Department of Energy

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November 13, 2024

Ms. April Webb
Interim Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

PPPO-02-10029969-25

Mr. Victor Weeks
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

Dear Ms. Webb and Mr. Weeks:

TRANSMITTAL OF THE D1 SITE MANAGEMENT PLAN, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, ANNUAL REVISION, FISCAL YEAR 2025, DOE/LX/07-2508&D1

In accordance with Section XVIII of the Paducah Federal Facility Agreement (FFA), the U.S. Department of Energy (DOE) is submitting the *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2025*, DOE/LX/07-2508&D1(SMP), for your review and comment. Approval of this fiscal year (FY) 2025 SMP will supersede the previously approved FY 2024 SMP.

This version of the SMP incorporates input received from the U.S. Environmental Protection Agency (EPA) and the Kentucky Department for Environmental Protection (KDEP) during scoping meetings held August 2024 through September 2024 and during an FFA FY 2025 SMP breakout meeting held November 6, 2024.

DOE appreciates the FFA parties' efforts in scoping the FY 2025 SMP. In accordance with Section XVIII and Appendix F of the FFA, EPA and KDEP have a 30-day review and comment period. If the FFA parties have no substantive comments, then DOE requests a letter of concurrence.

If you have any questions or require additional information, please contact me at (270) 217-2029.

Sincerely,

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April Ladd
Federal Facility Agreement Manager
Portsmouth/Paducah Project Office

Enclosures:
1. Certification Page
2. *Site Management Plan, Annual Revision, Fiscal Year 2025*, DOE/LX/07-2508&D1–Clean
3. *Site Management Plan, Annual Revision, Fiscal Year 2025*, DOE/LX/07-2508&D1–Redline

Administrative Record File—ARF ARR

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CERTIFICATION

Document Identification: ***Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2025*, DOE/LX/07-2508&D1, November 2024**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Four Rivers Nuclear Partnership, LLC

MYRNA REDFIELD (Affiliate)
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Myrna E. Redfield, Program Manager/Date Signed
Four Rivers Nuclear Partnership, LLC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

U.S. Department of Energy

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April Ladd, Paducah Site Lead/Date Signed
Portsmouth/Paducah Project Office
U.S. Department of Energy

DOE/LX/07-2508&D1
Primary Document

Site Management Plan
Paducah Gaseous Diffusion Plant
Paducah, Kentucky

Annual Revision—FY 2025

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DOE/LX/07-2508 &D1
Primary Document

Site Management Plan
Paducah Gaseous Diffusion Plant
Paducah, Kentucky

Annual Revision—FY 2025

Date Issued—November 2024

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

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CONTENTS

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FIGURES

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ACRONYMS

AFFF	aqueous film forming foam
AOC	area of concern
BGOU	Burial Grounds Operable Unit
BRA	baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CSOU	Comprehensive Site Operable Unit
CY	calendar year
D&D	deactivation and decommissioning
DMP	data management plan
DMSA	DOE material storage area
DNAPL	dense nonaqueous-phase liquid
DOE	U.S. Department of Energy
DUF_6	depleted uranium hexafluoride
ELCR	excess lifetime cancer risk
EM	environmental management
EPA	U.S. Environmental Protection Agency
ERH	electrical resistance heating
ESD	explanation of significant difference
EW	extraction well
FFA	Federal Facility Agreement
FS	feasibility study
FY	fiscal year
GA	geographical area
GDP	gaseous diffusion plant
GSA	generator staging area
GWOU	Groundwater Operable Unit
HI	hazard index
HSWA	Hazardous and Solid Waste Amendment
HVAC	heating, ventilating, and air conditioning
IRA	interim remedial action
KDEP	Kentucky Department for Environmental Protection
KOW	Kentucky Ordnance Works
KPDES	Kentucky Pollutant Discharge Elimination System
KY	Commonwealth of Kentucky
LUC	land use control
LUCAP	land use control assurance plan
LUCIP	land use control implementation plan
MCL	maximum contaminant level
MOA	memorandum of agreement
NCP	National Contingency Plan
NFA	no further action
NPL	National Priorities List
NSDD	North-South Diversion Ditch
NTCRA	non-time-critical removal action
OSWDF	on-site waste disposal facility
OU	operable unit
PFAS	per- and polyfluoroalkyl substances

PGDP	Paducah Gaseous Diffusion Plant
PTW	principal threat waste
RACR	remedial action completion report
RAO	remedial action objective
RAWP	remedial action work plan
RCRA	Resource Conservation and Recovery Act
RCW	recirculating cooling water
RDSI	remedial design support investigation
RFI	RCRA facility investigation
RGA	Regional Gravel Aquifer
RI	remedial investigation
ROD	Record of Decision
SAA	satellite accumulation area
SAP	sampling and analysis plan
SAR	SWMU assessment report
SE	site evaluation
SMP	Site Management Plan
SWMU	solid waste management unit
SWOU	Surface Water Operable Unit
TS	treatability study
UCRS	Upper Continental Recharge System
UST	underground storage tank
VOC	volatile organic compound
WAG	waste area group
WDA	waste disposal alternative
WKWMA	West Kentucky Wildlife Management Area

1. INTRODUCTION

The Paducah Gaseous Diffusion Plant (PGDP) was placed on the National Priorities List (NPL) on May 31, 1994. In accordance with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the U.S. Department of Energy (DOE) entered into a Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) and Kentucky on February 13, 1998. The FFA established one set of consistent requirements for achieving comprehensive site remediation in accordance with the Resource Conservation and Recovery Act and CERCLA, including stakeholder involvement.

Section XVIII of the FFA requires that DOE submit an annual Site Management Plan (SMP), which outlines DOE's strategic approach for achieving cleanup under the FFA, to EPA and the Energy and Environment Cabinet (formerly known as the Kentucky Environmental and Public Protection Cabinet) by November 15th of each year. The FFA states that the purpose of the SMP is to coordinate and document the potential and selected operable units (OUs), including removal actions; to define cleanup priorities; to identify work activities that will serve as the basis for enforceable timetables and deadlines under the agreement; and to establish long-term cleanup goals.

The current strategy includes the following:

- Addition of the C-400 Complex OU with enforceable milestones and planning dates for all the CERCLA activities under the OU, including the out-year enforceable milestone for the C-400 Remedial Action field start; and

- Resequencing of all other projects [e.g., CERCLA Waste Disposal Alternatives (WDA), Burial Grounds OU, Soils OU, Dissolved-Phase Plumes OU, Surface Water OU, Comprehensive Site OU (CSOU)].

- Consolidating the remedy decisions for all projects under four records of decision (RODs) [i.e., WDA, deactivation and decommissioning (D&D), environmental media, and CSOU].

This annual update of the SMP [fiscal year (FY) 2025 SMP] sets forth enforceable milestones for FY 2025, FY 2026, and FY 2027, with continued emphasis on the C-400 Complex consistent with the Memorandums of Agreement (MOAs) signed in August 2017 and August 2019 and the FY 2018/FY 2019 SMP. A new overall cleanup strategy for the site was discussed among the FFA parties in late FY 2023. At that time, DOE proposed to integrate and accelerate Paducah cleanup decisions for environmental media, D&D, and waste disposition. This approach is consistent with the approach successfully being used at the Portsmouth plant. Due to the earlier shutdown of the Portsmouth Gaseous Diffusion Plant, the Portsmouth plant is roughly 10–15 years ahead of the Paducah cleanup. With this proposal, DOE intends to maintain momentum by taking additional actions to address the high-concentration centroid of the dissolved-phase plume emanating from the C-400 Complex, documented in a post-ROD technical memorandum to the post-decision administrative record to the Northwest Plume ROD for interim action. DOE is also conducting sampling to isolate the location of the suspected dense nonaqueous-phase liquid north of the C-400 Complex OU and to aid in the placement of extraction wells to meet the objectives and fundamental design criteria for the northwest dissolved-phase plume ROD that will be documented in an addendum to the C-400 remedial investigation (RI) report. Three decision documents are proposed for submittal in 2029 (or earlier). These decision documents will propose and combine cleanup decisions for multiple environmental media areas (e.g., soils, surface water, groundwater, slabs, lagoons) into a single final decision, establishing final cleanup levels for the entire Paducah Site based on anticipated future use; propose and combine cleanup actions for multiple D&D buildings into a single final decision (incorporating some aspects of deactivation under the FFA/CERCLA process); and make a final waste disposal alternative decision. A final CSOU would consider appropriate actions for any remaining contamination, after actions determined by the three decision documents are complete. The CSOU evaluation will be conducted, with implementation of additional actions, as needed, to ensure long-term protectiveness of human health and the environment. CERCLA Five-Year Review evaluations are and will continue to be conducted to determine if any modifications to actions are required prior to the CSOU evaluation.

The current time frame for the completion of site cleanup is 2065.

Appendix 1 of this SMP contains a summary of the status of all actions taken to date relative to the signed Records of Decision or Action Memoranda (including both interim and final response actions). This appendix also serves to meet the requirements of Section X.A of the FFA to submit an annual removal action report describing a summary of removal actions performed during the previous FY. More detailed information on the status of each OU is available in the FFA Semiannual Progress Report.

2. LAND USE

The planning assumptions for current land use are depicted in Figure 1, and the reasonably foreseeable future use is depicted in Figure 2. Potential future uses include recreational, industrial, and waste management. Several factors were considered in establishing the land-use assumptions under this cleanup strategy, including current and past land use, stakeholder input, and interest expressed by outside entities for the industrial use of areas on and adjacent to PGDP. Section XLII of the FFA states that DOE shall provide notice to the FFA parties at least 90 days prior to any such sale or transfer and include notice of the FFA requirements in any document transferring ownership or operation of any portion of the site to any subsequent owner or operator.

2.1 LAND USE CONTROLS

The site cleanup strategy recognizes that the long-term protectiveness of some response actions might rely upon or be supplemented by engineering barriers, institutional controls, and/or other land use controls (LUCs). To ensure that these controls remain protective, CERCLA five-year reviews, in conjunction with monitoring of requirements contained in the Land Use Control Assurance Plan (LUCAP), are implemented.

A Land Use Control Implementation Plan (LUCIP) is developed for each remedy that includes LUCs. The LUCIPs include a detailed explanation of the implementation and long-term maintenance of the LUCs. The LUCAP requires annual certification in the SMP that the LUCIPs are being implemented. This certification also will identify any noncompliance with a LUCIP and the steps taken to correct any such noncompliance, any nonmajor changes in land use, and any changes in designated officials. Appendix 2 contains the annual certification of LUCIPs implemented at PGDP.

3. OPERABLE UNITS

Completion of OUs is required to achieve delisting of the site from the NPL and the decommissioning of the gaseous diffusion plant (GDP). Prior to final deletion from the NPL, partial delisting may occur if conditions are met to support potential property transfers. Appendix 3 includes additional information regarding scope for each of the defined OUs. This scope has been left in place; however, additional information on the integration and acceleration of cleanup has been included in Appendix 3. In addition, Appendix 4 contains lists of SWMUs and areas of concern (AOCs) sorted by OUs.

- C-400 Complex OU
- Groundwater OU
- Surface Water OU
- Lagoons OU
- Burial Grounds OU
- Soils OU
- Soils and Slabs OU
- Facility Decommissioning OU
- Depleted Uranium Hexafluoride (DUF_6) Footprint Underlying Soils OU
- CSOU
- CERCLA Waste Disposal Alternatives OU

DOE is currently implementing deactivation and utility optimization activities outside of the FFA

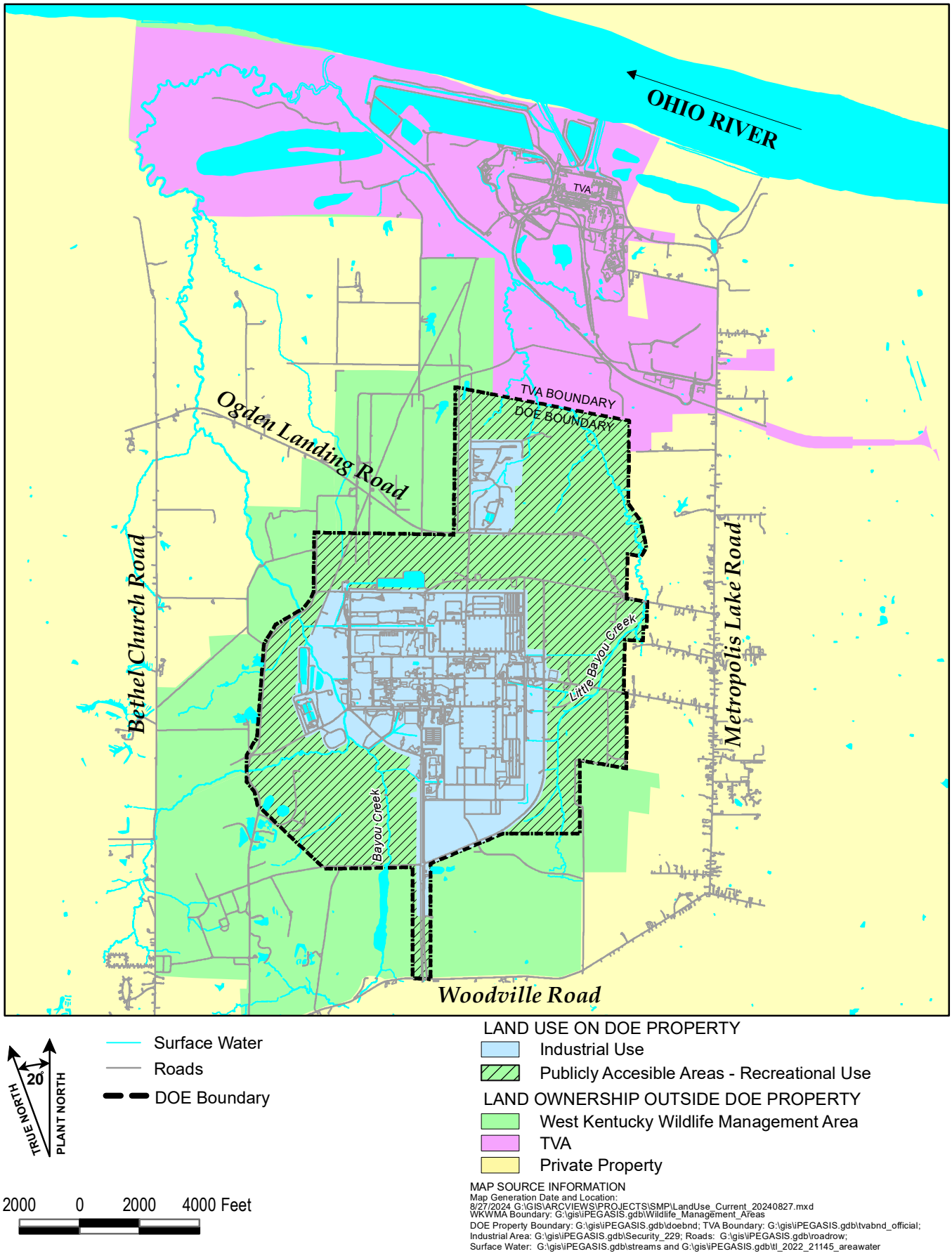

Figure 1. Current Land Use at PGDP

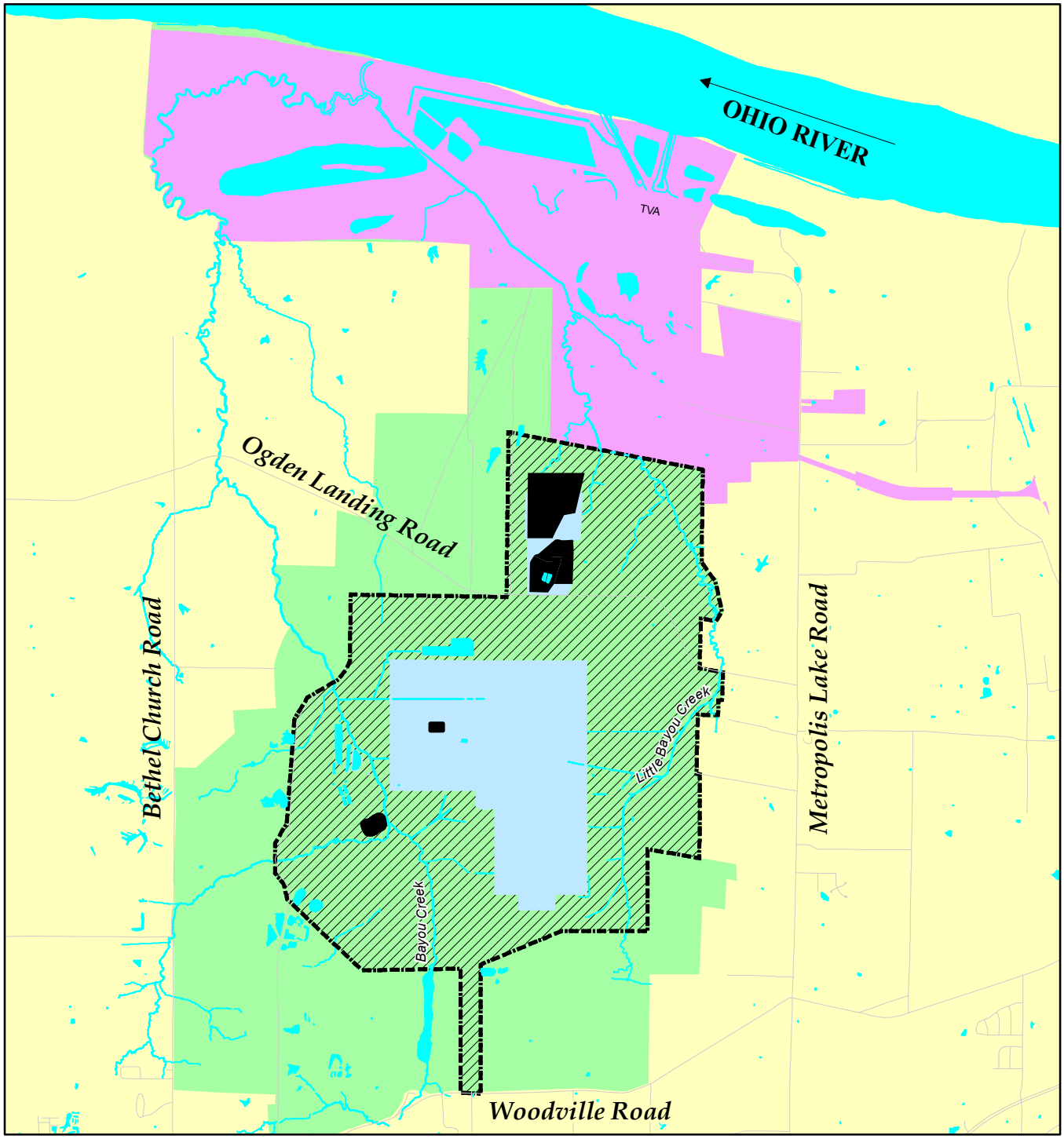

Figure 2. Reasonably Anticipated Future Land Use at PGDP

scope to prepare the site for effective implementation of all future mission activities, including cleanup activities. While the FFA parties have agreed to focus cleanup efforts on the C-400 Complex, long-term plans and strategies for cleanup continue to be refined for future decommissioning of the GDP and cleanup of other OUs. In addition, DOE continues to evaluate the emerging contaminants 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS) as potential contaminants at the Paducah Site. The final CSOU evaluation will support the final remedial decision for the site following completion of the three decisions proposed in the new overall cleanup strategy OUs. Any required environmental monitoring of remedy performance and/or progress toward achieving the remedial action objectives (RAOs) will be conducted and reported in accordance with the selected remedies. Once no further response is appropriate and all RAOs have been achieved, the site (remaining property not previously deleted and/or transferred) would be eligible for deletion from the NPL.

4. SITE PRIORITIZATION

DOE uses a combination of factors to prioritize work being implemented under the Environmental Management (EM) program at PGDP. These include considerations such as regulator expectations; risk-based decision making; compliance with other programs; funding projections; integration and acceleration of cleanup decisions; mortgage reduction; and demonstrated progress toward completing the EM mission. The site prioritization is evaluated each year as part of the annual update to the SMP. Additionally, the FFA parties are committed to working together to identify projects that could be addressed in the event that additional funding becomes available or cost savings are realized.

