1 of 1

January 15, 1993

**ENVIRONMENTAL RESTORATION
SITE-SPECIFIC PLAN FOR THE
PADUCAH GASEOUS DIFFUSION PLANT**

***U.S. Department of Energy
Oak Ridge Field Office***

**ENVIRONMENTAL RESTORATION
SITE-SPECIFIC PLAN FOR THE PADUCAH GASEOUS DIFFUSION PLANT**

FY93

**N. Frolio, DOE Site-Specific Plan Project Manager
DOE Field Office, Oak Ridge, Waste Management Division**

And

**A.T. Manion, Doe Site-Specific Plan Project Manager
DOE Field Office, Oak Ridge, Environmental Restoration Division**

**R.C. Edwards, Manager
DOE Paducah Program
DOE Field Office
Environmental Restoration Division**

**M.F.P. DeLozier, Director
Environmental Restoration Division
Martin Marietta Energy Systems, Inc.**

**K.G. Kahl, Director
Program Integration and
Administration Division
Martin Marietta Energy Systems, Inc.**

**D.G. Cope, Manager
Paducah Site
Environmental Restoration Division
Martin Marietta Energy Systems, Inc.**

Date Issued - January 15, 1993

**Prepared by
Science Applications International Corporation
Oak Ridge, TN 37831
under subcontract 95K-TK690C**

**Prepared for
U.S. Department of Energy
Office of Environmental Restoration and Waste Management
under budget and reporting code EW 20**

**MARTIN MARIETTA ENERGY SYSTEMS, INC.
managing the
Oak Ridge National Laboratory, Oak Ridge Y-12 Plant, and Oak Ridge K-25 Site
under contract DE-AC05-84OR21400
and the
Paducah Gaseous Diffusion Plant and Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-76OR00001
for the U.S. DEPARTMENT OF ENERGY**

MASTER

**Science Applications International Corporation
Oak Ridge, Tennessee**

**contributed to the preparation of this document and
should not be considered an eligible contractor for its
review.**

This report has been reproduced directly from the best available copy.

**Available to DOE and DOE contractors from the Office of Scientific
and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; prices
available from 615-576-8401, FTS 626-8401.**

**Available to the public from the National Technical Information Service,
U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA
22161.**

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

TABLE OF CONTENTS

	ACRONYMS	vii
1.0	INTRODUCTION	1-1
1.1	DESCRIPTION OF THE INSTALLATION	1-1
1.2	ENVIRONMENTAL RESTORATION (ER)	1-1
1.2.1	Environmental Restoration	1-4
2.0	REQUIREMENTS FOR IMPLEMENTATION	2-1
2.1	FEDERAL AND STATE REGULATIONS	2-1
2.1.1	The Resource Conservation and Recovery Act (RCRA)	2-1
2.1.2	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)	2-2
2.1.3	The National Environmental Policy Act (NEPA)	2-3
2.1.4	The Toxic Substances Control Act (TSCA)	2-3
2.1.5	The Clean Air Act (CAA)	2-3
2.1.6	The Clean Water Act (CWA)	2-4
2.2	DOE ORDERS	2-4
2.3	FEDERAL, STATE, AND LOCAL AGREEMENTS, ORDERS, AND DECREES	2-7
2.4	COURT DECREES	2-9
2.5	SUMMARY	2-9
3.0	ORGANIZATION/MANAGEMENT	3-1
3.1	ORGANIZATION	3-1
3.1.1	The Environmental Management Department of the Environment, Safety, and Health Division	3-1
3.1.2	The Environmental Restoration Department of the Environment, Safety, and Health Division	3-1
3.1.3	The Waste Management Department of the Chemical and Waste Services Division	3-2
3.1.4	The Environmental Monitoring Department of the Environment, Safety, and Health Division	3-2
3.1.5	The Analytical Laboratory Department of the Technical Services Division	3-2
3.1.6	The ES&H Shift Staff of the Safeguards and Security Division ...	3-2
3.1.7	Special Management Programs	3-2
3.1.8	The Plant Engineering Division	3-3
3.1.9	The Central Waste Management Division	3-3
3.1.10	Department of Energy	3-3
3.1.11	The Environmental Technology Department of the Technical Services Division	3-4

TABLE OF CONTENTS (continued)

3.2	MANAGEMENT	3-4
3.2.1	Environmental Restoration	3-4
4.0	ENVIRONMENTAL RESTORATION	4-1
4.1	OVERVIEW	4-1
4.1.1	Environmental Restoration Accomplishments for FY91 and FY92	4-1
4.1.2	Description	4-2
4.1.3	Resources	4-3
4.1.4	Schedules and Milestones	4-3
4.1.5	Funding	4-5
4.2	PROGRAM SUPPORT	4-6
4.2.1	Description	4-6
4.2.2	Resources	4-6
4.2.3	Schedules and Milestones	4-6
4.2.4	Funding	4-7
4.3	ASSESSMENT AND CHARACTERIZATION	4-7
4.3.1	Description	4-7
4.3.2	Resources	4-9
4.3.3	Schedules and Milestones	4-10
4.3.4	Funding	4-11
4.4	REMEDIATION	4-12
4.4.1	Description	4-12
4.4.2	Resources	4-12
4.4.3	Schedules and Milestones	4-13
4.4.4	Funding	4-13
4.5	DECONTAMINATION AND DECOMMISSIONING	4-13
4.5.1	Description	4-13
4.5.2	Resources	4-14
4.5.3	Schedules and Milestones	4-15
4.5.4	Funding	4-15
4.6	UNDERGROUND STORAGE TANKS (UST)	4-15
4.6.1	Description	4-15
5.0	COMPLIANCE WITH NATIONAL ENVIRONMENTAL POLICY ACT ...	5-1
5.1	ACTIONS RELATIVE TO NEPA	5-1

TABLE OF CONTENTS
(continued)

6.0	REPORTING AND DATA MANAGEMENT	6-1
6.1	REQUIRED REPORTS	6-1
6.2	MAINTENANCE OF RECORDS	6-2
6.3	SAMPLING AND ANALYSES	6-2
6.4	DATA VALIDATION/VERIFICATION	6-2
7.0	QUALITY ASSURANCE OBJECTIVES	7-1
7.1	PLANNING	7-2
7.2	IMPLEMENTATION	7-2
7.3	VERIFICATION	7-3
7.4	SAMPLING QUALITY ASSURANCE	7-3
7.5	ANALYTICAL QUALITY ASSURANCE	7-3
8.0	FEDERAL, STATE, AND LOCAL INTERACTIONS	8-1

Appendices:

Appendix A	GLOSSARY	A-1
Appendix B	REGULATORY COMMENTS	B-1
Appendix C	SITE MAP	C-1
Appendix D	PUBLIC COMMENTS	D-1

LIST OF TABLES AND FIGURES

<u>Tables</u>	<u>Page</u>
1 PGDP ERP ADS Crosswalk	1-3
2 Funding Summary Table (\$000)	1-4
3 List of PGDP Waste Management Units	1-4
4 Requirements for Project Implementation	2-10
5 PGDP's Major FY93 Milestones by ADS	4-4
6 PGDP ER Program Funding (\$000)	4-5
7 PGDP's ER Major Milestones	4-6
8 ER Program Support Funding (\$000)	4-7
9 Schedules and Milestones	4-10
10 PGDP ER Program Assessment Funding (\$000)	4-11
11 PGDP ER Program Remediation Funding (\$000)	4-13
12 Schedules and Milestones	4-15
13 PGDP D&D Funding (\$000)	4-15
14 NEPA Documents in Preparation or Planned Fiscal Year 1993	5-2
15 Environmental Reports	6-1

Figures

1 Map showing the location of PGDP within the state	1-2
2 Map showing the location of PGDP within the region	1-2
3 Site Map - Appendix C	C-1

LIST OF ACRONYMS

ACO	Administrative Consent Order
ADM	Action Description Memorandum
ADS	Activity Data Sheets
AIP	Agreement in Principle
ANSI	American National Standards Institute
AOC	Areas of Concern
AR	Administrative Record
ARARs	applicable relevant and appropriate requirements
ASME	American Society of Mechanical Engineers
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COR	Contracting Office Representative
CWA	Clean Water Act
D&D	Decontamination and Decommissioning
DOE	Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
ES	Energy Systems
EPA	Environmental Protection Agency
ER	Environmental Restoration
ES&H	Environment, Safety, and Health
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Agreement
HSWA	Hazardous and Solid Waste Amendment
KDOW	Kentucky Division of Water
KPDES	Kentucky Pollutant Discharge Elimination System
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollution
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NQA	National Quality Assurance
NQA-1	ANSI/ASME "Quality Assurance Program Requirement for Nuclear Facilities"
OR	Oak Ridge Field Office
PCB	Polychlorinated Biphenyl
PGDP	Paducah Gaseous Diffusion Plant
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SARA	Superfund Amendments and Reauthorization Act
SSP	Site-Specific Plan

SWMU	Solid Waste Management Unit
TCE	Trichloroethylene
TRU	Transuranium, transuranic
TSCA	Toxic Substances Control Act
UST	Underground Storage Tank
WAG	Waste Area Grouping
WKWMA	West Kentucky Wildlife Management Area
WMD	Waste Management Department

1.0 INTRODUCTION

1.1 DESCRIPTION OF THE INSTALLATION

The Paducah Gaseous Diffusion Plant (PGDP) occupies 748 security-fenced acres located on a 3400-acre tract in McCracken County, Kentucky, which was previously part of the Kentucky Ordnance Works TNT Plant (see Figures 1 and 2). The major access route to PGDP is U. S. Highway 60 which is intersected by Kentucky Highway 1154 (plant entrance road) approximately 16 road miles west of Paducah and 3 road miles south of the plant. Interstate Highway I-24 is east of the plant and intersects U. S. Highway 60 near the present city limits of Paducah. The largest cities within a 50-mile radius of the site are Paducah, Kentucky, with a population of approximately 30,000, located approximately 10 air miles east of the plant, and Cape Girardeau, Missouri, located approximately 40 miles west. The area surrounding the plant is mostly rural, with residents and farms located in all directions around the plant. The population of McCracken County, which includes Paducah and the PGDP area, is approximately 60,000. PGDP is located between Big and Little Bayou Creeks, which join north of the plant before entering the Ohio River. The plant's north, east, and west boundaries are defined by the West Kentucky Wildlife Management Area (WKWMA) on land which is managed by the Department of Fish and Wildlife Resources. Approximately 2,080 acres are presently leased to the Kentucky Wildlife Department. Also adjoining the northern boundary is the Tennessee Valley Authority Shawnee Steam Plant.

PGDP is managed for the Department of Energy (DOE) by Martin Marietta Energy Systems, Inc. (Energy Systems) and has an approved budget level of approximately 1,800 employees for FY92. The principle on-site process at PGDP is the separation of uranium isotopes through gaseous diffusion. The process produces enriched uranium, which is used for nuclear fuel in commercial power plants and for military purposes. Currently, the product of the Paducah gaseous diffusion process contains approximately 1.5 percent U^{235} and is used as feed material for the Portsmouth plant.

1.2 ENVIRONMENTAL RESTORATION (ER)

This section provides an overview of the major ER concerns at Paducah Gaseous Diffusion Plant (PGDP). The identified solid waste management units at PGDP are listed in Table 3. In the Department of Energy (DOE) Five Year Plan development process, one or more waste management units are addressed in a series of activity data sheets (ADSs) which identify planned scope, schedule, and cost objectives that are representative of the current state of planned technical development for individual or multiple sites. The units are grouped where doing so is technically and economically advantageous, that is, where cross-contamination is likely and, therefore, concurrent planning is desirable. Each of these waste management units is addressed in the 1994-1998 ER Five Year Plan as part of one or more of the ADSs identified in Table 1. The ADS numbers assigned in the 1994-1998 ER Five

Year Plan are referenced to a corresponding number, which is used to identify the work in the 1993-1997 ER Five Year Plan published last year. Each ER ADS has been given a priority rating of level 1, 2, 3, or 4. Priority 1 includes activities necessary to prevent near-term adverse impacts to workers, the public, or the environment. Priority 2 items encompass those activities required to meet the terms of agreements (in place or in negotiation) between DOE and federal, state, and local agencies. Priority 3 includes activities required for compliance with external environmental regulations that were not covered by Priority 1 and 2. Other actions included in Priority 3 are activities to ensure compliance with DOE Orders that implement external regulations or that set specific DOE regulatory standards, actions that would reduce risks or costs, and actions that would prevent disruption of the DOE mission. Priority 4 includes activities that are not required by regulation but that are desirable.

Table 1. PGDP ERP ADS Crosswalk

Description	Old ADS No. 1993-1997 ER Five Year Plan	New ADS No. 1994-1998 ER Five Year Plan
Support Facilities	554	5301
Off-Site Groundwater Contamination	551, 556	5302
Waste Area Groupings (WAGs) 5, 11	555, 556	5303
WAGs 1, 7	555, 556	5304
WAG 13	555, 556	5305
WAGs 8, 9	555, 556	5306
WAGs 12, 15	555, 556	5307
WAGs 10, 16	555, 556	5308
WAG 17	555, 556	5309
WAG 18	555, 556	5310
Groundwater Programs	552	5311
Underground Storage Tank (UST)	553, 555, 556	5312
WAGs 2, 3, 14	555, 556	5313
Program Management	550, 540, 557	5501
Decontamination and Decommissioning	510	5701

A funding summary table for FY92 through FY94 for ER is provided in Table 2. The funding requirements represent the requested dollars to improve and/or resolve environmental issues. Results of any reduced funding may include delays in meeting permit [Hazardous and Solid Waste Amendment (HSWA)] and Administrative Consent Order (ACO) commitments such as development and implementation of work plans and remediation efforts.

