1.5174	1.5318	1.3099–1.7250	Proficient
	3	0.9121	0.8700	0.7732–1.0510	Proficient
	4	0.6600	0.6527	0.5658–0.7541	Proficient
Toluene (mg)					
8/92	1	1.1285	1.2539	0.9752–1.2817	Proficient
	2	0.8681	0.8999	0.7474–0.9888	Proficient
	3	1.3345	1.3386	1.1827–1.4863	Proficient
	4	0.4901	0.5030	0.4304–0.5499	Proficient

[a]Special cause was a transcription error. Value should have been 0.0817, which would be Proficient.
[b]Result was not investigated by Analytical Chemistry Division.

Table 10.26. EPA Performance Evaluation DMR-QA Study Number 012, Y-12 Analytical Services, 1992

Analytes	Values		Limits		Performance evaluation
	Reported	True	Acceptable	Warning	
		Trace metals (μg/L)			
Aluminum	2,070	2,100	1,790–2,420	1,870–2,340	Acceptable
Arsenic	108	100	71.8–127	78.7–120	Acceptable
Beryllium	94.3	100	74.9–126	81.4–120	Acceptable
Cadmium	251	250	210–290	220–280	Acceptable
Chromium	783	800	658–927	691–893	Acceptable
Cobalt	108	110	95.4–126	99.3–122	Acceptable
Copper	788	790	714–877	735–856	Acceptable
Iron	1,430	1,500	1,310–1,690	1,360–1,650	Acceptable
Lead	596	550	474–623	493–604	Acceptable
Manganese	784	810	731–886	750–867	Acceptable
Mercury	5.49	5.3	3.89–6.65	4.24–6.30	Acceptable
Nickel	694	740	660–814	680–794	Acceptable
Selenium	11.5	14	6.59–18.8	8.11–17.3	Acceptable
Vanadium	9,850	10,000	8,530–11,300	8,890–11,000	Acceptable
Zinc	365	360	318–406	329–395	Acceptable
		Miscellaneous analytes			
pH, standard units	9.32	9.40	9.09–9.64	9.16–9.57	Acceptable
Suspended solids, mg/L	27.3	25.0	16.3–30.3	18.1–28.6	Acceptable
Oil and grease, mg/L	18.4	19.0	8.01–25.6	10.2–23.3	Acceptable
		Nutrients (mg/L)			
Ammonia-nitrogen	2.58	2.50	1.86–3.07	2.01–2.93	Acceptable
Nitrate-nitrogen	14.7	15.0	12.1–17.6	12.8–16.9	Acceptable
Kjeldahl-nitrogen	35.4	34.0	25.7–40.5	27.5–38.7	Acceptable
Total phosphorus	0.922	0.940	0.704–1.14	0.756–1.09	Acceptable
Orthophosphate	0.512	0.510	0.419–0.598	0.440–0.577	Acceptable
		Demands (mg/L)			
COD	55.6	56.3	38.2–69.5	42.2–65.6	Acceptable
TOC	22.3	22.2	18.8–26.1	19.7–25.1	Acceptable
5-day BOD	40.6	36.0	20.7–51.4	24.5–47.6	Acceptable
		Additional miscellaneous analytes (mg/L)			
Total cyanide	0.591	0.610	0.415–0.771	0.460–0.726	Acceptable
Total phenolics	0.175	0.207	0.103–0.312	0.130–0.285	Acceptable
Total residual chlorine	0.42	0.440	0.224–0.608	0.275–0.557	Acceptable

Table 10.27. EPA Performance Evaluation DMR-QA Study Number 012, ORNL, 1992

Analytes	Values		Limits		Performance evaluation
	Reported	True[a]	Acceptable	Warning	
Trace metals (µg/L)					
Aluminum	990	950	778–1130	823–1090	Acceptable
Arsenic	482	430	348–508	368–488	Acceptable
Beryllium	43.4	40	30.0–50.9	32.6–48.2	Acceptable
Cadmium	40.8	40	32.8–48.7	34.8–46.7	Acceptable
Chromium	334	315	266–371	279–358	Acceptable
Cobalt	382	370	322–414	334–403	Acceptable
Copper	135	130	113–144	117–140	Acceptable
Iron	562	540	471–613	489–595	Acceptable
Lead	151	150	120–179	127–172	Acceptable
Manganese	115	110	94.1–125	97.9–121	Acceptable
Mercury	0.37	0.330	0.0869–0.620	0.154–0.552	Acceptable
Nickel	2360	2200	1970–2410	2020–2360	Acceptable
Selenium	35	55.0	31.6–72.0	36.6–67.0	Check for error[b]
Vanadium	6240	6000	5250–6690	5440–6510	Acceptable
Zinc	1460	1400	1230–1570	1270–1520	Acceptable
Miscellaneous analytes, mg/L[c]					
pH, standard units	6.79	6.80	6.63–6.96	6.67–6.92	Acceptable
Total suspended solids	40	40.0	31.6–45.1	33.2–43.5	Acceptable
Oil and grease	12.7	11.0	4.13–15.7	5.59–14.2	Acceptable
Total cyanide	0.189	0.180	0.117–0.233	0.132–0.218	Acceptable
Total phenolics	0.049	0.054	0.0235–0.0853	0.0314–0.0774	Acceptable
Nutrients, mg/L					
Ammonia as nitrogen	14.1	14.0	11.2–16.6	11.8–16.0	Acceptable
Nitrate as nitrogen	4.63	4.80	3.75–5.72	3.99–5.48	Acceptable
Total phosphorus	1.88	2.30	1.78–2.75	1.90–2.64	Check for error[d]
Orthophosphate	1.54	2.30	1.92–2.63	2.01–2.54	Not Acceptable[e]
Demands, mg/L					
TOC	39.6	39.1	33.2–45.4	34.8–43.8	Acceptable
5-day BOD	55.3	64.2	38.8–89.7	45.1–83.3	Acceptable
Fathead minnow acute data, % of sample					
LC50	63.73	69.2	52.6–85.8	57.0–81.5	Acceptable
Fathead minnow chronic data, % of sample					
Survival, NOEC-DMW	25.00	32.5	D.L.[f]–65.9	7.52–57.4	Acceptable
Growth, IC25-DMW	62.55	46.4	D.L.–96.1	9.54–83.2	Acceptable
Growth, NOEC-DMW	25.00	32.3	D.L.–82.4	D.L.–69.6	Acceptable
Ceriodaphnia acute data, % of sample					
LC50–DMW, 25 deg.	28.28	19.9	3.66–36.2	7.78–32.1	Acceptable
Ceriodaphnia chronic data, % of sample					
Survival, NOEC-DMW	12.50	15.6	3.12–28.1	6.23–25.0	Acceptable
Reprod., IC25-DMW	15.63	12.8	D.L.–27.8	1.61–24.0	Acceptable
Reprod., NOEC-DMW	12.50	15.0	1.68–28.3	4.99–25.0	Acceptable

[a]Based upon theoretical calculations, or a reference value when necessary.
[b]Spike recovery was 95%.
[c]Units are mg/L except for pH, which is reported in pH units.
[d]Values averaged incorrecly. Correct value of 1.94 mg/L falls within the stated warning limits.
[e]Chromatograms showed small peak areas therefore producing unacceptable results.
[f]D.L. stands for detection limit.

Table 10.28. EPA Performance Evaluation DMR-QA Study Number 012, K-25 Site, 1992

Analytes	Values		Limits		Performance evaluation
	Reported	True[a]	Acceptance	Warning	
		Trace metals (μg/L)			
Aluminum	2,290	2,100	1,790–2,420	1,870–2,340	Acceptable
Arsenic	105	100	71.8–127	78.7–120	Acceptable
Beryllium	118	100	74.9–126	81.4–120	Acceptable
Cadmium	262	250	210–290	220–280	Acceptable
Chromium	822	800	658–927	691–893	Acceptable
Cobalt	111	110	95.4–126	99.3–122	Acceptable
Copper	810	790	714–877	735–856	Acceptable
Iron	1,520	1,500	1,310–1,690	1,360–1,650	Acceptable
Lead	538	550	474–623	493–604	Acceptable
Manganese	819	810	731–886	750–867	Acceptable
Mercury	4.94	5.3	3.89–6.65	4.24–6.30	Acceptable
Nickel	754	740	660–814	680–794	Acceptable
Selenium	14.2	14	6.59–18.8	8.11–17.3	Acceptable
Vanadium	10,200	10,000	8,530–11,300	8,890–11,000	Acceptable
Zinc	380	360	318–406	329–395	Acceptable
		Miscellaneous analytes (mg/L)			
pH	9.52	9.4	9.09–9.64	9.16–9.57	Acceptable
Total suspended solids	24	25	16.3–30.3	18.1–28.6	Acceptable
Oil and grease	14.6	19	8.01–25.6	10.2–23.3	Acceptable
		Nutritents (mg/L)			
Ammonia nitrogen	1.86	2.5	1.86–3.07	2.01–2.93	Check for error
Nitrate nitrogen	13.88	15	12.1–17.6	12.8–16.9	Acceptable
Total phosphorus	1.03	0.94	0.704–1.14	0.756–1.09	Acceptable
Orthophosphate	0.5	0.51	0.419–0.598	0.440–0.577	Acceptable
		Demands (mg/L)			
COD	49.9	56.3	38.2–69.5	42.2–65.6	Acceptable
TOC	22.65	22.2	18.8–26.1	19.7–25.1	Acceptable
5-day BOD	33.2	36	20.7–51.4	24.5–47.6	Acceptable
		Additional miscellaneous analytes (mg/L)			
Total cyanide	0.561	0.61	0.415–0.771	0.460–0.726	Acceptable
Total phenolics	0.213	0.207	0.103–0.312	0.130–0.285	Acceptable
Total residual chlorine	0.35	0.44	0.224–0.608	0.275–0.557	Acceptable