The risk prioritization criteria incorporate the general program-management principles of the National Contingency Plan, which emphasize the use of accelerated actions to address imminent threats and reduce migration of off-site contamination.

Enforceable milestones for FY 2025, FY 2026, FY 2027, and out-year enforceable completion dates consistent with these prioritization criteria are included in Appendix 5. Any enforceable completion dates for remedial actions shall be considered satisfied upon issuance of a D1 Remedial Action Completion Report (RACR) (i.e., Final Remedial Action Report, as specified in the FFA) for those areas where RAOs have been achieved. In cases where a period of operation and maintenance may be required to achieve RAOs, such as groundwater, a D1 Interim RACR will be issued upon completion of remedial construction and a determination by DOE that the remedy is operating as intended.

Risk Prioritization Criteria

- Mitigate immediate threats, both on- and off-site.
- Reduce further migration of off-site contamination.
- Address sources contributing to on-site and off-site contamination.
- Perform D&D /Address OUs.
- Address soils within the DUF_6 plant footprint once it ceases operations and D&D of the DUF_6 plant is complete.
- Evaluate the final CSOU.

Decommissioning of surplus DOE facilities is described in the 1995 DOE and EPA Memorandum: *Policy on Decommissioning DOE Facilities under CERCLA.* The Facility Decommissioning OU identifies industrial facilities (listed in Appendix 4) that, in some cases, already have been determined to pose a potential threat of release of hazardous substances to the environment that warrants decommissioning to be performed as a CERCLA non-time-critical removal action. The evaluation of facilities at PGDP to determine if there was a release threat to the environment that would warrant a site evaluation to determine if decommissioning should proceed under CERCLA is described in Appendix 6.

All data collected in support of any removal or remedial action shall be managed in accordance with an approved Data Management Plan (DMP). In accordance with Section XXVII.C of the FFA, Appendix 7 contains the final DMP for the Paducah Site.

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APPENDIX 1

ACTIONS TAKEN TO DATE

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Operable Unit Summary

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
GROUNDWATER OPERABLE UNIT				
WAG 26/Groundwater	Emergency removal action	Administrative Order by Consent under Sections 104 and 106 of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) November 4, 1988	Provided temporary water to local residences where private wells are contaminated by TCE and Tc-99.	Complete
WAG 26/Groundwater	Removal action	August 30, 1994 DOE/OR/06-1201&D2	Extended municipal water line to residences affected by off-site groundwater contamination. 2013 Five-Year Review required additional actions for vapor intrusion.	Construction Complete/Operational Additional actions for vapor intrusion complete.
WAG 26/Groundwater (Northwest Plume)	Interim Remedial Action (IRA)	July 23, 1993 DOE/OR/06-1143&D4	Hydraulic containment and treatment of high concentrations of off-site TCE contamination in the Northwest Plume.	Construction Complete/Operational
	ESD	November 19, 1996 DOE/OR/06-1481&D2	Originally proposed to eliminate activated carbon filters (proposal was later withdrawn in response to public comment). Reversed the sequence of two treatment units (ion exchange unit and air stripper) and eliminated the iron filings treatability study (TS).	Construction Complete/Operational

[1] Detailed information on the status of each project or operable unit is available in the FFA Semiannual Report.

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
GROUNDWATER OPERABLE UNIT (Continued)				
WAG 26/Groundwater (Northwest Plume) (continued)	ESD	January 27, 2011 DOE/LX/07-0343&D2	Optimization of the Northwest Plume system through placing existing southern extraction wells (EWs) on standby and installing two new EWs east of original southern extraction field.	Construction Complete/Operational
	Technical Memorandum to File	September 12, 2024 Northwest Plume (NWP-PT-PD)	*Nonsignificant Change for the Record of Decision for Interim Remedial Action of the Northwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*. A Memorandum to File was issued to document the changes made to the Northwest Plume Interim Remedial Action to fulfill the intent to further optimize the hydraulic control of and contaminant mass removal from the northwest TCE and Tc-99 plumes.	This Memorandum to File is part of the integrated and accelerated approach to site cleanup, which resulted in a recommendation to further increase the contaminant mass removal and further enhance plume capture by installing and operating one or more EWs near the TCE source zone while continuing to pump from the currently active EWs.
WAG 26/Groundwater (Northeast Plume)	IRA	June 15, 1995 DOE/OR/06-1356&D2	Hydraulic containment and treatment of high concentrations of off-site TCE contamination in the Northeast Plume.	Construction Complete/Operational
	ESD	January 13, 2016 DOE/LX/07-1291&D2/R2	An ESD has been submitted for optimization of the Northeast Plume system through placing existing EWs on standby, installing two new EWs in the upgradient high concentration area of the Northeast Plume near the eastern edge of the PGDP facility, and installing new treatment units for air stripping as an alternative to the cooling towers.	Construction of an alternate treatment unit was completed on May 30, 2013. The unit became operational on September 4, 2013. The ESD and RAWP were in dispute until July 2015 at which time the Memorandum of Agreement (MOA)[2] for resolution was signed. Optimization, including startup and batch testing, has been completed, and the system became fully operational in October 2017. Federal Facility Agreement (FFA) parties established and documented transect well baseline determinations in an addendum to the RAWP. Hydraulic assessment is complete. Beginning in 2018, Tc-99 and

[2] *Memorandum of Agreement for Resolution of Formal Dispute of the Explanation of Significant Differences to the Record of Decision for the Interim Remedial Action of the Northeast Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1291&D2), and Remedial Action Work Plan for Optimization of the Northeast Plume Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1280&D2),* August 4, 2015.

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
GROUNDWATER OPERABLE UNIT (Continued)				
WAG 26/Groundwater (Northeast Plume) (continued)				TCE concentration trends in the transect wells indicated potential changes in groundwater flow or source impacts. As a result, contaminant mobilization decision rules in the MOA were triggered. The FFA parties agreed in 2018 to adjust EW pumping rates; to continue operating under MOA Condition #3; and to review transect well results on a quarterly basis, considering additional adjustments as necessary, which may include an agreement to move into MOA Condition #4. Detailed Northeast Plume optimization information (noting MOA condition) is included in the FFA Semiannual Progress Report, and an evaluation of remedy protectiveness is addressed as part of the Five-Year Review.
SWMU 91/Soil	IRA	August 10, 1998 DOE/OR/06-1527&D2	*In situ* treatment of TCE-contaminated soils using the LASAGNA™ technology.	Complete
SWMU 11 and SWMU 533/Groundwater (C-400 Source Action)	IRA	August 9, 2005 DOE/OR/07-2150&D2/R2	*In situ* treatment of TCE source areas in the UCRS and RGA located in the southeast and southwest corners of the C-400 Building using electrical resistance heating technology.	Field operations for Phase I completed FY 2011. Parties agreed to divide Phase II into Phase IIa and Phase IIb. Phase IIa operations began July 22, 2013, and ceased November 5, 2014. A TS for steam-enhanced extraction conducted and completed June 30, 2015. TS Report approved June 2016. As a result of the DOE proposed strategy and reprioritization agreed to by the FFA

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
GROUNDWATER OPERABLE UNIT (Continued)				
SWMU 11 and SWMU 533/ Groundwater (C-400 Source Action) (continued)				Senior Managers in the August 8, 2017, MOA,[3] the remaining VOC source in the Phase IIb area will be addressed by the C-400 Complex OU. Phase I and Phase IIa activities are documented in a Remedial Action Completion Report for the C-400 Interim Remedial Action (ROD 2005) The 2013 Five-Year Review resulted in a deferred protectiveness status from EPA as stated in a letter from R. Chaffins dated September 30, 2014. DOE conducted a vapor intrusion study for the C-400 Building and results are documented in the 2013 Five-Year Review Addendum dated November 9, 2018. The C-400 Vapor Intrusion Study Addendum to the 2013 Five-Year Review was approved by KY on November 21, 2018; EPA approved on December 4, 2018.
SWMU 1; SWMU 211-A; and SWMU 211-B (Southwest Plume Sources)	Remedial Action	March 20, 2012 DOE/LX/07-0365&D2/R1	SWMU 1—*In situ* source treatment using deep soil mixing with interim LUCs. SWMU 211-A—*In situ* source treatment using enhanced *in situ* bioremediation with interim LUCs or long-term monitoring with interim LUCs based upon RDSI results. SWMU 211-B—*In situ* source treatment using enhanced *in situ* bioremediation with interim LUCs or long-term monitoring with interim LUCs based upon RDSI results.	ROD signed; RDSI field activities initiated on July 18, 2012. Completed RDSI field activities on April 26, 2013. Additional sampling was requested by EPA and completed by DOE. The Final Characterization Report Addendum and Letter Notification proposing remedy for 211-A and 211-B have been evaluated by the FFA parties. The FFA parties have agreed to move forward with 211-A and will determine an appropriate remedial action for 211-B based on a revised conceptual site model consistent with the data in the Final Characterization Report. Mobilization activities for SWMU 1 deep soil mixing were initiated on February 9, 2015, and soil mixing completed

[3] *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, August 8, 2017.

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
GROUNDWATER OPERABLE UNIT (Continued)				
SWMU 1; SWMU 211-A; and SWMU 211-B (Southwest Plume Sources) (continued)	Remedial Action (continued)			October 8, 2015. Soil sampling, monitoring wells installation, and Remedial Action Completion Report for SWMU 1 completed in FY 2016. The Remedial Action Completion Report approved by EPA and KY February 2017. Long-term monitoring continues at SWMU 1 in accordance with the ROD. The Remedial Design for SWMU 211-A was approved by EPA and KY in December 2019. The final Remedial Action Work Plan for SWMU 211-A was revised in December 2021 and was implemented in March 2022. The remedy was documented in an Interim Remedial Action Completion Report for SWMU 211-A that addressed completion of enhanced *in situ* bioremediation. A decision concerning a remedy for SWMU 211-B will be made by the FFA parties in conjunction with actions to be taken for the C-720 Building and surrounding area.
	ESD	December 2, 2022 DOE/LX/07-2480&D2	The ESD documents additional area treated by the SWMU 211-A remedy and the additional associated cost.	ESD signed.

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
SURFACE WATER OPERABLE UNIT				
WAG 25/Surface water (NSDD)	IRA	March 28, 1994 DOE/OR/06-1213&D3	Instituted action to treat certain plant effluent and control the migration of contaminated sediment associated with the NSDD.	Construction Complete/Operational
WAGs 18 & 25/Surface water and sediment (Surface Water/Ditches)	IRA	N/A	Institutional controls (fencing/posting) for off-site contamination in surface water, outfalls, and lagoons.	Construction Complete/Operational
WAG 24/Scrap (Scrapyards)	IRA	N/A	Installation of sediment controls to mitigate surface water/sediment runoff from scrap yards.	Construction Complete/Operational
WAGs 1 & 7 WAG 1: SWMU 100 (Fire Training Area) and SWMU 136 (C-740 TCE Spill Site) WAG 7: SWMU 8 (C-746-K Landfill), SWMU 130 (C-611 550-gal Gasoline UST), SWMU 131 (C-611 50-gal Gasoline UST), SWMU 132 (C-611 2,000-gal. Oil UST), SWMU 133 (C-611 Grouted UST), and SWMU 134 (C-611 1,000-gal Diesel/Gasoline Tank)	IRA	August 10, 1998 DOE/OR/06-1470&D3	Interim remedial action installed riprap along creek bank to prevent direct contact, implemented institutional controls, and long-term monitoring for SWMU 8. All other SWMUs were determined to require "no further action" (NFA) under the IRA. It should be noted that at SWMU 100, institutional controls (i.e., security fencing and patrols to prevent unknowing and unauthorized entry to the plant, and risk management procedures to prevent worker exposure to contaminated media) were selected as part of the remedy. Note: In relation to SWMU 100 (Fire Training Area), PFAS is an emergent contaminant that was not considered as part of the scope of the WAGs 1 & 7 RI/FS or ROD. The presence of PFAS will be evaluated separately; and if cleanup under CERCLA is required, then additional actions will be taken outside of the scope of WAGs 1 & 7.	Construction Complete/Operational
Drum Mountain (Scrap)	Non-time-critical removal action	March 27, 2000 DOE/OR/07-1863&D2	Removed and disposed of Drum Mountain.	Complete
WAG 24, WAG 14, and SWMU 99/Scrap	Non-time-critical removal action	September 26, 2001 DOE/OR/07-1965&D2	Removed and disposed of scrap metal with enhanced sediment control measures.	Complete

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
SURFACE WATER OPERABLE UNIT (Continued)				
SWMU 59/Sediment	IRA	September 25, 2002 DOE/OR/07-1948&D2	Remedial action for Sections 1 and 2 of the NSDD.	Complete
SWMU 58 (Sections 3, 4, and 5 of the NSDD); SWMU 69 (Outfall 001); SWMU 63 (Outfall 008); SWMU 66 (Outfall 010); SWMU 67 (Outfall 011); and SWMU 68 (Outfall 015) and their associated internal ditches and areas (including SWMUs 92 and 97)	Non-time-critical removal action	April 23, 2009 DOE/LX/07-0119&D2/R1	Removal action for contaminants associated with sediment in Sections 3, 4, and 5 of the NSDD and KPDES Outfalls 001, 008, 010, 011, and 015, and associated internal ditches and areas of PGDP.	Complete
BURIAL GROUNDS OPERABLE UNIT				
WAG 22/Waste and soil (SWMU 2- Burial Ground)	IRA	September 11, 1995 DOE/OR/06-1351&D1	The interim ROD selected an impermeable cap to reduce leachate migration from surface infiltration, groundwater monitoring, and institutional controls. Through agreement of the parties, an impermeable cap was not constructed [*Waste Area Grouping (WAG) 22 Post-Record of Decision (ROD) Change*, October 23, 1996]. This change also will be documented in the Final Remedial Decision for SWMU 2.	Final remedial action for SWMU 2 will be selected as part of the BGOU CERCLA process. Institutional controls and groundwater monitoring are ongoing pending final remedy selection.
SOILS OPERABLE UNIT				
C-750-A, -B, and -C USTs	N/A	N/A	Tank removal.	Complete
WAG 7 SWMU 8 (C-746-K Landfill)	IRA	N/A	Enhanced existing cap to reduce leachate migration from surface infiltration.	Complete
AOC 124 WAG 17/Soil (Concrete Rubble Piles)	Removal action	N/A DOE/OR/07-1477&D2	Excavated soil associated with AOC 124.	Complete
WAG 23/Soil	Removal action	September 11, 1997 DOE/OR/06-1626&D1	Excavated PCB and dioxin-contaminated surface soils to reduce risks to plant industrial workers.	Complete

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
SOILS OPERABLE UNIT (Continued)				
SWMU 193/Soil	Time-critical removal action	February 19, 2002 DOE/OR/07-1999&D2	Removed petroleum-contaminated soils.	Complete
SWMUs 76 and 519/Soil	Time-critical removal action	July 1, 2002 DOE/OR/07-2007&D2	Removed empty sulfuric acid tanks, size reduced for containerization and dispositioned.	Complete
SWMU 19 [C-410-B Hydrogen Fluoride (HF) Neutralization Lagoon], SWMU 40 (C-403) and SWMU 181 (C-218 Firing Range)	Non-time-critical removal action	May 11, 2009 DOE/LX/07-0121&D2/R1	Removal of lead-contaminated soil at the C-218 Firing Range (SWMU 181). Removal of contamination within the respective SWMU boundaries of C-410-B (SWMU 19). Removal of contamination within the respective SWMU boundaries of C-403 (SWMU 40).	SWMU 19 and SWMU 181 are complete. SWMU 40 removal action was not completed as part of the NTCRA, and SWMU 40 will be addressed as part of the C-400 Complex OU final remedial action.
SWMU 27 (Acid Neutralization Tank)	Time Critical Removal Action	September 9, 2016 DOE/LX/07-2406&D2	Removed liquid and sludge to the extent practicable within the acid neutralization tank. Filled the tank with flowable fill.	Fieldwork for SWMU 27 completed in September 2016. The final Removal Action Report was submitted in June 2017 and was approved by EPA and Kentucky in July 2017. Final cleanup decision for this SWMU will be addressed as part of the Soils and Slabs OU.
FACILITY DECOMMISSIONING OPERABLE UNIT				
SWMU 478/Infrastructure (C-410)	Non-time-critical removal action	August 3, 2002 DOE/OR/07-2002&D1/R1	Remove process equipment and piping.	Completed December 2013.
SWMU 478/Infrastructure (C-410)	Non-time-critical removal action	November 23, 2009 DOE/LX/07-0273&D2	Addendum to document a change in scope of the removal action to 1) expand the scope of the existing NTCRA to include facility structure demolition to the slabs and disposition of demolition debris and 2) allow the non-process systems to remain in place and to remove these systems at the same time the building is demolished using heavy equipment such as excavators with shears.	Fieldwork for C-410/C-420 completed in December 2015. Removal Action Report approved in June 2016.

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status[1]
FACILITY DECOMMISSIONING OPERABLE UNIT (Continued)				
SWMU 477/Infrastructure (C-340 Metals Plant) and SWMU 137 (C-746-A East End Smelter)	Non-time-critical removal action	May 18, 2010 DOE/LX/07-0290&D2	Decommissioning of the C-340 Metals Plant and C-746-A East End Smelter, which entails the demolition of C-340-A, -B, and -C structures as well as the C-746-A East End Smelter. The slabs and soils underlying these structures will be addressed in future CERCLA response actions.	Fieldwork for C-746-A East End Smelter completed in FY 2010. Removal Action Report approved in November 2011. Fieldwork for C-340 completed in September 2013. Removal Action Report approved in May 2014.
SWMU 480 (C-402 Lime House); SWMU 55 (C-405 Incinerator); and SWMU 464 (C-746-A West End Smelter)	Non-time-critical removal action	December 5, 2005 DOE/OR/07-2237&D2	Removed, characterized, and disposed of building structure and contents.	Complete

AOC = area of concern; BGOU = Burial Grounds Operable Unit; ESD = explanation of significant differences; FS = feasibility study; FY = fiscal year; HF = Hydrogen Fluoride; IRA = interim remedial action; KPDES = Kentucky Pollutant Discharge Elimination System; LUCs = land use controls; N/A = not applicable; NSDD = North-South Diversion Ditch; NTCRA = non-time-critical removal action; PFAS = per- and polyfluoroalkyl substances; PGDP = Paducah Gaseous Diffusion Plant; PCB = polychlorinated biphenyl; RDSI = remedial design/support investigation; RGA = Regional Gravel Aquifer; ROD = Record of Decision; SWMU = solid waste management unit; Tc-99 = technetium-99; TCE = trichloroethene; UCRS = Upper Continental Recharge System; UST = underground storage tank; VOC = volatile organic compound; WAG = waste area group

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APPENDIX 2

CERTIFICATION OF LUCIPS

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CERTIFICATION OF LUCIPS

In March 2000, the Federal Facility Agreement (FFA) parties signed the *Memorandum of Agreement for Implementation of a Land Use Control Assurance Plan (LUCAP) for the United States Department of Energy Paducah Gaseous Diffusion Plant*, March 30, 2000. The purpose of this memorandum of agreement (MOA), together with the approved *Land Use Control Assurance Plan for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1799&D2, (LUCAP) is to establish and implement procedures to assure the long-term effectiveness of land use controls being relied upon to protect human health and the environment at certain contaminated portions of the Paducah Gaseous Diffusion Plant (PGDP) that are undergoing remediation pursuant to the *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*. Subsequent to the finalization of the March 2000 MOA, the U.S. Department of Energy (DOE) Paducah Site developed two unit-specific land use control implementation plans (LUCIPs): one for the North-South Diversion Ditch and one for the interim remedial action at the C-400 Cleaning Building. In addition to the unit-specific LUCIPs, the FFA parties entered into a Record of Decision (ROD) for the Southwest Groundwater Plume that contained land use controls. Per FFA party agreement, a unit-specific LUCIP was not developed subsequent to issuance of the Southwest Groundwater Plume ROD. In July 2020, a memorandum was issued that documented an update to Table B-1 of Appendix B of the LUCAP to include the two unit-specific LUCIPs, along with the Southwest Groundwater Plume ROD. As part of scoping for the 2023 Five-Year Review, additional historical land use controls were identified for the C-746-K Sanitary Landfill (SWMU 8) and the Fire Training Area (SWMU 100). In July 2023, a memorandum was issued that documented an update to Table B-1 of Appendix B of the LUCAP to include the ROD for Waste Area Groups 1 and 7. These land use controls identified are certified in this Site Management Plan, through an annual verification of deed restrictions, Excavation and Penetration Permitting Program, and inspections.