Table 2. Funding Summary Table (\$000)

	1993
ER*	51,279

*Includes Uranium Enrichment Program contribution of \$24,289.

1.2.1 Environmental Restoration

The two major site characterization projects in 1993 are the investigations of local groundwater contamination and the 169 solid waste management units (SWMUs) and areas of concern (AOC). A listing of the SWMUs and AOCs is provided in Table 3. The locations of these units are identified on the maps provided in Appendix C. Site investigation efforts on groundwater contamination were initiated in May 1989 and will be continuing through 1993. Development of Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plans will be initiated for the investigation of high-priority SWMUs/AOCs [as agreed upon by the Environmental Protection Agency (EPA)/State of Kentucky]. The investigation of the 169 SWMUs and AOCs is required under the HSWA permit issued from EPA in 1991.

Table 3. List of PGDP Waste Management Units

Unit No.	Name
1	C-747 Oil Landfarm
2	C-749 Uranium Burial Ground
3	C-404 Low-Level Radioactive Waste Burial Ground
4	C-747 Contaminated Burial Yard
5	C-746-F Classified Burial Yard
6	C-747-B Burial Ground
7	C-747-A Burial Ground
8	C-746-K Inactive Sanitary Landfill

Table 3. List of PGDP Waste Management Units

Unit No.	Name
9	C-746-S Residential Landfill
10	C-746-T Inert Landfill
11	C-400 Trichloroethylene Leak Site
12	C-747-A UF ₄ Drum Yard
13	C-746-P Clean Scrap Yard
14	C-746-E Contaminated Scrap Yard
15	C-746-C Scrap Yard
16	C-746-D Classified Scrap Yard
17	C-616-E Sludge Lagoon
18	C-616-F Full Flow Lagoon
19	C-410-B Neutralization Lagoon
20	C-410-E HF Emergency Holding Pond
21	C-611-W Sludge Lagoon
22	C-611-Y Overflow Lagoon
23	C-611-V Lagoons
24	C-750-D Underground Storage Tank
25	C-750, 1000 Gallon Waste Oil Tank
26	C-400 to C-404 Underground Transfer Line
27	C-722 Acid Neutralization Tank
28	C-712 Acid Neutralization Tank
29	C-746-B Transuranium Storage Area
30	C-747-A Burn Area
31	C-720 Compressor Pit Water Storage Tank
32	C-728 Clean Waste Oil Tank
33	C-728 Motor Cleaning Facility
34	C-746-M Polychlorinated Biphenyl (PCB) Waste Storage Area

Table 3. List of PGDP Waste Management Units

Unit No.	Name
35	C-337 PCB Waste Storage Area
36	C-337 PCB Waste Staging Area
37	C-333 PCB Waste Staging Area
38	C-615 Sewage Treatment Plant
39	C-746-B PCB Waste Storage Area
40	C-403 Neutralization Tank
41	C-410-C Neutralization Tank
42	C-616 Chromate Reduction Facility
43	C-746-B Waste Chemical Storage Area
44	C-733 Hazardous Waste Storage Area
45	C-746-R Waste Solvent Storage Area
46	C-409 Hazardous Waste Pilot Plant
46A	C-746-Q Hazardous and Low-Level Waste Storage Building
47	C-400 Technetium Storage Tank Area
48	C-400-A Gold Dissolver Storage Tank
49	C-400-B Waste Solution Storage Tank
50	C-400-C Nickel Stripper Evaporation Tank
51	C-400-D Lime Precipitation Tank
52	C-400 Waste Decontamination Solution Storage Tanks
53	C-400 NaOH Precipitation Tank
54	C-400 Degreaser Solvent Recovery Unit
55	C-405 Incinerator
56	C-540-A PCB Waste Staging Area
57	C-541-A PCB Waste Staging Area
58	N-S Diversion Ditch (outside plant security area)
59	N-S Diversion Ditch (inside plant security area)

Table 3. List of PGDP Waste Management Units

Unit No.	Name
60	C-375-E2 Effluent Ditch
61	C-375-E5 Effluent Ditch
62	C-375-S6 Southwest Ditch
63	C-375-W7 Oil Skimmer Ditch
64	Little Bayou Creek
65	Big Bayou Creek
66	C-375-E3 Effluent Ditch
67	C-375-E4 Effluent Ditch
68	C-375-W8 Effluent Ditch
69	C-375-W9 Effluent Ditch
70	C-334-A Vaporizer
71	C-337-A Vaporizer
72	C-200 Underground Gasoline Tanks
73	C-710 Underground Gasoline Tanks
74	C-340 PCB Spill Site
75	C-633 PCB Spill Site
76	C-632-B H ₂ SO ₄ Storage Tank
77	C-634-B H ₂ SO ₄ Storage Tank
78	C-420 PCB Spill Site
79	C-611 PCB Spill Site
80	C-540-A PCB Spill Site
81	C-541-A PCB Spill Site
82	C-531 Switchyard
83	C-533 Switchyard
84	C-535 Switchyard
85	C-537 Switchyard

Table 3. List of PGDP Waste Management Units

Unit No.	Name
86	C-631 Pump House and Cooling Tower
87	C-633 Pump House and Cooling Tower
88	C-635 Pump House and Cooling Tower
89	C-637 Pump House and Cooling Tower
90	C-720 Underground Petroleum Naphtha Pipe
91	UF ₆ Cylinder Drop Test Area
92	Fill Area for Dirt from C-420 PCB Spill Site
93	Concrete Disposal Area East of Plant Security Area
94	KOW Trickling Filter and Leach Field
95	KOW Burn Area
96	Cooling Tower Scrap Wood Pile
97	C-601 Diesel Spill (previously AOC #A)
98	C-400 Basement Sump (previously AOC #B)
99	C-745 Kellogg Building Site (previously AOC #C)
100	Fire Training Area (previously AOC #D)
101	C-340 Hydraulic System (previously AOC #E)
102	Plant Storm Sewer (previously 96a, 96b, and 96c)
103	Concrete Rubble Pile (1)
104	Concrete Rubble Pile (2)
105	Concrete Rubble Pile (3)
106	Concrete Rubble Pile (4)
107	Concrete Rubble Pile (5)
108	Concrete Rubble Pile (6)
109	Concrete Rubble Pile (7)
110	Concrete Rubble Pile (8)
111	Concrete Rubble Pile (9)

Table 3. List of PGDP Waste Management Units

Unit No.	Name
112	Concrete Rubble Pile (10)
113	Concrete Rubble Pile (11)
114	Concrete Rubble Pile (12)
115	Concrete Rubble Pile (13)
116	Concrete Rubble Pile (14)
117	Concrete Rubble Pile (15)
118	Concrete Rubble Pile (16)
119	Concrete Rubble Pile (17)
120	Concrete Rubble Pile (18)
121	Concrete Rubble Pile (19)
122	Concrete Rubble Pile (20)
123	Concrete Rubble Pile (21)
124	Concrete Rubble Pile (22)
125	Concrete Rubble Pile (23)
126	Concrete Rubble Pile (24)
127	Concrete Rubble Pile (25)
128	Concrete Rubble Pile (26)
129	Concrete Rubble Pile (27)
130	C-611 UST - 550 Gallon Gas Tank (west of C-611)
131	C-611 UST - 50 Gallon Gas Tank (east of C-611)
132	C-611 UST - 2000 Gallon Oil Tank (north of C-611)
133	C-611 UST - Unknown Size, Grouted Tank (south of C-611)
134	C-611 UST - 1000 Gallon Diesel/Gas Tank (southeast of C-611)
135	C-333 PCB Soil Contamination (north side of C-333)
136	C-740 TCE Spill Site (northwest of corner, C-740 Concrete Pad)
137	C-746-A Inactive PCB Transformer/Sump

Table 3. List of PGDP Waste Management Units

Unit No.	Name
138	C-100 Southside Berms (fertilized with C-611/615 sludge)
139	C-746-A1 (UST)
140	C-746-A2 (UST)
141	C-720 Inactive Trichloroethylene (TCE) Degreaser
142	C-750-A (Gasoline UST)
143	C-750-B (Diesel UST)
144	C-746-A Hazardous and Mixed Waste Storage Facility
145	Residential/Inert Landfill Barrow Area
146	Concrete Rubble Pile (40)
147	Concrete Rubble Pile (41)
148	Concrete Rubble Pile (42)
149	Concrete Rubble Pile (43)
150	Concrete Rubble Pile (44)
151	Concrete Rubble Pile (45)
152	Concrete Rubble Pile (46)
153	C-331 PCB Soil Contamination - West Side
154	C-331 PCB Soil Contamination - Southeast Side
155	C-333 PCB Soil Contamination - West Side
156	C-310 PCB Soil Contamination - West Side
157	KOW Toluene Spill Area
158	Chilled Water System Leak Site
159	C-746-H3 Storage Pad
160	C-745 Cylinder Yard Spoils Area - PCB Soil Contamination
161	C-744-T-01 Trailer Site - Soil Backfill
162	C-617-A Sanitary Waterline - Soil Backfill
163	C-304 Building/HVAC Piping System - Soil Backfill

Table 3. List of PGDP Waste Management Units

Unit No.	Name
164	KPDES Outfall Ditch 017 Flume - Soil Backfill
165	C-616-L Pipeline and Vault Soil Contamination
166	C-100 Trailer Complex Soil Contamination (east side)
167	C-720 Whiteroom Sump
168	KPDES Outfall Ditch 013
169	C-410-E 300 Gallon Aboveground HF Tank

The ER Department is responsible for the protection of the environment and public from potential hazards due to past plant activities and waste disposal practices. This objective will be achieved by characterization of groundwater and surface water contamination, identification, investigation, and initiation of corrective measures at SWMUs and spill sites.

Implementing these objectives includes identifying the source and extent of groundwater contamination, continuing hydrogeological characterization of the plant site, developing RFI work plans for SWMUs and spill sites, evaluating SWMUs and spill sites to determine necessary corrective actions, and identifying additional SWMUs and spill sites that may exist at the facility.

2.0 REQUIREMENTS FOR IMPLEMENTATION

2.1 FEDERAL AND STATE REGULATIONS

The major federal and state (Kentucky) regulations applicable to Paducah Gaseous Diffusion Plant (PGDP) and the identified Environmental Restoration (ER) operations are discussed below.

2.1.1 The Resource Conservation and Recovery Act (RCRA)

RCRA, as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA), regulates hazardous waste management. The primary objective of RCRA is to protect human health and the environment. The secondary objective is to conserve valuable material and energy resources by providing assistance to state and local governments for achieving goals in:

- prohibiting open dumping;
- regulating the management of hazardous wastes;
- encouraging recycling and treatment of hazardous wastes;
- providing guidelines for solid waste management; and
- promoting beneficial solid waste management, resource recovery, and resource conservation systems.

RCRA provides cradle-to-grave tracking of hazardous wastes from generation to transport to treatment, storage, or disposal. The disposal sites that were closed or abandoned before November 19, 1980 (effective date of the RCRA regulations) are regulated under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Everyone involved in activities connected to the handling of hazardous waste, including operators of federal facilities, must comply with RCRA. Activities may include:

- generation/production,
- marketing and distribution,
- transport,
- treatment,
- burning (fuel),
- storage,
- disposal, and
- storage of hazardous materials in underground tanks.

Compliance starts with notifying the U.S. Environmental Protection Agency (EPA) or authorized states about activities involving hazardous wastes or hazardous waste-derived fuels.

As amended by HSWA, RCRA Section 3004(u) requires corrective actions for releases of hazardous substances. RCRA Section 3004(v) mandates off-site corrective actions. The RCRA provisions for corrective actions overlap to some degree with CERCLA provisions, creating the need for coordination of RCRA and CERCLA activities. RCRA will impact all major categories of tasks contemplated by this plan, including ER.

The State of Kentucky is authorized to administer its own RCRA program in lieu of the federal program, except for those RCRA provisions imposed by HSWA. Also Kentucky has RCRA authorization to regulate mixed hazardous waste.

The Kentucky Division of Waste Management (KDWM) is responsible for implementing these regulations. Region IV of EPA administers the federal RCRA program, including the HSWA provisions. The closure and permitting activities associated with PGDP's landfills are also regulated by KDWM through its solid waste regulations.

2.1.2 Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)

CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), provides a federal mechanism to respond to the hazards posed by abandoned disposal sites. It provides federal authority to respond to current uncontrolled releases of hazardous and radioactive substances (since May 1989) from a vessel (including transportation vehicles) or from any on-shore or off-shore facilities. The act imposes strict liabilities on a broad class of potentially responsible parties. It establishes funding ("Superfund") for the government either to order the responsible parties to clean up the spill or to seek reimbursement from the responsible parties after the government has completed cleanup.

CERCLA also requires owners and operators of currently operating vessels and facilities to file reports. Any releases of a specific quantity of "hazardous substances" must be reported, and the responsible party must clean it up. A "hazardous substance" is anything included on a "list of lists" compiled by referring to four other major environmental statutes under which toxic or hazardous substances are identified. EPA is authorized to expand the CERCLA list by adding compounds or mixtures which, when released into the environment, may present substantial danger to public health, welfare, or the environment.