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

Table 10.29. EPA EMSL-LV Intercomparison Radionuclide Control Program, Y-12 Analytical Services, 1992

Analysis and sample date	Values		Normalized deviation	Performance evaluation
	EPA	Y-12		
		Air filter, pCi/filter		
^{137}Cs				
3/27	10.0 ± 5.0	9.67	–0.12	Acceptable
8/28	18.0 ± 5.0	16.33	–0.58	Acceptable
Gross alpha				
3/27	7.0 ± 5.0	8.67	0.58	Acceptable
8/28	30.0 ± 8.0	33.33	0.72	Acceptable
Gross beta				
3/27	41.0 ± 5.0	41.67	0.23	Acceptable
8/28	69.0 ± 10.0	72.00	0.52	Acceptable
^{90}Sr				
8/28	25.0 ± 5.0	22.67	–0.81	Acceptable
		Performance Eval-A (Water, pCi/L)		
Gross alpha				
4/14	40.0 ± 10.0	41.33	0.23	Acceptable
10/20	29.0 ± 7.0	35.67	1.65	Acceptable
U				
4/14	4.0 ± 3.0	6.20	1.27	Acceptable
10/20	10.2 ± 3.0	10.27	0.04	Acceptable
		Performance Eval-B (Water, pCi/L)		
^{60}Co				
4/14	56.0 ± 5.0	59.33	1.15	Acceptable
10/20	15.0 ± 5.0	16.33	0.46	Acceptable
^{134}Cs				
4/14	24.0 ± 5.0	24.33	0.12	Acceptable
10/20	5.0 ± 5.0	5.00	0.00	Acceptable
^{137}Cs				
4/14	22.0 ± 5.0	23.33	0.46	Acceptable
10/20	8.0 ± 5.0	8.00	0.00	Acceptable
Gross beta				
4/14	140.0 ± 21.0	81.00	–4.87	Unacceptable
10/20	53.0 ± 10.0	36.33	–2.89	Acceptable
^{133}Ba				
2/14	76.0 ± 8.0	81.00	1.08	Acceptable
6/5	98.0 ± 10.0	97.67	–0.06	Acceptable
10/9	74.0 ± 7.0	74.00	0.00	Acceptable
^{60}Co				
2/14	40.0 ± 5.0	44.00	1.39	Acceptable
6/5	20.0 ± 5.0	20.67	0.23	Acceptable
10/9	10.0 ± 5.0	10.67	0.23	Acceptable
^{134}Cs				
2/14	31.0 ± 5.0	30.00	–0.35	Acceptable
6/5	15.0 ± 5.0	15.33	0.12	Acceptable
10/9	8.0 ± 5.0	7.67	–0.12	Acceptable

Table 10.29 (continued)

Analysis and sample date	Values		Normalized deviation	Performance evaluation
	EPA	Y-12		
^{137}Cs				
2/14	49.0 ± 5.0	49.67	0.23	Acceptable
6/5	15.0 ± 5.0	15.33	0.12	Acceptable
10/9	8.0 ± 5.0	9.33	0.46	Acceptable
Gross alpha				
5/15	15.0 ±5 .0	16.67	0.58	Acceptable
Gross beta				
5/15	44.0 ± 5.0	28.00	–5.54	Unacceptable
^{3}H				
2/21	7904.0 ± 790.0	8216.67	0.69	Acceptable
6/19	2125.0 ± 347.0	2266.67	0.71	Acceptable
10/23	5962.0 ± 596.0	8066.67	6.12	Unacceptable
^{239}Pu				
1/24	16.8 ±1 .7	15.00	–1.83	Acceptable
8/21	9.0 ± 0.9	8.77	–0.45	Acceptable
^{106}Ru				
2/14	203.0 ± 20.0	197.33	–0.49	Acceptable
6/5	141.0 ± 14.0	132.00	–1.11	Acceptable
10/9	175.0 ± 18.0	163.33	–1.12	Acceptable
U				
3/13	25.3 ± 3.0	26.00	0.40	Acceptable
7/24	4.0 ± 3.0	3.53	–0.27	Acceptable
11/13	15.2 ± 3.0	14.00	–0.69	Acceptable
^{65}Zn				
2/14	148.0 ± 15.0	161.00	1.50	Acceptable
6/5	99.0 ± 10.0	106.00	1.21	Acceptable
10/9	148.0 ± 15.0	160.00	1.39	Acceptable

Table 10.30. EPA EMSL-LV Intercomparison Radionuclide Control Program, ORNL Low-Level Radiochemical Laboratory, 1992

Analysis and sample date	Values		Ratio[b] (ORNL/EPA)	Performance evaluations[c]
	EPA[a]	ORNL		
	Water (pCi/L)			
Gross alpha				
1/92	30.0±8.0	16.00	0.53	Unacceptable
5/92	15.0± 5.0	9.67	0.64	Acceptable
Gross beta				
1/92	30.0±5.0	23.67	0.79	Warning
5/92	44.0± 5.0	43.00	0.98	Acceptable
^{133}Ba				
2/92	76.0±8.0	69.67	0.92	Acceptable
6/92	98.0±10.0	91.33	0.93	Acceptable
10/92	74.0±7.0	75.67	1.02	Acceptable
^{134}Cs				
2/92	31.0±5.0	29.00	0.94	Acceptable
6/92	15.0±5.0	14.67	0.98	Acceptable
10/92	8.0± 5.0	8.00	1.00	Acceptable
^{137}Cs				
2/92	49.0±5.0	52.00	1.06	Acceptable
6/92	15.0±5.0	25.67	1.71	Unacceptable
10/92	8.0± 5.0	10.67	1.33	Acceptable
^{60}Co				
2/92	40.0±5.0	39.00	0.98	Acceptable
6/92	20.0±5.0	20.67	1.03	Acceptable
10/92	10.0± 5.0	10.00	1.00	Acceptable
^{131}I				
2/92	59.0±6.0	59.33	1.01	Acceptable
8/92	45.0± 6.0	43.67	0.97	Acceptable
^{106}Ru				
2/92	203.0±20.0	183.33	0.90	Acceptable
6/92	141.0±14.0	126.67	0.90	Acceptable
10/92	175.0±18.0	160.00	0.91	Acceptable
^{89}Sr				
1/92	51.0±5.0	46.67	0.92	Acceptable
5/92	29.0±5.0	13.00	0.45	Unacceptable
9/92	20.0± 5.0	18.67	0.93	Acceptable
^{90}Sr				
1/92	20.0±5.0	26.33	1.32	Warning
5/92	8.0±5.0	14.00	1.75	Warning
9/92	15.0± 5.0	18.00	1.20	Acceptable
^{3}H				
2/92	7904.0±790.0	6600.0	0.84	Warning
6/92	2125.0± 347.0	74.33	0.03	Unacceptable
^{65}Zn				
2/92	148.0±15.0	150.00	1.01	Acceptable
6/92	99.0±10.0	100.00	1.01	Acceptable
10/92	148.0± 15.0	160.00	1.08	Acceptable

Table 10.30 (continued)

Analysis and sample date	Values		Ratio[b] (ORNL/EPA)	Performance evaluations[c]
	EPA[a]	ORNL		
	Air (pCi/filter)			
Gross alpha				
3/92	7.0±5.0	6.67	0.95	Acceptable
8/92	30.0± 8.0	26.00	0.87	Acceptable
Gross beta				
3/92	41.0±5.0	37.33	0.91	Acceptable
8/92	69.0± 10.0	56.00	0.81	Warning
^{137}Cs				
3/92	10.0±5.0	10.00	1.00	Acceptable
8/92	18.0± 5.0	21.67	1.20	Acceptable
^{90}Sr				
3/92	15.0±5.0	17.33	1.16	Acceptable
8/92	25.0± 5.0	28.33	1.13	Acceptable
	Milk (pCi/L)			
^{137}Cs				
4/92	39.0±5.0	40.33	1.03	Acceptable
^{131}I				
4/92	78.0±8.0	82.33	1.06	Acceptable

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

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

[c]The EPA gives three classes of performance based on the number of standard deviations that a result is from the true value; these are acceptable (<1 sigma), warning (2 to 3 sigma), and unacceptable(> 3 sigma).

Table 10.31. EPA EMSL-LV Intercomparison Radionuclide Control Program, K-25 Site, 1992

Analysis and sample data	Values[a]		Ratio[b] (EPA/K-25)	Performance evaluation
	EPA	K-25		
		Water (pCi/L)		
^{133}Ba				
6/5	98±10	83 ± 6.93	1.18	Acceptable
10/9	74±7	70±2.65	1.06	Acceptable
^{134}Cs				
4/14	24±5	20.33±1.53	1.18	Acceptable
6/5	15±5	12±2.65	1.25	Acceptable
10/9	8±5	4.67±1.53	1.71	Acceptable
10/20	5±5	3.33±0.58	1.50	Acceptable
^{137}Cs				
4/14	22±5	21.33±1.53	1.03	Acceptable
6/5	15±5	14.33±1.53	1.05	Acceptable
10/9	8±5	7.67±2.52	1.04	Acceptable
10/20	8±5	6.67±0.58	1.20	Acceptable
^{60}Co				
4/14	56±5	52.67±3.06	1.06	Acceptable
6/5	20±5	17.67±0.58	1.13	Acceptable
10/9	10±5	10.67±1.53	0.94	Acceptable
10/20	15±5	14.33±0.58	1.05	Acceptable
^{3}H				
6/19	*c*	*c*	*c*	*c*
Gross alpha				
4/14	40±10	45±2	0.89	Acceptable
5/15	15±5	16.67±1.15	0.90	Acceptable
9/18	45±11	29±3.61	1.55	Acceptable
10/20	29±7	30.33±1.15	0.96	Acceptable
Gross beta				
4/14	140±21	113.67±3.21	1.23	Acceptable
5/15	44±5	48.33±1.53	0.91	Acceptable
9/18	50±5	31±1.73	1.61	Below the control limit[d]
10/20	53±10	46.67±0.58	1.14	Acceptable
^{239}Pu				
1/24	16.8±1.7	33.9±1.39	0.50	Outlier[e]
8/21	9±0.9	8.6±0.53	1.05	Acceptable
^{226}Ra				
4/14	*c*	*c*	*c*	*c*
10/20	*c*	*c*	*c*	*c*
^{228}Ra				
4/14	*c*	*c*	*c*	*c*
10/20	*c*	*c*	*c*	*c*