In accordance with Section 2.9 of the LUCAP, DOE annually certifies the land use controls and LUCIPs in Appendix B of the LUCAP are being implemented by DOE at PGDP.

Changes in the designated officials identified under the LUCIP/LUCAP are noted in the FFA semiannual reports. Additionally, there have been no major changes of land use as described in Section 2.8 of the LUCAP.

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APPENDIX 3

OPERABLE UNIT SCOPE DESCRIPTIONS

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OPERABLE UNIT SCOPE DESCRIPTIONS

INTRODUCTION

Pursuant to Section XVIII of the Federal Facility Agreement (FFA), the following operable unit (OU) -specific descriptions document the FFA Managers' common understanding of the expected scope of work for each of the OUs. The FFA Managers acknowledge that the scope may change as each project progresses; however, this appendix represents the best understanding, given existing information. The milestone dates associated with executing the scope of work are defined in Appendix 5 (Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets). Schedules are based on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documentation and review/comment time frames established in the FFA.

Scope was established based on the current understanding of site conditions and to achieve compliance with CERCLA, the National Contingency Plan (NCP), and the FFA. The actual scope of any given remedy will be developed with the U.S. Environmental Protection Agency (EPA) and the Commonwealth of Kentucky (KY) in compliance with the CERCLA process and documented in the appropriate decision document, each of which is subject to public participation in accordance with the FFA, CERCLA, and the NCP. Goals have been established for each OU to guide the development of project-specific remedial action objectives (RAOs).

In 2023, the U.S. Department of Energy (DOE) proposed to integrate and accelerate Paducah cleanup decisions for environmental media, deactivation and decommissioning (D&D), and waste disposition. With this proposal, DOE intends to maintain momentum by taking additional actions to address the high-concentration centroid of the dissolved-phase plume emanating from the C-400 Complex documented in a post-record of decision (ROD) technical memorandum to the post-decision administrative record for the Northwest Plume ROD for interim action. This Memorandum to File documents the changes made to the Northwest Plume Interim Remedial Action to fulfill the intent to further optimize the hydraulic control of and contaminant mass removal from the northwest trichloroethene (TCE) and technetium-99 (Tc-99) plumes. DOE is also conducting sampling to isolate the location of the suspected dense nonaqueous-phase liquid (DNAPL) north of the C-400 Complex OU and to aid in the placement of one or possibly more extraction wells to meet the objectives and fundamental design criteria for the northwest dissolved-phase plume ROD that will be documented in an addendum to the C-400 RI report.

Three RI/feasibility studies (FS), proposed plans, and RODs are proposed for submittal in 2029 (or earlier). The Environmental Media ROD will propose and combine cleanup actions for at- and below grade features (e.g., slabs, utilities, basement structures), soils, surface water, groundwater, slabs, lagoons, and burial grounds into a single final decision (Figure 3.1), establishing final cleanup levels for the entire Paducah Site based on anticipated future use. The Sitewide D&D ROD will propose and combine all abovegrade structures into a single final decision (incorporating deactivation under the FFA/CERCLA process, as defined in the ROD). The WDA ROD will make a final waste disposition decision for waste generated by the D&D and Environmental Media Decisions. A final comprehensive site OU (CSOU) would consider appropriate actions for remaining contamination after actions determined by the three decision documents are complete.

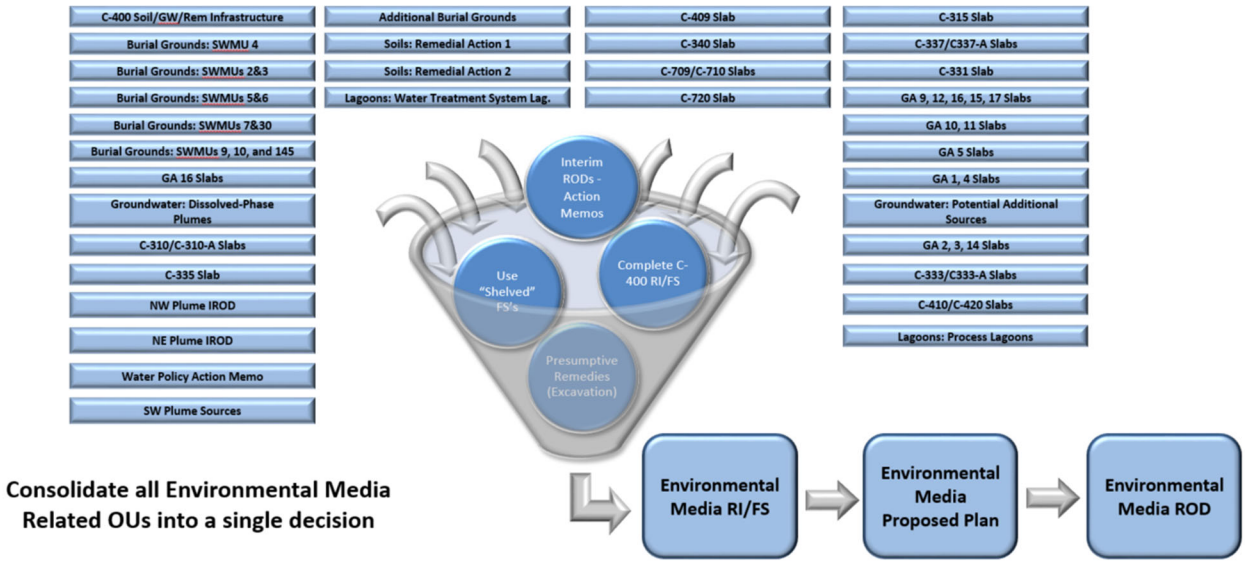


Figure 3.1. Environmental Media Comprehensive Strategy

While this Site Management Plan (SMP) documents the FFA parties' conceptual alignment on the integrated and accelerated approach to site cleanup, the FFA parties continue to work toward implementing this strategy and the details of the approach. Previous OU scope descriptions remain largely unchanged in this appendix and will be updated after the proposed WDA ROD is signed. Additionally, out-year enforceable milestone dates for BGOU, GWOU, Soils OU, and SWOU are unchanged in Appendix 5 until proposed decision documents (i.e., Environmental Media ROD, D&D ROD, and WDA ROD) are signed. Table 3.1 illustrates the OU decision crosswalk and conceptual approach. DOE intends to work with the FFA parties to provide additional details on executing this approach. The collaboration providing the strategy, details, and schedule will be documented as an appendix to the FY 2026 SMP. If this strategy is deemed a major modification to the FFA, public participation will be coordinated as necessary and appropriate.

Table 3.1. Operable Unit Decision Crosswalk

Decision 2029 ROD	Current Operable Unit
WDA	Waste Disposal Alternatives
D&D	Facility Decommissioning OU (abovegrade structures only)
	C-400 Complex, (abovegrade structures only)
	Remaining non-CERCLA Decommissioning OU activities (not currently in an OU)
Environmental Media	Soils (SWMUs) -Soils Remedial subproject
	Soils and Slabs
	Facility Decommissioning OU (at- and below grade features)
	C-400 Complex (at- and below grade features)
	Burial Grounds -SWMUs 2, 3, 4, 5, 6, 7, 30 -SWMU 9, 10, 145 -Additional burial grounds (SWMU 472, 520)

Table 3.1. Operable Unit Decision Crosswalk (Continued)

Decision 2029 ROD	Current Operable Unit
Environmental Media (continued)	Groundwater -Southwest Plume Sources subproject -Northeast Plume subproject -Northwest Plume subproject -Dissolved Phase Plumes subproject -Potential Additional Groundwater Sources subproject Water Policy subproject
	Surface Water
	Lagoons -Process Lagoons Water Treatment System Lagoon
CSOU	DUF_6 Footprint Underlying Soil
	Comprehensive risk review of remaining site conditions

Previously, DOE provided assumptions for bounding cost and schedule forecasts based on existing information for the OUs. These assumptions have been removed from the SMP until the new strategy is finalized. As the strategy is finalized, the FFA parties will evaluate consolidating OUs [e.g., Lagoons OU with Surface Water OU (SWOU) and Soils and Slabs OU with Facility Decommissioning OU and Soils OU).

GROUNDWATER OPERABLE UNIT

The Groundwater Operable Unit (GWOU) is being implemented in a phased approach consisting of sequenced response actions designed to accomplish the following goals:

(1) Prevent human exposure to contaminated groundwater;
(2) Prevent or minimize further migration of contaminant plumes;
(3) Prevent, reduce, or control contaminant sources contributing to groundwater contamination; and
(4) Restore the groundwater to its beneficial uses wherever practicable.

A series of actions already have been completed toward meeting these goals, as depicted in Figure 3.2. These previous actions are summarized in Appendix 1 (Actions Taken to Date).

The scope of the GWOU consists of potential sources (e.g., DNAPL or buried wastes) that are contributing to groundwater contamination and the dissolved-phase groundwater plumes. The dissolved-phase groundwater consists of contaminated groundwater primarily in the Regional Gravel Aquifer (RGA), but also includes limited areas in the Upper Continental Recharge System (UCRS) that typically are associated with source areas. Remedies documented in signed RODs have been selected for the identified C-400 source areas and Southwest Plume source areas to address volatile organic compound (VOC) contamination. Figure 3.3 illustrates the effectiveness of these remedies to date on the dissolved-phase groundwater trichloroethene (TCE) contamination.

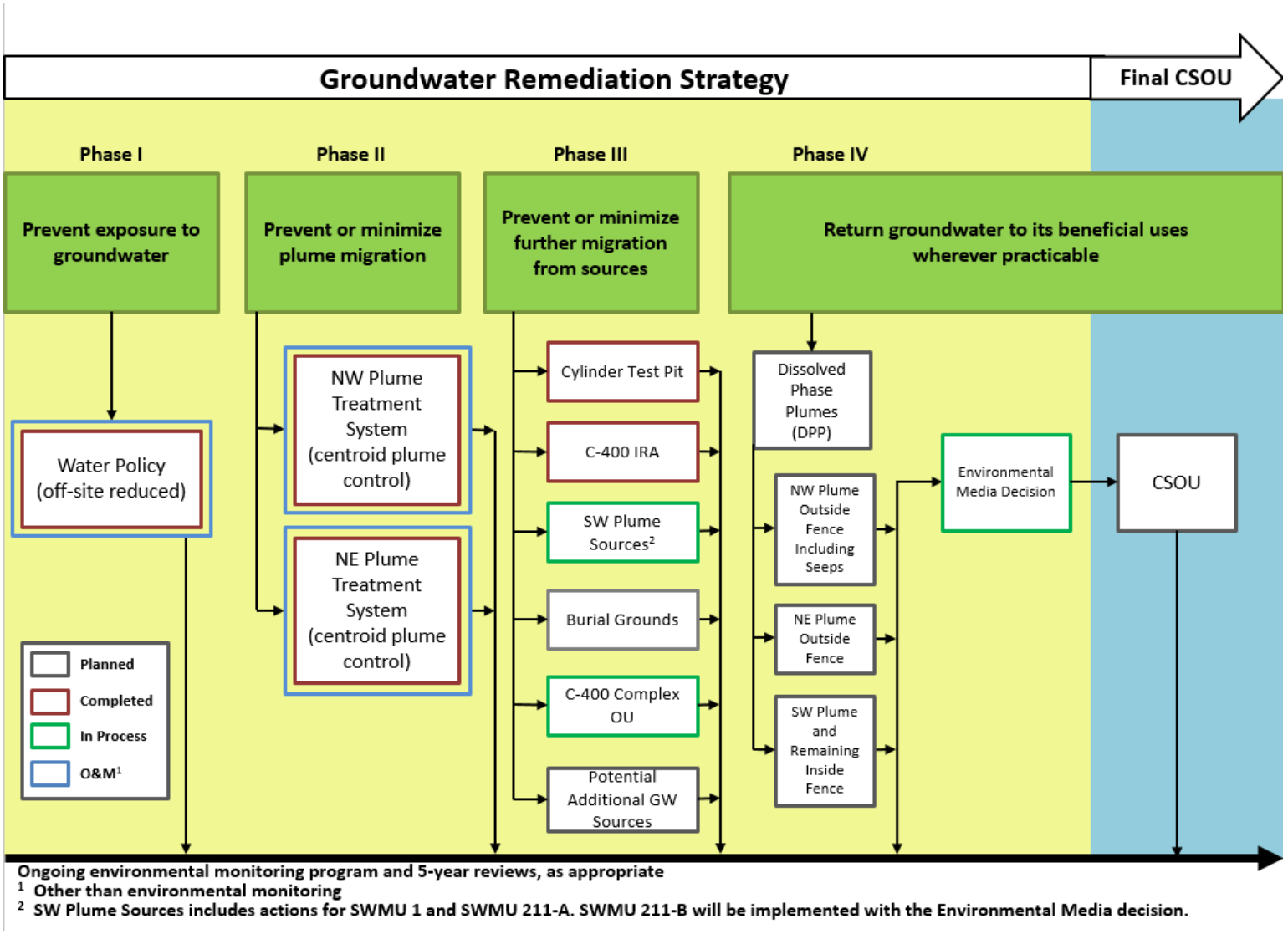


Figure 3.2. Groundwater Remediation Strategy

Figure 3.3. TCE Plumes as Interpreted for 1995, 2000, 2010, and 2022

C-400 Interim Remedial Action

The success of the Six-Phase Heating project conducted in 2003 led to a ROD signed in 2005 that required mass removal of TCE source material within the UCRS and RGA using electrical resistance heating (ERH). The scope of the interim remedy for the C-400 source action was limited to accessible areas located around the outside perimeter of the east and southwest portions of the C-400 Building due to on-going United States Enrichment Corporation operations that occupied the C-400 Building. Implementation of the ERH remedy was designed using a two-phase approach. Phase I was completed in 2010 and focused on selected treatment areas around C-400 (east and southwest areas) where the majority of the TCE was confined to the UCRS; however, an important objective of Phase I also was to evaluate the heating performance of the ERH design in the underlying RGA down to the McNairy Formation. During implementation of Phase I, temperature goals were not attained in the lower RGA in the southwest treatment area, particularly in the lower RGA. Because of the inability of ERH to reach target temperatures in the lower RGA, the FFA parties agreed to divide Phase II into Phase IIa [using ERH to address the UCRS and upper RGA to a depth of 60 ft below ground surface (bgs)] and Phase IIb (using a technology to be decided to address the lower RGA). Phase IIa operations were completed successfully in fall of 2014 and consisted of the implementation of ERH in the UCRS and upper RGA in the southeast treatment area. To help evaluate applicable technologies for potential use in the lower RGA during Phase IIb, a Steam-enhanced Extraction Treatability Study (TS) was performed in 2015 to obtain data specific to understanding the behavior of steam injected into the RGA under variable injection scenarios. The TS Report for Phase IIb, dated May 2016, demonstrated the technology would be technically implementable in the hydrogeological conditions tested, although several uncertainties remained regarding the full nature and extent of the Phase II source area, particularly whether a portion of the source extends beneath the C-400 Building.

Prior to moving forward with implementation of the interim remedial action, DOE approached EPA and KY and proposed reprioritization of the DOE mission based on the return of the enrichment facilities (including C-400); the need to perform work in a comprehensive manner at the C-400 Complex; and the expected impacts of anticipated future funding limitations across the DOE Complex. In June 2016, DOE provided a written proposal for the entire C-400 Complex that included acceleration of the investigation and cleanup of the C-400 Complex for all sources of contamination associated with and underlying the C-400 Building. This OU also will address the remaining VOC source in the Phase IIb area. On August 8, 2017, the FFA Senior Managers signed a memorandum of agreement (MOA) for the C-400 Complex that proposed the C-400 Complex as a separate OU identified as the C-400 Complex OU. Additionally, the path forward for the C-400 Complex also is documented in the *Memorandum of Agreement for Resolution of Formal Dispute Regarding the Non-concurrence by EPA and KDEP on the DOE Milestone Modification Request for Submittal of the Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (DOE/LX/07-2407&D1), September 28, 2017, and *Memorandum of Agreement for Resolution of Formal Disputes on EPA Conditional Concurrence on the Removal Notification for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2420&D2 and the *Engineering Evaluation/Cost Analysis for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2425&D2, August 1, 2019. In FY 2022, during development of the C-400 Complex Operable Unit Remedial Investigation/Feasibility Study report, it was determined to include the C-400 building demolition with the remedial action. A milestone modification documenting the resequencing and incorporation of the C-400 building demolition into the C-400 Complex OU remedial action was signed by the FFA parties on September 16, 2022. This relevant milestone modification supersedes the previous MOA.

As a result, the prior work performed under the C-400 Interim Remedial Action for Phase I and Phase IIa was documented in the final *Remedial Action Completion Report for the Interim Remedial Action for the*

Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building, completing the remediation work under the 2005 *Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant Paducah, Kentucky*, DOE/OR/07-2150&D2/R2.

Southwest Plume Sources Remedial Action

Scope

This project addresses the following three areas in the Southwest Plume: the C-747-C Oil Landfarm (SWMU 1), the areas near the southeast and northeast (SWMU 211) areas of the C-720 Building, and part of the storm sewer between the south side of the C-400 Building and Outfall 008 (SWMU 102). TCE and its breakdown products [*cis*-1,2-dichloroethene (DCE), *trans*-1,2-DCE, and vinyl chloride] and 1,1-DCE are the primary contaminants of concern (COCs) associated with these sources. The remedy in the Southwest Plume ROD for SWMU 1 has been completed, with long-term monitoring and land use controls (LUCs) in place. The remaining scope of the Southwest Plume ROD related to SWMU 211-A and SWMU 211-B was subject to an remedial design support investigation (RDSI).

During the RDSI for SWMU 211-A and SWMU 211-B, it was determined that there was a potential of DNAPL in the RGA associated with SWMU 211-B that was directly adjacent to and potentially underneath the C-720 Building, resulting in a conceptual site model that is invalid and making the selected remedial alternatives of the ROD for SWMU 211-B no longer applicable. As a result, the SWMU 211-B remedy will be reevaluated as part of the Environmental Media RI/FS. In the interim, the LUCs associated with SWMU 211-B will remain in place until future reevaluation of SWMU 211-B is complete. In accordance with the signed MOA for the C-400 Complex dated August 8, 2017, the remedy for SWMU 211-A was completed.

Evaluation of a final remedial action for non-VOCs COCs associated with direct contact exposure risks will be addressed as part of the Environmental Media RI/FS.

Dissolved-Phase Plumes Remedial Action[4]

Scope

This project includes conducting a RI [including a baseline risk assessment (BRA)], FS, and selecting a remedy and implementing any necessary response actions for the dissolved-phase groundwater contamination. The RI will evaluate dissolved-phase groundwater contamination, including, but not limited to, the Northwest Plume (SWMU 201), Northeast Plume (SWMU 202), Southwest Plume (SWMU 210), and the groundwater contamination contributing to the Little Bayou Creek seeps. The RI also may determine whether any follow-up actions or modifications to response actions for the GWOU are necessary and would be evaluated further in a FS. The primary RAO for this project is based on the resolution of dispute for the Southwest Plume dated March 24, 2008, as follows:

- Return contaminated groundwaters to their beneficial use(s) and attain chemical-specific applicable or relevant and appropriate requirements [e.g., maximum contaminant levels (MCLs)] and/or risk-based concentrations for all identified COCs throughout the plume (or at the edge of the waste management

[4] The scope and planning assumptions are consistent with the March 24, 2008, DOE/OR/07-2180&D2, and May 20, 2010, DOE/LX/07-0186&D2, SW Plume Dispute Resolutions.

area depending on whether the waste source is removed), consistent with CERCLA, the NCP (including the Preamble), and any pertinent EPA guidance.

