

**U.S. Department of Energy
Portsmouth Annual Environmental Data
for 2004
Piketon, Ohio**

Date Issued—August 2006

Prepared by
CDM, a Joint Venture/Environmental Quality Management, Inc.
Piketon, OH
under subcontract LPP05S0003

Prepared for the
U.S. Department of Energy
Portsmouth Paducah Project Office

LATA/PARALLAX PORTSMOUTH, LLC
managing the
Environmental Remediation Activities at the
Portsmouth Gaseous Diffusion Plant
under contract DE-AC24-05OH20192
for the
U.S. DEPARTMENT OF ENERGY

Classification Authority

Classification Authority
Classification Authority
Classification Authority
Classification Authority

This document is approved for public release
per review by:
Henry H. Thomas 9/15/05
PORTS Classification/Information Office Date

Classification Authority
Classification Authority
Classification Authority
Classification Authority
Classification Authority

CONTENTS

TABLES.....	v
ACRONYMS.....	vii
1. INTRODUCTION.....	1-1
2. ENVIRONMENTAL MONITORING.....	2-1
3. DOSE.....	3-1
4. GROUNDWATER.....	4-1

This page intentionally left blank.

TABLES

2.1	Radionuclide concentrations in DOE and USEC NPDES outfall water samples for 2004.....	2-2
2.2	DOE NPDES permit summary for 2004	2-5
2.3	2004 DOE NPDES discharge and compliance rates	2-6
2.4	2004 USEC NPDES discharge monitoring results.....	2-8
2.5	Radionuclides and PCBs in surface water runoff samples from DOE depleted uranium hexafluoride cylinder storage yards for 2004.....	2-11
2.6	Ambient air monitoring program summary for radionuclides and fluoride – 2004	2-13
2.7	DOE environmental radiation monitoring program (mrem) – 2004	2-17
2.8	Quarterly dose measurements (mrem/quarter) at locations near the depleted uranium cylinder storage yards – 2004.....	2-18
2.9	Local surface water monitoring program results for chemical and radiological parameters – 2004	2-19
2.10	Sediment monitoring program results – 2004	2-24
2.11	Soil and vegetation monitoring at ambient air monitoring stations – 2004	2-29
2.12	Biota (fish) monitoring program results – 2004.....	2-32
2.13	Biota (crops) monitoring program results – 2004	2-33
3.1	Emissions (Ci/year) from DOE PORTS air emission sources in 2004	3-1
3.2	Predicted radiation doses from airborne releases at PORTS in 2004.....	3-2
3.3	Dose calculations for ambient air monitoring stations in 2004.....	3-2
4.1	Volatile organic compounds detected at the X-749/X-120/PK Landfill	4-4
4.2	Results for radionuclides at the X-749/X-120/PK Landfill.....	4-16
4.3	Volatile organic compounds detected at the Quadrant I Groundwater Investigative Area	4-36
4.4	Results for radionuclides at the Quadrant I Groundwater Investigative Area.....	4-40
4.5	Volatile organic compounds detected at the Quadrant II Groundwater Investigative Area.....	4-50
4.6	Results for radionuclides at the Quadrant II Groundwater Investigative Area	4-52

4.7	Volatile organic compounds detected at the X-701B Holding Pond	4-55
4.8	Results for radionuclides at the X-701B Holding Pond	4-58
4.9	Results for chromium at the X-633 Pumphouse/Cooling Towers Area	4-68
4.10	Volatile organic compounds detected at the X-616 Chromium Sludge Surface Impoundments	4-69
4.11	Results for chromium at the X-616 Chromium Sludge Surface Impoundments	4-70
4.12	Results for radionuclides at the X-616 Chromium Sludge Surface Impoundments	4-71
4.13	Volatile organic compounds detected at the X-740 Waste Oil Handling Facility	4-73
4.14	Results for radionuclides at the X-740 Waste Oil Handling Facility	4-76
4.15	Results for beryllium and chromium at the X-611A Former Lime Sludge Lagoons	4-80
4.16	Results for radionuclides at the X-735 Landfills	4-81
4.17	Volatile organic compounds detected at the X-734 Landfills	4-86
4.18	Results for radionuclides at the X-734 Landfills	4-87
4.19	Results for cadmium, cobalt, and nickel at the X-533 Switchyard Area	4-91
4.20	Volatile organic compounds detected at surface water monitoring locations	4-92
4.21	Results for radionuclides at surface water monitoring locations	4-94
4.22	Results for radionuclides at exit pathway monitoring locations	4-98

ACRONYMS

°C	degrees Celsius
Ci	curie
cm	centimeter
DCG	derived concentration guide
DOE	U.S. Department of Energy
DOE PORTS	facilities operated by DOE (not leased to USEC) at the Portsmouth Gaseous Diffusion Plant
g	gram
GWTF	groundwater treatment facility
kg	kilogram
km	kilometer
L	liter
m	meter
m ³	cubic meter
μg	microgram
mg	milligram
MGD	million gallons per day
mR	milliroentgen
mrem	millirem
na	not analyzed
ND	not detected
NPDES	National Pollutant Discharge Elimination System
pCi	picocurie
PK	Peter Kiewit
PORTS	Portsmouth Gaseous Diffusion Plant
SU	standard unit
TU _a	acute toxicity unit
USEC	United States Enrichment Corporation
VOC	volatile organic compound

SECRET

SECRET

CONFIDENTIAL

CONFIDENTIAL

SECRET

CONFIDENTIAL

SECRET

This page intentionally left blank.

CONFIDENTIAL

CONFIDENTIAL

1. INTRODUCTION

Environmental monitoring at the Portsmouth Gaseous Diffusion Plant (PORTS) is conducted throughout the year. Monitoring demonstrates that the site is a safe place to work, that plant operations do not adversely affect neighboring communities, and that activities comply with federal and state regulations.

This document is a compilation of the environmental monitoring data for calendar year 2004 and is intended as a tool for analysts in environmental monitoring, environmental restoration, and other related disciplines. The data in this document form the basis for the summary information in the *Portsmouth Annual Environmental Report for 2004* (DOE/PPPO/03-0001&D1).

Radiological monitoring data presented in this Data Report and discussed in the *Annual Environmental Report for 2004* indicate that the maximum dose a member of the public could receive from radionuclides released by PORTS in 2004 or detected by environmental monitoring programs in 2004 is 1.86 mrem, which is significantly less than the 100 mrem limit set by DOE.

Other non-radiological chemicals such as metals and volatile organic compounds are also monitored. Discharges of metals and other chemicals to surface water are controlled by National Pollutant Discharge Elimination System (NPDES) permits. None of the discharge limitations in these permits were exceeded during 2004. The *Annual Environmental Report for 2004* provides more information about non-radiological chemicals released from PORTS or detected by PORTS monitoring programs during 2004.