Section 105 of CERCLA states that the government's cleanup activity must be conducted in accordance with the National Contingency Plan (NCP). The NCP establishes a blueprint

for cleaning up releases into the water, land, or air and assigns response authority to federal and state governments and private parties. The NCP details response procedures, including both immediate removal and long-term remedial actions. SARA amended CERCLA by adding provisions which, among other things are specifically aimed at federal facilities and which increase EPA enforcement authority. CERCLA, as amended by SARA, provides the framework for determining cleanup standards, schedules, and evaluating remedies. The requirements of CERCLA are administered by EPA Region IV.

2.1.3 The National Environmental Policy Act (NEPA)

NEPA requires every federal agency to consider the environment in its decision making process and publicly address the environmental impact of major federal actions that may significantly affect the environment before such actions are initiated. Potential environmental impacts and issues of concern are addressed in environmental assessments or environmental impact statements, which are made available to the public and are circulated to other interested agencies and individuals. U.S. Department of Energy (DOE) Order 5400.4 establishes DOE policy on integrating NEPA and CERCLA processes for ER projects. DOE Order 5440.1D establishes internal DOE responsibilities and procedures for implementation of NEPA. DOE has also established DOE NEPA Implementing Procedures; 57 FR 15114, (1992).

2.1.4 The Toxic Substance Control Act (TSCA)

TSCA regulates, among other things, the use and disposal of materials containing more than 50 parts per million of polychlorinated biphenyls (PCBs). TSCA applies to ER projects that deal with PCBs. PCB-related projects may also be regulated by CERCLA and RCRA. The requirements of TSCA are administered by EPA Region IV.

2.1.5 The Clean Air Act (CAA)

CAA is a comprehensive and complex federal statute designed to prevent and control air pollution from stationary and mobile sources. It authorizes EPA to establish national standards for air quality that must be met by the states through compliance with EPA-approved State Implementation Plans. These plans must contain standards for preventing significant deterioration of air quality in areas where the ambient standards are already being met. Permits are required for specific air emissions. CAA requirements may become applicable or relevant and appropriate requirements (ARARs) for CERCLA cleanups. Radionuclides are also regulated under CAA. Air emissions from PGDP are managed in accordance with DOE Orders (5480.1A, 5480.4, and 5829.2A) and guidelines of CAA and National Emission Standards for Hazardous Air Pollutants, as regulated by the Kentucky Division for Air Quality.

2.1.6 The Clean Water Act (CWA)

CWA sets standards for, and regulates, discharges into surface water and sets pretreatment standards for discharges into publicly-owned treatment works. Facilities that directly discharge wastewater must obtain a National Pollutant Discharge Elimination System (NPDES) permit. CWA regulations address:

- technology-based effluent limitations,
- water quality-based effluent limitations,
- new source performance standards, and
- control strategies for toxic pollutants and thermal discharges.

The NPDES permit program is administered by the Kentucky Division of Water (KDOW).

In addition, PGDP was placed on the 304(1) list under CWA following the discovery of PCB-contaminated fish in creeks near the facility. This action requires characterization and corrective actions at units releasing PCBs, so that discharges to streams will meet water quality standards by June 1992.

The Pollution Prevention Act of 1990 requires industries to reduce or prevent pollution at the source through cost-effective changes in production, operation, and raw material use. PGDP incorporates a waste minimization and Pollution Prevention Awareness Program to satisfy the requirements of this act.

In summary, CERCLA/SARA, RCRA, TSCA, CAA, and CWA provide the principle basis for the tasks addressed in the Site-Specific Plan (SSP). For major federal environmental actions, NEPA also defines the process by which decisions are made and implemented.

2.2 DOE ORDERS

U.S. Department of Energy (DOE) and DOE contractors are subject to the requirements of DOE Orders in addition to the requirements of federal and state regulatory agencies. Therefore, DOE Orders will impact the Environmental Restoration (ER) processes. Significant DOE Orders for these tasks are summarized below.

DOE Order 5820.2A Radioactive Waste Management (9/26/68) establishes policies, guidelines, and minimum requirements for managing radioactive and mixed wastes. This order requires that DOE Low-Level Waste be managed to protect public health and safety and to preserve the environment. Waste management systems performance assessments of all aspects of waste generation are required. These include:

- waste reduction, segregation, minimization, and characterization;
- waste acceptance criteria;
- waste treatment, storage, shipment, and disposal; and
- disposal site selection, design, operation, and closure/post-closure.

Chapter V of DOE Order 5820.2A sets requirements for decommissioning radioactively-contaminated facilities. Planning for facility decommissioning must be initiated during the design phase for new facilities and before termination of operations for existing facilities. Also, planners must consider the two-year budget cycle to ensure adequate funding availability.

Decommissioning project activities include facility characterization, the environmental review process (NEPA, RCRA, CERCLA, TSCA, SARA), and technical engineering planning, which includes a Decommissioning Project Plan. Status reports on project activities must be prepared in accordance with DOE Order 1332.1A or 4700.1.

Post-decommissioning activities involve final chemical and radiological surveys and preparation of a project final report. The responsible field organization will compile a Project Data Package. Long-term maintenance, surveillance, and other safety controls will be provided by the responsible program organization. The decommissioned property may be released from DOE ownership according to the requirements of DOE Order 4300.1B. DOE Order 5700.6B requires that quality assurance be maintained by using the applicable requirements of American National Standards Institute/American Society of Mechanical Engineers Nuclear Quality Assurance 1989, "Quality Assurance Program Requirements for Nuclear Facilities" (ANSI/ASME NQA-1).

The waste management plan outline requirements are detailed in Chapter VI of DOE Order 5820.2A. The primary purpose of the waste management plan is to compile and consolidate an annual report on:

- how waste management operations are conducted,
- what facilities are being used to manage wastes,
- what changes may be required for current waste management systems, and
- what plans are in store for the coming fiscal year.

The scope of the plan includes the management of both radioactive and hazardous constituents, whether these are separated or mixed. Included in the waste management plan are:

- an executive summary,
- general site information,
- radioactive and mixed waste management operations information,
- hazardous waste management descriptions,
- current fiscal year costs and operational schedules,
- environmental monitoring programs, and
- related subjects.

Required waste management documentation includes information about low-level waste, transuranic waste, and decommissioning activities. This includes:

- safety analysis report data,
- a tank assessment,
- a facility closure,
- a radiological performance assessment,
- waste acceptance criteria,
- off-site disposal data,
- new site selection data, and
- decommissioning data.

DOE Order 5400.2A Environmental Compliance Issue Coordination (1/31/89) establishes DOE requirements for coordinating significant environmental compliance issues by creating a process within DOE for resolving conflicting compliance issues.

DOE Order 5400.3 Hazardous and Radioactive Mixed Waste Management (2/22/89) establishes DOE hazardous and radioactive mixed waste policies and requirements. The Order clarifies DOE's interpretation of the definition of "byproject material" (10 CFR 962) as it relates to Resource Conservation and Recovery Act (RCRA) regulation of mixed wastes and establishes the lines of authority at DOE/Headquarters for RCRA implementation.

DOE Order 5400.4, Integration of NEPA and CERCLA, establishes DOE policy on integrating NEPA and CERCLA processes for ER projects.

DOE Order 5440.1D, NEPA Compliance Program (2/22/91), establishes internal DOE responsibilities and procedures for implementing NEPA. It directs DOE line management to incorporate NEPA requirements early in the planning process by proposed actions.

DOE NEPA Implementing Procedures; 57 FR 15144, (1992), establish the procedures to be followed in fulfilling DOE's NEPA responsibilities.

Other relevant DOE Orders include DOE Order 5400.1, General Environmental Protection Program (11/9/88), which establishes the environmental protection program for DOE operations, and DOE Order 5480.1B, Environment, Safety, and Health Program for DOE Operations (9/23/86), which outlines (1) environmental protection safety and (2) health protection policies and responsibilities.

2.3 FEDERAL, STATE, AND LOCAL AGREEMENTS, ORDERS, AND DECREES

Agreed Order

PGDP effluents do not always meet warm water aquatic habitat criteria that defined the limits in Kentucky Pollutant Discharge Elimination System (KPDES) Permit KY0004049 issued in October 1986. The DOE requested adjudication of the permit and, as a result, an agreed order between Kentucky Division of Water (KDOW) and DOE was reached. The agreed order also required the establishment of a Best Management Practice to determine the effects of plant effluents on aquatic biota. These monitoring activities will continue until the KPDES permit is reissued in the fall of 1992. At the end of the biological monitoring study, if current discharge limits are determined to harm the ecosystem, further corrective actions will be implemented.

Administrative Consent Order (ACO)

Environmental Restoration (ER) groundwater activities are primarily driven by an ACO between DOE and the Environmental Protection Agency (EPA) dated October 20, 1988. The ACO is under the authority of Section 104 and 106 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The ACO was developed in response to the discovery of off-site groundwater contamination of trichloroethylene and technetium in areas north of PGDP. The ACO requires an investigation to determine the source and extent of groundwater and surface water contamination at PGDP, an undertaking of measures to protect residents, interim corrective measures, as appropriate, and modifications of the ACO after the investigation to include remediation of the groundwater contamination.

A subcontractor has performed an investigation on the groundwater contamination under an EPA-approved work plan.

Agreement in Principle (AIP)

An AIP was negotiated between DOE and the State of Kentucky to provide adequate funds for Kentucky to properly oversee PGDP's Environmental Compliance and ER Programs. The agreement was signed in FY91; it will last five years and will then be renegotiated.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)

The PGDP NESHAP Federal Facility Compliance Agreement (FFCA) was signed on May 27, 1992. The deliverable included in the FFCA which required PGDP to identify all sources which has the potential to have a dose of 0.1 mrem has been completed and forwarded to EPA. The Quality Assurance Plan also required in the FFCA has been completed and forwarded to the DOE Site Office for transmittal to EPA. It is believed that PGDP has completed all requirements of the FFCA unless new radiological sources are identified during the vent stack survey.

Resource Conservation and Recovery Act (RCRA)/Toxicity Characteristic Leaching Procedure

The FFCA covers testing of plant solid waste stored outside of RCRA permitted storage areas. About 25,000 drums and several waste streams are involved. Both DOE and EPA has signed the agreement, with an effective date of April 3, 1992. PGDP is currently awaiting comments from EPA Region IV on the approval of the implementation plan.

Land Disposal Restricted (LDR) Waste

Presently there is no treatment capability for radiological contaminated wastes. Mixed waste is presently being generated and stored at the PGDP in violation of land disposal restrictions. A request for formal agreement with the EPA was forwarded to DOE on July 31, 1989. DOE/Energy Systems negotiations on an FFCA were initiated with EPA on July 10, 1991. A LDR FFCA for the DOE, Oak Ridge Field Office (OR) and PGDP was transmitted to DOE/OR for signatures on May 4, 1992. The OR FFCA has been signed. The PGDP FFCA was signed June 30, 1992.

Toxic Substances Control Act (TSCA)

The TSCA FFCA establishes a plan intended to bring DOE's uranium enrichment facilities into full compliance with TSCA and the Polychlorinated Biphenyl (PCB) regulations at 40 CFR 761. The following issues are addressed in the FFCA:

- Unauthorized use of PCBs in ventilation systems gaskets,
- Historic PCB spills from ventilation system gaskets,
- PCB wastes stored for disposal greater than the TSCA one year limit,
- Unauthorized use of PCBs in C-340 hydraulic systems, and
- Unauthorized use of leaking PCB capacitors in switchyard potential devices.

EPA signed agreement on February 20, 1992, which is the effective date. Major near term commitments are: monthly potential device activity summary reports, quarterly PCB FFCA progress reports, PCB waste storage compliance by June 30, 1992 and certification to EPA, Annual Compliance Agreement Report to EPA by July 1.

2.4 COURT DECREES

None

2.5 SUMMARY

A summary of the requirements for implementation for each of the current projects identified on the Activity Data Sheet (ADS) is provided in Table 4.

Table 4. Requirements for Project Implementation

ADS No.	Project Description	Federal/State Regulations	DOE Order	Agreed Order
5301	Support Facilities - Corrective Measures	CERCLA RCRA		
5302	Off-site Groundwater Contamination			CERCLA
5303	WAGs 5 and 11	CERCLA RCRA		
5304	WAGs 1 and 7	CERCLA RCRA		
5305	WAG 13	CERCLA RCRA		
5306	WAGs 8 and 9	CERCLA RCRA		
5307	WAGs 12 and 15	CERCLA RCRA		
5308	WAGs 10 and 16	CERCLA RCRA		
5309	WAG 17	CERCLA RCRA		
5310	WAG 18	CERCLA RCRA		
5311	Groundwater Program	CERCLA RCRA		
5312	Underground Storage Tanks	CERCLA RCRA		
5313	WAGs 2, 3, and 14	CERCLA RCRA		
5501	Program Management Support	CERCLA RCRA 3004U		CERCLA AIP
5701	Facility Decontamination and Decommissioning		5400.1 5820.2A	

3.0 ORGANIZATION/MANAGEMENT

3.1 ORGANIZATION

Martin Marietta Energy System, Inc. (Energy Systems) is the managing contractor and the U.S. Department of Energy (DOE) the owner at Paducah Gaseous Diffusion Plant (PGDP). Both have direct responsibility for conducting environmental restoration and waste management activities including:

- monitoring,
- laboratory analyses,
- data management,
- reporting,
- waste management,
- environmental remediation, and
- operation of waste treatment and pollution prevention systems.