DOE completed a Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment to focus on the Paducah Gaseous Diffusion Plant (PGDP) buildings located over the groundwater plumes, consistent with EPA vapor intrusion guidance, with input from EPA and Kentucky Department for Environmental Protection (KDEP) utilizing a project team developed from the technical working groups established to evaluate and make recommendations to FFA Managers on programmatic issues at the PGDP. Upon completion of the assessment, a Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report was issued by DOE in FY 2021. The project's Work Plan and Report were FFA Secondary Documents subject to regulatory review and concurrence, and DOE written responses to comments, consistent with FFA Section XX, Review/Comment on Draft/Final Documents. No further evaluation was recommended for the buildings represented by preliminary investigation, although the report recommended additional sampling at three facilities to confirm the conclusions regarding the potential threat to human health from vapor intrusion and/or to bring human exposure to vapor intrusion under control. EPA and KY accepted the report on February 12, 2022, and February 14, 2022, respectively. The additional recommended sampling took place in FY 2023, and an addendum to the Preliminary Risk Assessment Report was issued by DOE.

Because plume conditions are dynamic and will change over the next several decades, the Dissolved Phase Operable Unit will include a data quality objective to address the site-wide vapor intrusion pathway for the site. Prior to the Dissolved Phase Operable Unit, a data quality objective to address vapor intrusion will be included in other operable units' project RI scoping and subsequent investigations and decision-making, as appropriate.

Additionally, DOE has developed a sitewide groundwater strategy in collaboration with EPA and KY, that identifies both short- and long-term tasks, including additional sampling, to help refine the PGDP groundwater conceptual site model to address conceptual site model uncertainties and support forthcoming five-year reviews of groundwater actions. Activities include colloidal borescope studies, manual water-level measurements, and continuous water-level measurements using pressure transducers. Data collected as part of the groundwater strategy are evaluated with other groundwater-related data on an ongoing basis. DOE plans to continue with quarterly Groundwater Modeling Working Group meetings that include EPA and KY, to discuss the results of ongoing activities (e.g., efforts currently underway by the Tennessee Valley Authority and the Olmstead Dam Project) and the planning for other near- and long-term sitewide groundwater strategy activities, which will be documented in various technical papers. During FY 2023, DOE developed a groundwater model to support future actions for the site, including siting for a potential on-site waste disposal facility (OSWDF) and routinely provided updates on the model development to the Modeling Working Group.

Potential Additional Groundwater Sources

Scope

This project consists of potential sources (e.g., DNAPL) that are contributing to groundwater contamination and the dissolved-phase groundwater plumes under a building structure or newly identified sources not addressed under the other GWOU projects. The project scope includes the management, planning, assessments, CERCLA documents, RIs, final remedial actions per an approved ROD, and preparation of required completion documentation.

This project is being reserved for other sources to groundwater contamination that may be identified in the future similar to the area south of the C-400 Complex that was evaluated as part of the C-400 RI/FS

fieldwork, the area north of the C-400 Complex that was identified during the C-400 RI/FS fieldwork, and an area near C-310 that has been identified during additional vapor intrusion sampling.

C-400 COMPLEX OPERABLE UNIT

Scope

This project is intended to evaluate fully and take the necessary actions to address all environmental contamination in order to achieve a final remedial action for the entire C-400 Complex as shown in Figure 3.4. This scope is defined to include a RI/FS for the entire C-400 Complex and final remedial action that includes building demolition, soils, groundwater sources, and slabs. The C-400 Complex action will address all sources of contamination, including, but not limited to, principal threat waste (PTW) (e.g., TCE DNAPL and high concentration TCE contamination). There are 22 SWMUs located within the boundaries of the C-400 Complex OU. Five of the 22 SWMUs (349, 350, 351, 352, and 353) are DOE material storage areas (DMSAs) that were under the sole oversight authority of Kentucky pursuant to a DOE-KDEP Agreed Order (October 2003) and excluded from cleanup under the FFA pursuant to Section IV.F of the FFA. Ten of the SWMUs (48, 49, 50, 51, 52, 53, 54, 383, 384, and 537) have been designated as NFA and are listed in the No Further Action section of Appendix 4. As a result, only seven of the 22 SWMUs (11, 40, 47, 98, 203, 480, and 533) located within the boundaries of the C-400 Complex OU will require further CERCLA evaluation under the FFA. These seven SWMUs are listed in the C-400 Complex OU section of Appendix 4. The C-400 Complex action has been prioritized in the cleanup schedule. The RI/FS report was submitted per the milestones established in Appendix 5. The following is the scope.

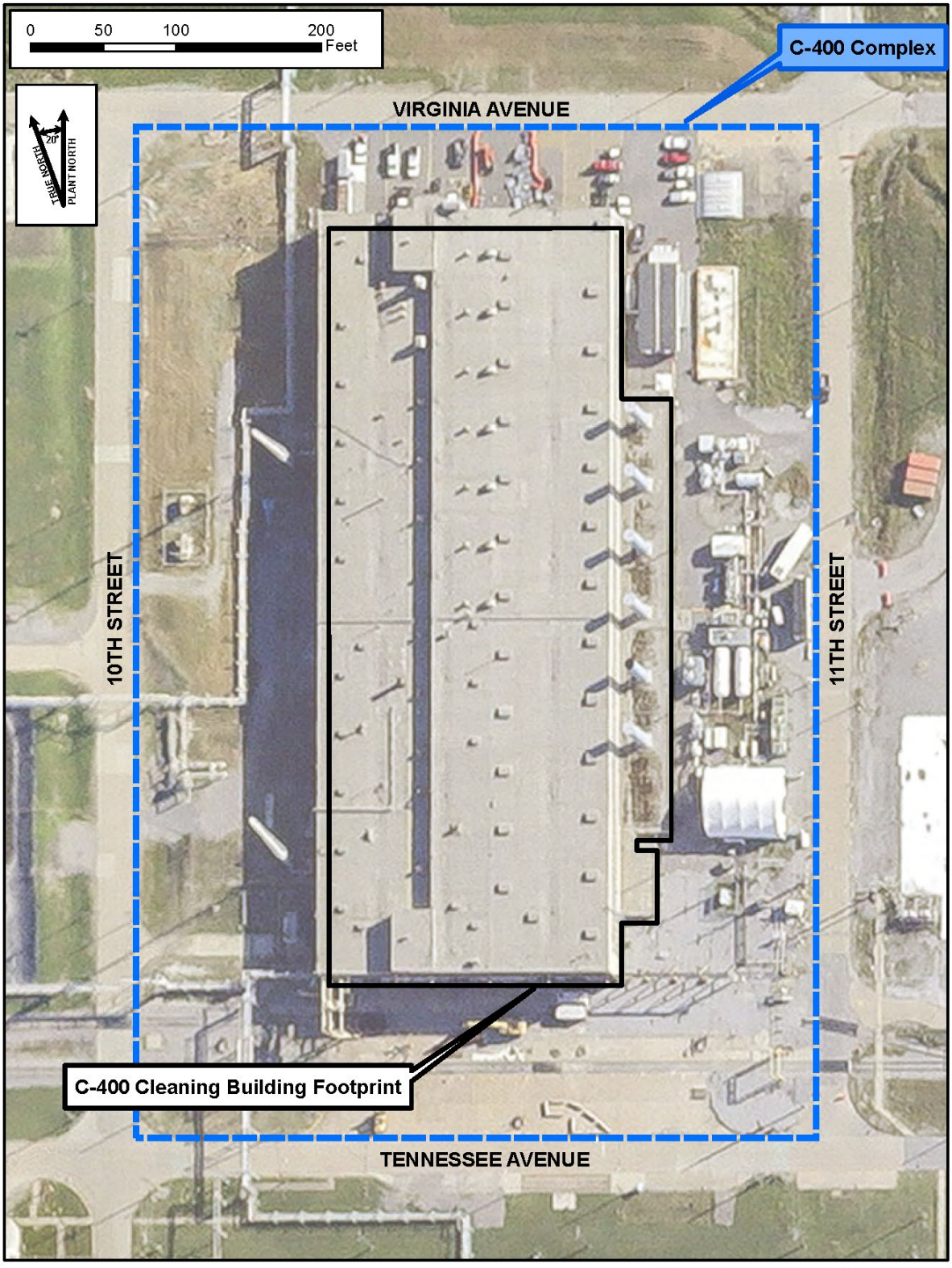
- CERCLA Final Remedial Action consists of the following:

  — Conduct a combined RI/FS for the C-400 Complex area that includes an investigation of all remaining building structure(s) (e.g., slab and subsurface structures) and releases of any hazardous substances to soils and groundwater associated with the C-400 Building and C-400 Complex area operations (including, but not limited to, TCE DNAPL and high concentration TCE contamination areas considered PTW).

  — RI characterization to define the full nature and extent of all contamination from the surface down through the RGA and to include the upper McNairy.

  — Remedy selection (proposed plan and ROD) to document a final remedial action(s) for all source areas and COCs requiring remediation and building demolition for the entire C-400 Complex.

  — Post-ROD documents (e.g., remedial design report, remedial action work plan) and implementation of a final remedial action(s) as specified in the ROD.



Source: *Remedial Investigation/Feasibility Study Work Plan for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2433&D2/R1

Figure 3.4. C-400 Complex—Scope of Final Action

BURIAL GROUNDS OPERABLE UNIT

In order to facilitate the development of subsequent documents, the FFA parties have agreed to group the Burial Grounds OU (BGOU) SWMUs into more manageable remedial action subprojects. These subprojects will be further evaluated prior to field execution of the remedial actions to determine whether the SWMU boundaries should be further modified into a single or expanded area of contamination based on contiguous contamination to facilitate waste management activities.

The BGOU will employ the CERCLA remedial process to accomplish the following goals (based on February 10, 2012, BGOU dispute resolution):

- Contribute to protection of groundwater by eliminating, reducing, or controlling sources of groundwater contamination;

- Prevent exposure to waste and contaminated soils that present an unacceptable risk from direct contact; and

- Treat or remove PTW wherever practicable, consistent with 40 *CFR* § 300.430(a)(1)(iii)(A).

The following are the SWMU-specific RAOs for SWMUs 5 and 6.

- Contribute to the protection of groundwater by eliminating, reducing, or controlling sources of groundwater contamination that will result in an exceedance of the MCL or risk-based concentration for residential use of groundwater in the absence of an MCL in RGA groundwater.

- Prevent exposure to waste or waste-related contaminated soils that exceed target cumulative excess lifetime cancer risks (ELCRs) and cumulative noncancer hazard indices (HIs) for the future industrial and future outdoor worker receptors. The acceptable cumulative risk levels for this RAO are defined as follows:

  — Surface Soil: cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a future industrial worker.
  — Subsurface Soil: cumulative ELCR < 1E-04 and cumulative HI ≤ 1 for a future outdoor worker.

The following are the SWMU-specific RAOs for SWMUs 2, 3, 7, and 30.

- Contribute to the protection of groundwater by eliminating, reducing, or controlling sources of groundwater contamination that could result in an exceedance in RGA groundwater of the MCL (or risk-based concentration for residential use of groundwater in the absence of an MCL).

- Prevent exposure to waste that exceeds target cumulative ELCRs and cumulative noncancer HIs for the future excavation worker receptor. The acceptable cumulative risk levels for this RAO are defined as follows:

  — Waste: cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a future excavation worker (considering a five-year exposure based upon the outdoor worker scenario in the 2013 Risk Methods Document).

- Prevent exposure to contaminated soils that exceed target cumulative ELCRs and cumulative noncancer HIs for the future industrial and future excavation worker receptors. The acceptable cumulative risk levels for this RAO are defined as follows:

— Surface Soil: cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a future industrial worker (considering default exposures in the 2013 Risk Methods Document).

— Surface and Subsurface Soil: cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a future excavation worker (considering a five-year exposure based on the outdoor worker scenario in the 2013 Risk Methods Document).

- Treat or remove PTW wherever practicable, consistent with 40 *CFR* § 300.430 (a)(1)(iii)(A).

The SWMU-specific RAOs for SWMU 4 that have been included in the FS are defined as follows:

- Contribute to the protection of groundwater by eliminating, reducing, or controlling sources of groundwater contamination that will result in an exceedance in RGA groundwater of the MCL (or risk-based concentration for residential use of groundwater in the absence of an MCL).

- Prevent exposure to waste that exceeds target cumulative ELCRs and cumulative non-cancer HIs for the future excavation worker receptor. The acceptable cumulative risk levels for this RAO are defined as follows:

  — Waste: Cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a future excavation.

- Prevent exposure to contaminated soils that exceed target cumulative ELCRs and cumulative non-cancer HIs for the current and future industrial worker and future excavation worker receptors. The acceptable cumulative risk levels for this RAO are defined as follows:

  — Surface Soil: Cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a current and future industrial worker (considering default exposures in the Risk Methods Document).

  — Surface and Subsurface Soil: Cumulative ELCR < 1E-05 and cumulative HI ≤ 1 for a future excavation worker.

- Treat or remove PTW wherever practicable, consistent with 40 *CFR* § 300.430(a)(iii)(A).

BGOU Remedial (10 SWMUs)

Scope

The BGOU consists of the following 10 SWMUs.

- C-749: Uranium Burial Ground (SWMU 2)
- C-404: Low-Level Radioactive Waste Burial Ground (SWMU 3)
- C-747/748-B: Contaminated Burial Ground (SWMU 4)
- C-746-F: Burial Ground (SWMU 5)
- C-747-B: Burial Area (SWMU 6)
- C-747-A: Burial Ground and Burn Area (SWMUs 7 and 30)
- Residential/Inert Borrow Area/Old North-South Diversion Ditch Disposal Trench (SWMU 145)
- C-746-S: Residential Landfill (SWMU 9)[5]
- C-746-T: Inert Landfill (SWMU 10)[5]

[5] Previously closed under solid waste regulations (C-746-T closed on 2/9/95; C-746-S closed on 8/4/95).

Based on review of existing disposal records and sample data, the burial grounds contain various types of materials such as sanitary and/or hazardous waste; however, the known contents of each individual burial ground are specific to the material that was disposed of within the burial ground and are described in the specific CERCLA documents for each burial ground. Some of the burial grounds contain PTW that has released or may in the future release to soils and groundwater. Surface soil within BGOU SWMUs is being addressed by BGOU rather than Soils OU.

Additional Burial Grounds

Scope

This project includes the remaining burial grounds, as identified in Appendix 4 under Additional Burial Grounds. Currently there are two units identified: SWMU 472 and SWMU 520. The project scope includes the management, planning, assessments, CERCLA documents, RIs, final remedial actions per an approved ROD, and preparation of required completion documentation.

SURFACE WATER OPERABLE UNIT

The Surface Water Operable Unit (SWOU) is being implemented in a phased approach consisting of a series of sequenced remedial and removal actions designed to accomplish the following goals:

(1) Prevent human exposure to contaminated sediments presenting an unacceptable risk to on-site workers and off-site recreational users of surface water;

(2) Prevent or minimize further off-site migration of contaminated sediments and surface water;

(3) Reduce, control, or minimize contaminant sources contributing to sediment and surface water contamination; and

(4) Evaluate and select long-term solutions for off-site surface water contamination to protect recreational users and ecological receptors.

A series of actions already have been completed toward meeting these goals, as depicted in Figure 3.5. The previous actions are summarized in Appendix 1 (Actions Taken to Date).

The SWOU consists of the specific SWMUs and areas of concern (AOCs) identified in Appendix 4 (Source Area by Operable Unit), and includes the soils/sediments and storm water corresponding with the points of discharge from facility piping to ditches, outfalls and Bayou and Little Bayou Creeks. Metals, radionuclides, and PCBs are the likely contaminants of interest for the SWOU.

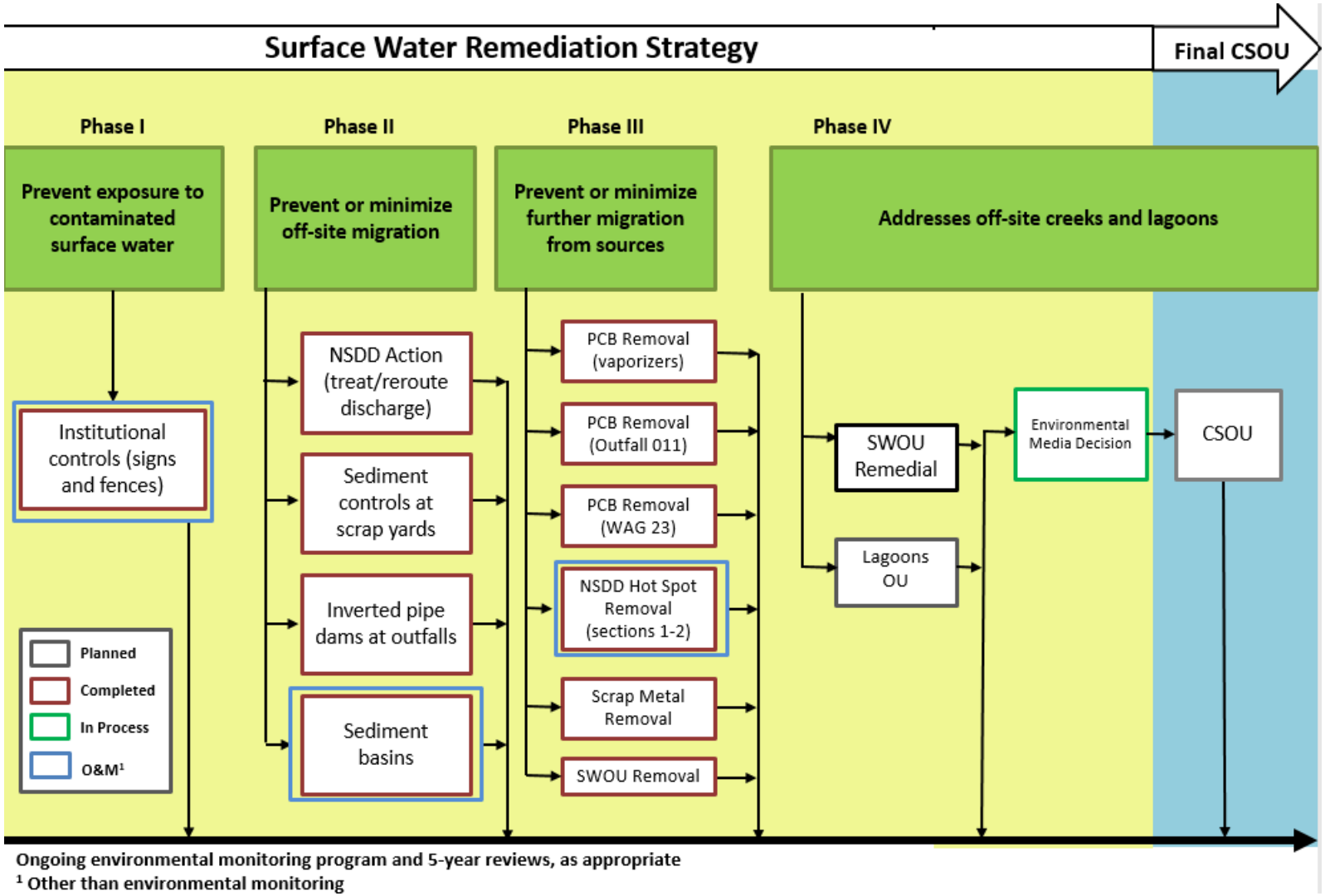


Figure 3.5. Surface Water Remediation Strategy

Surface Water Remedial Action

Scope

The scope of this project includes an RI and FS remedy selection and implementation of any necessary response actions for on- and off-site areas, including Bayou Creek; Little Bayou Creek; Outfalls 001, 002, 008, 009, 010, 011, 012, 013, 015, and 016 and associated internal ditches; and Sections 3, 4, and 5 of the North-South Diversion Ditch; as well as scoping for and completion of a baseline ecological risk assessment for PGDP. This OU also will address the five outfalls formerly identified in the Lagoons and Ditches OU (Outfalls 005, 006, 017, 019 and 020). The Surface Water Remedial Action includes evaluation of all areas with ditches from PGDP that drain to Bayou and Little Bayou Creeks to the Ohio River, including those areas previously addressed in the SWOU Removal Action. The timing and sequence of any remedial actions will require coordination with ongoing site activities, including Depleted Uranium Hexafluoride (DUF_6) operations to prevent recontamination and consideration of ongoing permitted discharges. The SWOU will address contaminated media (e.g., surface water and sediments) associated with ditches and creeks as part of the remedial action consistent with the NCP and EPA guidance. A final remedial action decision for the lagoons will be addressed as part of the Environmental Media decision.