Table 10.31 (continued)

Analysis and sample data	Values (pCi/unit)[a]		Ratio[b] (EPA/K-25)	Performance evaluation
	EPA	K-25		
		Water (pCi/L)		
^{106}Ru				
6/5	141±14	92±21.63	1.53	Outlier[d]
10/9	175±18	141±4.58	1.24	Below the control limit[d]
U				
3/13	25.3±3	21.33±0.64	1.19	Acceptable
4/14	4±3	3.7±0.17	1.08	Acceptable
7/24	4±3	2.9±0.36	1.38	Acceptable
10/20	10.2±3	7.93±0.29	1.29	Acceptable
11/13	15.2±3	9.7±0.2	1.57	Below the control limit
^{89}Sr				
4/14	[c]	[c]	[c]	[c]
10/20	[c]	[c]	[c]	[c]
^{90}Sr				
4/14	[c]	[c]	[c]	[c]
10/20	[c]	[c]	[c]	[c]
^{65}Zn				
6/5	99±10	91.67±4.04	1.08	Acceptable
10/9	148±15	147±5	1.01	Acceptable
		Air (pCi/filter)		
Alpha				
3/27	7±5	15.67±0.58	0.45	Acceptable
8/28	30±30	37.67±1.53	0.80	Acceptable
Beta				
3/27	41±5	98±3	0.42	Outlier[d]
8/28	69±10	68.67±1.15	1.00	Acceptable
^{90}Sr				
3/27	15±5	3±2.65	5.00	Outlier[d]
8/28	[c]	[c]	[c]	[c]
^{137}Cs				
3/27	10±5	9.67±3.79	1.03	Acceptable
8/28	18±5	16.67±1.15	1.08	Acceptable

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

[b]Ratio is given 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]No data reported.

[d]Reason for results is unknown.

[e]Dilution error.

Table 10.32. DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP), Y-12 Analytical Services

Parameter	EML value	Y-12 value	Y-12 percent error[a]	Ratio (Y-12/EML)	Performance evaluation
QAP-36, May 1992					
Air filter[a]					
^{54}Mn	5.97	6.6	7	1.11	Acceptable
^{57}Co	7.93	8.0	3	1.01	Acceptable
^{60}Co	5.81	5.9	4	1.02	Acceptable
^{134}Cs	4.44	4.9	5	1.10	Acceptable
^{137}Cs	5.76	6.0	6	1.04	Acceptable
^{144}Ce	63.9	73	2	1.14	Acceptable
^{238}Pu	0.270	0.26	23	0.96	Acceptable
^{239}Pu	0.285	0.30	19	1.05	Acceptable
^{241}Am	0.334	0.38	15	1.14	Acceptable
^{234}U	0.100	0.10	19	1.00	Acceptable
^{238}U	0.100	0.10	19	1.00	Acceptable
U	0.200	0.21	0	1.05	Acceptable
U, µg/filter	7.88	7.8	0	0.99	Acceptable
Soil[b]					
^{238}Pu	0.050	0.21	133	4.20	Unacceptable
^{239}Pu	25.5	25	14	0.98	Acceptable
^{234}U	29.7	24	18	0.81	Acceptable
^{238}U	29.6	25	18	0.84	Acceptable
U	59.3	51	0	0.86	Acceptable
U, µg/g	2.34	0.99	0	0.42	Unacceptable
Vegetation[b]					
^{40}K	294	1100	70	3.74	Unacceptable
^{238}Pu	1.08	3.3	60	3.06	Unacceptable
^{239}Pu	0.311	0.61	180	1.96	Unacceptable
^{241}Am	0.210	0.01	0	0.05	Unacceptable
Water[c]					
^{3}H	227	220	5	0.97	Acceptable
^{54}Mn	56.6	58	3	1.02	Acceptable
^{60}Co	94.0	98	0	1.04	Acceptable
^{134}Cs	71.8	76	1	1.06	Acceptable
^{137}Cs	84.6	84	2	0.99	Acceptable
^{144}Ce	189	193	1	1.02	Acceptable
^{238}Pu	0.450	0.43	13	0.96	Acceptable
^{239}Pu	0.580	0.47	14	0.81	Acceptable
^{241}Am	0.510	0.51	0	1.00	Acceptable
^{234}U	0.415	0.70	21	1.69	Unacceptable
^{238}U	0.423	2.5	15	5.91	Unacceptable
U	0.838	4.1	18	4.89	Unacceptable
U, µg/mL	0.330	0.32	0	0.97	Acceptable

Table 10.32 (continued)

Parameter	EML value	Y-12 value	Y-12 percent error	Ratio (Y-12/EML)	Performance evaluation
		QAP-37, November 1992			
		Air filter[a]			
^{7}Be	308	250	6	0.81	Acceptable
^{54}Mn	25.9	24	62	0.93	Acceptable
^{57}Co	6.40	5.2	5	0.81	Acceptable
^{60}Co	3.06	2.9	13	0.95	Acceptable
^{90}Sr	0.137	0.17	41	1.24	Acceptable
^{134}Cs	3.72	3.1	9	0.83	Acceptable
^{137}Cs	5.82	5.2	7	0.89	Acceptable
^{144}Ce	43.3	34	52	0.79	Acceptable
^{238}Pu	0.042	0.026	76	0.62	Acceptable
^{239}Pu	0.045	0.027	74	0.60	Acceptable
^{241}Am	0.032	0.05	39	1.56	Unacceptable
U	0.033	0.03	66	0.92	Acceptable
U, µg/F	1.28	1.30	0	1.02	Acceptable
		Soil[b]			
^{40}K	384	90	33	0.23	Unacceptable
^{90}Sr	9.57	2.5	20	0.26	Unacceptable
^{137}Cs	285	270	3	0.95	Acceptable
^{238}Pu	21.9	20	17	0.91	Acceptable
^{239}Pu	7.76	5.8	25	0.75	Acceptable
^{241}Am	1.83	6.5	29	3.55	Unacceptable
U	58.8	53	20	0.90	Acceptable
U, µg/g	2.32	0.973	0	0.42	Unacceptable
		Water[c]			
^{3}H	118	120	16	1.02	Acceptable
^{54}Mn	33.3	37	4	1.11	Acceptable
^{60}Co	27.8	30	1	1.08	Acceptable
^{90}Sr	2.20	1.67	26	0.76	Acceptable
^{134}Cs	44.1	52	2	1.18	Acceptable
^{137}Cs	29.0	32	5	1.10	Acceptable
^{144}Ce	51.2	59	4	1.15	Acceptable
^{238}Pu	1.97	1.7	14	0.86	Acceptable
^{239}Pu	0.238	0.23	0	0.97	Acceptable
^{241}Am	0.205	0.42	50	2.05	Unacceptable
U	0.230	0.25	32	1.09	Acceptable
U, µg/mL	0.009	0.009	0	0	Acceptable

[a]Units = bq/filter unless otherwise indicated.
[b]Units = bq/kg unless otherwise indicated.
[c]Units = bq/L unless otherwise indicated.

Table 10.33. DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP), ORNL Low-Level Radiochemical Laboratory, March 1992

Parameter	EML value	ORNL value	ORNL % error[a]	Ratio (ORNL/EML)[b]	Performance evaluation
		Air (pCi/filter)			
^{7}Be	0.286E+02	0.300E+02	6	1.05	Acceptable
^{43}Mn	0.597E+01	0.650E+01	3	1.09	Acceptable
^{57}Co	0.793E+01	0.760E+01	3	0.96	Acceptable
^{60}Co	0.581E+01	0.620E+01	3	1.07	Acceptable
^{90}Sr	0.207E+00	0.410E+00	19	1.98	Unacceptable
^{134}Cs	0.444E+01	0.440E+01	11	0.99	Acceptable
^{137}Cs	0.576E+01	0.620E+01	3	1.08	Acceptable
^{144}Ce	0.639E+02	0.710E+02	1	1.11	Acceptable
^{238}Pu	0.270E+00	0.300E+00	6	1.11	Acceptable
^{239}Pu	0.285E+00	0.300E+00	6	1.05	Acceptable
^{241}Am	0.334E+00	0.330E+00	6	0.99	Acceptable
U, Bq	0.200E+00	0.180E+00	16	0.90	Acceptable
		Soil (pCi/g)			
^{40}K	0.719E+03	0.720E+03	6	1.00	Acceptable
^{90}Sr	0.450E+01	0.770E+01	55	1.71	Unacceptable
^{137}Cs	0.523E+01	0.520E+01	36	0.99	Acceptable
^{238}Pu	0.500E-01	0.200E-01	850	0.40	Unacceptable
^{239}Pu	0.255E+02	0.280E+02	14	1.10	Acceptable
^{241}Am	0.700E-01	0.400E-01	*c*	0.57	Acceptable
U, Bq	0.593E+02	0.230E+02	13	0.39	Unacceptable
		Vegetation (pCi/g)			
^{40}K	0.294E+03	0.320E+03	18	1.09	Acceptable
^{90}Sr	0.376E+03	0.380E+03	5	1.01	Acceptable
^{137}Cs	0.246E+02	0.260E+02	11	1.06	Acceptable
^{238}Pu	0.108E+01	0.120E+01	25	1.11	Acceptable
^{239}Pu	0.311E+00	0.360E+00	52	1.16	Acceptable
^{241}Am	0.210E+00	0.440E+00	63	2.10	Unacceptable
		Water (pCi/mL)			
^{3}H	0.227E+03	0.240E+03	12	1.06	Acceptable
^{54}Mn	0.566E+02	0.560E+02	1	0.99	Acceptable
^{60}Co	0.940E+02	0.950E+02	1	1.01	Acceptable
^{90}Sr	0.213E+01	0.240E+01	16	1.13	Acceptable
^{134}Cs	0.718E+02	0.720E+02	2	1.00	Acceptable
^{137}Cs	0.846E+02	0.890E+02	1	1.05	Acceptable
^{144}Ce	0.189E+03	0.180E+03	5	0.95	Acceptable
^{238}Pu	0.450E+00	0.480E+00	10	1.07	Acceptable
^{239}Pu	0.580E+00	0.540E+00	11	0.93	Acceptable
^{241}Am	0.510E+00	0.540E+00	16	1.06	Acceptable
U, Bq	0.838E+00	0.740E+00	14	0.88	Acceptable

[a]Counting error = 2 sigma.
[b]If ratio (ORNL/EML) falls within 0.5–1.5, then result is acceptable.
[c]Percentage of error reported was >1000%.