Within Energy Systems, there are many organizations with responsibility for the management, implementation, and conduct of environmental and waste management program activities.

3.1.1 The Environmental Management Department of the Environment, Safety, and Health Division

The overall goal of Environmental Management is to achieve full compliance with all current regulations, to anticipate and plan for achieving compliance with future regulations, and to set timetables and assign responsibilities for achieving these objectives. Environmental Management provides staff functions for management of air pollution control, water pollution control, solid waste management, asbestos abatement programs, and administrative functions such as environmental permitting and notification, program/project review, and environmental auditing.

3.1.2 The Environmental Restoration Department of the Environment, Safety, and Health Division

The department was established to identify and assess sites that may contaminate the environment with hazardous substances and to develop and implement remedial actions to control and minimize the release of these contaminants from the sites. The program will also define the extent of existing contamination and determine the proper extent of existing contamination and the proper corrective action for any contaminated areas, such as solid waste management units (SWMUs) and spill sites.

3.1.3 The Waste Management Department of the Chemical and Waste Services Division

This department is responsible for the management of solid wastes generated by PGDP operations. These waste streams include conventional wastes (office, cafeteria, and construction wastes), hazardous (RCRA) and mixed (hazardous/radioactive) wastes, Polychlorinated Biphenyl (PCB) and PCB/uranium wastes, low-level radioactive wastes, classified wastes, scrap metal, environmental restoration wastes, and other special-case wastes, such as medical and asbestos wastes. These wastes are managed in accordance with all federal and state regulations, DOE Orders, and Energy Systems policies and procedures. The implementation of DOE Order 5820.2A for radioactive waste is another major responsibility.

3.1.4 The Environmental Monitoring Department of the Environment, Safety, and Health Division

The Environmental Monitoring Section of the Environment, Safety, and Health Division has primary responsibility for monitoring receptors of potential plant discharges such as air, surface water, and groundwater. Other types of regular monitoring activities (e.g., soil, sediment, vegetation) in support of the PGDP environmental restoration (ER) and waste management (WM) activities are also conducted by this group.

3.1.5 The Analytical Laboratory Department of the Technical Services Division

The major responsibility of the Analytical Laboratory is to provide chemical and physical analyses in support of the PGDP ES&H and operating groups. Extensive capabilities exist for analyses of both inorganic and organic materials. In addition to classical chemical procedures, a variety of instrumental capabilities are available.

3.1.6 The ES&H Shift Staff of the Safeguards and Security Division

The main objective of the ES&H shift representatives is to provide and maintain continuity of PGDP ES&H operational activities. The ES&H shift representative is assigned the responsibility of assisting the plant shift superintendent in all ES&H activities to safeguard plant employees, the public, and the environment and to ensure compliance with applicable regulations.

3.1.7 Special Management Programs

Special management programs include PCB management of the Environmental Management Division and waste minimization of the Energy Systems "Corporate PCB Policy" and all other federal, state, or corporate regulations that pertain to PCBs. The PCB Program

Manager provides management direction and oversight in the development, implementation, and maintenance of plant and project specific plans, policies, and procedures.

The PGDP waste minimization program was established to assure implementation of Energy Systems and PGDP policies in conformance with applicable DOE Orders and federal and state regulatory requirements. The responsibilities of the waste minimization program manager are to organize a PGDP waste minimization program, including development and implementation of a program plan and revision of plan procedures, to reflect plant requirements. The program manager also evaluates existing waste generating processes and recommends actions to reduce the volume and health hazards of waste to the maximum extent practical.

3.1.8 The Plant Engineering Division

The Plant Engineering Division works closely with numerous PGDP environmental organizations to ensure projects meet requirements of federal, state, local, and corporate regulations and policies. In this capacity, Plant Engineering staff work closely with the plant National Environmental Policy Act coordinator. All Plant Engineering Division staff members are responsible for the use of sound environmental protection practices.

3.1.9 The Central Waste Management Division

Energy Systems Environmental and Safety Activities staff and the Central Waste Management Division are responsible for oversight and coordination of corrective action and waste management program activities at U.S. DOE, Oak Ridge Field Office (OR) facilities operated by Energy Systems. Their responsibility is to coordinate the implementation of and ensure uniformity and consistency in meeting corrective action and waste management activity objectives.

3.1.10 Department of Energy

OR has overall responsibility for all ER and waste management activities at PGDP. Within DOE/OR, there are three organizations with specific responsibilities for these activities.

3.1.10.1 The PGDP Site Office

The PGDP site office is responsible for administering the PGDP Environmental Protection Program and for directing Energy Systems to execute ER and waste management activities.

3.1.10.2 The OR Environmental Protection Division

The OR Environmental Protection Division provides oversight, confirmation, and independent verification of ER and waste management programs and provides technical support to implement the requirements of these activities.

3.1.10.3 The OR ER and WM Organization

The OR ER and Waste Management Organization was formed to centralize the project management and administrative activities associated with remedial action and waste management programs. These activities had previously been managed on a site-specific basis under the purview of the contracting office representatives and project managers. The centralized structure improves the efficiency in which remedial actions are evaluated and implemented and it provides greater consistency in the management of wastes produced by current and past DOE operations.

3.1.11 The Environmental Technology Department of the Technical Services Division

The Environmental Technology Department's primary responsibility is providing technical support for environmental, regulatory, and health and safety issues at PGDP. Additional activities supported by this group include waste characterization, site characterization, and certain other sampling activities in support of high-priority needs.

3.2 MANAGEMENT

3.2.1 Environmental Restoration

The deputy assistant secretary for Environmental Restoration (ER) U.S. Department of Energy (DOE) administers the ER program for the Paducah Gaseous Diffusion Plant (PGDP), providing:

- program accountability,
- management,
- budgeting, and
- planning.

The DOE Oak Ridge Field Office (OR) Environmental Restoration and Waste Management Division (ERWMD) provides guidance regarding compliance and consistency across DOE facilities. The OR assistant manager for ER and Waste Management (WM)

provides direction for all OR facilities. The DOE Paducah site office manager is the designated contracting office representative (COR). His duties include:

- implementing management systems,
- identifying tasks,
- establishing and planning long-range goals,
- negotiating with regulators, and
- submitting required documentation.

The COR is also the designated program coordinator under the Administrative Consent Order. The DOE Paducah site office manager closely coordinates activities with the deputy assistant secretary's staff and includes frequent meetings and reviews that also include Energy Systems personnel.

The ER program at PGDP is managed by the ER Program Manager. Personnel in this department provide direct support for ER activities, including technical direction for program management. The program is further supported by a matrix team of PGDP, Oak Ridge, and subcontractor personnel.

ER costs and schedules are monitored by the monthly reports submitted by the program manager to DOE. These reports include current progress in relation to milestones, summaries of expenditures and budget levels, and summaries of significant accomplishments, findings, and problems.

Technical performance during project activities is evaluated as a part of quality assurance plan implementation, especially by use of surveillances and audits. Outside consultants from the academic field are also used evaluate technical performance. Presently, two university faculty members are under contract for activities, such as documentation, implementation, and evaluation activities, such as groundwater flow modeling, analyses of hydrogeological data, and evaluation of analytical data.

4.0 ENVIRONMENTAL RESTORATION

4.1 OVERVIEW

Paducah's Environmental Restoration (ER) Program is divided into five major areas of activities: (1) program support, (2) assessment and characterization, (3) remediation, (4) decontamination and decommissioning (D&D), and (5) underground storage tanks (USTs). Program support activities include overall management of Paducah Gaseous Diffusion Plant's (PGDP's) ER Program, the Federal Facility Agreement, and Kentucky Agreement in Principle (AIP) support [under Activity Data Sheet (ADS) 5501]. Assessment activities include the development and implementation of Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFIs) for approximately 148 Solid Waste Management Units (SWMUs) at PGDP. The Groundwater Program (ADS 5311) for PGDP is also part of the assessment activities and includes implementation of PGDP's groundwater protection plan. Other assessment and site characterization activities, such as those for Off-Site Groundwater Contamination (ADS 5302), are ongoing in individual Waste Area Groupings (WAGs) (under ADSs 5303 through 5310 and ADS 5313). Remediation activities are currently being planned in individual WAGs (also 5303 through 5310 and 5313). RCRA Corrective Actions are being planned for the UST Program (ADS 5312). D&D activities are addressed in ADS 5701 Facility D&D and include Surveillance and Maintenance of three uranium process buildings in standby status and remediation of one building whose processes has been shut down.

4.1.1 Environmental Restoration Accomplishments for FY91 and FY92

A number of accomplishments in the areas of program support, assessment and characterization remediation, D&D, and USTs were accomplished during FY91 and FY92.

Program Support - The ER program was expanded to a total of 28 personnel, with plans to expand to 35 by the end of the current fiscal year. The ER program consists of a manager, technical specialist, project management section, hydrogeologic service section, management services section, waste management coordinator, regulations coordinator, and various support groups who have provided matrixed personnel to the program.

One hundred, sixty nine SWMUs at PGDP will be included in the assessment activities. The SWMUs have been separated into two distinct categories: (1) 21 sources contributing to off-site contamination and (2) the remaining sources that do not appear to be contributing to off-site contamination. The SWMUs identified as off-site contributors have been given a high priority and are undergoing a streamlined response action under the CERCLA ACO. The remaining SWMUs (148) will be subject to a RCRA RFI in accordance with the Schedule of Compliance in the Hazardous and Solid Waste Amendments (HWSA) Permit.

Assessment and Characterization - Several projects to assess and characterize groundwater contamination, USTs, SWMUs, and old spill sites were implemented.

The investigation to determine the extent and source of groundwater contamination has completed the two phase investigations. Phase I, which identified the extent of off-site groundwater contamination was completed and the approved Site Investigation Report issued in March 1991. Phase II of the site investigation, which identified the on-site sources of off-site groundwater contamination was issued in October 1991. The Alternative Evaluation and Results of Public Health and Ecological Assessments reports were issued for review in December 1991. Other accomplishments include: conducted fourth public meeting and issued fifth newsletter to discuss results of Phase II site investigation, conducted meeting with the general plant population to discuss Phase II site investigation results, and continued routine monitoring of residential wells and provided public drinking water to residents with contaminated drinking water wells. The Phase II site investigation determined the source(s) of the off-site groundwater contamination and recommended potential corrective measures.

All groundwater activities were incorporated into PGDP's Groundwater Protection Plan. The groundwater model update for PGDP will be received from Geotrans, Inc., and efforts were completed for the fieldwork associated with the Groundwater Monitoring Phase III Program. This report will be issued in late FY92.

PGDP's 169 SWMUs spill sites and USTs will be investigated under HSWA of 1984. Paducah's draft HSWA permit was issued July 1991. The C-750 UST investigation work plan was submitted to the state of Kentucky, and approval investigation activities was completed during FY92.

Remediation - Remedial activities at Paducah included the removal of two leaking 10,000 gallon petroleum tanks and the initial development of cost estimates for future remedial action work to be carried out at Paducah's inactive sites. Support facility activities included utilities upgrading for the ER program and the subcontractor's facilities, specification for the mobile field support laboratory, and engineering design for the off-site decontamination pad.

4.1.2 Description

The major site investigation activities in FY92 for ER are the site investigation of PGDP's SWMUs. Site investigation efforts on groundwater contamination began in May 1989 and were completed in 1992. These activities were conducted under an Administrative Consent Order (ACO) between DOE and Environmental Protection Agency (EPA). The UST release investigation was conducted in response to the discovery of two leaking USTs in late FY89. The investigation of the 169 SWMUs/areas of concern (AOCs) will continue in

FY93 with the development of RFI plans for eight WAGs and the investigation of eight WAGs.

This investigation is directed by a HSWA permit which defines a schedule for submission of work plans for characterization. The Record of Decision for groundwater contamination site investigation driven by the ACO will be completed and will initiate the design of corrective measures.

4.1.3 Resources

Resource requirements for each subtask are described in the following sections of this document.

4.1.4 Schedules and Milestones

PGDP's major FY93 milestones by ADS are shown in Table 5.