LAGOONS OPERABLE UNIT

Scope

This OU consists of the specific SWMUs and AOCs identified in Appendix 4 (Source Area by OU). It includes both process and water treatment system lagoons and associated soils/sediments. This OU includes the lagoons identified in Appendix 4 under Lagoons OU. Currently, six lagoons are identified (SWMU 17, SWMU 18, SWMU 21, SWMU 22, SWMU 23, and SWMU 171). This OU will address the primary inputs to the outfalls to ensure no risk pathway will continue to contribute contamination to the PGDP outfalls once the remedial actions are completed. For example, the C-613 Sedimentation Basin will be addressed to the extent that no recontamination pathway exists. The project scope includes the management, planning, assessments, CERCLA documents, RIs, final remedial actions per an approved ROD (i.e., Environmental Media ROD), and preparation of required completion documentation.

SOILS OPERABLE UNIT

The Soils OU has been implemented in a phased approach consisting of remedial and removal actions to accomplish the following goals:

- Prevent human exposure to contamination presenting an unacceptable risk;
- Prevent or minimize further off-site migration; and
- Reduce, control, or minimize contaminated soil hot spots contributing to off-site contamination.

The original scope of the Soils OU consisted of 86 SWMUs/AOCs; three inactive facilities (SWMUs 181, SWMU 40, and SWMU 19); and the soil/rubble areas that have been identified to date. The scope of the removal action for two of the three inactive facilities has been completed, except excavation of contaminated soil at the C-403 Neutralization Tank (SWMU 40). SWMU 40 will be addressed as part of the C-400 OU Complex. The scope for the soil/rubble areas also has been completed. During the development of the RI/FS Work Plan/Report, it was determined that only 63 of the 86 SWMUs/AOCs included within the original scope could be addressed under this OU, based upon accessibility. Those SWMUs/AOCs identified as inaccessible will be addressed as part of the Soils and Slabs OU scope. Following the Time-Critical Removal Notification for SWMU 27, it was moved to the Soils and Slabs OU, leaving 62 SWMUs/AOCs to be addressed under this OU. The Soils OU scope focuses on plant surface

soils (ground surface to 10 ft bgs and 16 ft bgs in the vicinity of pipelines). Sequencing of the work will be determined based on OU-specific circumstances, as mutually agreed by the FFA parties.

A series of Soils OU actions has been completed to date (See Figure 3.6). These previous actions are summarized in Appendix 1 (Actions Taken to Date).

Soils OU Remedial Action

Scope

The scope of this project includes an RI and FS remedy selection, which will be completed as part of the Environmental Media decision, and implementation of any necessary response actions for the 62 SWMUs/AOCs listed in Appendix 4. Sites are included in this OU based on the expectation that they primarily pose a direct contact threat to on-site industrial workers and likely are not a migration threat to groundwater or surface water. The project has incorporated results from previous actions and sitewide evaluations/surveys. Results of the Soils OU RI will be used in scoping for and completion of the baseline ecological risk assessment conducted under the Environmental Media RI/FS. It is noted that the boundaries for SWMU 216, which were investigated as part of the Soils OU RI, have been revised. As a result, conclusions for SWMU 216 in the RI report are not complete and will need to be addressed in a subsequent action.

SOILS AND SLABS OPERABLE UNIT

Scope

This OU includes the units identified in Appendix 4 Soils and Slabs OU. This OU also includes soil units that were determined to be inaccessible during development of the Soils OU RI/FS Work Plan/Report. Other units have been included in this OU for slabs and underlying soils for demolished facilities. The project scope includes the management, planning, assessments, CERCLA documents, RIs, final remedial actions per an approved ROD (i.e., Environmental Media ROD), and preparation of required completion closure documentation.

For planning purposes, the property under control of DOE has been divided into 17 geographical areas (GAs) to assist in the focus of long-term planning efforts for DOE property (See Figure 3.7). GAs are boundaries established for the purpose of planning and evaluating areas for future use, D&D, and remediation integration. No facilities or SWMUs/AOCs are located completely within GA 7. GA 6 does not contain any facilities that are expected to have any requirements for CERCLA evaluation; and GA 8 includes a minimal number of facilities associated with permitted landfill operations. For planning purposes, the Soils and Slabs OU is using these geographical divisions to plan and group the actions that will address the remaining balance of plant soils and slabs. Tunnels at PGDP that link buildings together, slabs, and subgrade structures (i.e., utilities, Underground Radiological Material Areas) will be addressed by the Environmental Media ROD.

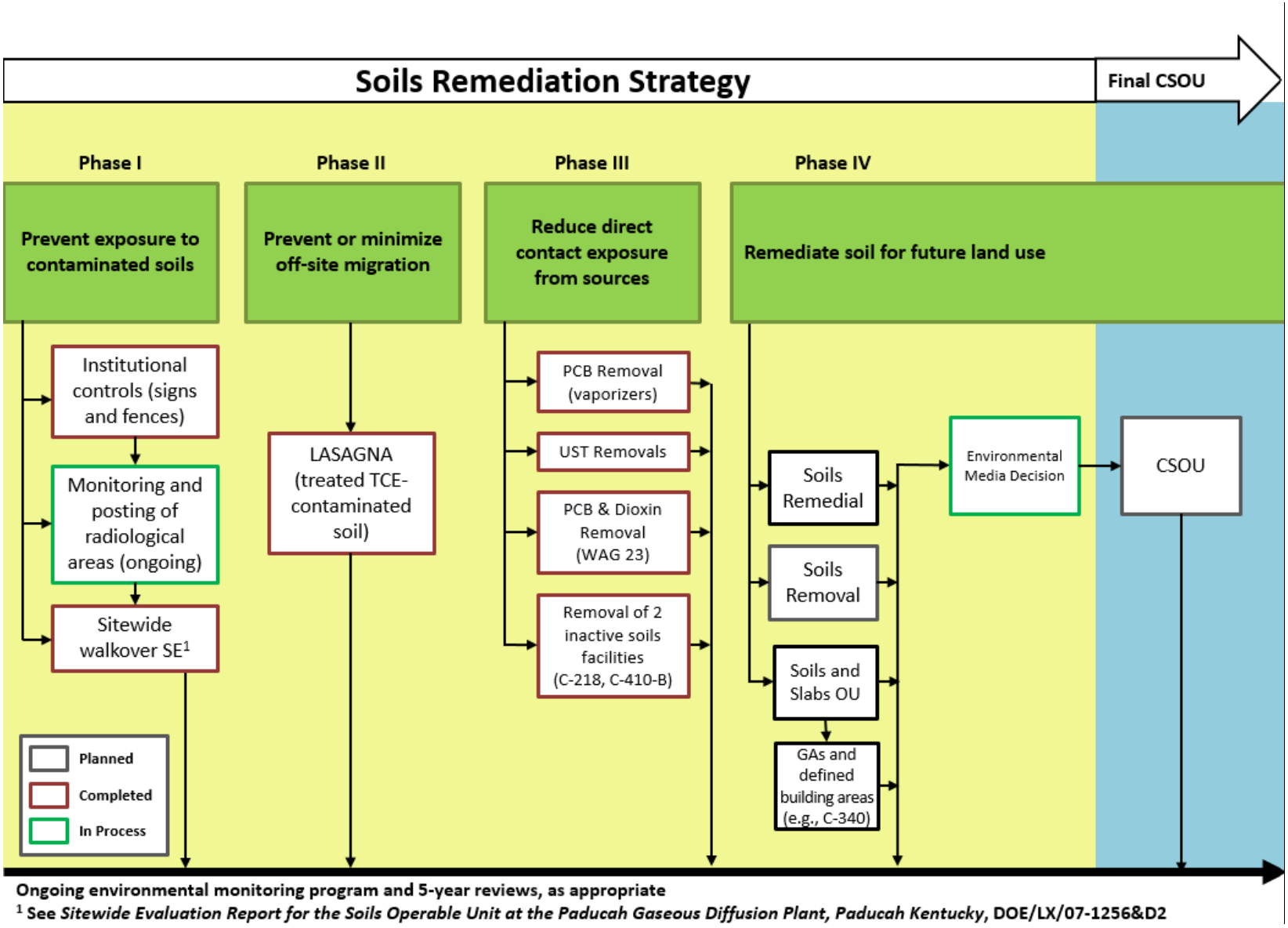
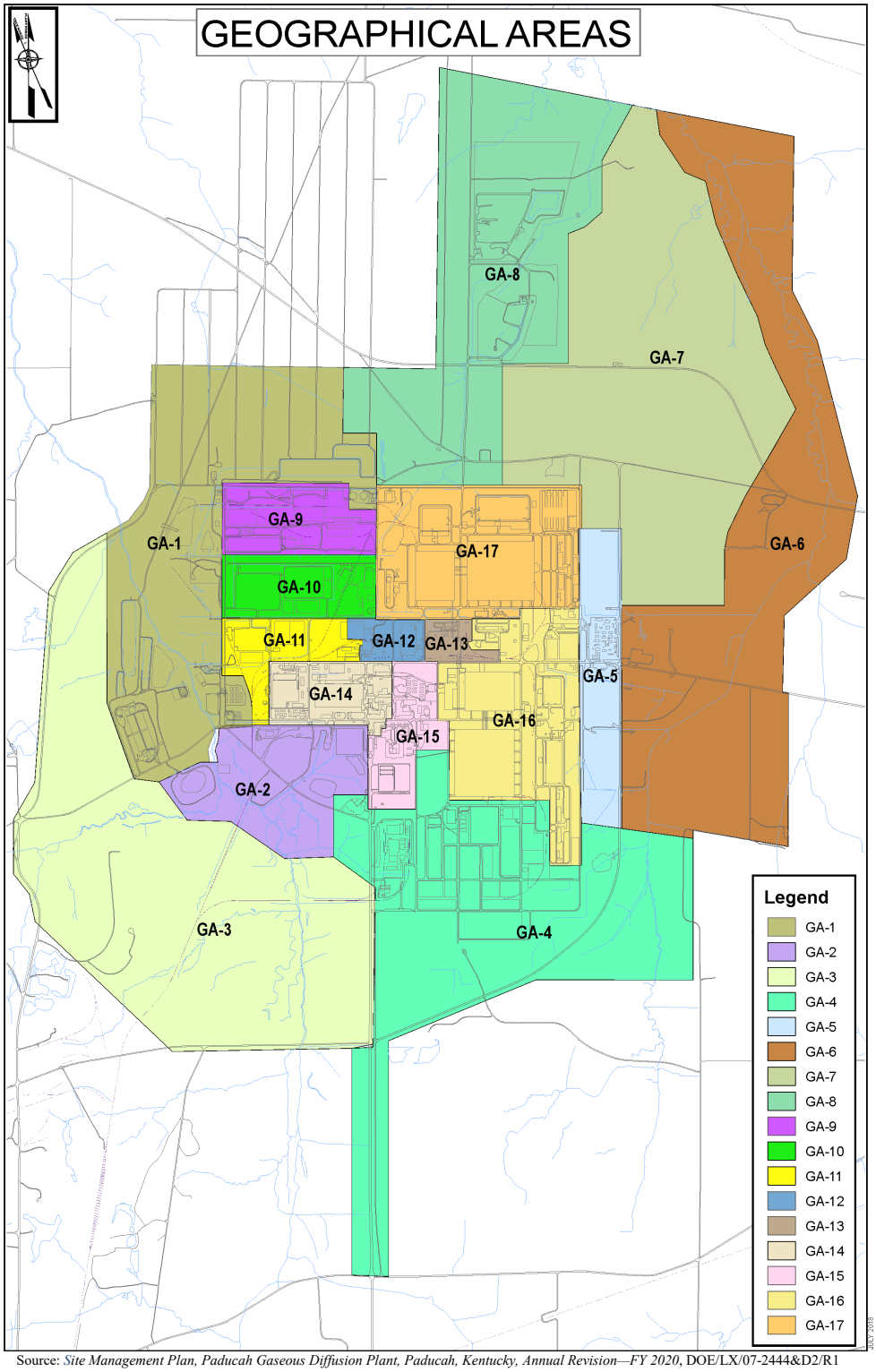


Figure 3.6. Soils Remediation Strategy



Source: *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2020*, DOE/LX/07-2444&D2/R1

Figure 3.7. DOE Property Geographical Areas

For those facilities (previously identified in Appendix 6 of the SMP) where the FFA parties have agreed, through consultation, to remove the aboveground structure outside of CERCLA, the concrete pad/soils associated with those facilities will be evaluated as part of the Environmental Media RI/FS. Facilities to be demolished outside of CERCLA, according to the provisions agreed to in the consultations packages, are listed in Table 3.2. Additionally, facilities identified in the Facility Decommissioning OU with site evaluation (SE) reports that recommend the facility be demolished outside of CERCLA and concurred on or pending concurrence by EPA and KY, are included in Table 3.2. Table 3.3 lists facilities (previously listed in Table 3.2) that were agreed through consultation or SE reports that have been demolished outside of CERCLA.

Table 3.2. Facilities to Be Demolished Outside of CERCLA

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-100	Administrative Building	11/9/2021	N/A	SE for the underlying slab and soils*
C-101	Former Cafeteria	11/9/2021	N/A	SE for the underlying slab and soils*
C-102	Hospital	11/9/2021	N/A	SE for the underlying slab and soils*
C-200	Guard and Fire Headquarters	3/24/2021	N/A	Evaluation in GA 14
C-203	Emergency Vehicle Shelter	3/4/2021	N/A	Evaluation in GA 14
C-204	Disintegrator Building	N/A	6/15/2001 SWMU Assessment Report (SAR)	C-204 is SWMU 479 and was granted NFA by KY 6/3/2002.
C-205	Respirator Issue Facility	11/9/2021	N/A	Evaluation in GA 14
C-207	Fire Training Facility	10/19/2021	N/A	SE for the underlying slab and soils, including surrounding soils associated with the burn pan areas*
C-300	Central Control Building	11/9/2021	N/A	Evaluation in GA 15
C-303	Supervisory Control and Data Acquisition System	3/4/2021	N/A	Evaluation in GA 15
C-320	Communication Building	3/4/2021	N/A	Evaluation in GA 15
C-350	Drying Agent Storage Building	N/A	2/18/2021	NFA (concurrence by EPA 3/10/2021; KY 3/19/2021) Planned for demolition in fiscal year (FY) 2025.
C-410-D	Fluorine Storage Building	3/4/2021	N/A	Evaluation in GA 13 Planned for demolition in FY 2025.
C-410-K	Fluorine Facility	3/4/2021	N/A	Evaluation in GA 13 Planned for demolition in FY 2025.
C-410-L	Quonset Hut	3/4/2021	N/A	Evaluation in GA 13
C-531-2	Switchyard	9/1/2023	N/A	Facilities were discussed at an August 7, 2023, SMP scoping meeting; EPA and KY concurred with DOE's recommendation to remove the facilities outside of CERCLA via e-mail on 9/1/2023. This concurrence was based on a 3/13/2019 email agreement between DOE and KY, and a 7/19/2023 email from DOE that stated during 2019, KY had worked with EPA to ensure that there were no regulatory issues. Evaluation will be conducted under the Soils and Slabs OU.
C-533-2	Switchyard	9/1/2023	N/A	
C-535-2	Switchyard	9/1/2023	N/A	
C-537-2	Switchyard	9/1/2023	N/A	

Table 3.2. Facilities to Be Demolished Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-601	Nitrogen Generator Building Addition	3/24/2021	N/A	Evaluation in GA 12
C-601-C	Steam Plant Fuel Oil Pump House	7/16/2021	N/A	Evaluation in GA 12
C-604	Utilities Maintenance Building	7/16/2021	N/A	Evaluation in GA 12
C-605	Substation Building	7/16/2021	N/A	Evaluation in GA 12
C-607	Emergency Air Compressor Generator Build	3/24/2021	N/A	Evaluation in GA 12
C-611-A	Building and Shop Storage	N/A	12/1/2021	SE Report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021) Planned for demolition in FY 2025.
C-611-A1	Activated Carbon Storage Facility	N/A	12/1/2021	NFA (concurrence by EPA and KY 12/21/2021)
C-611-B	Head House	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-B1	Polymer Feed System Enclosure	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-C	Flocculator Basin	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-F1	Secondary Coagulation Basin	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils.
C-611-F2	Secondary Coagulation Basin	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-F3	Feed Facility	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-H	Filter Building and Pump Station	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-J	Pump House (Settled Water)	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)

Table 3.2. Facilities to Be Demolished Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-611-P	Building—Pump House	N/A	8/27/2024	NFA (concurrence by EPA 9/21/2021; KY 9/21/2021) Revision to 8/26/2021 SE Report (concurrence by EPA 8/27/2024 and KY 9/3/2024)
C-611-S	Storage and Chlorine Facility	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-T	Booster Pump Station Plant Water	N/A	8/27/2024	NFA (concurrence by EPA 9/21/2021; KY 9/21/2021) Revision to 8/26/2021 SE Report (concurrence by EPA 8/27/2024 and KY 9/3/2024) Planned for demolition in FY 2025.
C-611-U	Softening Facility (West)	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-X	Softening Facility (East)	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-611-Z	Flocculator Basin	N/A	12/1/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA and KY 12/21/2021)
C-612	Northwest Plume Groundwater Treatment Facility	11/9/2021	N/A	Evaluation in GA 1, following agreement that the facility is no longer required to treat contaminated groundwater
C-615-H	Sewage Lift Station	10/19/2021	N/A	Evaluation in GA 17
C-631-1	Pump House	1/24/2023	N/A	Evaluation in Soils and Slabs OU
C-631-2	Cooling Tower	1/24/2023	N/A	Evaluation in Soils and Slabs OU
C-631-3	Fire Water Pump House	1/24/2023	N/A	Evaluation in Soils and Slabs OU
C-631-4	Blending Pump House	1/24/2023	N/A	Evaluation in Soils and Slabs OU
C-631-5	Blending Cooling Tower (West)	1/24/2023	N/A	Evaluation in Soils and Slabs OU
C-631-6	Blending Cooling Tower (East)	1/24/2023	N/A	Evaluation in Soils and Slabs OU
C-633-1	Pump House	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-633-2A	Cooling Tower (South)	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-633-2B	Cooling Tower (North)	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-633-3	Blending Pump House	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-633-4	Blending Cooling Tower (North)	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-633-5	Blending Cooling Tower (South)	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-633-6	Sand Filter Building	4/4/2023	N/A	Evaluation in Soils and Slabs OU
C-635-1	Pump House	8/31/2022	N/A	Evaluation in Soils and Slabs OU
C-635-2	Cooling Tower	8/31/2022	N/A	Evaluation in Soils and Slabs OU
C-635-3	Blending Pump House	8/31/2022	N/A	Evaluation in Soils and Slabs OU

Table 3.2. Facilities to Be Demolished Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-635-4	Blending Cooling Tower (North)	8/31/2022	N/A	Evaluation in Soils and Slabs OU
C-635-5	Blending Cooling Tower (South)	8/31/2022	N/A	Evaluation in Soils and Slabs OU
C-637-1	Pump House	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-637-2A	Cooling Tower (South)	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-637-2B	Cooling Tower (North)	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-637-3	Blending Pump House	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-637-4	Blending Cooling Tower (North)	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-637-5	Blending Cooling Tower (South)	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-637-6	Sand Filter Building	6/22/2023	N/A	Evaluation in Soils and Slabs OU
C-635-6	Recirculating Heat Utilization Pump House	7/16/2021	N/A	Evaluation in GA 17
C-720-D	Transformer Building	7/13/2021	N/A	Evaluation in GA 14
C-720-G	Warehouse	7/13/2021	N/A	Evaluation in GA 14
C-720-H	Warehouse	7/13/2021	N/A	Evaluation in GA 14
C-720-J	Air Lock	7/13/2021	N/A	Evaluation in GA 14
C-724-B	Carpenter Shop	N/A	3/18/2021	NFA (concurrence by EPA 3/25/2021; KY 4/12/2021)
C-724-C	Paint Shop	N/A	3/18/2021	RCRA facility investigation (RFI)/RI is necessary for the AOC 178 portion of the facility (concurrence by EPA 3/25/2021; KY 4/12/2021)
C-724-D	Lumber Storage Building	3/4/2021	N/A	Evaluation in GA 14
C-725	Paint Shop	N/A	6/23/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (concurrence by EPA 7/29/2021; KY 8/20/2021)
C-729	Acetylene Building	N/A	2/18/2021	NFA (concurrence by EPA 3/10/2021; KY 3/18/2021) Planned for demolition in FY 2025.
C-730	Maintenance Service Building	7/16/2021	N/A	SE for the underlying slab and soils*
C-731	Railroad Repair Equipment Storage Building	3/4/2021	N/A	Evaluation in GA 14
C-740-B	Oil Drum Storage Shelter	7/13/2021	N/A	SE for the underlying slab and soils*
C-744	Material Handling Building	N/A	2/18/2021	NFA (concurrence by EPA 3/10/2021; KY 3/18/2021)
C-745-R1	Cylinder Changeout Building	7/16/2021	N/A	Evaluation in GA 4
C-746-G	Building—Electrical Equipment Storage	3/4/2021	N/A	SE for the underlying slab and soils*
C-750	Garage	N/A	8/4/2021	RFI is necessary for the AOC 573 portion of the facility (concurrence by EPA 8/20/2021; KY 9/2/2021)

Table 3.2. Facilities to Be Demolished Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Reports	Conclusion for Slab and Underlying Soils
C-753-A	Toxic Substances Control Act Waste Storage Building	N/A	4/18/2006 (Updated SAR)	C-753-A is SWMU 206. It is a regulated facility under the Toxic Substances Control Act and was granted an NFA by KY on 3/7/1997.
C-754-B	Low Level Waste Storage	11/9/2021	N/A	Evaluation in GA 16
C-755-A	Decontamination Building	10/19/2021	N/A	SE for the underlying slab and soils*
C-755-B	Changehouse Building	10/19/2021	N/A	Evaluation in GA 5
C-755-C	Sample Shipment/Storage Facility	10/19/2021	N/A	Evaluation in GA 5
C-757	Solid and Low-Level Waste Processing Facility	11/9/2021	N/A	SE for the underlying slab and soils*

*SE for the underlying slab and soils to be performed in concert with deactivation of the facility. Consultation package reflected that the slab would be added to Appendix 4 of the SMP; however, documentation has been included in Table 3.2.
**"Off-site" relates to the name of the facility and is not intended to imply a CERCLA off-site determination.