Table 10.34. DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP), ORNL Low-Level Radiochemical Laboratory, September 1992

Parameter	EML value	ORNL value	ORNL % error[a]	Ratio (ORNL/EML)[b]	Performance evaluation
		Air (pCi/filter)			
^{7}Be	0.308E+03	0.280E+03	3	0.91	Acceptable
^{54}Mn	0.259E+02	0.260E+02	3	1.00	Acceptable
^{57}Co	0.640E+01	0.560E+01	8	0.88	Acceptable
^{60}Co	0.306E+01	0.320E+01	9	1.05	Acceptable
^{90}Sr	0.137E+00	0.510E+00	39	3.72	Unacceptable
^{134}Cs	0.372E+01	0.300E+01	33	0.81	Acceptable
^{137}Cs	0.582E+01	0.570E+01	7	0.98	Acceptable
^{144}Ce	0.433E+02	0.360E+02	2	0.83	Acceptable
^{238}Pu	0.420E–01	0.300E–01	53	0.71	Acceptable
^{239}Pu	0.450E–01	0.320E–01	46	0.71	Acceptable
^{241}Am	0.320E–01	0.240E–01	74	0.75	Acceptable
U, Bq	0.326E–01	0.390E–01	56	1.20	Acceptable
		Soil (pCi/g)			
^{40}K	0.384E+03	0.400E+03	12	1.04	Acceptable
^{90}Sr	0.957E+01	0.940E+01	35	0.98	Acceptable
^{137}Cs	0.285E+03	0.290E+03	3	1.02	Acceptable
^{238}Pu	0.219E+02	0.150E+02	20	0.68	Acceptable
^{239}Pu	0.776E+01	0.520E+01	28	0.67	Acceptable
^{241}Am	0.183E+01	0.950E+00	52	0.52	Acceptable
U, Bq	0.588E+02	0.130E+02	23	0.22	Unacceptable
		Vegetation (pCi/g)			
^{40}K	0.101E+04	0.100E+04	10	0.99	Acceptable
^{90}Sr	0.489E+03	0.500E+03	4	1.02	Acceptable
^{137}Cs	0.292E+02	0.300E+02	10	1.03	Acceptable
^{238}Pu	0.125E+01	0.100E+01	50	0.80	Acceptable
^{239}Pu	0.379E+00	0.330E+00	87	0.87	Acceptable
^{241}Am	0.242E+00	0.300E+00	146	1.24	Acceptable
		Water (pCi/mL)			
^{3}H	0.118E+03	0.120E+03	25	1.02	Acceptable
^{54}Mn	0.333E+02	0.340E+02	2	1.02	Acceptable
^{60}Co	0.278E+02	0.280E+02	3	1.01	Acceptable
^{90}90Sr	0.220E+01	0.290E+01	27	1.32	Acceptable
^{134}Cs	0.441E+02	0.480E+02	6	1.09	Acceptable
^{137}Cs	0.290E+02	0.360E+02	2	1.24	Acceptable
^{144}Ce	0.512E+02	0.530E+02	5	1.04	Acceptable
^{238}Pu	0.197E+01	0.200E+01	10	1.02	Acceptable
^{239}Pu	0.238E+00	0.280E+00	25	1.18	Acceptable
^{241}Am	0.205E+00	0.160E+00	62	0.78	Acceptable
U, Bq	0.230E+00	0.210E+00	52	0.91	Acceptable

[a]Counting error = 2 sigma.

[b]If ratio (ORNL/EML) falls within 0.5–1.5, then result is acceptable.

Table 10.35. DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP), K-25 Site, March 1992

Parameter	EML value	K-25 value	Error, K-25 (%)	Ratio (K-25/EML)	Performance evaluation[a]
		Water (Bq/L)			
^{54}Mn	0.566×10^{2}	0.551×10^{2}	1	0.97 ± 0.02	Acceptable
^{60}Co	0.940×10^{2}	0.944×10^{2}	0	1.00 ± 0.01	Acceptable
^{90}Sr	0.213×10^{1}	0.130×10^{1}	1	0.61 ± 0.17	Acceptable
^{134}Cs	0.718×10^{2}	0.744×10^{2}	0	1.04 ± 0.02	Acceptable
^{137}Cs	0.846×10^{2}	0.873×10^{2}	1	1.03 ± 0.03	Acceptable
^{144}Ce	0.189×10^{3}	0.183×10^{3}	1	0.97 ± 0.02	Acceptable
^{238}Pu	0.450×10^{0}	0.531×10^{0}	6	1.18 ± 0.12	Acceptable
^{239}Pu	0.596×10^{0}	0.580×10^{0}	5	1.03 ± 0.09	Acceptable
^{241}Am	0.510×10^{0}	0.124×10^{0}	16	0.24 ± 0.04	Unacceptable[b]
U (pCi/mL)	0.83×10^{0}	0.717×10^{0}	8	0.86 ± 0.12	Acceptable
		Air (Bq/filter)			
^{54}Mn	0.597×10^{1}	0.606×10^{1}	6	1.02 ± 0.08	Acceptable
^{57}Co	0.793×10^{1}	0.698×10^{1}	2	0.88 ± 0.04	Acceptable
^{60}Co	0.581×10^{1}	0.573×10^{1}	5	0.99 ± 0.07	Acceptable
^{90}Sr	0.207×10^{0}	0.143×10^{0}	181	0.69 ± 1.26	Acceptable
^{134}Cs	0.444×10^{1}	0.475×10^{1}	4	1.07 ± 0.07	Acceptable
^{137}Cs	0.576×10^{1}	0.607×10^{1}	6	1.05 ± 0.08	Acceptable
^{144}Ce	0.639×10^{2}	0.723×10^{2}	2	1.13 ± 0.06	Acceptable
^{238}Pu	0.270×10^{0}	0.317×10^{0}	8	1.17 ± 0.11	Acceptable
^{239}Pu	0.285×10^{0}	0.305×10^{0}	8	1.07 ± 0.14	Acceptable
^{241}Am	0.334×10^{0}	0.348×10^{0}	9	1.04 ± 0.11	Acceptable
U (pCi/filter)	0.200×10^{0}	0.232×10^{0}	10	1.16 ± 0.13	Acceptable
		Soil (Bq/g)			
^{137}Cs	0.523×10^{1}	0.541×10^{1}	388	1.03 ± 4.02	Acceptable
^{239}Pu	0.255×10^{2}	0.262×10^{2}	6	1.03 ± 0.10	Acceptable
U (pCi/kg)	0.593×10^{2}	0.160×10^{2}	12	0.27 ± 0.03	Unacceptable[c]

[a]Acceptable ratio is 0.5 to1.5.
[b]No cause can be determined for results.
[c]No tracer used in the analysis.

Table 10.36. DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP), K-25 Site, September 1992

Parameter	EML value	K-25 value	Error, K-25 (%)	Ratio (K-25/EML)	Performance evaluation[a]
		Water (Bq/L)			
^{54}Mn	0.333×10^{2}	0.327×10^{2}	5	0.98 ± 0.06	Acceptable
^{60}Co	0.278×10^{2}	0.292×10^{2}	4	1.05 ± 0.06	Acceptable
^{134}Cs	0.441×10^{2}	0.455×10^{2}	3	1.03 ± 0.06	Acceptable
^{137}Cs	0.290×10^{2}	0.296×10^{2}	5	1.02 ± 0.07	Acceptable
^{144}Ce	0.512×10^{2}	0.544×10^{2}	11	1.06 ± 0.13	Acceptable
^{238}Pu	0.197×10^{1}	0.207×10^{1}	12	1.05 ± 0.14	Acceptable
^{239}Pu	0.238×10^{0}	0.282×10^{0}	32	1.18 ± 0.40	Acceptable
U (pCi/mL)	0.230×10^{0}	0.211×10^{0}	38	0.92 ± 0.35	Acceptable
		Air (Bq/filter)			
^{7}Be	0.308×10^{3}	0.292×10^{3}	3	0.95 ± 0.04	Acceptable
^{54}Mn	0.259×10^{2}	0.249×10^{2}	2	0.96 ± 0.04	Acceptable
^{57}Co	0.640×10^{1}	0.618×10^{1}	3	0.97 ± 0.06	Acceptable
^{60}Co	0.306×10^{1}	0.307×10^{1}	7	1.00 ± 0.10	Acceptable
^{134}Cs	0.372×10^{1}	0.325×10^{1}	6	0.87 ± 0.06	Acceptable
^{137}Cs	0.582×10^{1}	0.525×10^{1}	7	0.98 ± 0.05	Acceptable
^{144}Ce	0.433×10^{2}	0.425×10^{2}	4	0.98 ± 0.05	Acceptable
^{238}Pu	0.420×10^{-1}	0.734×10^{-1}	25	1.75 ± 0.48	Unacceptable
^{239}Pu	0.450×10^{-1}	0.456×10^{-1}	32	1.01 ± 0.34	Acceptable
U (pCi/filter)	0.326×10^{-1}	0.309×10^{-1}	42	0.95 ± 0.42	Acceptable

[a]Acceptable ratio is 0.5 to 1.5.