Table 5. PGDP's Major FY93 Milestones by ADS

	Milestone Description	Scheduled Date
ADS 5301	REC. Management Trailer Construction Complete	2/17/93
ADS 5301	Design Complete for Decontamination Pad	12/30/92
ADS 5301	Contract Awarded for ER Waste Storage Facility Phase I	5/3/93
ADS 5301	Construction Complete for Field Laboratory	5/4/93
ADS 5301	Design Complete for Mixed Waste Storage Facility	5/19/93
ADS 5301	Design Complete for Administrative Record (AR)/ER Building	6/14/93
ADS 5301	Design Complete for ER Waste Storage Facility Phase II	7/7/93
ADS 5301	Construction Complete for Waste Holding Facility	7/12/93
ADS 5302	Monitoring of Residential Wells and Provide Drinking Water to Residents with Contaminated Drinking Water	Continuing
ADS 5303	Remedial Investigation Field Activities Complete	7/18/93
ADS 5304	EPA Approve Final RFI Work Plan	1/9/93
ADS 5305	EPA Approve Final RFI Work Plan	7/15/93
ADS 5306	Issue Final RFI Work Plan to EPA	9/28/93
ADS 5307	Issue Draft RFI Work Plan to EPA	9/13/93
ADS 5308	Issue Draft RFI Work Plan to DOE	9/21/93
ADS 5311	Complete Construction of Groundwater Monitoring Phase IV	9/30/93
ADS 5312	Corrective Action Plan to Regulators	1/31/93
ADS 5313	EPA Approve Final RFI Work Plan	4/16/93
ADS 5501	Complete AR for Groundwater Contamination ACO	12/31/92
ADS 5701	Issue D3P for C-340	10/01/92

4.1.5 Funding

Table 6. PGDP ER Program Funding (\$000)

Section No.	Title	1993
5.2 (ADS 5501)	Program Management	6,291
5.3 (ADS 5302, 5304-5313)	Assessment	22,428
5.4 (ADS 5301-5302, 5312)	Remediation	19,860
5.5 (ADS 5701)	D&D	2,700
Total ER		51,279

4.2 PROGRAM SUPPORT

4.2.1 Description

Program support includes project management, engineering, and construction management of the Environmental Restoration (ER) Program at Paducah Gaseous Diffusion Plant (PGDP). Activities include contract administration, tracking and coordination of subcontractors, and coordination of investigation and corrective measures field activities. Other management activities are described in the Management Plan for the U.S. Department of Energy (DOE) Oak Ridge Field Office (OR) ER program DOE/OR-931. Program support also includes tasks to be performed as required to comply with the Federal Facility Agreement, agreement in principle, and PGDP's ER Administrative Record (AR).

4.2.2 Resources

Personnel from PGDP will be involved with management and coordination of subcontractor activities. Additionally, PGDP will perform quality assurance activities, including audits, surveillances, and analyses of split and duplicate samples during the assessment activities. A full-time staff of 28 employees is presently assigned to management, assessment, and remediation activities, with additional professionals to be added. A key function of a matrixed organization of approximately 47 people will be to support the investigation activities with additional plant personnel supporting the program on an as-needed basis.

4.2.3 Schedules and Milestones

PGDP's ER major milestones and schedules include:

Table 7. PGDP's ER Major Milestones

Milestone Number	Milestone Description	Scheduled Date
ADS 5501 - Site	Complete AR for Groundwater Contamination Administrative Consent Order	12/31/92

4.2.4 Funding

Table 8. ER Program Support Funding (\$000)

ADS No.	Title	1993
OR 5501 EW	Program Management	3146
OR 5501 CD	Program Management	3145
Total ER Program Support		6291

4.3 ASSESSMENT AND CHARACTERIZATION

4.3.1 Description

Assessment of existing surface and groundwater contamination at PGDP is performed to maintain compliance with the Administrative Consent Order (ACO) under Comprehensive Environmental Response, Compensation, Liability Act (CERCLA), Sections 104 and 106. PGDP is presently in compliance with the ACO. One Activity Data Sheet (ADS), ADS 5302, addresses investigation of the surface and groundwater contamination.

In August 1988, Trichloroethylene (TCE), an industrial solvent, and Tc-99, a man-made radionuclide, were found in residential wells north of PGDP. In response, Environmental Protection Agency (EPA) and Department of Energy (DOE) have entered into an ACO under CERCLA, Sections 104 and 106. One requirement of the ACO includes the development and implementation of a work plan to define the horizontal and vertical extent of any groundwater and surface water contamination at PGDP and identification of potential receptors of contamination and migration pathways. In accordance with the ACO, the **Phase I Site Investigation Work Plan for Paducah Gaseous Diffusion Plant**, March 23, 1989, was developed for the site, approved by EPA, implemented, and the final Phase I report issued March 25, 1991. The investigation included activities such as groundwater well installation and sampling, soil sampling, sediments sampling, and surface water sampling. The **Phase II Site Investigation Work Plan for Paducah Gaseous Diffusion Plant, KY/.ER-3**, dated July 1990, was developed for the site, approved by EPA, and field work was completed in June 1991, with the draft report issued in December 1991. The work plan included three stages of work. Stage A included on-site groundwater wells installation and sampling, soil sampling, sediment sampling, and aquifer tests. Stage B included further definition of off-site contamination. Stage B activities were focused by the final Phase I results. Stage C, included treatability studies, remedial alternative option development and evaluation, preparation of a risk assessment, and preparation of a final report.

The interim record of decision for the proposed remediation for groundwater contamination is scheduled to be issued in FY93.

The results of the two-phase investigation are a characterization of the groundwater and surface water contamination and characterization of sources, including sources of Polychlorinated Biphenyls (PCBs), in surface water. Phase I of the investigation provided data used to characterize off-site groundwater contamination and off-site surface water contamination, and to determine the on-site units responsible for the contamination. The implementation of Phase II of the investigation was to characterize the one-site units responsible for the contamination and gather data to allow evaluation of remedial action alternatives. Phases I and II of the investigation will satisfy the ACO and also provide additional information necessary to characterize sources of PCB discharge to surface water. Reduction of PCB discharges is required by Section 304(1) of the Clean Water Act.

Investigation reports, containing data summaries and recommendations for further activities, were developed at the end of each phase of the investigation. These reports are deliverables required by the ACO. The report generated for Phase II of the investigation contains an evaluation of potential remedial alternatives and a recommended remedial measure.

PGDP will perform assessments of solid waste management units and spill sites. These assessments will be performed to maintain compliance with the PGDP Hazardous and Solid Waste Amendments permit. Preliminary assessments were made of 96 of the 169 Solid Waste Management Units (SWMUs) and CERCLA units, and this information was published in July 1987. Preliminary Assessment of the remainder of the 169 SWMUs was completed effective 90 days from the date of the Hazardous and Solid Waste Amendment (HSWA) permit. The HSWA permit was issued on August 19, 1991, with the Treatment, Storage, and Disposal Part B Permit under Resource Conservation and Recovery Act (RCRA). PGDP has nine activity data sheets (ADS 5303 through 5310 and 5313) for these investigations. A RCRA Facility Investigation (RFI) Plan for Waste Area Groupings (WAGs) 5 and 11 has been developed and another is due in late 1992.

The assessments will include development and implementation of RCRA facility investigation plans. These plans will include the number and types of samples to be taken, numbers and specifications for groundwater wells to be installed, and analyses to be performed on samples. Additionally, items such as quality assurance, investigation-derived waste management, and health and safety of investigation personnel will be addressed in the RFI plans.

Presently, EPA Region IV is the lead agency for the investigation under HSWA. However, the state of Kentucky may become the lead agency if Kentucky receives authorization to enforce the 1984 amendments to RCRA. PGDP is not listed on the National Priority List

(NPL). However, PGDP has become a proposed site since the EPA has reevaluated the hazard ranking score for PGDP. When PGDP becomes an NPL site, the investigation of SWMUs and spill sites may become CERCLA driven. Based upon this possibility, PGDP is planning to investigate SWMUs and spill sites under the HSWA permit, but will perform all investigations in compliance with CERCLA as well as RCRA. The purpose of compliance with both regulations is to avoid having to reinvestigate under CERCLA at a later date.

In order to better define the hydrogeologic conditions at PGDP, a program is ongoing to characterize the site lithology, groundwater flow system, and develop a monitoring network to detect any additional contamination that may be migrating off the plant site. This program includes seismic mapping and the development of a groundwater flow model. Additional characterization projects are planned for 1993 (Phase IV) and 1994 (Phase V). These projects will result in installation of wells and piezometers and the performance of aquifer pumping tests.

A groundwater protection management plan was developed by the Environmental Restoration (ER) Department to integrate the investigations being carried out for contaminated groundwater, the HSWA investigation, and the groundwater monitoring hydrogeologic assessment projects into a single groundwater monitoring and protection strategy for the facility. PGDP has one activity data sheet (ADS 5311) for all groundwater program activities.

4.3.2 Resources

The major effort of investigation activities will be performed by subcontractors to Energy Systems. Personnel from PGDP will be involved with management and coordination of subcontractor activities. Additionally, PGDP will perform quality assurance activities, including audits, surveillances, and analyses of split and duplicate samples during the assessment activities. A full-time staff of 28 employees are presently assigned to management assessment and remediation activities, with additional personnel to be added. A matrix organization of approximately 47 people support the investigation activities with additional plant personnel supporting the program on an as-needed basis.

A major portion of the equipment necessary for implementation of the investigation (laboratory facilities, drilling rigs, excavation equipment, vehicles, and sampling equipment) is provided by subcontractors. Equipment and materials to be utilized during the investigation activities that will be provided by PGDP include computer systems, data management systems, laboratory facilities for quality assurance sample analyses, and field laboratory facilities.

4.3.3 Schedules and Milestones

Table 9. Schedules and Milestones

ADS No.	Milestone Description	Scheduled Date
ADS 5302	Monitoring of residential wells and provide drinking water to residents with contaminated drinking water	Continuing
ADS 5303	EPA Approve RFI Final Work Plan	10/11/92
ADS 5303	Remedial Investigation Field Activities Complete	7/18/93
ADS 5304	EPA Approve Final RFI Work Plan	1/9/93
ADS 5305	EPA Approve Final RFI Work Plan	7/15/93
ADS 5306	Issue Final RFI Work Plan to EPA	9/28/93
ADS 5307	Issue Draft RFI Work Plan to EPA	9/13/93
ADS 5308	Issue Draft RFI Work Plan to DOE	9/21/93
ADS 5311	Complete Construction of Groundwater Monitoring Phase IV	9/30/93
ADS 5313	EPA Approve Final RFI Work Plan	4/16/93

4.3.4 Funding

Table 10. PGDP ER Program Assessment Funding (\$000)

ADS No.	Title	1993
OR-5302-EW	Off-site Groundwater Contamination	1265
OR-5302-CD	Off-site Groundwater Contamination	1265
OR-5303-EW	WAGs 5 and 11	750
OR-5303-CD	WAGs 5 and 11	750
OR-5304-EW	WAGs 1 and 7	2600
OR-5304-CD	WAGs 1 and 7	2600
OR-5305-EW	WAG 13	1538
OR-5305-CD	WAG 13	1537
OR-5306-EW	WAGs 8 and 9	258
OR-5306-CD	WAGs 8 and 9	257
OR-5307-EW	WAGs 12 and 15	162
OR-5307-CD	WAGs 12 and 15	163
OR-5308-EW	WAGs 10 and 16	162
OR-5308-CD	WAGs 10 and 16	163
OR-5309-EW	WAG 17	100
OR-5309-CD	WAG 17	100
OR-5310-EW	WAG 18	50
OR-5310-CD	WAG 18	50
OR-5311-EW	Groundwater Program	2124
OR-5311-CD	Groundwater Program	2124
OR-5313-EW	WAGs 2, 3, and 14	2205
OR-5313-CD	WAGs 2, 3 and 14	2205
Total ER Assessment		22,428

4.4 REMEDIATION

4.4.1 Description

Remediation of groundwater or surface water contamination will be performed as appropriate. Interim corrective measures, such as sampling of potentially affected residential wells and provision of alternative water supplies, have been implemented at PGDP. These interim corrective measures are also requirements of the Administrative Consent Order (ACO). Additionally, longer-term remedial measures will be implemented for cleanup of the contamination. The existing ACO between Department of Energy (DOE) and Environmental Protection Agency (EPA) will be replaced with a Federal Facility Agreement (FFA). This activity will complete the remediation efforts for the groundwater and surface water contamination. Interim corrective measures are currently being planned to install a pilot hydraulic containment system on the northwest side of the plume and perform institutional controls along the surface water streams and surface.

Upon completion of the groundwater and surface water contamination investigations, a remedial measure will be implemented, based upon data collected during the investigations. The corrective actions will be selected based upon an alternatives evaluation. The alternatives evaluation report was submitted to EPA and the state of Kentucky and is currently being reviewed. EPA and the state of Kentucky will have approval authority during the selection and implementation of remedial measures.

Long-term remediation of groundwater and surface water and interim corrective measures will be funded with a 50/50 split in FY93 and a 33/67 split in FY94 between uranium enrichment (UE) and Environmental Restoration (ER) operating funds.

Remedial activities will be performed at Solid Waste Management Units (SWMUs) and spill sites investigated under the Hazardous and Solid Waste Amendment (HSWA) permit. Alternative evaluations for selecting corrective actions will be completed for each site after investigations of the area are completed. EPA presently maintains approval authority over these corrective actions. The HSWA activities will also become part of the FFA.

Interim remedial measures may be performed as a part of the HSWA remediation, if imminent threats to human health and the environment exist. These activities will be funded with the same split between UE and ER operating funds. Long-term remediation will also be funded by UE and ER operating funds.

4.4.2 Resources

The major effort of remediation activities will be performed by subcontractors to Energy Systems. Personnel from PGDP will be involved with management and coordination of

subcontractor activities. Additionally, PGDP will perform quality assurance activities, including audits, surveillances, and analyses of split and duplicate samples during the assessment activities. A full-time staff of 28 employees are presently assigned to management assessment and remediation activities, with additional professionals to be added.

A matrix organization of approximately 47 people support the investigation activities as a key part of their job duties, with additional plant personnel supporting the program on an as-needed basis.

4.4.3 Schedules and Milestones

Schedules and milestones are being developed since the completion of the assessment phases.