Table 3.3. Facilities (previously listed in Table 3.2) Demolished Outside of CERCLA

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-301	Former Fire Training Building	11/9/2021	N/A	CERCLA evaluation (as part of SWMU 223) conducted under the Soils and Slabs OU. The aboveground portion of the building was demolished 2/15/2024.
C-400-A	Shed	5/11/2020	N/A	Evaluation as part of the C-400 Remedial Field Investigation. The aboveground portion of the building was demolished in August 2019.
C-370-E	Former Historical Water Quality Monitoring Sampling Station—L10	12/16/2021	N/A	Facility was discussed at the December 2021 FFA Managers Meeting; EPA and KY concurred with DOE's recommendation to remove the facility outside of CERCLA. Evaluation will be conducted as part of the SWOU Remedial Action. The aboveground portion of the building was demolished 6/28/2023.
C-611-Q	36″ Raw Water Line Booster Station	3/24/2021	N/A	Evaluation in GA 8 (Consultation package updated 1/18/2024). The aboveground portion of the building was demolished 3/14/2024.
C-615-O	Oil Control Building	3/24/2021	N/A	Evaluation in GA 11. The aboveground portion of the building was demolished 5/24/2023.
C-710-A	Gas Cylinder Storage Building	3/4/2021	N/A	Evaluation in GA 15. The aboveground portion of the building was demolished 2/7/2024.
C-711	Storage/Former Gas Manifold	3/4/2021	N/A	Evaluation in GA 15. The aboveground portion of the building was demolished 2/7/2024.

Table 3.3. Facilities (previously listed in Table 3.2) Demolished Outside of CERCLA

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-721	Gas Manifold Storage	3/4/2021	N/A	SE for the underlying slab and soils* The aboveground portion of the building was demolished 5/21/2024.
C-727	90-Day Mixed Waste Accumulation Facility	5/25/2021	N/A	Evaluation in GA 16. The aboveground portion of the building was demolished 4/15/2024.
C-742	Cylinder Storage Building	7/13/2021	N/A	Evaluation in GA 14. The aboveground portion of the building was demolished 5/23/2024.
C-742-B	Dry Agent Cylinder Storage Building	5/11/2020	N/A	Evaluation in GA 10. The aboveground portion of the building was demolished in April 2019.
C-745-B1	Cylinder Storage Yard Office	2/7/2020	N/A	Evaluation in GA 10. The aboveground portion of the building was demolished in April 2019.
C-746-A	North Warehouse	5/25/2021	N/A	Evaluation in GA 9. The aboveground portion of the building was demolished 5/16/2024.
C-752-C	Off-site** Decontamination Facility	10/19/2021	N/A	Evaluation in GA 2; SAR 419 revision. The aboveground portion of the building was demolished 7/10/2024.

*SE for the underlying slab and soils to be performed in concert with deactivation of the facility. Consultation package reflected that the slab would be added to Appendix 4 of the SMP; however, documentation has been included in Table 3.2.
**"Off-site" relates to the name of the facility and is not intended to imply a CERCLA off-site determination.

FACILITY DECOMMISSIONING OPERABLE UNIT

For the Facility Decommissioning OU under the SMP, this OU includes decommissioning activities as defined in the joint policy issued under a DOE and EPA Memorandum dated May 22, 1995, *Policy on Decommissioning DOE Facilities under CERCLA*.

Prior to shutdown of the GDP, a subproject of this OU consisted of 17 inactive facilities (15 small inactive facilities, C-340 Complex, and C-410/C-420 Complex). The completion of the C-410/C-420 Complex in FY 2016 marks the completion of the Decommissioning OU Pre-GDP shutdown scope ("Paducah Federal Facility Agreement—Decontamination and Decommissioning Operable Unit Completion Notification Letter," PPPO-02-3334049-16, dated April 11, 2016). Decommissioning of CERCLA facilities completed to date is summarized in Appendix 1 (Actions Taken to Date).

The scope of the Sitewide D&D ROD will include the deactivation and decommissioning of the abovegrade portion of structures at the Paducah Site. Decommissioning includes activities that take place after a facility has been deactivated and can include decontamination and dismantlement. Dismantlement involves the disassembly or demolition and removal, of any structure or system. The below grade portions of structures, slabs, foundations, footings, or underground utilities will be covered under the Environmental Media decision. The D&D remedy scope is planned to include the following:

- Industrial facilities that DOE has determined pose a potential threat of release of hazardous substances to the environment. These facilities are listed as part of the Facility Decommissioning OU in Appendix 4.

- Administrative, nonindustrial, and support facilities that have no potential for release.

- Balance of plant facilities which have undergone CERCLA determinations regarding a release or potential threat of release. Through consultation with the FFA parties, these facilities have been determined to not pose a threat of release and are listed in Table 3.2 or Table 3.3.

DOE is proceeding with deactivation work of the remaining facilities not operating to support DOE site activities during development of the RI/FS and until the D&D ROD is issued. The Policy states that DOE is required to conduct a removal SE in accordance with the NCP and the requirements of any interagency agreements (i.e., FFA). Section IX, (Site Evaluations) of the FFA requires that DOE conduct integrated SEs upon discovery of an area with potential or known release. The FFA further requires DOE to provide the removal SE Reports as part of the removal notification to EPA and KY for review and approval for NTCRAs.

For those industrial facilities in Appendix 4 that require a removal SE, DOE will submit a report within 120 days (or other time frame agreed to by the FFA parties) after completion of deactivation. The SE Report will document any known release or threat of any release from those buildings and the magnitude of the threat of release (i.e., whether there is a substantial threat of release). The SE Report shall state whether demolition of the facility should be conducted using a CERCLA NTCRA (in lieu of a remedial action) and will serve to designate any facility or portions thereof that are related to any identified release as a SWMU and/or AOC. If a facility was designated previously in its entirety as a SWMU/AOC requiring CERCLA Action, DOE may use the existing SE, update or conduct a new SE, or include the SE as part of the removal notification for the NTCRA.

Facilities will be sequenced to optimize cost and scheduled to support the site cleanup and will be coordinated with the FFA parties.

DUF_6 FOOTPRINT UNDERLYING SOILS OPERABLE UNIT

Scope

This OU includes the units identified in Appendix 4 under DUF_6 Footprint Underlying Soils OU. This OU currently has 3 SWMUs that are located beneath or immediately adjacent to the DUF_6 facility. These units existed prior to construction of the DUF_6 facility; as such, the scope of this OU is limited only to those SWMUs. The scope does not include D&D or remediation of the currently operating DUF_6 facility. The project is planned to occur after D&D of DUF_6 facility. The length of time that the facility will be required to operate to process all of the cylinders for which DOE has disposition responsibility directly impacts the timing for completion of the DUF_6 OU. Remediation of the DUF_6 OU or the residual risk associated with this OU will be addressed as part of the CSOU.

FINAL COMPREHENSIVE SITE OPERABLE UNIT[6]

The final CSOU evaluation will occur following completion of the Facility Decommissioning OU, Soils and Slabs OU, and completion of cleanup of each of the specific OUs (i.e., C-400 Complex OU, GWOU, SWOU, Lagoons OU, BGOU, and Soils OU). As final actions for SWMUs and GAs are completed, those SWMUs and GAs will be placed in the CSOU section of Appendix 4 of the SMP to ensure that the results of the completed action are accounted for in the overall CSOU evaluation. The final CSOU will maximize

[6] The FFA, as currently written, contemplates multiple CSOUs, consisting of those associated with integrator units (i.e., groundwater, surface water) and a final CSOU completed after issuance of all final RODs for the site. The FFA parties acknowledge that the scope description above is intended to reflect a single final CSOU to address all media, and a future FFA modification will address any inconsistencies between the FFA and SMP strategy.

use of the relevant data from previous cleanup activities and document the residual contamination and risk. Circumstances may dictate additional field activities as a result of evaluating existing information; however, it is the assumption of DOE that any SWMUs or GAs entered into the CSOU will not require any additional response action. A work plan will compile and evaluate the existing information to determine if any data gaps exist related to conducting a sitewide evaluation. The RI will include a sitewide baseline human health and ecological risk assessment to evaluate residual risks and ensure all actions taken to date, when considered collectively, are protective of human health and the environment from a sitewide perspective. If the results of the final CSOU BRA conclude that overall protection of human health and the environment has been achieved, a final Proposed Plan and NFA ROD will be developed. If the BRA concludes that residual contamination still poses an unacceptable risk that exceeds the criteria established in Section XII of the FFA, a final FS will be developed, followed by a final Proposed Plan, ROD, and implementation of the final remedy. DOE intends to conduct necessary long-term monitoring to evaluate progress toward achieving RAOs. When no further response is appropriate and all the RAOs for all remedies have been achieved, PGDP will be eligible for deletion from the National Priorities List (NPL). It should be noted that partial NPL delisting may be pursued for eligible areas prior to the CSOU.

OTHER PROJECTS

CERCLA Waste Disposal Alternatives Operable Unit

Scope

The scope of this project is to evaluate disposal options for CERCLA waste that will be generated as a result of implementing remedial actions for all of the OUs as determined by the Sitewide D&D ROD and Environmental Media ROD. The evaluation of disposal options will be conducted using the CERCLA remedial decision-making process. Accordingly, the scope of the RI/FS will be focused and tailored to the nature of this project (i.e., this is not a typical project where potential releases are investigated, evaluated, and remediated). Additionally, due to significant public interest in the project, frequent interactions with the public are expected throughout the project life cycle. The decision about whether to implement an on-site disposal facility will be documented in a ROD.

The potential OSWDF, portions thereof, and/or related waste support facilities will be evaluated for designation as a Corrective Action Management Unit in accordance with 40 *CFR* § 264.552.

Emerging Contaminants

Certain per- and polyfluoroalkyl substances (PFAS), which includes perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and 1,4-dioxane have been identified by EPA as emerging contaminants.

On December 19, 2019, EPA issued the *Interim Recommendations for Addressing Groundwater Contaminated with Perfluorooctanoic Acid and Perfluorooctanesulfonate* memorandum, as a priority action for federal cleanup programs under EPA's PFAS Action Plan. Aggressively addressing PFAS is an active and ongoing effort for EPA. DOE issued an internal memorandum, "Addressing Per-and Polyfluoroalkyl Substances at the Department of Energy" on September 16, 2021. DOE's memorandum provides guidance to appropriately characterize historic PFAS use and releases at DOE sites. DOE's efforts will focus on assessing aqueous film forming foam (AFFF) releases to the environment from fire suppression systems, fire-fighter training operations, and emergencies resulting in AFFF use; identifying other uses and incidents of disposal of PFAS; and conducting ongoing testing and monitoring for PFAS at levels exceeding established health advisory levels or regulatory limits. On October 26, 2021, DOE issued the letter "Response to Request for Status and Path Forward for the Department of Energy's Evaluation of Per- And Polyfluoroalkyl Substances at the Paducah Site," (PPPO-02-10015447-22) in response to EPA

Region IV's recommendation that the FFA parties address PFAS as a sitewide emergent contaminant issue to document a sitewide Paducah Site PFAS SE under the FFA.

DOE's response, which is included in their October 2021 response letter, indicates that the recommendation for a sitewide Paducah Site PFAS sampling effort as part of the ongoing environmental monitoring program will proceed. DOE provided briefings on the sampling strategy in FY 2022 and incorporated input from EPA and KY. Sampling was completed in FY 2023 and reporting is in progress.

Effective July 8, 2024, EPA designated PFOA and PFOS, including their salts and structural isomers, as CERCLA hazardous substances under 40 *CFR* Part 302. Any actions required by this rule and as may be applicable to the Paducah Site will be addressed in the Environmental Media ROD.

The sitewide PFAS Screening Assessment sampling is a DOE-initiated preliminary characterization of PFAS and is being conducted concurrent with DOE's routine environmental monitoring. The screening assessment includes the collection of PFAS data needed to perform an initial sitewide evaluation for the presence of PFAS in certain environmental media and in potable water from the Paducah Site water treatment plant. The DOE sampling plan and quality assurance plan worksheets identify the information to be obtained and the decision criteria to be used for responding to the question of whether certain environmental media and potable water pose a potential threat to human health that may require future evaluation under CERCLA at the Paducah Site. Upon completion of the screening assessment, the results will be documented in a report, projected for the 4th quarter of FY 2024. Additional sampling to support the FY 2023 PFAS Screening Assessment will be considered:

- To supplement FY 2023 PFAS sampling efforts, if funding is available, from Upper Continental Recharge System (UCRS) soil and Regional Gravel Aquifer groundwater in the C-400 RI addendum area and, with any remaining contingency borings, from UCRS soil in the SWMU 100 Fire Training Area (FTA) potentially contaminated with PFAS. As discussed in Appendix 1, in relation to the SWMU 100 FTA, PFAS is an emergent contaminant that was not considered as part of the scope of the WAGs 1 & 7 RI/FS or ROD and the presence of PFAS is being evaluated separately from this ROD; if cleanup under CERCLA is required, then additional actions will be taken outside of the scope of WAGs 1 & 7 in the Environmental Media ROD.

- To provide heightened comparability of results through the collection of each group of samples within a specified timeframe from the Northeast Plume and Northwest Plume treatment systems influents and effluents and the associated discharge outfalls (C001, K001, K002) for treated groundwater as well as C-746-U Landfill leachate and the associated discharge outfall for treated leachate.

Sampling and analysis for 1,4-dioxane has been conducted at the Paducah Site on a project-specific basis. The most recent 1,4-dioxane data were collected as part of the C-400 Cleaning Building RI, with 1,4-dioxane detected in several groundwater samples. Additional sampling and analysis for 1,4-dioxane is being considered for FY 2025.

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APPENDIX 4

SOURCE AREA BY OPERABLE UNIT

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Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit

C-400 COMPLEX			
Operable Unit	**Subproject**	**SWMU No.**	**Description**
C-400 Complex OU	C-400 Final Remedial Action	11	C-400 TCE Leak Site
		40	C-403 Neutralization Tank slab and underlying soils
		47	C-400 Technetium Storage Tank Area
		98	C-400 Basement Sump
		203	C-400 Discard Waste System slab and underlying soils
		480	C-402 Lime House building slab and underlying soils
		533	TCE Spill Site from TCE Unloading Operations at C-400
		Five SWMUs (349, 350, 351, 352, and 353) within the C-400 Building are DMSAs that were designated as SWMUs under the Kentucky Hazardous Waste Management Permit pursuant to a DOE-KDEP Agreed Order (October 2003) and were not identified for action under the FFA. Ten other SWMUs within the C-400 Building (48, 49, 50, 51, 52, 53, 54, 383, 384, and 537) have been designated as no further action (NFA) and are listed in the NFA section of Appendix 4.	
GROUNDWATER			
GWOU	C-400 Interim Remedial Action	11	C-400 TCE Leak Site
		533	TCE Spill Site from TCE Unloading Operations at C-400
	Southwest Plume Sources	1	C-747-C Oil Land Farm
		211 A	C-720 TCE Spill Site Northeast
		211 B	C-720 TCE Spill Site Southeast
	Dissolved-Phase Plumes	201	Northwest Groundwater Plume
		202	Northeast Groundwater Plume
		210	Southwest Groundwater Plume
	Potential Additional Groundwater Sources	NA	This operable unit is being reserved for remaining sources to groundwater contamination that may be identified in the future
SURFACE WATER			
SWOU	SWOU Remedial Action / Removal Action	58	North-South Diversion Ditch (NSDD) (Outside) (includes KPDES 003)
		60	C-375-E2 Effluent Ditch (KPDES 002)[7]
		61	C-375-E5 Effluent Ditch (KPDES 013)[8]
		62	C-375-S6 SW Ditch (KPDES 009)[8]
		63	C-375-W7 Oil Skimmer Ditch (KPDES 008 and KPDES 004)
		66	C-375-E3 Effluent Ditch (KPDES 010)
		67	C-375-E4 Effluent Ditch (C-340 Ditch) (KPDES 011)
		68	C-375-W8 Effluent Ditch (KPDES 015)
		69	C-375-W9 Effluent Ditch (KPDES 001)
		92	Fill Area for Dirt from the C-420 PCB Spill Site

[7] The results of the Surface Water Operable Unit (SWOU) (On-Site) Site Investigation determined that there were no unacceptable levels of risk to current and anticipated future receptors that warranted inclusion of Solid Waste Management Unit (SWMU) 60 (Outfall 002), SWMU 168 (Outfall 012), or SWMU 102 (Paducah Gaseous Diffusion Plant storm sewer systems associated with C-333-A, C-337-A, C-340, C-535, and C-537). As a result, no action will be taken for these SWMUs as originally planned under the SWOU removal action. These SWMUs will be evaluated further as part of the SWOU remedial action. It also should be noted that during development of the Sampling and Analysis Plan for SWOU (On-Site) Removal Action, Outfall 009 and Outfall 013 were evaluated. This assessment of the outfalls, which included a review of historical data, indicated that Outfall 009 and Outfall 013 did not require an early action, and further assessment of Outfall 009 and Outfall 013 would be addressed during the Comprehensive Site Operable Unit (CSOU). Based upon current site strategy, Outfall 009 and Outfall 013 also will be addressed as part of the SWOU remedial action.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