Table 10.37. Proficiency Environmental Testing Control Program, Y-12 Analytical Services, Environmental Monitoring/East Laboratory, CY 1992, Level 1 Concentration

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Biochemical oxygen demand	103.5	0.638	11	0	0
Chemical oxygen demand	93.5	0.439	12	0	0
Total organic carbon	105.4	0.797	11	1	0
Ammonia nitrogen	99.9	0.248	12	0	0
Nitrate nitrogen	110.2	0.558	11	0	0
Phosphate-P	102.4	0.404	12	0	0
Kjeldahl nitrogen	117.2	0.416	11	0	0
Total phosphorus	96.9	0.282	12	0	0
Total suspended solids	83.7	0.771	12	0	0
Total dissolved solids	98.7	1.029	11	1	0
Oil and grease	98.4	0.518	11	0	0
Alkalinity	99.9	0.288	12	0	0
Calcium	101.1	0.298	12	0	0
Chloride	98.6	0.388	12	0	0
Conductivity	89.9	0.388	12	0	0
Magnesium	101.6	0.314	12	0	0
Potassium	104.3	0.443	12	0	0
Sodium	100.9	0.254	12	0	0
Sulfate	101.0	0.291	12	0	0
Total hardness	101.3	0.355	12	0	0
pH	96.4	0.781	12	0	0
Aluminum	104.7	0.450	12	0	0
Antimony	102.3	0.589	12	0	0
Arsenic	97.0	0.823	10	1	0
Barium	101.8	0.529	12	0	0
Beryllium	101.0	0.461	12	0	0
Boron	103.7	0.286	12	0	0
Cadmium	107.5	0.777	11	0	1
Chromium	102.4	0.260	12	0	0
Cobalt	101.8	0.404	12	0	0
Copper	105.1	0.670	11	1	0
Iron	111.4	0.791	11	0	1
Lead	102.9	0.616	12	0	0
Manganese	102.2	0.501	12	0	0
Mercury	100.9	0.249	11	0	0
Molybdenum	101.3	0.538	12	0	0
Nickel	103.5	0.486	12	0	0
Selenium	99.4	0.574	12	0	0
Silver	99.8	0.368	12	0	0
Thallium	93.5	0.577	11	0	0
Vanadium	102.7	0.417	12	0	0
Zinc	111.7	0.720	11	1	0
Phenol	94.9	0.503	12	0	0
Cyanide	94.0	0.570	12	0	0
Residual chlorine	100.0	0.437	11	0	0
Fluoride	101.7	1.080	10	1	1
Hexavalent chromium	98.3	0.895	10	0	0
Uranium	93.3	0.807	11	0	0
		Organics			
Benzene	94.0	1.076	8	0	0
Chlorobenzene	128.4	0.940	6	2	0
1,2-Dichlorobenzene	99.3	1.004	5	0	0
Ethylbenzene	105.9	1.041	7	1	0

Table 10.37 (continued)

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Toluene	123.6	1.072	5	0	0
Carbon tetrachloride	96.6	0.847	6	0	0
Chloroform	100.8	0.836	9	0	0
1,2-Dichloroethane	98.8	0.064	1	0	0
Methylene chloride	110.0	0.689	4	1	0
Tetrachloroethene	94.7	0.682	7	0	0
1,1,1-Trichloroethane	92.8	0.666	7	0	0
1,1,2-Trichloroethane	82.6	1.046	7	0	0
Trichloroethene	91.1	0.493	4	0	0
4-Chloro-3-methyl phenol	79.6	0.387	8	0	0
2-Chlorophenol	81.3	0.835	8	0	0
2,4-Dichlorophenol	73.4	0.545	4	0	0
2,4-Dinitrophenol	86.2	1.281	6	1	0
2-Methyl-4,6-dinitrophenol	97.0	1.225	2	0	0
2-Nitrophenol	79.2	0.638	8	0	0
4-Nitrophenol	70.4	0.708	6	0	0
Pentachlorophenol	106.3	1.323	6	0	0
Phenol	77.3	0.871	4	0	0
2,4,6-Trichlorophenol	80.9	0.296	6	0	0
Bis(2-ethylhexyl) phthalate	27.8	1.580	1	1	0
Di-n-butylphthalate	56.8	0.872	6	1	0
Diethylphthalate	41.2	1.155	5	2	0
Dimethylphthalate	62.5	0.821	3	0	0
2,4-Dinitrotoluene	86.9	0.593	3	0	0
2,6-Dinitrotoluene	84.3	0.511	5	0	0
Isophorone	80.0	0.386	5	0	0
Nitrobenzene	78.9	0.564	6	0	0
Acenaphthene	86.0	0.517	6	0	0
Anthracene	92.6	0.471	4	0	0
Benzo (a) pyrene	99.6	0.100	1	0	0
Chrysene	47.9	2.376	1	0	1
Napthalene	79.5	0.537	5	0	0
Phenanthrene	93.7	0.548	6	0	0
Pyrene	98.7	0.473	5	0	0
Bis (2-chloroethyl) ether	74.8	0.820	5	0	0
1,2-Dichlorobenzene	73.0	0.427	5	0	0
1,4-Dichlorobenzene	71.3	0.499	7	0	0
Hexachlorobenzene	63.7	1.115	1	0	0
Hexachlorobutadiene	72.4	0.408	4	0	0
Hexachlorocyclopentadiene	88.0	1.790	1	1	0
Hexachloroethane	60.4	0.434	2	0	0
1,2,4-Trichlorobenzene	80.6	0.842	8	0	0
Aldrin	58.6	0.775	4	0	0
Gamma-BHC	88.8	0.542	3	0	0
4,4'-DDT	88.9	0.352	2	0	0
Dieldrin	137.0	3.476	1	0	1
Endrin	81.1	1.048	1	0	0
Heptachlor	83.6	1.116	3	0	1

[a]Average of all results for the Y-12 Environmental Monitoring/East 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 10.38. Proficiency Environmental Testing Control Program, Y-12 Analytical Services, Environmental Monitoring/East Laboratory, CY 1992, Level 2 Concentration

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Biochemical oxygen demand	105.5	0.537	10	0	0
Chemical oxygen demand	120.0	1.482	11	0	1
Total organic carbon	102.7	0.344	12	0	0
Ammonia nitrogen	98.3	0.359	12	0	0
Nitrate nitrogen	106.5	0.662	11	0	0
Phosphate-P	102.0	0.404	12	0	0
Kjeldahl nitrogen	108.9	0.597	10	1	0
Total phosphorus	100.3	0.268	12	0	0
Total suspended solids	91.6	0.612	12	0	0
Total dissolved solids	98.6	0.769	10	2	0
Oil and grease	92.1	0.521	11	0	0
Alkalinity	102.8	0.309	12	0	0
Calcium	101.3	0.275	12	0	0
Chloride	99.3	0.445	12	0	0
Conductivity	90.2	0.377	12	0	0
Magnesium	102.0	0.362	12	0	0
Potassium	101.3	0.528	11	1	0
Sodium	100.4	0.290	12	0	0
Sulfate	101.5	0.606	12	0	0
Total hardness	101.6	0.442	12	0	0
pH	97.0	0.759	12	0	0
Aluminum	100.8	0.266	12	0	0
Antimony	103.3	0.516	12	0	0
Arsenic	98.6	0.228	12	0	0
Barium	101.3	0.451	12	0	0
Beryllium	101.0	0.537	12	0	0
Boron	101.4	0.333	12	0	0
Cadmium	104.1	0.548	12	0	0
Chromium	102.3	0.349	12	0	0
Cobalt	101.8	0.454	12	0	0
Copper	103.9	0.611	12	0	0
Iron	101.4	0.425	11	1	0
Lead	103.2	0.576	12	0	0
Manganese	100.7	0.387	12	0	0
Mercury	102.3	0.273	11	0	0
Molybdenum	101.1	0.406	12	0	0
Nickel	100.5	0.286	12	0	0
Selenium	142.8	5.533	11	0	1
Silver	101.1	0.310	12	0	0
Thallium	96.9	0.228	12	0	0
Vanadium	101.3	0.471	12	0	0
Zinc	103.4	0.552	12	0	0
Phenol	92.9	0.794	11	1	0
Cyanide	92.8	0.671	10	2	0
Residual chlorine	91.8	0.361	11	0	0
Fluoride	100.5	0.805	11	1	0
Hexavalent chromium	107.7	1.690	7	2	1
Uranium	89.6	0.892	11	0	0
		Organics			
Benzene	101.1	0.306	8	0	0
Chlorobenzene	98.2	0.365	8	0	0
1,2-Dichlorobenzene	118.6	1.243	4	1	0
Ethylbenzene	108.4	0.738	7	1	0

Table 10.38 (continued)