4.4.4 Funding

Table 11. PGDP ER Program Remediation Funding (\$000)

ADS No.	Title	1993
OR-5301-EW	Support Facilities	3070
OR-5301-CD	Support Facilities	3070
OR-5302-EW	Off-site Groundwater Contamination	5960
OR-5302-CD	Off-site Groundwater Contamination	5960
OR-5312-EW	USTs	900
OR-5312-CD	USTs	900
Total ER Remediation		19,860

4.5 DECONTAMINATION AND DECOMMISSIONING

4.5.1 Description

One facility at Paducah Gaseous Diffusion Plant (PGDP) is shutdown, and 3 facilities are presently in standby. These buildings must be maintained to assure they are not a threat to public health and safety. The shutdown facility is C-340, and the 3 facilities included in standby are C-420, C-411, and C-410 uranium processing buildings. The C-410, C-411, and C-420 Buildings were used for UF₆ feed production; and the C-340 Building was used for

reduction of UF_6 to UF_4 and uranium metal production. These facilities require some level of maintenance to assure compliance with regulations and to physically protect facilities for safety reasons. Activities such as roof repairs, lighting repairs, security patrols, and maintenance of fire protection and heating systems are required. A percentage of the plant's administrative costs, such as accounting, stores, and maintaining equipment inventories are distributed to these facilities. PGDP has no alternative but to maintain some minimum level of support for these facilities until their final disposition is decided by Department of Energy (DOE).

The potential exists for the costs of maintaining these facilities to increase. Presently, costs for the surveillance and maintenance of these facilities are funded from operating expense funds. The majority of the activities supporting these facilities are performed by PGDP employees.

Plans are being prepared to investigate and remediate the C-340 facility. The investigation will start in FY93 after fire protection and electricity is reinstated in the facility.

A future project will be planned for the Decontamination and Decommissioning (D&D) of the 3 facilities at PGDP that are presently in standby. This activity will include the removal, decontamination, and disposal of process equipment and buildings. The driver for this activity is the elimination of the yearly costs of maintaining the facilities in a standby status.

Lessons learned from facility characterization, decontamination, dismantlement, and material disposition activities will be used as inputs to the Deactivation, Decommissioning, and Recycle demonstrations and projects.

4.5.2 Resources

The majority of maintenance and surveillance activities at PGDP facilities presently in standby are performed by PGDP personnel. The major resources utilized include manpower from several areas of the plant, such as maintenance personnel; security inspectors; fire protection personnel; environmental, safety and health disciplines; engineering; and administrative personnel.

The demolition of facilities presently in standby status would require support of subcontractors to PGDP. The majority of the equipment, such as cranes and transport equipment, and personnel would be supplied by the subcontractors. A significant amount of manpower would be required by PGDP personnel for the management and oversight of the subcontractors. Extensive support will be required from the engineering disciplines, waste management personnel, and health and safety personnel. A somewhat less significant level of support will be required from environmental compliance personnel, security

personnel, and administrative (record keeping, traffic, purchasing, etc.) persons for this activity.

4.5.3 Schedules and Milestones

Table 12. Schedules and Milestones

Milestone Number	Milestone Description	Scheduled Date
ADS 5701 - Site	Issue D&D Design Plan for C-340	2/28/93

4.5.4 Funding

Table 13. PGDP D&D Funding (\$000)

ADS No.	Title	1993
OR-5701-CD	D&D Facility	0
OR-5701-EW	D&D Facility	2700
Total ER D&D		2700

4.6 UNDERGROUND STORAGE TANKS (UST)

4.6.1 Description

There are 13 Underground Storage Tanks (USTs) at Paducah Gaseous Diffusion Plant (PGDP). Eleven of these tanks were removed from service prior to December 22, 1988. These tanks will be addressed as Solid Waste Management Units under the PGDP Environmental Restoration (ER) program. The remaining two USTs, which contained gasoline and diesel fuel, were found to be leaking in July 1989. The tanks have been emptied and removed. Presently, the USTs' Site Investigation Work Plan is being implemented.

The initial abatement, initial site characterization, and removal of tanks were funded by ER funds. The Site Investigation was funded from the ER operating funds in FY91 and FY92, and the remediation will be funded by ER operating funds during FY93.

5.0 COMPLIANCE WITH NATIONAL ENVIRONMENTAL POLICY ACT

Project review at Paducah Gaseous Diffusion Plant (PGDP) is performed under the NEPA compliance program. NEPA compliance requires that any action accomplished with federal funds be evaluated for potential environmental impacts and identification of alternatives to eliminate or mitigate these impacts. The NEPA Compliance Department is responsible for coordinating NEPA compliance documentation and reviews. A categorical exclusion (CX) is prepared when a category of actions falls within the list of actions in Appendix B to Subpart D of the DOE NEPA Implementing Procedures. DOE approves CX documentation. These activities normally do not individually or cumulatively have significant effect on the quality of the human environment and require neither an environmental assessment (EA) nor environmental impact statement (EIS). An EA is prepared when an action falls within Appendix C to Subpart D of the DOE NEPA Implementing Procedures, or when a decision is made to prepare an EA based on information obtained. The EA provides sufficient evidence and analysis for determining whether or not to prepare a Finding of No Significant Impact or EIS. The EIS is a detailed written statement that ensures that the policies and goals of NEPA are included in the programs and actions of the federal government. When an EIS is prepared, the process is complete when DOE issues a Record of Decision (ROD).

At PGDP, preparation of NEPA compliance documents is a U.S. Department of Energy (DOE) milestone. Details pertaining to NEPA documents are provided in monthly compliance reports and annual environmental compliance work plans.

5.1 ACTIONS RELATIVE TO NEPA

In addition to the existing NEPA documentation for activities involving CERCLA, RCRA, DOE Orders, and other ongoing actions; additional NEPA documentation to support future activities is scheduled for submission during FY93.

**Table 14. NEPA Documents in Preparation or Planned
Fiscal Year 1993**

Level of document*	Project name/description	Scheduled Submission
Paducah Gaseous Diffusion Plant		
CX	Institutional Control of Off-Site Contamination	October 15, 1992
CX	D&D Design Plan for C-340	Nov. 30, 1992
CX	C-746-H3 Storage Pad Upgrade	October 15, 1992
CX, B3.1	PGDP Administrative Consent Order Well Sampling	January 15, 1993

*Legend

CX Categorical Exclusion

6.0 REPORTING AND DATA MANAGEMENT

6.1 REQUIRED REPORTS

A list of all Environmental Restoration (ER) reports or plans routinely submitted to Energy Systems as well as regulatory agencies, including U.S. Department of Energy (DOE), is provided in Table 15.

Table 15. Environmental Reports

a.	Monthly ACO Progress Report
Date Due: Quarterly
Submitted to: DOE/EPA/Kentucky
b.	Monthly Remedial Action Progress Report
Date Due: 10th of each month
Submitted to: DOE
c.	Final Report on Phase I of Groundwater Investigation
Date Due: March 25, 1992
Submitted to: EPA/Kentucky
d.	Phase II Site Investigation Work Plan
Date Due: October 1991
Submitted to: EPA/Kentucky
e.	RCRA Facility Investigation Plans for Individual SWMUs and Spill Sites
Date Due: Schedule is defined by the HSWA permit
Submitted to: EPA/Kentucky
f.	Final Report and Alternatives Evaluation Report on Groundwater Investigation
Date Due: December 1991
Submitted to: EPA/Kentucky
g.	RCRA Facility Investigation Reports for SWMU and Spill Site Investigation
Date Due: Will be defined by work plans
Submitted to: EPA/Kentucky
h.	Groundwater Protection Management Plan
Date Due: May 1990
Submitted to: DOE

6.2 MAINTENANCE OF RECORDS

Records documenting environmental restoration (ER) activities are maintained in the ER Department offices, with the majority of data gathered during the site investigation maintained in an electronic data base and assimilated in a geographic information system. This system is operational and is being maintained by ER personnel. Use of the system is limited to those persons with a need to access the data. Additionally, data is protected by allowing only selected persons the ability to change the data in the data base.

Information necessary to defend information gathered during the ER program, such as chain-of-custody forms, data validation packages, and hard copies of analytical results, will be maintained within a locked file system or within a locked office to physically protect this information. Duplicate copies of critical data may be maintained in a separate, protected location.

Records are classified and maintained in accordance with Energy Systems Policy Procedure GP-21, "Retention and Disposition of Records." In addition, certain environmental records are maintained in accordance with the "Essential and Vital Records Program" as defined in Energy Systems Procedure GP-22.

6.3 SAMPLING AND ANALYSES

The Environmental Restoration (ER) program archives soil samples for future evaluation as sources of lithologic information, and potentially for further analytical evaluation. These samples will be catalogued and stored in a sample storage area located near the ER offices. A controlled (heated and cooled) environment, with protection from physical harm, is provided for the archive area. The length of time that archived samples will be maintained is presently undetermined. Plant and animal samples, if archived, will be stored in a freezer.

Sampling is performed according to Environmental Protection Agency procedures and Energy Systems' Environmental Surveillance Procedures Quality Control Program.

6.4 DATA VALIDATION/VERIFICATION

For each major measurement parameter, including all pollutant measurement systems, significant efforts are conducted to ensure all data has been validated and verified. These efforts include the review of equations and calculations used to determine the concentration, identification of acceptable criteria to determine the accuracy of the data, and determination of methods to identify and treat outlier data and identify key individuals who are responsible to handle the data.

7.0 QUALITY ASSURANCE OBJECTIVES

The Paducah Gaseous Diffusion Plant (PGDP) Quality Assurance (QA) Program objectives are to assure that all items and services utilized in the design, construction, operation, maintenance, and decommissioning of the facility will meet all quality criteria. The QA Program requirements are fulfilled by a combination of:

- implementation by the line organization of control system procedures for activities directly related to achieving quality, and
- verification coordinated by the QA organization of the control systems implemented.

In order to fully implement this QA Program and achieve the associated objectives, it is imperative that each employee maintain the highest degree of concern for excellence and quality achievement. Early identification of quality requirements, comprehensive quality planning, and implementation of the plans are essential elements of this program. Other key areas include problem prevention/solution and verification of corrective actions.

The QA Program has been developed to meet the requirements contained in DOE Order 5700.6C, "Quality Assurance," which includes ANSI/ASME NQA-1 requirements, as well as to provide both Energy Systems and DOE management with confidence that established quality requirements are being met. PGDP recognizes quality achievement as an equal to cost and schedule requirements.

Implementation of the requirements is obtained through the issuance of Standard Practice Procedures (SPP) to provide overall plant wide QA guidance and incorporation of the SPP requirements into the divisional operating procedures. The following site-specific plans have been issued to provide guidance for the PGDP QA Program:

P-GP-21, "Organization (Quality Assurance Responsibilities)"
P-GP-22, "Quality Assurance Program"
P-GP-23, "Design Control"
P-GP-24, "Procurement Document Control"
P-GP-25, "Instructions, Procedures, and Drawings"
P-GP-26, "Document Control"
P-GP-27, "Control of Purchased Items and Services"
P-GP-28, "Identification and Control of Items"
P-GP-29, "Control of Processes"
P-GP-30, "Inspection"
P-GP-31, "Test Control"

P-GP-32, "Control of Measurement and Test Equipment"
P-GP-33, "Handling, Storage, and Shipping"
P-GP-34, "Inspection, Test, and Operating Status"
P-GP-35, "Control of Nonconforming Items"
P-GP-36, "Corrective Actions"
P-GP-37, "Quality Assurance Records"
P-GP-38, "Internal Technical Audits"
P-GP-39, "ADP Software Control"
P-GP-40, "Performance Improvement Process"
P-GP-41, "Quality Glossary"
P-GP-42, "Quality Event Reporting"
P-GP-43, "Quality Investigation Reports"
P-GP-44, "Unusual Occurrence Report"
P-GP-45, "Problem Alert"
P-GP-46, "Quality Assurance Surveillance"
P-GP-47, "Readiness Review"
P-GP-48, "Material Traceability"
EM-3, "Incorporation of NQA-1 in Procedures"

In addition, a QA Program Plan has also been developed for PGDP's Environmental Restoration (ER) progress. The requirements established in these procedures are implemented on a graded approach to all activities covered under this plan.

7.1 PLANNING

Currently, Energy Systems Quality Procedure ESP-2.6, "Quality Assurance Plans" is in the procedure used in developing quality plans at Paducah Gaseous Diffusion Plant (PGDP). A team of individuals is identified to review the project/activity to ensure that the proper controls have been established and/or documented. The planning process consists of two phases. The first phase is the identification of which aspects of the project/activity require controls and what those controls are (i.e., procedures). The second phase is called a risk assessment. This consists of identifying events that would have some impact on the activity/project and measures to minimize or control those events.

7.2 IMPLEMENTATION

Implementation of the Quality Assurance (QA) Program is addressed in Standard Practice and Procedures (SPP), P-GP-21 and P-GP-22. These documents state that implementation of the quality program is the responsibility of line management and that this implementation is to be documented in divisional procedures.

7.3 VERIFICATION

Verification is normally performed on audit/surveillance inspection deficiencies to determine if a corrective action was completed as it was committed to do.