SURFACE WATER (CONTINUED)			
Operable Unit	**Subproject**	**SWMU No.**	**Description**
SWOU	SWOU Remedial Action – Removal Action	97	C-601 Diesel Spill
		102 B	Plant Storm Sewer associated with C-333-A, C-337-A, C-340, C-535, and C-537[8]
		168	KPDES Outfall Ditch 012[9]
		526	Internal Plant Drainage Ditches (includes KPDES 016)[9]
	SWOU Remedial Action	64	Little Bayou Creek
		65	Bayou Creek
		93	Concrete Disposal Area East of Plant Security Area
		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)
		113	Concrete Rubble Pile (11)
		129	Concrete Rubble Pile (27)
		175	Concrete Rubble Pile (28)
		185	C-611-4 Horseshoe Lagoon (includes KPDES 014)
		199	Big Bayou Creek Monitoring Station
		205	Eastern Portion of Yellow Water Line
		549	Dirt/Concrete Rubble Pile near Outfall 008
		550	Concrete Culvert Sections Located on the West Bank of the Ditch Leading to Outfall 001
		Others	Outfalls 017, 018, 019/020, and 526 and associated ditches
LAGOONS			
Lagoons OU	Process Lagoons	17	C-616-E Sludge Lagoon
		18	C-616-F Full-Flow Lagoon
		171	C-617-B Lagoon (formerly identified as C-617-A in the 10/12/1992 SAR)
	Water Treatment System Lagoons	21	C-611-W Sludge Lagoon
		22	C-611-Y Overflow Lagoon (includes KPDES 006)
		23	C-611-V Lagoon (includes KPDES 005)
BURIAL GROUNDS			
BGOU	BGOU Remedial (10 SWMUs)	2	C-749 Uranium Burial Ground
		3	C-404 Low-Level Radioactive Waste Burial Ground
		4	C-747 Contaminated Burial Ground
		5	C-746-F Classified Burial Ground
		6	C-747-B Burial Area
		7	C-747-A Burial Ground
		9	C-746-S Residential Landfill
		10	C-746-T Inert Landfill
		30	C-747-A Burn Area
		145	Residential/Inert Landfill Borrow Area (P-Landfill)
	Additional Burial Grounds	472	C-746-B Pad
		520	Scrap Material West of C-746-A

[8] See footnote #7.
[9] Kentucky Pollutant Discharge Elimination System (KPDES) Outfall 016, in its entirety, will be addressed as part of the SWOU Remedial Investigation.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

SOILS			
Operable Unit	**Subproject**	**SWMU No.**	**Description**
Soils OU	Soils Remedial	1	C-747-C Oil Land Farm
		13	C-746-P Clean Scrap Yard[10]
		14	C-746-E Contaminated Scrap Yard
		15	C-746-C Scrap Yard[11]
		19	C-410-B HF Neutralization Lagoon
		26	C-400 to C-404 Underground Transfer Line[11]
		56	C-540-A PCB Waste Staging Area[11]
		57	C-541-A PCB Waste Staging Area[11]
		76	C-632-B Sulfuric Acid Storage Tank
		77	C-634-B Sulfuric Acid Storage Tank[11, 12]
		80	C-540-A PCB Spill Site[11]
		81	C-541-A PCB Spill Site
		99 B	C-745 Kellogg Bldg. Site—Septic Tank/Leach Field
		138	C-100 Southside Berm
		153	C-331 PCB Soil Contamination (West)
		156	C-310 PCB Soil Contamination (West Side)
		158	Chilled-Water System Leak Site
		160	C-745 Cylinder Yard Spoils (PCB Soils)
		163	C-304 Bldg./HVAC Piping System (Soil Backfill)
		165	C-616-L Pipeline & Vault Soil Contamination
		169	C-410-E HF Vent Surge Protection Tank
		170	C-729 Acetylene Bldg. Drain Pits
		180	Outdoor Firing Range (WKWMA)
		181	Outdoor Firing Range (PGDP)
		194	McGraw Construction Facilities (South Side Leach Field Area)
		195	Curlee Road Contaminated Soil Mounds
		196	C-746-A Septic System
		200	Soil Contamination South of TSCA Waste Storage Facility
		204	Dykes Road Historical Staging Area[11]
		211 A	C-720 TCE Spill Site Northeast[11]
		212	C-745-A Radiological Contamination Area
		213	OS-02
		214	OS-03
		215	OS-04
		216	OS-05[13]
		217	OS-06
		219	OS-08
		221	OS-10
		222	OS-11
		224	OS-13[11]
		225 A	OS-14[11]

[10] These SWMUs/areas of concern (AOCs) were evaluated under Soils OU RI 2 and will be addressed by a subsequent Soils OU feasibility study.
[11] SWMUs 56 and 57 are located within, and will be addressed as part of, SWMUs 80 and 81, respectively.
[12] This SWMU was evaluated as part of the Soils Operable Unit. The soils and underlying slabs associated with this SWMU will be addressed under the Soils and Slabs OU as part of post-GDP shutdown activities.
[13] The boundaries for SWMU 216 were revised after the Soils OU RI was completed; as a result, the conclusions in the Soils OU RI Report for SWMU 216 are incomplete and will need to be addressed in a subsequent action.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

SOILS (CONTINUED)			
Operable Unit	**Subproject**	**SWMU No.**	**Description**
Soils OU (Continued)	Soils Remedial (Continued)	225 B	Contaminated Soil Area near C-533-1 DMSA OS-14[14]
		227	OS-16
		228	OS-17
		229	OS-18[15]
		486	Rubble Pile WKWMA (approximately 116 ft off roadside)
		487	Rubble Pile WKWMA (approximately 483 ft off roadside)
		488	PCB Contamination Area by the C-410 Trailer Complex
		489	Septic Tank North of C-710 Laboratory
		492	Contaminated Soil Area Near Outfall 010
		493	Concrete Rubble Piles Near Outfall 001
		517	Rubble and Debris Erosion Control Fill Area
		518	Field South of C-746-P1 Clean Scrap Yard
		520	Scrap Material West of C-746-A
		531	Aluminum Slag Reacting Area (C-746-H4) near the C-746-A Facility
		541	Contaminated Soil Area South of Outfall 011
		561	Soil Pile I
		562	Soil Piles C, D, E, F, G, H, J, K, and P in subunit 1 north of Soil Pile I on the west bank of Little Bayou Creek
		563	Soil Piles 20, CC, and BW in subunit 4 north of outfall 012 west of Little Bayou Creek
		564	Soil Pile AT in subunit 5 that consists of three soil areas on the east side of the NSDD north of the P-, S-, and T-Landfills
		565	Rubble Area KY-19 (along Bayou Creek north of C-611 Water Treatment Plant)[15]
		567	Soil Pile K013 near Outfall 013, West of Little Bayou Creek
SOILS AND SLABS			
Soils and Slabs OU		16	C-746-D Classified Scrap Yard
		20	C-410-E HF Emergency Holding Pond slab and underlying soils
		27	C-722 Acid Neutralization Tank
		28	C-712 Laboratory Equalization Tank slab and underlying soils
		31	C-720 Compressor Pit Water Storage Tank slab and underlying soils
		32	C-728 Clean Waste Oil Tanks slab and underlying soils
		33	C-728 Motor Cleaning Facility slab and underlying soils
		38	C-615 Sewage Treatment Plant slab and underlying soils
		41	C-410-C Neutralization Tank slab and underlying soils
		42	C-616 Chromate Reduction Facility slab and underlying soils
		55	C-405 Incinerator building slab and underlying soils
		70	C-333-A Vaporizer slab and underlying soils
		71	C-337-A Vaporizer slab and underlying soils
		74	C-340 PCB Transformer Spill Site
		75	C-633 PCB Spill Site

[14] See footnote #10.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

SOILS AND SLABS (CONTINUED)			
Operable Unit	**Subproject**	**SWMU No.**	**Description**
Soils and Slabs OU (Continued)		77	C-634-B-Sulfuric Acid Storage Tank slab and underlying soils
		78	C-420 PCB Spill Site
		79	C-611 PCB Spill Site
		82	C-531 Switchyard slab and underlying soils
		83	C-533 Switchyard slab and underlying soils
		84	C-535 Switchyard slab and underlying soils
		85	C-537 Switchyard slab and underlying soils
		86	C-631 Pumphouse and Cooling Tower Slabs and Associated Soils
		87	C-633 Pumphouse and Cooling Tower Slabs and Associated Soils
		88	C-635 Pumphouse and Cooling Tower Slabs and Associated Soils
		89	C-637 Pumphouse and Cooling Tower slab and underlying soils
		99 A	C-745 Kellogg Bldg. Site–Cylinder Yard
		135	C-333 PCB Soil Contamination (North Side)
		137	C-746-A Inactive PCB Transformer Sump Area[15]
		154	C-331 PCB Soil Contamination (Southeast)
		155	C-333 PCB Soil Contamination (West)
		159	C-746-H3 Storage Pad slab and underlying soils
		161	C-743-T-01 Trailer Site (Soil Backfill)
		162	C-617-A Sanitary Water Line (Soil Backfill)
		166	C-100 Trailer Complex Soil Contamination (East Side)
		167	C-720 White Room Sump slab and underlying soils
		172	C-726 Sandblasting Facility slab and underlying soils
		176	C-331 RCW Leak Northwest Side
		177	C-331 RCW Leak East Side
		178	C-724-A Paint Spray Booth slab and underlying soils
		179	Plant Sanitary Sewer System
		192	C-710 Acid Interceptor Pit slab and underlying soils
		198	C-410-D Area Soil Contamination slab and underlying soils
		209	C-720 Compressor Shop Pit Sump slab and underlying soils
		211 B	C-720 TCE Spill Site Southeast
		218	OS-07 slab and underlying soils
		220	OS-09 slab and underlying soils
		223	OS-12 slab and underlying soils
		226	OS-15
		463	C-746-A East End Smelter slab and underlying soils
		464	C-746-A West End Smelter building slab and underlying soils
		469	C-745-J Yard
		470	C-746-V Yard
		474	West of Vortec Site
		477	C-340 Metals Plant building slab and underlying soils
		478	C-410/420 Feed Plant building slab and underlying soils
		482	C-415 Feed Plant Storage Building slab and underlying soils
		483	Nitrogen Generating Facilities slab and underlying soils

[15] SWMU 137 was evaluated as part of the American Recovery and Reinvestment Act and the Soils OU. SWMU 137 will be addressed as part of Soils and Slabs OU.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

SOILS AND SLABS (CONTINUED)			
Operable Unit	**Subproject**	**SWMU No.**	**Description**
Soils and Slabs OU (Continued)		498	C-410/420 Sump at Column D & E-1&2 slab and underlying soils
		499	C-410/420 Sump at Column H-9&10 slab and underlying soils
		500	C-410/420 Sump at Column U-10&11 slab and underlying soils
		501	C-410/420 UF_6 Scale Pit Sumps A&B slab and underlying soils
		502	C-410/420 Sump at Column U-9 slab and underlying soils
		503	C-410/420 Sump at Column G-1 slab and underlying soils
		504	C-410/420 Sump at Column L-10 slab and underlying soils
		505	C-410/420 Sump at Column A-3N slab and underlying soils
		506	C-410/420 Sump at Column Wa-9 slab and underlying soils
		507	C-410/420 Condensate Tank Pit slab and underlying soils
		508	C-410/420 Settling Basin slab and underlying soils
		509	C-410/420 Drain pit slab and underlying soils
		510	C-410/420 Sump at Column P&Q-2 slab and underlying soils
		511	C-410/420 Sump at Column Q&R-2 slab and underlying soils
		512	C-410/420 Sump at Column R-2 slab and underlying soils
		513	C-411 Cell Maintenance Room Sump slab and underlying soils
		522	C-340 Work Pit at Ground Floor Level (B-7—B-9) slab and underlying soils
		523	C-340 Metals Plant Pit at Ground Floor (F-6 to F-11) slab and underlying soils
		524	C-340 Pickling System Sump (B-10 to B-11) slab and underlying soils
		529	C-340 Powder Plant Sump at Ground Floor Level slab and underlying soils
		571	C-602 Coal Storage Yard
		572	C-360 Toll Transfer and Sampling Building Slab and Underlying Soils
		573	C-750 Garage Slab and Underlying Soils and Associated Outside Areas
		574	C-709-A Acid Neutralization Vault
		575	C-721 Gas Manifold Storage Slab and Underlying Soils Area
FACILITY DECOMMISSIONING			
Facility Decomm-issioning OU	Remaining Decomm-issioning	The following SWMUs/AOCs or facilities may include multiple smaller facilities. A more detailed listing of facilities is included in the following table entitled "Detailed Facility Decommissioning OU Facilities List." *Denotes facilities that have been identified as requiring a CERCLA NTCRA.	
		33*	C-728 Motor Cleaning Facility
		38*	C-615 Sewage Treatment Plant
		42*	C-616 Chromate Reduction Facility
		70*	C-333-A Vaporizer
		71*	C-337-A Vaporizer
		82*	C-531 Switchyard
		83*	C-533 Switchyard
		84*	C-535 Switchyard
		85*	C-537 Switchyard
		172*	C-726 Sandblasting Facility
		482*	C-415 Feed Plant Storage Building
		572*	C-360 Toll Transfer and Sampling Building

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

DECONTAMINATION AND DECOMMISSIONING (CONTINUED)			
Facility Decomm-issioning OU (Continued)	Remaining Decomm-issioning (Continued)	Other Buildings (non-SWMUs)	See Table "Detailed Facility Decommissioning OU Facilities List." Process Building tie-lines and bridges will be included with the appropriate process building.
DUF_6 FOOTPRINT UNDERLYING SOILS			
DUF_6 Footprint Underlying Soils OU		164	KPDES Outfall Ditch 017 Flume—Soil Backfill
		183	McGraw UST
		193	McGraw Construction Facilities (South Side Cylinder Yard Area, East of Hobbs Road)
FINAL COMPREHENSIVE SITE OPERABLE UNIT			
CSOU[16,17,18]	**SWMU No.**		**Description**
	8		C-746-K Inactive Sanitary Landfill
	59		NSDD (Inside)
	91		UF_6 Cylinder Drop Test Area
	100		Fire Training Area
PERMITTED			
Permitted	**SWMU No.**		**Description**
	3		C-404 Low-Level Radioactive Waste Burial Ground[19]
	9		C-746-S Residential Landfill
	10		C-746-T Inert Landfill
	44		C-733 Hazardous Waste Storage Area
	46 A		C-746-Q Hazardous and Low-Level Mixed Waste Storage Facility[20]
	207		C-752-A ER Waste Storage Bldg.
	208		C-746-U Solid Waste Contained Landfill

[16] The FFA, as currently written, contemplates multiple CSOUs, consisting of those associated with integrator units (i.e., groundwater, surface water), and a final CSOU completed after issuance of all final RODs for the site. The FFA parties acknowledge that the scope description is intended to reflect a single CSOU to address all media, and a future FFA modification will be conducted to resolve any inconsistencies between the FFA and Site Management Plan strategy.

[17] Historically, once an action has been completed for a particular SWMU whereby no additional active response actions are expected, such SWMUs have been placed in the CSOU for further evaluation; however, the FFA parties recognized the need to reach consensus on the criteria for assigning units to the CSOU. As a result, placement of SWMUs 8, 59, 91, and 100 in the CSOU is provisional pending the FFA parties reaching consensus on such criteria.

[18] The scope of the GAs is sequenced to occur prior to the CSOU, and any actions taken under the GAs will be considered as part of the final CSOU.

[19] SWMU 3 was issued only a post-closure permit, was not permitted for construction and operation, and was not an engineered hazardous waste landfill.

[20] The C-746-Q Facility also includes C-746-Q1.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION[21]		
SWMU No.	**Description**	**NFA Approval By**
12	C-747-A UF_4 Drum Yard	FFA Managers Agreement—11/17/2011; FFA Managers Meeting, 4/12/2012 (Based on information presented at these meetings and on verbal agreement, KY agreed with DOE's assessment that SWMU 12 should be granted NFA status in a letter dated 4/24/2012.)
24	C-750-D UST	KDWM (UST Branch) 11/23/1999
25	C-750 1,000-gal Waste Oil Tank (UST)	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM (UST Branch) 6/20/1994
29	C-746-B TRU Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993
34	C-746-M PCB Waste Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993
35	C-337 PCB Waste Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993
36	C-337 PCB Waste Staging Area	EPA HSWA Class 1 Permit Mod 3/17/1993
37	C-333 PCB Waste Staging Area	EPA HSWA Class 1 Permit Mod 3/17/1993
39	C-746-B PCB Waste Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993
43	C-746-B Waste Chemical Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993; Closed after 1993
45	C-746-R Waste Solvent Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993; Closed after 1993
46	C-409 Hazardous Waste Pilot Plant[22]	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM (Mod #13) 9/26/1997
48	Gold Dissolver Storage Tank (DMSA C400-03)	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM 7/8/2010
49	C-400-B Waste Solution Storage Tank	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM 9/26/1997
50	C-400-C Nickel Stripper Evaporation Tank	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM (Mod #13) 9/26/1997
51	C-400-D Lime Precipitation Tank	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM (ROC) 8/8/1994
52	C-400 Waste Decontamination Solution Storage Tanks	EPA HSWA Class 1 Permit Mod 3/17/1993
53	C-400 NaOH Precipitation Unit	EPA HSWA Class 1 Permit Mod 3/17/1993
54	C-400 Degreaser Solvent Recovery Unit	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM 7/8/2010
72	C-200 Underground Gasoline Tanks	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM (UST C-200A; UST Branch) 11/23/1999

[21] The FFA Parties agree that KDWM will serve as the sole agency for the review and comment on all SWMU assessment reports. The FFA Parties agree that, as a standard practice for waste management units (e.g., TSDs, SWMUs, and AOCs), KDWM's determination for NFA under both the RCRA permit (i.e., Kentucky Hazardous Waste Facility Permit, EPA HSWA Permit) and the FFA are accepted by all parties.

[22] Radiological contamination associated with the sump in this unit will be addressed under the Decommissioning program for the C-409 Stabilization Building.