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		Unacceptable
			Acceptable	Warning	
Toluene	94.2	0.384	5	0	0
Carbon tetrachloride	103.6	0.478	6	0	0
Chloroform	102.7	0.433	9	0	0
1,2-Dichloroethane	108.1	0.784	1	0	0
Methylene chloride	110.5	0.469	5	0	0
Tetrachloroethene	102.8	0.652	7	0	0
1,1,1-Trichloroethane	104.2	0.422	7	0	0
1,1,2-Trichloroethane	101.3	0.511	7	0	0
Trichloroethene	101.7	0.542	4	0	0
4-Chloro-3-methyl phenol	85.2	0.438	8	0	0
2-Chlorophenol	76.0	0.679	8	0	0
2,4-Dichlorophenol	77.8	0.601	4	0	0
2,4-Dinitrophenol	93.8	0.699	7	0	0
2-Methyl-4,6-dinitrophenol	95.2	0.652	2	0	0
2-Nitrophenol	85.1	0.807	8	0	0
4-Nitrophenol	73.2	0.636	6	0	0
Pentachlorophenol	104.7	1.010	5	1	0
Phenol	72.4	0.607	5	0	0
2,4,6-Trichlorophenol	85.3	0.498	6	0	0
Bis(2-Ethylhexyl) phthalate	63.2	0.539	2	0	0
Di-n-butylphthalate	50.6	0.645	7	0	0
Diethylphthalate	30.5	1.180	6	1	0
Dimethylphthalate	33.7	0.681	3	0	0
2,4-Dinitrotoluene	98.2	0.898	3	0	0
2,6-Dinitrotoluene	89.2	0.621	5	0	0
Isophorone	77.9	0.192	5	0	0
Nitrobenzene	81.2	0.379	6	0	0
Acenaphthene	84.3	0.505	6	0	0
Anthracene	94.6	0.901	4	0	0
Benzo (a) pyrene	88.1	0.232	1	0	0
Chrysene	77.7	1.314	2	0	0
Napthalene	86.0	0.542	5	0	0
Phenanthrene	92.3	0.637	6	0	0
Pyrene	98.0	0.547	5	0	0
Bis (2-chloroethyl) ether	78.2	0.577	5	0	0
1,2-Dichlorobenzene	74.6	0.664	5	0	0
1,4-Dichlorobenzene	75.0	0.636	7	0	0
Hexachlorobenzene	81.0	0.158	1	0	0
Hexachlorobutadiene	83.9	0.967	4	0	0
Hexachlorocyclopentadiene	64.9	0.308	2	0	0
Hexachloroethane	76.8	0.832	2	0	0
1,2,4-Trichlorobenzene	78.3	0.645	8	0	0
Aldrin	62.8	0.758	4	0	0
Gamma-BHC	76.6	0.419	3	0	0
4,4'-DDT	89.9	0.067	2	0	0
Dieldrin	84.8	0.217	3	0	0
Endrin	80.0	0.803	1	0	0
Heptachlor	65.4	0.475	4	0	0

[a]Average of all results for the Y-12 Environmental Monitoring/East 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 10.39. Proficiency Environmental Testing Control Program, Y-12 Analytical Services, 9995 Waste Monitoring Laboratory, CY 1992, Level 1 Concentration

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Chemical oxygen demand	75.8	1.869	3	0	1
Total organic carbon	104.9	0.336	1	0	0
Oil and grease	94.1	1.128	5	0	0
Alkalinity	105.1	0.757	5	0	0
Chloride	99.4	0.212	5	0	0
Sulfate	104.3	0.604	5	0	0
Mercury	111.9	0.467	5	0	0
Phenol	102.0	0.506	7	0	0
Cyanide	114.6	1.226	5	0	1
Fluoride	93.2	1.082	3	0	1
		Organics			
Benzene	101.1	0.262	6	0	0
Chlorobenzene	103.6	0.269	5	0	0
1,2-Dichlorobenzene	100.6	0.297	3	0	0
Ethylbenzene	84.2	1.075	6	0	0
Toluene	102.2	0.571	3	0	0
Carbon tetrachloride	93.6	0.517	4	0	0
Chloroform	101.1	0.233	6	0	0
1,2-Dichloroethane	101.9	0.330	1	0	0
Methylene chloride	104.0	0.247	4	0	0
Tetrachloroethene	97.0	0.408	5	0	0
1,1,1-Trichloroethane	96.4	0.358	5	0	0
1,1,2-Trichloroethane	106.6	0.504	4	0	0
Trichloroethene	100.7	0.514	4	0	0

[a]Average of all results for the Y-12 9995 Waste Monitoring 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 10.40. Proficiency Environmental Testing Control Program, Y-12 Analytical Services, 9995 Waste Monitoring Laboratory, CY 1992, Level 2 Concentration

Parameter	Average recovery[a] (%)	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Warning	Unacceptable
Chemical oxygen demand	64.1	1.158	4	0	0
Total organic carbon	102.9	0.090	1	0	0
Oil and grease	95.5	0.543	5	0	0
Alkalinity	113.7	0.866	5	0	0
Chloride	100.1	0.303	5	0	0
Sulfate	100.5	0.376	5	0	0
Mercury	113.7	0.664	5	0	0
Phenol	103.1	0.655	7	0	0
Cyanide	95.0	0.504	7	0	0
Fluoride	93.2	1.082	3	0	1
		Organics			
Benzene	102.1	0.286	6	0	0
Chlorobenzene	102.5	0.321	5	0	0
1,2-Dichlorobenzene	99.9	0.514	3	0	0
Ethylbenzene	84.9	1.185	6	0	0
Toluene	100.4	0.330	3	0	0
Carbon tetrachloride	93.8	0.566	4	0	0
Chloroform	99.3	0.195	6	0	0
1,2-Dichloroethane	98.3	0.047	1	0	0
Methylene chloride	104.0	0.440	4	0	0
Tetrachloroethene	95.6	0.387	5	0	0
1,1,1-Trichloroethane	95.4	0.280	5	0	0
1,1,2-Trichloroethane	108.5	0.494	4	0	0
Trichloroethene	103.7	0.720	4	0	0

[a]Average of all results for the Y-12 9995 Waste Monitoring 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 10.41. Proficiency Environmental Testing Control Program, ORNL, CY 1992
Level 1 Concentration, Inorganics

Parameter	Average recovery (%)[a]	Average number of standard deviations[b]	Performance		
			Acceptable[c]	Marginal[c]	Unacceptable[c]
Biological oxygen demand	99.5	0.59	11	0	0
Total organic carbon	101.2	0.74	2	0	0
Chemical oxygen demand	105.9	1.44	4	0	0
Ammonia as nitrogen	105.5	0.27	12	0	0
Nitrate as nitrogen	99.4	0.39	12	0	0
Orthophosphate as phosphate	110.1	3.35	5	1	6
Total phosphorus	95.7	0.34	9	0	0
Total suspended solids	89.7	0.82	12	0	0
Total dissolved solids	104.0	0.55	11	0	0
Oil and grease	99.3	0.38	12	0	0
Alkalinity	96.7	0.44	12	0	0
Calcium	98.2	0.39	3	0	0
Chloride	102.5	0.71	12	0	0
Conductivity	93.6	0.45	12	0	0
Magnesium	98.9	0.29	3	0	0
Potassium	96.0	0.59	3	0	0
Sodium	97.1	0.72	3	0	0
Sulfate	95.4	0.40	12	0	0
Total hardness as $CaCo_3$	99.5	0.43	12	0	0
pH	100.7	0.61	12	0	0
Aluminum	96.3	0.46	11	0	1
Antimony	100.0	0.37	12	0	0
Arsenic	103.9	0.45	12	0	0
Barium	100.4	0.34	12	0	0
Beryllium	101.0	0.44	12	0	0
Boron	105.2	0.29	12	0	0
Cadmium	101.6	0.21	12	0	0
Chromium	99.7	0.34	12	0	0
Cobalt	99.4	0.20	11	0	0
Copper	99.7	0.19	12	0	0
Iron	100.2	0.25	11	0	0
Lead	100.9	0.35	12	0	0
Manganese	98.7	0.23	12	0	0
Mercury	99.4	0.54	6	0	0
Molybdenum	100.0	0.32	12	0	0
Nickel	99.2	0.32	11	0	0
Selenium	95.9	0.47	12	0	0
Silver	99.2	0.14	12	0	0
Thallium	101.6	0.34	4	0	0
Vanadium	91.5	2.25	11	0	1
Zinc	99.3	0.32	12	0	0
Phenol	98.3	0.35	12	0	0
Cyanide	103.5	0.34	12	0	0
Total orgainc halides	93.5	0.78	5	1	0
Uranium	100.2	0.64	11	0	0

[a]Average of all results at ORNL IA lab. 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 10.42. Proficiency Environmental Testing Control Program, ORNL, CY 1992 Level 2 Concentration, Inorganics

Parameter	Average recovery (%)[a]	Average number of standard deviations[b]	Performance		
			Acceptable[c]	Marginal[c]	Unacceptable[c]
Biological oxygen demand	107.5	0.87	10	1	0
Total organic carbon	94.3	0.72	2	0	0
Chemical oxygen demand	100.7	0.14	4	0	0
Ammonia as nitrogen	102.6	0.27	12	0	0
Nitrate as nitrogen	100.6	0.28	11	0	0
Orthophosphate as phosphate	96.7	1.06	9	2	0
Total phosphorus	100.1	0.68	9	0	0
Total suspended solids	91.1	0.85	12	0	0
Total dissolved solids	104.6	0.67	11	0	0
Oil and grease	96.2	0.51	12	0	0
Alkalinity	96.5	0.60	12	0	0
Calcium	96.6	0.43	3	0	0
Chloride	103.6	1.05	9	0	2
Conductivity	94.5	0.53	12	0	0
Magnesium	98.0	0.61	3	0	0
Potassium	99.0	0.33	3	0	0
Sodium	96.8	0.73	3	0	0
Sulfate	98.0	0.31	11	0	0
Total hardness as $CaCo_3$	100.1	0.29	12	0	0
pH	100.6	0.72	12	0	0
Aluminum	98.1	0.23	12	0	0
Antimony	102.3	0.41	12	0	0
Arsenic	104.0	0.49	12	0	0
Barium	100.3	0.38	12	0	0
Beryllium	101.0	0.55	12	0	0
Boron	100.9	0.41	12	0	0
Cadmium	100.9	0.27	12	0	0
Chromium	100.8	0.19	12	0	0
Cobalt	98.6	0.30	11	0	0
Copper	100.4	0.31	12	0	0
Iron	100.4	0.40	11	0	0
Lead	98.8	0.54	11	0	1
Manganese	99.3	0.31	12	0	0
Mercury	100.5	0.21	6	0	0
Molybdenum	99.5	0.24	12	0	0
Nickel	100.0	0.28	11	0	0
Selenium	102.8	0.57	11	0	0
Silver	99.5	0.18	12	0	0
Thallium	98.5	0.61	4	0	0
Vanadium	98.1	0.56	12	0	0
Zinc	99.1	0.23	12	0	0
Phenol	99.2	0.38	12	0	0
Cyanide	106.6	0.42	12	0	0
Total orgainc halides	85.7	0.68	6	0	0
Uranium	99.8	0.59	11	0	0