7.4 SAMPLING QUALITY ASSURANCE

From the point of conception of any sampling program, Quality Assurance (QA) plays an important role. Each monitoring or sampling organization plans a project, sets objectives, identifies responsibilities, and selects sampling methods and the appropriate sampling instruments or devices according to use and cleaning practices recommended by the American Society for Testing and Materials, the Environmental Protection Agency (EPA), or other established authorities. The number of samples, locations of sampling sites, sampling methods, sampling schedule, and coordination of sampling and analytical resources to meet critical completion times must all be decided. The rationale for these decisions and others is mainly the responsibility of the sampling organization, with input from compliance and analytical organizations. Sampling plans and field documentation are prepared as appropriate. Chain-of-custody documentation is prepared from the point of sampling, and the samples are properly protected until they are placed into the custody of analytical laboratory control programs. In the laboratory, chain of custody continues until the sample is analyzed. For hazardous waste samples, chain of custody is maintained to the point of sample disposal. The performance of all field analytical procedures is documented using EPA-approved methods when available.

7.5 ANALYTICAL QUALITY ASSURANCE

The analytical laboratories of the Energy Systems installations continue to implement a strong tradition of Quality Assurance (QA) and Quality Control (QC). The continued implementation of sound methodology, safe practices, analytical recovery, high precision and accuracy are well established. Since the beginning of the installation's operation, the laboratories have been involved in the handling and analysis of materials of high purity and hazardous materials, for which strict accountability is required. Implementation of QA and QC measures are, therefore, a daily responsibility.

Upon receiving the samples from the sampling group or the sample transporter, the laboratory custodian assumes responsibility for the proper protection and handling of the samples. Using guidance from Environmental Protection Agency (EPA), the laboratory documents the steps in handling, analysis, and approval of results. The performance of all analytical procedures is documented using EPA-approved methods when they are available.

A key feature in analytical QA is QC. Paducah Gaseous Diffusion Plant participates in programs that are: (1) internal to the laboratory; (2) internal to the Quality and Technical Services Division, but external to the laboratory; and (3) external to the plant.

8.0 FEDERAL, STATE, AND LOCAL INTERACTIONS

Kentucky Pollutant Discharge Elimination System Permit KY0004049, issued in September 1986, established effluent limits for all Paducah Gaseous Diffusion Plant (PGDP) liquid effluents. PGDP effluent do not always meet warm water aquatic habitat criteria that defined the limits in this permit. U.S. Department of Energy (DOE) requested adjudication of the permit and, as a result, an agreed order between Kentucky Department of Water (KDOW) and DOE was reached. The agreed order was effective October 12, 1987, and established interim effluent limits and required a BMP to determine the effects of plant effluents.

An Administrative Consent Order (ACO) was developed in October 1988 between DOE and Environmental Protection Agency, with approval from the Department of Justice, addressing PGDP's groundwater contamination. The state of Kentucky was involved during discussions of the ACO, but chose not to be a signatory part to the agreement. This agreement requires DOE to take certain actions in response to the groundwater contamination, including development and implementation of a work plan for investigation of the source and extent of the contamination, continued sampling of potentially affected residential wells, and provision of alternative drinking water supplies to those residents with contaminated wells. DOE has initiated efforts to comply with these requirements.

A license agreement has been developed with the West Kentucky Wildlife Management Area (WKWMA). The WKWMA adjoins PGDP. This agreement allows installation and sampling of groundwater wells, sampling of surface water, sampling of sediment, sampling of plant and animal tissue samples, sampling of soils, and other investigation activities as necessary. This agreement was necessary because a significant amount of sampling activities during the groundwater contamination investigation will be carried out in the WKWMA.

An Agreement in Principle was negotiated between DOE and the state of Kentucky during FY91. This agreement granted Kentucky funds for oversight of PGDP's Environmental Compliance and Environmental Restoration (ER) Programs.

A Paducah Environmental Advisory Committee (PEAC) was formed to provide an independent review of the PGDP Environmental Protection Program. The PEAC is composed of an independent group of 5 distinguished area residents and specialists, unaffiliated with DOE or Energy Systems, with knowledge and experience in the areas of health, science, education, business, environmental advocacy, and civic leadership. The committee was charged with the following responsibilities:

- reviewing the sources of environmental pollutants, the control systems, the surveillance activities associated with the operation of PGDP, and the recommendations for modification thereto;
- evaluating plans for remedial activities and studies to correct, enlarge, or close waste management facilities and provide recommendations for appropriate changes in strategy or direction;
- addressing the long-term fate and health effects of trace quantities of uranium, other radionuclides, and other pollutants of concern in PGDP environs;
- advising on both scientific and community concern aspects of environmental and health issues to the PGDP plant manager or the director of the office of environmental and safety activities for Energy Systems; and
- advising on the appropriate methods and form of reporting of environmental and health data to the general public.

The committee met for the first time in May 1986 and has routinely made visits to the plant over the past four years. Reports of their findings and recommendations are periodically prepared. The operation of the PEAC is expected to be continuing in nature until current needs are assessed and problems are resolved. It is expected that the committee will continue to play an important part in the plant's Environmental Protection Program.

For the ER Program and other larger projects, National Environmental Policy Act (NEPA) activities will increase the level of public participation in these activities. Copies of all reports are provided for public review and are included in the administrative record. These records are presently made available for public review at the Paducah Public Library. Those projects requiring environmental assessments or environmental impact statements will have significant public involvement.

An information briefing on the Natural Resource Damage Assessment Rule was presented to the PGDP Natural Resource Trustees on December 17, 1991. A list of Trustees was established at the meeting and approved later. The Natural Resource Damage Assessment Rule is a process by which Natural Resource Trustees may assess damages for injuries to natural resources resulting from releases of hazardous substances. Trustees may seek to recover those damages from responsible parties and compensation is for injury that has not been and is not expected to be addressed by CERCLA response actions. NRDA is established by law and codified in regulations.

APPENDIX A

GLOSSARY

GLOSSARY

Action Plan. A plan describing specific cleanup or Corrective Activity.

Ambient. Surrounding.

Applicable or Relevant and Appropriate Requirements (ARARs). Requirements, including cleanup standards, standards of control, and other substantive environmental protection requirements and criteria for hazardous substances as specified under federal and state Law and regulations, that must be met when complying with the Comprehensive Environmental Response, Compensation, and Liability Act (from the Superfund Amendments and Reauthorization Act).

Aquifer. A geologic formation or structure that is capable of yielding water in usable quantities.

Assay. Determination of the components of a material.

Biota. Animal and plant life of a particular region.

Blowdown. Removal of liquids or solids from a process vessel or storage vessel or a line by the use of pressure.

Borehole. A hole made by boring into the ground to study stratification, to obtain natural resources, or to release underground pressure.

Byproduct Material. A product from a manufacturing process that is not considered the principal material.

Cathodic Protection. Protecting a metal from electrochemical corrosion by using it as the cathode of a cell with a sacrificial anode.

Centrifuge. A rotating device for separating liquids of different specific gravities or for separating suspended colloidal particles, such as clay particles in an aqueous suspension, according to particle-size fractions by centrifugal force.

Characterization. Facility or site sampling, monitoring, and analysis activities to determine the extent and nature of a release. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Clean Air Act (CAA). Its purpose is to "protect and enhance the quality of the United States' air resources." Its primary application is through Prevention of Significant Deterioration permits to regulate new potentially-polluting facilities. Of increasing importance are the National Emissions Standards for Hazardous Air Pollutants (NESHAP). The CAA was passed in 1970 as amendments to 42 USC 7401.

Clean Water Act of 1977 (CWA). Amended the Federal Water Pollution Control Act, first passed in 1956. Its objective is to "restore and maintain the chemical, physical, and biological integrity of the United States' waters." The Act's major enforcement tool is the National Pollutant Discharge Elimination System (NPDES) permit.

Closure Plan. Documentation prepared to guide the deactivation, stabilization, and surveillance of a waste management unit or facility under the Resource Conservation and Recovery Act.

Compliance Agreements. Legally binding agreements between regulators and regulated entities that set standards and schedules for compliance with environmental statutes. Includes Consent Order and Compliance Agreements, Federal Facility Agreements, and Federal Facility Compliance Agreements.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). federal statute (also known as Superfund), enacted in 1980 and reauthorized in 1986, that provides the statutory authority for the cleanup of hazardous substances that could endanger public health, welfare, or the environment.

Conductivity. The ratio of the electric current density to the electric field in a material.

Corrective Activities. Projects that are required to bring facilities managed by the DOE/OR into compliance with federal, state, and local requirements and with DOE Orders or policies.

Criticality. The condition in which a nuclear reaction is self-sustaining.

Decommissioning. The process of removing a facility from operation, followed by decontamination, entombment, dismantlement, or conversion to another use.

Decontamination. The removal of unwanted materials (typically radioactive materials) from facilities, soils, or equipment by washing, chemical action, mechanical cleaning, or other techniques.

Disposal. Waste emplacement designed to ensure isolation of waste from the biosphere, with no intention of retrieval for the foreseeable future. It requires deliberate action to regain access to the waste.

DOE Orders. Internal requirements that establish DOE policies and procedures for compliance with applicable laws and regulations.

Effluent. Treated liquid wastes or wastewaters discharged from a treatment unit.

Enrichment (uranium). The process that increases the percentage of uranium-235 isotopes in uranium from 1 to about 3 percent so that it can be used as fuel in a powerplant.

Environmental Restoration. Cleanup and restoration of sites contaminated with hazardous during past production or disposal activities.

Federal Facility Agreement (model FFA). See Compliance Agreements.

Federal Facility Compliance Agreement. See Compliance Agreements.

Field Offices (DOE). Albuquerque, Chicago, Idaho, Nevada, Oak Ridge, Richland, San Francisco, and Savannah River.

Fissile. Capable of being split. In nuclear materials, capable of causing or undergoing fission.

Fissionable Materials. Material whose nuclei are capable of undergoing fission, or being split apart.

Flow metering. Measurement of pressure, flow rate, and discharge rate of a liquid, vapor, or gas flowing through a pipe.

Gaseous Diffusion. A technology for separating fissionable uranium-235 isotopes from the more abundant nonfissionable uranium isotopes by pumping gaseous uranium hexafluoride through resistant barriers.

Graphite reactor. A reactor in which a very pure form of carbon is used as a moderator.

Groundwater. Water occurring beneath the earth's surface in the part that is wholly saturated.

Hazardous Waste. As defined in the Resource Conservation and Recovery Act, solid wastes that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness or pose a substantial present or potential hazard to human health or to the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hot Cell (Cave). A heavily-shielded compartment in which highly radioactive material can be handled, generally by remote control.

Hydrogeology. The science dealing with underground water and its movement.

Implementation Plan. A document that contains the detailed actions needed to achieve a set of specified goals and objectives.

In Situ. In its original location or site.

Industrial Waste. Worthless materials remaining from industrial operations.

Intelligent Machine. See robot.

Land Disposal Restrictions (LDRs). Provisions of Hazardous and Solid Waste Amendments requiring phased-in treatment of hazardous wastes before disposal.

Leachate. A contaminated liquid resulting when water percolates, or trickles through, waste materials and collects components of those wastes. Leaching may occur at landfills and may result in hazardous substances entering soil, surface water, or groundwater.

Life Cycle. Thirty years or the useful life of the item, whichever is less; the life span of an object, from creation to final disposition.

Low-Level Waste. Radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or byproduct material.

Migration of contaminants. Unaided movement of contaminants (liquids, metals, etc.) into the surrounding environment.

Mixed Waste. Mixed waste contains both radioactive and hazardous components, as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act, respectively.

National Environmental Policy Act (NEPA) of 1969. Act that establishes requirements for conducting environmental reviews of Federal actions that have potential to significantly impact the human environment.

National Pollutant Discharge Elimination System (NPDES). Section 402 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act) that establishes a permit for discharges to water and provides standards by which such permits may be granted.

National Priorities List. Formal listing of the United States' worst hazardous waste sites, as established by the Comprehensive Environmental Response, Compensation, and Liability Act.

Neutralization. Treatment of corrosive hazardous wastes to yield a pH near 7.

Oscillation-free. Free of instability or variation.

Performance Assessment. A term used to denote all activities (qualitative and quantitative) carried out to (1) determine the long-term ability of a site/facility to effectively isolate wastes and to ensure the long-term health and safety of the public and (2) provide the basis for demonstrating regulatory compliance. Performance assessment serves as a focal point for site characterization, model development, and uncertainty analysis research activities.

Privatization. Transferring a public entity (property, service, etc.) to private interests.

Pyrophoric. Able to ignite spontaneously when exposed to air.

Quality Assurance. Internal program of oversight and verification to ensure the highest level of accuracy and conformance to established standards.

Radioactive Waste. A solid, liquid, or gaseous material of negligible economic value that contains radionuclides in excess of threshold quantities. This does not include material contaminated by radionuclides from nuclear weapons testing.

Radiogenic. Produced by radioactivity.

Radioisotope. An unstable isotope of an element that will eventually undergo radioactive decay (i.e., disintegration). Radioisotopes with special properties are produced routinely for use in medical treatment and diagnosis, for industrial tracers, and for general research.

RCRA Facility Investigation (RFI). The RCRA process of determining the extent of hazardous waste contamination; similar in intent to the Comprehensive Environmental Response, Compensation, and Liability Act Remedial Investigation.

RCRA Part B Permit. The detailed second part of a Resource Conservation and Recovery Act permit application that describes wastes managed, quantities of waste, and facilities.

Record of Decision (ROD). The Comprehensive Environmental Response, Compensation, and Liability Act document that announces the method of remedial action selected for implementation at a site after the Feasibility Study/Proposed Plan process has been completed.