[a]Average of all results at ORNL IA lab. 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 10.43. Proficiency Environmental Testing Control Program, ORNL, CY 1992 Level 1 Concentration, Organics

Parameter	Average recovery (%)[a]	Average number of standard deviations[b]	Performance		
			Acceptable[c]	Marginal[c]	Unacceptable[c]
Benzene	99.8	0.46	10	0	0
Chlorobenzene	93.5	0.46	10	0	0
1,2-dichlorobenzene	100.7	0.30	6	0	0
1,4-dichlorobenzene	90.2	0.45	1	0	0
Ethylbenzene	94.1	0.40	10	0	0
Toluene	95.5	0.62	7	0	0
Carbon tetrachloride	88.0	0.68	7	0	0
Chloroform	95.1	0.69	11	0	0
1,2-dichloroethane	88.5	0.82	2	0	0
Methylene chloride	101.9	0.30	7	0	0
Tetrachloroethene	89.7	0.46	8	0	0
1,1,1-trichloroethane	90.1	0.60	9	0	0
1,1,2-trichloroethane	94.1	0.34	8	0	0
Trichloroethene	92.8	0.29	4	0	0
4-chloro-3-methylphenol	86.7	0.90	8	1	0
2-chlorophenol	76.1	0.69	10	0	0
2,4-dichlorophenol	73.3	0.60	6	0	0
2,4-dinitrophenol	58.3	0.40	8	0	0
2-methyl-4,6-dinitrophenol	71.1	0.54	2	0	0
2-nitrophenol	79.4	0.88	8	1	0
4-nitrophenol	86.4	0.96	8	0	0
Pentachlorophenol	92.5	0.94	8	0	0
Phenol	76.1	0.90	6	0	0
2,4,6-trichlorophenol	74.6	0.50	7	0	0
Bis(2-ethylhexyl)phthalate	63.4	0.57	5	0	0
Di-n-butylphthalate	104.0	0.96	8	0	0
Diethylphthalate	104.4	1.19	8	1	0
Dimethylphthalate	85.9	0.82	8	0	0
2,4-dinitrotoluene	84.6	0.55	4	0	0
2,6-dinitrotoluene	78.0	0.56	6	0	0
Isophorone	80.3	0.60	7	0	0
Nitrobenzene	76.2	0.40	7	0	0
Acenaphthene	82.7	0.72	6	1	0
Anthracene	95.5	0.87	5	0	0
Benzo(a)pyrene	85.4	0.35	1	0	0
Chrysene	92.2	0.22	3	0	0
Naphthalene	78.5	0.90	5	1	0
Phenanthrene	106.4	1.19	5	1	0
Pyrene	92.5	0.69	7	0	0
Bis(2-chloroethyl)ether	73.9	0.61	7	0	0
1,2-dichlorobenzene	69.9	0.08	4	0	0
1,4-dichlorobenzene	56.8	0.77	7	0	0
Hexachlorobenzene	71.4	1.22	2	0	0
Hexachlorobutadiene	42.5	1.23	4	0	0
Hexachlorocyclopentadiene	33.7	0.89	4	0	0
Hexachloroethane	47.5	1.08	4	0	0
1,2,4-trichlorobenzene	66.3	0.57	10	0	0
Aldrin	55.2	1.16	7	2	0
Gamma-BHC	80.3	0.36	6	0	0
4,4'-DDT	82.8	0.32	7	0	0
Dieldrin	81.0	0.33	9	0	0
Endrin	96.9	0.42	4	0	0
Heptachlor	69.8	0.70	8	0	0

[a]Average of all results at ORNL OAL group. 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 10.44. Proficiency Environmental Testing Control Program, ORNL, CY 1992 Level 2 Concentration, Organics

Parameter	Average recovery (%)[a]	Average number of standard deviations[b]	Performance		
			Acceptable[c]	Marginal[c]	Unacceptable[c]
Benzene	96.6	0.40	10	0	0
Chlorobenzene	94.9	0.33	10	0	0
1,2-dichlorobenzene	100.8	0.42	6	0	0
1,4-dichlorobenzene	91.0	0.50	1	0	0
Ethylbenzene	95.2	0.36	10	0	0
Toluene	95.4	0.33	7	0	0
Carbon tetrachloride	92.7	0.65	7	0	0
Chloroform	96.7	0.32	11	0	0
1,2-dichloroethane	92.8	0.60	2	0	0
Methylene chloride	100.2	0.22	7	0	0
Tetrachloroethene	90.6	0.35	8	0	0
1,1,1-trichloroethane	92.7	0.47	9	0	0
1,1,2-trichloroethane	98.0	0.36	8	0	0
Trichloroethene	92.1	0.42	4	0	0
4-chloro-3-methylphenol	85.2	0.86	8	2	0
2-chlorophenol	68.9	0.59	10	0	0
2,4-dichlorophenol	71.4	0.63	6	0	0
2,4-dinitrophenol	74.7	053	8	0	0
2-methyl-4,6-dinitrophenol	77.1	0.92	2	0	0
2-nitrophenol	85.4	0.80	8	1	0
4-nitrophenol	91.6	1.14	8	0	0
Pentachlorophenol	91.5	0.65	8	0	0
Phenol	71.7	0.74	6	0	0
2,4,6-trichlorophenol	74.7	0.57	6	1	0
Bis(2-ethylhexyl)phthalate	53.4	0.73	5	0	0
Di-n-butylphthalate	71.3	0.41	8	0	0
Diethylphthalate	88.2	0.85	9	0	0
Dimethylphthalate	73.7	0.59	8	0	0
2,4-dinitrotoluene	94.1	0.61	4	0	0
2,6-dinitrotoluene	85.7	0.47	6	0	0
Isophorone	78.5	0.40	7	0	0
Nitrobenzene	76.1	0.45	7	0	0
Acenaphthene	77.7	0.62	7	0	0
Anthracene	86.4	0.67	5	0	0
Benzo(a)pyrene	69.9	0.51	1	0	0
Chrysene	82.6	0.26	3	0	0
Naphthalene	75.8	0.82	6	0	0
Phenanthrene	94.0	0.85	6	0	0
Pyrene	81.2	0.65	7	0	0
Bis(2-chloroethyl)ether	69.8	0.53	7	0	0
1,2-dichlorobenzene	65.1	0.24	4	0	0
1,4-dichlorobenzene	52.5	0.67	6	1	0
Hexachlorobenzene	72.6	1.17	2	0	0
Hexachlorobutadiene	45.3	0.92	4	0	0
Hexachlorocyclopentadiene	41.5	0.80	4	0	0
Hexachloroethane	53.9	0.59	4	0	0
1,2,4-trichlorobenzene	64.5	0.54	10	0	0
Aldrin	54.9	1.12	8	1	0
Gamma-BHC	77.5	0.69	6	0	0
4,4'-DDT	80.6	0.32	7	0	0
Dieldrin	82.7	0.35	9	0	0
Endrin	108.3	0.47	4	0	0
Heptachlor	61.6	1.05	8	1	0

[a]Average of all results at ORNL OAL group. 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 10.45. Proficiency Environmental Testing Control Program, K-25 Site, CY 1992 Level 1 concentrations

Parameter[a]	Average recovery (%)[a]	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Marginal	Unacceptable
Alkalinity	103.572	1.40	7	0	1[d]
Aluminum	110.717	0.50	8	0	0
Ammonia nitrogen	131.990	0.58	7	0	1[e]
Antimony	95.541	0.01	7	0	0
Arsenic	93.571	–0.46	8	0	0
Barium	100.651	0.24	8	0	0
Beryllium	93.718	–0.61	8	0	0
Biochemical oxygen demand	106.958	0.54	7	0	1[f]
Boron	103.868	0.10	7	0	0
Cadmium	102.524	0.36	8	0	0
Calcium	168.970	6.65	7	0	1[g]
Chemical oxygen demand	91.880	–0.41	7	0	0
Chloride	101.644	0.39	8	0	0
Chromium	103.417	0.30	8	0	0
Chromium +6	93.263	–0.34	8	0	0
Cobalt	104.270	0.44	8	0	0
Conductivity	94.480	0.88	7	0	1[d]
Copper	104.102	0.46	8	0	0
Cyanide	87.283	–0.64	8	0	0
Fluoride	102.880	0.36	8	0	0
Iron	99.078	–0.01	8	0	0
Lead	90.551	–0.83	8	0	0
Magnesium	129.444	3.85	7	0	1[g]
Manganese	103.466	0.68	8	0	0
Mercury	99.186	–0.28	7	0	0
Molybdenum	99.671	0.19	7	0	0
Nickel	106.260	0.61	8	0	0
Nitrate nitrogen	87.160	–0.97	7	1	0
Oil and grease	88.409	–0.06	8	0	0
Orthophosphate as P	96.264	–0.65	8	0	0
pH	100.758	0.53	8	0	0
Phenol	115.625	0.92	6	2	0
Potassium	105.254	0.65	8	0	0
Selenium	92.576	–0.51	7	1	0
Silver	106.851	0.64	8	0	0
Sodium	104.288	0.59	8	0	0
Sulfate	98.128	–0.03	8	0	0
Thallium	92.251	–0.31	8	0	0
Total dissolved solids	107.896	0.15	8	0	0
Total hardness (as $CaCO_3$)	130.556	3.81	7	0	1[d]
Total Kjeldahl nitrogen	84.010	–0.74	1	0	0
Total organic carbon	100.635	–0.21	8	0	0
Total organic halides (TO_X)	113.910	0.34	3	0	0
Total phosphorus as P	108.973	0.42	8	0	0
Total residual chlorine	83.044	–0.82	7	1	0
Total suspended solids	84.018	–0.69	8	0	0
Uranium	101.436	0.29	8	0	0
Vanadium	102.693	0.32	8	0	0
Zinc	102.872	0.10	8	0	0

[a]Average of all results for K-25 Site. 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.