Remediation. Those activities performed to remove or treat hazardous waste sites or to relieve their effects.

Site. For the purposes of this plan, sites are lands, installations, and/or facilities for which DOE has, or shares, responsibility for Environmental Restoration and Waste Management activities.

Sludge. Pumpable material of naturally-occurring or man-made origin possessing a relatively fixed volume and a moisture content ranging from 15 to 90 percent.

Solid Waste Management Unit (SWMU). Any unit at a facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste. Includes, but is not limited to, container storage areas, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, injection wells, recycling operations, miscellaneous units, and releases from such units.

Stabilization. The process of reducing the hazardous potential of a waste by chemically or physically converting the toxic contaminants into their least mobile or least reactive form.

Storage. Retention and monitoring of waste in a retrievable manner pending final disposal.

Subassembly. A component or structural unit manufactured separately from, but designed to be incorporated with, other parts of a final assembly or finished product.

Superfund Amendments and Reauthorization Act (SARA). The 1986 Act amending and reauthorizing the Comprehensive Environmental Response, Compensation, and Liability Act.

Thermal Desorption. Removal of absorbed materials or elements through the use of heat.

Tiger Team. A team of independent experts appointed by the Secretary of the U.S. Department of Energy (DOE) to identify environmental and safety issues at DOE facilities.

Toxic. Relating to poisoning of the human body by physical contact, ingestion, or inhalation.

Toxic Substances Control Act (TSCA). TSCA was enacted in 1976 to protect human health and the environment from unreasonable risk due to exposure to, manufacture of, distribution of, use of, or disposal of substances containing toxic chemicals. Under TSCA, any hazardous wastes that contain more than 50 parts per million of polychlorinated biphenyls are subject to regulation under this Act.

Treatment. Any activity that alters the chemical or physical nature of a hazardous waste to reduce its toxicity, volume, mobility, or render it amenable for transport, storage, or disposal.

Transuranic (TRU) Waste. Waste that is contaminated with alpha-emitting transuranium nuclides with half lives greater than 20 years and concentrations greater than 100 nanocuries per gram of waste. Waste contaminated with elements having atomic numbers greater than uranium.

Tumulus. Above-ground low-level waste disposal in concrete bunkers covered by a protective liner.

Underground Storage Tank (UST). Any tank or associated piping containing hazardous materials as defined by the Hazardous and Solid Waste Amendments (Subtitle C or Subtitle I).

Waste Area Grouping (WAG). A grouping of facilities and/or release sites with area-wide soil and/or groundwater contamination that is not readily traceable to individual facilities or sites. Generally, a WAG would be limited to an area adjoining the contamination and having a specific water movement pattern.

Waste Minimization. The reduction, to the extent feasible, of hazardous waste that is generated prior to treatment, storage, or disposal of the waste. Waste minimization includes any source reduction or recycling activity that results in either (1) reduction of total volume of hazardous waste, (2) reduction of toxicity of hazardous waste, or (3) both.

Waste Stream. Terminology used to refer to waste leaving a facility or operation.

APPENDIX B
REGULATORY COMMENTS

**RESPONSE TO REGULATORY AGENCY COMMENTS ON THE
FY 92 SITE SPECIFIC PLAN FOR THE
PADUCAH GASEOUS DIFFUSION PLANT**

COMMENT SOURCE: Commonwealth of Kentucky, Department for Environmental Protection

- Comment 1. "Several schedule and milestone tables cover projects from April 1991 through December 1992. Does the fiscal year for the plant start in October 1991 and run through September 1992? The site specific plan should cover programs within a 12 month period."
- Response 1. Yes, the fiscal year runs from October 1 of one year through September 30 of the next.
- Comment 2. Regarding Sect. 4.4.1, Solid Waste Description, page 37: "PGDP has PCB contaminated ventilation gaskets within some plant buildings. Oil drips from the gaskets are categorized as PCB spills by EPA Regulations. The plant has implemented a program to capture these drips in collection troughs. Provide the division with a copy of this program and a project completion date for the clean-up of the contaminated gaskets."
- Response 2. Resolution of this comment is being worked through the Uranium Enrichment's Waste Management Program at PGDP.
- Comment 3. Regarding Sect. 5.4, Remediation, page 47: "Remediation efforts will be funded through Uranium Enrichment (UE) and Environmental Restoration (ER) operation funds, a 50/50 split. If 1992 remediation efforts exceed projected costs, will the needed funds continue to come from UE & ER operation budgets? Is there a cap on remediation funds? If so, what is the limit for FY 1992?"
- Response 3. If 1992 remediation efforts exceed projected costs, the needed funds will continue to come from UE & ER operation budgets. The budget authorization limits for FY 1992 are \$10,810,000 (UE) and \$7,803,000 (ER).
- Comment 4. Regarding Page 7: "The last paragraph refers to maps in Appendix A-2 which identify the locations of the SWMUs and AOC. These maps are not contained in Appendix A-2 which is titled 'Public Comments on the FY 1990 SSP'."
- Response 4. Omission of the maps was an error in final compilation and will be corrected in the future.
- Comment 5. Regarding page 31: "Under the section on Technology Development it states that 'this section is not applicable to the Paducah Gaseous Diffusion Plant.' Even though

technology development activities presently are not being carried out at the PGDP, activities at other DOE facilities could be applicable to actions (future cleanup, process changes for pollution prevention) at the PGDP and should be outlined in future PGDP site specific plans."

- Response 5. The purpose of the Site Specific Plan for the PGDP is to summarize those activities which are ongoing at that facility in the coming year. It is not appropriate to make this document a summary of DOE-wide technology development efforts. As new developments or breakthroughs are made within the DOE's national Technology Development programs, they will, of course, be made available to all DOE facilities.
- Comment 6. Regarding page 33: "The fourth paragraph under section 4.4.1. states that there are nickel ingots with asbestos adhering to the surfaces in the scrap metal yard. Has the DOE discussed this situation with the DEP's Division for Air Quality or the Division of Waste Management?"
- Response 6. Resolution of this comment is being worked through the Uranium Enrichment's Waste Management Program at PGDP.
- Comment 7. Regarding Section 1.2.1, page 6, paragraph 2: "The BMP must be conducted on effluents as well, or in conjunction with, chemical studies on the effluents and sources of contamination impacting each effluent. Any monitoring planned for the coming years should comply with existing and reissued KPDES permit requirements, the 1987 Agreed Order, unless superseded by a more recent document, and any more recent Agreed Order executed by DOE and DEP. It is already known that current discharges are impacting aquatic life. Corrective actions are needed to remediate sources, ditches and streams and provide proper treatment of effluents to comply with KPDES permit limits and water quality standards. We contest the assertion that a CDR is not needed at this time. It is not so much biological monitoring but chemical monitoring that must be completed. Regardless of source identification studies planned, a treatment system could be under design at least as soon as the new KPDES permit conditions are developed in 1992."
- Response 7. The comment is valid. We will work on this.
- Comment 8. Regarding Sect. 1.2.1, page 6, paragraph 3: "A TIE/TRE study proposal has not been submitted. Instead, a generic guidance document with no pertinent TIE/TRE specifics has been submitted. A proper TIE/TRE is needed. When will the BMP end? How does DOE intend to complete analysis and develop a GPP in FY 1992? We concur with this goal if it can be achieved."
- Response 8. Resolution of this comment is being worked through the Uranium Enrichment's Waste Management Program at PGDP.

- Comment 9. Regarding Sect. 1.2.1, page 7, paragraph 2: "This paragraph should be updated to indicate whether the FFCA was completed in FY 1991 or whether it will be completed in FY 1992."
- Response 9. The FFCA was not completed in FY 1991. It was submitted for signatures in May 1992. The status of the FFCA will be monitored in future plans.
- Comment 10. Regarding page 18, paragraph 4: "The Kentucky Division of Waste Management (KDWM) does not regulate the radioactive portion of mixed waste nor does the KDWM regulate radioactive material/radioactive waste. The Kentucky Cabinet for Human Resources Cabinet (Cabinet) is responsible for regulations that deal with radioactive materials. The Cabinet was designated in enabling legislation as the lead agency for regulation of radioactive materials and as such is required by State statutes to regulate any activities under CERCLA involving radioactive material. Kentucky and not Nuclear Regulatory Commission (NRC) regulations are enforceable as related to Paducah Gaseous Diffusion Plant (PGDP) under a CERCLA action. Kentucky regulations would not be 'applicable' at PGDP; however, Kentucky's regulations as related to radioactive materials would be 'relevant and appropriate' at PGDP under CERCLA. Therefore, the Environmental Restoration and Waste Management Site Specific Plan should reflect the proper use of ARARs as related to PGDP."
- Response 10. The PGDP Environmental Restoration and Waste Management Site Specific Plan will reflect the proper ARARs.
- Comment 11. Regarding page 47, paragraph 1: "The Hazardous and Solid Waste Amendment (HSWA) Permit does not cover radioactive materials. If the Administrative Consent Order is converted to a HSWA Permit, how will radioactive contamination of groundwater, surface water, etc. be properly addressed by the remedial action?"
- Response 11. The ACO will be converted to a Federal Facilities Agreement.
- Comment 12. Regarding page 61, paragraph 2: The Nuclear Regulatory Commission (NRC) doesn't have regulatory authority in the Commonwealth. Kentucky is an Agreement State and a Low-Level Waste (LLW) disposal facility shall meet Kentucky's regulations 902 KAR 100:021 Section 7 & 8 and 902 KAR 100:022. If burial is to take place on-site at PGDP, the Commonwealth would expect DOE to comply with these requirements. This results from Kentucky's responsibility/regulations to protect public health and safety with regard to radioactive material and LLW."
- Response 12. Resolution of this comment is being worked through the Uranium Enrichment's Waste Management Program at PGDP.

APPENDIX C

SITE MAP

PADUCAH GASEOUS DIFFUSION PLANT WASTE AREA GROUPINGS

Paducah Gaseous Diffusion Plant (PGDP) Waste Area Groupings (WAGs)

PGDP WAG 1 consists of three Waste Management Units (WMUs): the C-615 Sewage Treatment Plant, the fire training area, and the trichloroethylene (TCE) spill site. Possible contaminants include TCE, radionuclides, waste oils, and metals.

PGDP WAG 2 consists of the C-747 contaminated burial ground. Possible contaminants include metals and radionuclides.

PGDP WAG 3 consists of three WMUs: the C-747-P clean scrap yard, C-746-F classified burial ground, and the C-747-B burial area. Possible contaminants include radionuclides and metals.

PGDP WAG 4 consists of five underground storage tanks (USTs) which will require investigation under the Kentucky UST Program. Possible contaminants include gasoline and diesel fuel.

PGDP WAG 5 consists of eight WMUs including the C-746-D classified scrap yard, C-375-E5 effluent ditch, C-633 polychlorinated biphenyl (PCB) spill sites, C-632-B sulfuric acid storage tank area, C-531 and 533 switchyards, C-633 pumphouse and cooling tower, and the C-746 Kellogg Building site. Possible contaminants include PCBs, chromates, and TCE.

PGDP WAG 6 is the C-400 technetium storage tank area, with technetium being the contaminant of concern.

PGDP WAG 7 consists of four C-611 USTs, C-611 diesel/gasoline tank, and the C-746-K landfill. Possible contaminants include diesel fuel, gasoline, metals, and volatile organic chemicals (VOCs).

PGDP WAG 8 contains the C-337-A vaporizers, C-535 and 537 switchyards, and the C-637 pumphouse and cooling tower. Possible contaminants include PCBs and chromates.

PGDP WAG 9 is comprised of the C-750-D UST, C-720 compressor pit water storage tank, C-720 underground petroleum naphtha line, and the C-601 diesel spill site. Contaminants include diesel fuel, gasoline, and other petroleum products.

PGDP WAG 10 consists of the C-410-E hydrofluoric acid (HF) holding pond, C-634-B sulfuric acid storage tank, C-637 pumphouse and cooling tower, and PCB contaminated soil. Possible contaminants include PCBs, chromates, and HF.

PGDP WAG 11 consists of the C-410-B HF neutralization lagoon, C-410-C neutralization tank, C-405 incinerator, and the C-635 pumphouse and cooling tower. Possible contaminants include radionuclides, chromates, and metals.

PGDP WAG 12 includes the C-616-E sludge lagoon and the C-616 chromates reduction facility. Possible contaminants include PCBs and chromates.

PGDP WAG 13 encompasses the C-611-W sludge lagoon, C-611-Y overflow lagoon, C-611-V lagoon, C-375-S6 ditch, and the C-375-E8 ditch. Possible contaminants include PCB and radionuclides.

PGDP WAG 14 consists of the C-400 to C-404 underground transfer line which is possibly contaminated with TCE and radionuclides.

PGDP WAG 15 contains the C-746-A inactive PCB transformer area and the C-746-A1 and C-746-A2 USTs. Possible contaminants include PCB, gasoline, and diesel fuel.

PGDP WAG 16 is the C-333-A vaporizer which is possibly contaminated with uranium and PCB.

PGDP WAG 17 encompasses rubble piles possibly contaminated with radionuclides.

PGDP WAG 18 is the plant storm sewer system. Possible contaminants include PCB, TCE, and radionuclides.

APPENDIX D
PUBLIC COMMENTS

No comments were received from the public in response to a formal request.

**DATE
FILMED**

11 / 18 / 93

END