[d]Contaminated water.

[e]Instrument problems.

[f]No cause for results could be determined.

[g]Dilution error.

Table 10.46. Proficiency Environmental Testing Control Program, K-25 Site, CY 1992 Level 2 concentrations

Parameter[a]	Average recovery (%)[a]	Average number of standard deviations[b]	Performance[c]		
			Acceptable	Marginal	Unacceptable
Alkalinity	102.537	–0.02	8	0	0
Aluminum	109.145	0.55	8	0	0
Ammonia nitrogen	109.228	0.76	6	1	1[d]
Antimony	96.605	–0.19	7	0	0
Arsenic	94.773	–0.52	7	1	0
Barium	100.091	0.14	8	0	0
Beryllium	94.599	–0.62	8	0	0
Biochemical oxygen demand	110.667	0.33	8	0	0
Boron	100.969	0.21	7	0	0
Cadmium	103.602	0.49	8	0	0
Calcium	104.850	0.64	8	0	0
Chemical oxygen demand	83.448	–0.55	6	0	1[e]
Chloride	101.201	0.30	8	0	0
Chromium	104.185	0.48	8	0	0
Chromium +6	92.659	–0.85	8	0	0
Cobalt	103.081	0.61	8	0	0
Conductivity	93.439	0.43	8	0	0
Copper	104.602	0.75	8	0	0
Cyanide	85.656	–0.86	8	0	0
Fluoride	106.892	0.80	8	0	0
Iron	101.925	0.27	8	0	0
Lead	102.184	–0.05	7	0	1[f]
Magnesium	107.351	1.15	8	0	0
Manganese	103.451	0.78	8	0	0
Mercury	96.301	–0.36	7	0	0
Molybdenum	97.871	–0.02	7	0	0
Nickel	107.075	0.89	8	0	0
Nitrate nitrogen	88.736	–0.98	7	0	0
Oil and grease	90.632	0.06	7	1	0
Orthophosphate as P	101.014	0.03	8	0	0
pH	99.929	0.24	8	0	0
Phenol	100.179	0.24	8	0	0
Potassium	103.088	0.37	8	0	0
Selenium	91.544	–0.53	8	0	0
Silver	103.775	0.58	8	0	0
Sodium	104.245	0.60	8	0	0
Sulfate	98.826	–0.22	8	0	0
Thallium	90.409	–0.55	7	1	0
Total dissolved solids	104.682	0.14	8	0	0
Total hardness (as $CaCO_3$)	97.490	–0.38	8	0	0
Total Kjeldahl nitrogen	85.866	–0.78	1	0	0
Total organic carbon	99.757	–0.24	8	0	0
Total organic halides (TO_x)	114.716	1.01	3	0	0
Total phosphorus as P	104.233	0.47	8	0	0
Total residual chlorine	95.524	0.17	8	0	0
Total suspended solids	89.354	–0.63	8	0	0
Uranium	98.566	0.51	8	0	0
Vanadium	102.830	0.57	7	1	0
Zinc	103.690	0.61	8	0	0

[a]Average of all results for K-25 Site. 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.

[d]Instrument problems.

[e]No cause for results could be determined.

[f]Dilution error.

Table 10.47. Environmental audits and reviews at the Y-12 Plant during 1992

Date	Audit	Reviewer	Subject	Findings
February 10–21	Assessment	DOE-HQ	ES&H Program	1
February 12–21	Appraisal	DOE-ORO	Fusion Energy	8
March 31–April 2	Inspection	EPA	Compliance Sampling	1
March 31–April 2	Inspection	EPA	EPA Sampling	0
April 21–23	Inspection	EPA	NESHAP	1
April 22	Inspection	DOE-ORO	NEPA Surveillance	2
April 22–24	Inspection	EPA	TSCA	1
April 27–May 1	Inspection	TDEC	RCRA	1
May 12–21	Appraisal	DOE-HQ	Technical Safety Appraisal	19
June 16–19	Inspection	TDEC	Annual Clean Air Compliance	1
June 25	Assessment	TDEC	Clean Air Compliance	1
September 14–18	Audit	Martin Marietta Corporation	Environmental Program	86
September 22	Inspection	TDEC	Tennessee Solid Waste Disposal Act	12
October 7–27	Surveillance	DOE-ORO	Air Pollution Control Program	3
October 8–November 10	Surveillance	DOE	Dike Water Management Program	3
October 16–21	Surveillance	DOE-ORO	Air Pollution Control Program	0
October 29–November 3	Audit	DOE	NESHAPS Annual Report	*a*
November 30–December 30	Surveillance	DOE-ORO	Air Pollution Control Program	1
December 9	Surveillance	DOE-ORO	RCRA	6
December 31–January 7, 1993	Surveillance	DOE-ORO	Air Pollution Program	0

[a]No report available.

Table 10.48. Environmental audits and reviews at ORNL during 1992

Date	Audit/review	Reviewer	Subject	Findings/outcome
February–November	Review of ORNL air-permitted sources	DOE-ORO, X-10 Site Office	Thirty-five air-permitted sources were reviewed during 9 separate surveillances	No findings were cited; several observations have been resolved
February–October	Surveillance of ORNL RCRA satellite and 90-day accumulation areas and sampling and analytical QA	DOE-ORO, RCRA Waste Generator, X-10 Site Office	Areas at X-10 Site and X-10 at Y-12 Site were reviewed on 5 separate occasions	No previously identitified regulatory concerns were cited. However, there were several observations, many of which have been resolved
March 18–19	RCRA inspection	TDEC	RCRA TSD facilities	No findings were cited
April 10	Mixed waste storage facilities	DOE-ORO, X-10 Site Office	Compliance with RCRA and DOE orders	Several observations were noted; areas of concern have been resolved
April 17	Air emission source inspection	TDEC	Selected air-permitted sources	No findings were cited
May 20–25	Review of ORNL Environmental Compliance Program	Energy Systems	Multimedia compliance review of environmental management	Eighteen previously unidentified findings were cited
June 27	NPDES Compliance evaluation inspection	EPA-IV	Review of ORNL NPDES Permit Monitoring Program	No findings were cited; areas of concern have been resolved
July 8–18	Clean Water Act surveillance	DOE-ORO, X-10 Site Office	Review of ORNL NPDES Program, ORNL Surface Water Compliance Status	Findings have been resolved or scheduled for resolution
July 30–31	RCRA inspection	TDEC	RCRA Waste Generator Areas at X-10 Site and X-10 facilities at Y-12 Plant	No findings were cited; two areas of potential concern were resolved
August 19–20	RCRA groundwater comprehensive monitoring evaluation	TDEC	Review of ORNL SWSA 6 Groundwater Monitoring Program	No findings were cited

Table 10.49. K-25 Site internal and external environmental audits during 1992

Subject	Auditors	Date	Findings
K-25 Wastewater Treatment Facilities (K-1407 CNF K-1232)	DOE	2/92	32 findings No observations
K-25 Vaults RCRA Waste Storage Facilities (K-301-1 K-306-4 Vaults	DOE	9/92	32 Findings 26 observations
Groundwater Protection Program Walkthrough	DOE	9/92	No findings No observations
CNF Pipeline Investigation	EPA	11/92	
PCB Inspection	EPA	4/92	
Technical Audit of the K-25 Site	Energy Systems	7/92	20 findings 17 negative observations
Environmental Compliance/Waste Management Audit (Conard Stair)	Energy Systems	7/92	20 Findings 33 negative observations
Analytical Laboratory & Sampling Verification	Energy Systems	12/92	No findings No observations
RCRA Inspection	TDEC	4/92	
RCRA Inspection (TSCA Incinerator only)	TDEC	7/92	
CAA Inspection	TDEC	7/92	
CNF Operations Program	K-25 Site	3/92	1 finding 1 positive observation
Groundwater Protection Program	K-25 Site	6/92	3 negative observations
Site Underground Storage Tanks (Including Management Plan)	K-25 Site	6/92	1 finding No observations
Technical Specifications for Processing PWMP Drums	K-25 Site	1/92	No findings No observations
K-25 Site Air Source Evaluation	K-25 Site	1/92	No findings No observations
K-25 RCRA Satellite and 90-Day Accumulation Area	K-25 Site	1/92	7 findings 6 observations
K-25 RCRA Satellite and 90-Day Accumulation Area	K-25 Site	4/92	3 findings No observations
AVLIS–NEPA Env. Assessment Compliance Status	K-25 Site	2/92	No findings No observations
NEPA–Documentation Requirements	K-25 Site	5/92	No findings No observations
Underground Storage Tanks Record/Tracking System	K-25 Site	3/92	12 findings 5 observations
Implementation of the K-25 Site Groundwater Sampling and Monitoring Implementation Plan	K-25 Site	3/92	No findings No observations
GWPP-Sampling and Environmental Field	K-25 Site	3/92	1 finding No observations
Implementation of the K-25 Site Spill Prevention Control and Counter-Measure (SPCC) Document	K-25 Site	3/92	No findings No observations
K-25 Site PCB Temporary Storage Areas (stays)	K-25 Site	9/92	1 concern No findings No observations
K-25 Site PCB Storage Areas	K-25 Site	9/92	1 concern No findings No observations
Mitchell Branch Watershed (Erosion/Pollution Control)	K-25 Site	6/92	1 observation No findings No observations
NPDES EPA Analytical laboratory Method 325.3	K-25 Site	9/92	1 concern No findings No observations

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