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION (CONTINUED)		
SWMU No.	**Description**	**NFA Approval By**
73	C-710 Underground Gasoline Tanks	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM (UST C-200A; UST C-710; UST Branch) 2/19/2002
90	C-728 Petroleum Naphtha Pipe (formerly identified as the C-720 Petroleum Naphtha Pipe or C-720 Underground Petroleum Naphtha Pipe in historical documents)	KDWM 1/14/2015
94	KOW Trickling Filter and Leach Field	KDWM Superfund Branch 1/15/2020
96	C-333 Cooling Tower Scrap Wood Pile	EPA HSWA Class 1 Permit Mod 3/17/1993
101	C-340 Hydraulic System	EPA and KDWM 4/2/2015
102 A	Plant Storm Sewer—between the south side of the C-400 Building and Outfall 008	EPA and KY via SW Plume ROD 3/16/2012; KDWM 1/14/2015
103	Concrete Rubble Pile (1)	EPA and KY via WAG 17 ROD 9/29/1997
104	Concrete Rubble Pile (2)	EPA and KY via WAG 17 ROD 9/29/1997
110	Concrete Rubble Pile (8)	EPA and KY via WAG 17 ROD 9/29/1997
111	Concrete Rubble Pile (9)	EPA and KY via WAG 17 ROD 9/29/1997
112	Concrete Rubble Pile (10)	EPA and KY via WAG 17 ROD 9/29/1997
114	Concrete Rubble Pile (12)	EPA and KY via WAG 17 ROD 9/29/1997
115	Concrete Rubble Pile (13)	EPA and KY via WAG 17 ROD 9/29/1997
116	Concrete Rubble Pile (14)	EPA and KY via WAG 17 ROD 9/29/1997
117	Concrete Rubble Pile (15)	EPA and KY via WAG 17 ROD 9/29/1997
118	Concrete Rubble Pile (16)	EPA and KY via WAG 17 ROD 9/29/1997
119	Concrete Rubble Pile (17)	EPA and KY via WAG 17 ROD 9/29/1997
120	Concrete Rubble Pile (18)	EPA and KY via WAG 17 ROD 9/29/1997
121	Concrete Rubble Pile (19)	EPA and KY via WAG 17 ROD 9/29/1997
122	Concrete Rubble Pile (20)	WAG 17 RI Work Plan
123	Concrete Rubble Pile (21)	EPA and KY via WAG 17 ROD 9/29/1997
124	Concrete Rubble Pile (22)	EPA and KY via WAG 17 ROD 9/29/1997
125	Concrete Rubble Pile (23)	EPA and KY via WAG 17 ROD 9/29/1997
126	Concrete Rubble Pile (24)	EPA and KY via WAG 17 ROD 9/29/1997
127	Concrete Rubble Pile (25)	EPA and KY via WAG 17 ROD 9/29/1997
128	Concrete Rubble Pile (26)	EPA and KY via WAG 17 ROD 9/29/1997

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION (CONTINUED)		
SWMU No.	**Description**	**NFA Approval By**
130	C-611 550-gal Gasoline UST	KDWM 12/6/1996 EPA and KY via WAG 1&7 ROD
131	C-611 50-gal Gasoline UST	KDWM 12/6/1996 EPA and KY via WAG 1&7 ROD 8/10/1998
132	C-611 2,000-gal Oil UST	KDWM 12/6/1996 EPA and KY via WAG 1&7 ROD 8/10/1998
133	C-611 (unknown size) Grouted UST	KDWM 12/6/1996 EPA and KY via WAG 1&7 ROD 8/10/1998
134	C-611 1,000-gal Diesel/Gasoline Tank	KDWM 12/6/1996 EPA and KY via WAG 1&7 ROD 8/10/1998
136	C-740 TCE Spill Site	EPA and KY via WAG 1&7 ROD 8/10/1998
139	C-746-A1 UST	KDWM 12/9/2005
140	C-746-A2 UST	KDWM 12/19/1996
141	C-720 Inactive TCE Degreaser	KDWM 8/11/1992; EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit
142	C-750-A 10,000-gal Gasoline Tank (UST)	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM 3/25/1999
143	C-750-B 10,000-gal Diesel Tank (UST)	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM 3/25/1999
144	C-746-A Hazardous and Mixed Waste Storage Facility	EPA HSWA Class 1 Permit Mod 3/17/1993—Regulated by RCRA Permit; KDWM 10/10/2011
146	Concrete Rubble Pile (40)	EPA and KY via WAG 17 ROD 9/29/1997
147	Concrete Rubble Pile (41)	EPA and KY via WAG 17 ROD 9/29/1997
148	Concrete Rubble Pile (42)	EPA and KY via WAG 17 ROD 9/29/1997
149	Concrete Rubble Pile (43)	EPA and KY via WAG 17 ROD 9/29/1997
150	Concrete Rubble Pile (44)	EPA and KY via WAG 17 ROD 9/29/1997
151	Concrete Rubble Pile (45)	EPA and KY via WAG 17 ROD 9/29/1997
152	Concrete Rubble Pile (46)	EPA and KY via WAG 17 ROD 9/29/1997
157	KOW Toluene Spill Area	KDWM Superfund Branch 1/15/2020
173	C-746-A Trash-Sorting Facility	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM 12/18/1992
174	C-745-K Low-Level Storage Area	EPA HSWA Class 1 Permit Mod 3/17/1993; KDWM 2/22/1993
182	Western Portion of Yellow Water Line	KDWM Superfund Branch 1/15/2020

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION (CONTINUED)		
SWMU No.	**Description**	**NFA Approval By**
184	Concrete Rubble Pile (29)	EPA and KY via WAG 17 ROD 9/29/1997
186	C-751 Fuel Facility	KDWM 10/20/1993
187	C-611 Septic System	KDWM 10/20/1993
188	C-633 Septic System	KDWM 10/20/1993
189	C-637 Septic System	KDWM 10/20/1993
190	C-337A Sewage Treatment Aeration Tank	KDWM 10/20/1993
191	C-333-A Sewage Treatment Aeration Tank	KDWM 10/20/1993
197	Concrete Rubble Pile (30)	EPA and KY via WAG 17 ROD 9/29/1997
206	C-753-A Toxic Substances Control Act Waste Storage Bldg.	KDWM 3/7/1997
208	C-746-U Solid Waste Contained Landfill	KDWM 3/7/1997
360	C-535	KDWM 1/4/2006
361	C-727–90 day	KDWM 8/28/2007
362	G-310-04	KDWM 8/28/2007
363	G-331-03	KDWM 6/29/2004
364	G-331-05	KDWM 6/29/2004
365	G-333-02	KDWM 5/12/2003
366	G-333-03	KDWM 5/12/2003
367	G-333-04	KDWM 5/12/2003
368	G-333-08	KDWM 6/29/2004
369	G-333-10	KDWM 5/12/2003
370	G-333-20	KDWM 5/12/2003
371	G-335-01	KDWM 1/4/2006
372	G-337-02	KDWM 9/11/2003
373	G-337-03	KDWM 9/11/2003
374	G-337-13	KDWM 9/11/2003
375	G-337-14	KDWM 9/11/2003
376	G-337-15	KDWM 9/11/2003
377	G-337-22	KDWM 1/4/2006
378	G-340-01	EPA and KDWM 4/02/2015
379	G-340-03	EPA and KDWM 4/02/2015
380	G-340-04	EPA and KDWM 4/02/2015
381	G-340-05	EPA and KDWM 4/02/2015
382	G-340-06	KDWM 8/28/2007
383	G-400-01	KDWM 5/12/2003
384	G-400-02	KDWM 5/12/2003
385	G-409-25	KDWM 5/12/2003
386	G-410-01	KDWM 8/28/2007
387	C-416-01	KDWM 8/28/2007
388	C-416 Decontamination Pad	KDWM 4/12/2004
389	G-533-01	KDWM 6/29/2004
390	G-535-02	KDWM 6/29/2004
391	G-537-01	KDWM 1/4/2006
392	G-540-A-01	KDWM 2/14/2006
393	G-540-A-1-02	KDWM 2/14/2006
394	G-541-A-01	KDWM 4/12/2004
395	G-600-01	KDWM 3/8/2007
396	G-611-U-01	KDWM 3/8/2007
397	G-612-01	KDWM 3/8/2007
398	G-612-02	KDWM 3/8/2007

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION (CONTINUED)		
SWMU No.	**Description**	**NFA Approval By**
399	G-612-A-01	KDWM 3/8/2007
400	G-635-01	KDWM 3/8/2007
401	G-710	KDWM 1/4/2006
402	G-710-04	KDWM 9/11/2003
403	G-710-20	KDWM 1/4/2006
404	G-710-24	KDWM 9/11/2003
405	G-720-22	KDWM 2/14/2006
406	G-743-T-17-01	KDWM 6/29/2004
407	G-743-T-17-02	KDWM 3/8/2007
408	G-745-B-01	KDWM 3/8/2007
409	G-745-T-01	KDWM 2/14/2006
410	G-746-G-01	KDWM 6/29/2004
411	G-746-G-1-01	KDWM 3/8/2007
412	G-746-G-2-01	KDWM 11/1/2004
413	G-746-G-3-01	KDWM 11/1/2004
414	G-746-F-01	KDWM 1/4/2006
415	G-746-S-01	KDWM 8/28/2007
416	G-746-X-01 (PCBs)	KDWM 3/8/2007
417	G-746-X-01 (Asbestos)	KDWM 3/8/2007
418	G-748-B-01	KDWM 6/29/2004
419	C-752-C Decontamination Facility	KDWM 8/28/2007; KDWM 4/22/2022
420	G-752-C-02	KDWM 3/8/2007
421	G-754-01	KDWM 1/4/2006
422	G-755-A-01, G-755-A-02, and G-755-A-03	KDWM 1/28/2004
423	G-755-C-01	KDWM 1/28/2004
424	G-755-T-07-01	KDWM 1/28/2004
425	G-755-T-08	KDWM 1/28/2004
426	G-755-T-2-3-01	KDWM 1/28/2004
427	G-755-T-3-1-01	KDWM 1/28/2004
428	G-755-T-3-2-01	KDWM 1/28/2004
429	S-310-04	KDWM 8/28/2007
430	S-331-02	KDWM 1/4/2006
431	S-333-12	KDWM 5/12/2003
432	S-335-09	KDWM 1/4/2006
433	S-337-11	KDWM 9/11/2003
434	S-340-01	EPA and KY 4/2/2015
435	S-409-100	KDWM 5/12/2003
436	S-409-20	KDWM 5/12/2003
437	S-409-40	KDWM 5/12/2003
438	S-409-60	KDWM 5/12/2003
439	S-409-80	KDWM 5/12/2003
440	S-410-05	KDWM 8/28/2007
441	S-540-A-2-01	KDWM 6/29/2004
442	S-612-01	KDWM 2/14/2006
443	S-709-01	KDWM 6/29/2004
444	S-709-02	KDWM 6/29/2004
445	S-710-05	KDWM 2/14/2006
446	S-710-06	KDWM 9/11/2003
447	S-710-09	KDWM 1/4/2006
448	S-710-16	KDWM 9/11/2003
449	S-710-18	KDWM 9/11/2003
450	S-710-32	KDWM 1/4/2006

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION (CONTINUED)		
SWMU No.	**Description**	**NFA Approval By**
451	S-710-41	KDWM 9/11/2003
452	S-710-44	KDWM 1/4/2006
453	S-710-46	KDWM 9/11/2003
454	S-743-T-17-01	KDWM 2/14/2006
455	S-755-T-16-01	KDWM 1/28/2004
456	S-755-T-16-02	KDWM 1/28/2004
457	S-755-T-16-03	KDWM 1/28/2004
458	S-755-T-2-3-01	KDWM 1/28/2004
459	S-755-T-3-1-01	KDWM 1/28/2004
460	S-755-T-3-2-01	KDWM 1/28/2004
461	S-755-T-3-2-02	KDWM 1/28/2004
462	S-755-T-3-2-03	KDWM 1/28/2004
465	Yard Rubble Pile and Crushate Storage Area (G-Yard)	KDWM 10/13/2009
466	South of Dyke Road, Pond Area	KDWM 8/17/2009
467	Concrete Cylinder Holders Storage Area on Western Kentucky Wildlife Management Area	KDWM 8/17/2009
468	Area Northwest of Outfall 015	KDWM 2/14/2006
471	Outside C-746-B South Storage Area	KDWM 8/17/2009
473	C-746-B Pad, West	KDWM 8/28/2007
475	C-745-G5-01 (Paint Enclosure)	KDWM 2/14/2006
476	Concrete Crusher	KDWM 2/14/2006
479	C-204 Disintegrator Building	KDWM 6/3/2002
481	C-410-A Hydrogen Holder	KDWM 4/2/2002
484	C-611-M Storage Tank	KDWM 8/30/2002
485	C-611-N Sanitary Water Storage	KDWM 2/18/2002
490	McGraw Fuel Facility Waste Oil Storage Tank	KDWM 12/21/2001
491	Mercury Spill at the C-611 Water Treatment Plant Vault	KDWM 3/22/2004
494	Ash Receiver Area in C-410/420	KDWM 6/3/2016; EPA 6/9/2016
495	C-410-I Ash Receiver Shed	KDWM 6/3/2016; EPA 6/9/2016
496	C-410 Fluorine/Hydrogen Filters (Northeast Mezzanine)	KDWM 6/3/2016; EPA 6/9/2016
497	C-410/420 F_2 Cell Neutralization Room Vats	KDWM 6/3/2016; EPA 6/9/2016
514	C-340 Magnesium Fluoride Reject Silo	EPA and KY 4/2/2015
515	C-340 “Dirty” Dust Collection System	EPA and KY 4/2/2015
516	C-340 Derby Preparation Area Sludge Collection System	EPA and KY 4/2/2015
519	C-410 Sulfuric Acid Tank (C-634-B)	KDWM 1/10/2003
521	C-340 Saw System Degreaser	EPA and KY 4/2/2015
525	Concrete Water Tower Supports (KOW)	KDWM 8/28/2007
527	C-410 GSA/SAA at Column J-6	KDWM 8/28/2007
528	GSA/SAA at the Northwest corner of C-745-G3 Paint Enclosure	KDWM 2/14/2006
530	Soil and Debris Storage Area by C-745-T Yard	KDWM 3/8/2007
532	Photographic Solution Treatment Area in the C-102 Building	KDWM 5/21/2003
534	UST #18, within SWMU 193	KDWM (UST Branch) 12/4/2002
535	S-755-T08-01 (Satellite Accumulation Area at C-755, Trailer 8)	KDWM 2/14/2006
536	Concrete Truck Washout Area	KDWM 6/27/2002
537	S-400-001 (SAA Located Outside at the Southeast Corner of the C-400 Building)	KDWM 2/14/2006
538	S-MST-01-01 & S-MST-01-02 (Mobile Trailer 01)	KDWM 2/14/2006
539	S-MST-02-01 & S-MST-02-02 (Mobile Trailer 02)	KDWM 2/14/2006
540	S-MST-03-01 & S-MST-03-02 (Mobile Trailer 03)	KDWM 2/14/2006
542 A	G-746-B-01; S-746-B-01; S-746-B-02 (GSA/SAAs located outside C-746-A)	KDWM 1/28/2004

Table 4.1. Solid Waste Management Units/Areas of Concern by Operable Unit (Continued)

NO FURTHER ACTION (CONTINUED)		
SWMU No.	**Description**	**NFA Approval By**
542 B	G-746-A-01; S-746-A-01; S-746-A-02 (GSA/SAAs located outside C-746-A)	KDWM 1/28/2004
543	T-746-S-01 (90-Day Storage Area)	KDWM 1/28/2004
544	T-752-C-01 (90-Day Storage Area)	KDWM 1/28/2004
545	C-755-T-22-01 and G-755-T-22	KDWM 1/28/2004
546	PGDP Post 67 Diesel Fuel Spill Area	KDWM 2/14/2006
547	PGDP Post 38 Diesel Spill Area	KDWM 2/14/2006
548	Staging Area for Concrete Piers, Wood and Rubble North Side of C-745-B Cylinder Yard	KDWM 8/28/2007
551	C-755-GSA-23 Located at C-755 near the East Fence Line	KDWM 8/28/2007
552	C-760 90-Day Accumulation Area	KDWM 3/8/2007
566	H-340-01	KDWM 12/02/2010
568	C-340 ST-90 Boxes	KDWM 12/02/2010
569	C-743-T-17 Sample Return Refrigerator	KDWM 5/24/2012
570	Sample Return Sealand	KDWM 5/24/2012
PENDING NO FURTHER ACTION DECISION		
SWMU No.	**Description**	
	Reserved	
SWMUs THAT WILL BE INVESTIGATED AND REMEDIATED BY THE U.S. ARMY CORPS OF ENGINEERS[23]		
95	KOW Burn Area	

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CSOU = Comprehensive Site Operable Unit
D&D = deactivation and decommissioning
EPA = U.S. Environmental Protection Agency
ER = environmental remediation
FFA = Federal Facility Agreement
GDP = gaseous diffusion plant
GSA= generator staging area
HSWA = Hazardous and Solid Waste Amendments
HVAC = heating, ventilating, and air-conditioning
KDWM = Kentucky Division of Waste Management
KOW = Kentucky Ordinance Works
KPDES = Kentucky Pollutant Discharge Elimination System
KY = Kentucky
NFA = no further action
NSDD = North-South Diversion Ditch
NTCRA = non-time-critical removal action
OU = operable unit
PCB = polychlorinated biphenyl
PGDP = Paducah Gaseous Diffusion Plant
RCW = recirculating cooling water
RI = remedial investigation
ROD = Record of Decision
SAA = satellite accumulation area
SAP = Sampling and Analysis Plan
SAR = SWMU assessment report
SWMU = solid waste management unit
SWOU = Surface Water Operable Unit
TBD = to be determined
TCE = trichloroethene
TSCA = Toxic Substances Control Act
UST = underground storage tank
WAG = waste area group
WKWMA = West Kentucky Wildlife Management Area

[23] The Corps of Engineers accepted responsibility for the investigation/remediation of this SWMU in a letter dated March 13, 1996. EPA and Kentucky review/approval of the CERCLA documentation (not yet available) associated with this SWMU has not occurred.

Table 4.2. Detailed Facility Decommissioning OU Facilities List

Facility Number	Description	SWMU/AOC Number	Facility Status	Integrated Site Evaluation (SE) Complete	CERCLA NTCRA Required
Gaseous Diffusion Process Facilities and Process Building Tie Lines and Bridges					
C-310	Purge and Product Building	--	Deactivating	No	Pending SE
C-310-A	Product Withdrawal Building	--	Deactivating	No	Pending SE
C-315	Surge and Waste Building	--	Shutdown	No	Pending SE
C-331	Process Building	--	Shutdown	No	Pending SE
C-333	Process Building	--	Deactivating	No	Pending SE
C-333-A	Feed Vaporization Facility	70	Deactivating	8/24/1987	Yes
C-335	Process Building	--	Deactivating	No	Pending SE
C-337	Process Building	--	Deactivating	No	Pending SE
C-337-A	Feed Vaporization Facility	71	Shutdown	8/24/1987	Yes
C-310-335[24]	Tie-Line	--	Deactivating	No	Pending SE
C-310-331-A	Bridge (Enclosed)	--	Deactivating	No	Pending SE
C-310-331-B	Tie-Line	--	Deactivating	No	Pending SE
C-315-331	Tie-Line	--	Deactivating	No	Pending SE
C-331-333-A	Bridge (Enclosed—300 ft)	--	Deactivating	No	Pending SE
C-331-333-B	Tie-Line (East)	--	Deactivating	No	Pending SE
C-331-333-C	Tie-Line (West)	--	Deactivating	No	Pending SE
C-331-335	Tie-Line	--	Deactivating	No	Pending SE
C-335-337-A	Bridge (Enclosed)	--	Deactivating	No	Pending SE
C-335-337-B	Tie-Line (North)	--	Deactivating	No	Pending SE
C-335-337-C	Tie-Line (South)	--	Deactivating	No	Pending SE
Process Support Facilities					
C-409	Stabilization Building	--	Operating	No	Pending SE
C-415	Feed Plant Storage	482	Operating	7/18/2001; under development	Re-evaluating SE
C-600	Steam Plant	--	Standby	No	Pending SE
Switchyards					
C-531-1	Switch House	82	Shutdown	8/24/1987	Yes
C-531-3A	Fire Valve House No. 1	82	Shutdown	8/24/1987	Yes
C-531-3B	Fire Valve House No. 2	82	Shutdown	8/24/1987	Yes
C-532	Relay House[26]	82	Standby	8/24/1987	Yes
C-533-1	Switch House[25]	83	Standby	8/24/1987	Yes
C-533-3A	Fire Valve House No. 1	83	Shutdown	8/24/1987	Yes
C-533-3B	Fire Valve House No. 2	83	Shutdown	8/24/1987	Yes
C-533-3C	Fire Valve House No. 3	83	Shutdown	8/24/1987	Yes
C-533-3D	Fire Valve House No. 4	83	Shutdown	8/24/1987	Yes
C-535-1	Switch House	84	Deactivating	8/24/1987	Yes
C-535-3A	Fire Valve House No. 1	84	Shutdown	8/24/1987	Yes
C-535-3B	Fire Valve House No. 2	84	Shutdown	8/24/1987	Yes
C-535-4	Test Shop (Maintenance Office)	84	Shutdown	8/24/1987	Yes
C-536	Relay House	84	Shutdown	8/24/1987	Yes

[24] The C-310-335 Tie-Line intersects with the C-331-335 Tie-Line and, as a result, the C-310-335 Tie-Line is not listed separately in the facilities information management system.

[25] These facilities have "Standby" status designation until the DOE Excess Screening process is complete. Once approval is received, these facilities will receive a status of "Deactivating" or "Shutdown" because the facility no longer will be maintained for future use.

Table 4.2. Detailed Facility Decommissioning OU Facilities List (Continued)

Facility Number	Description	SWMU/AOC Number	Facility Status	Integrated Site Evaluation (SE) Complete	CERCLA NTCRA Required
Switchyards (Continued)					
C-537-1	Switch House	85	Deactivating	8/24/1987	Yes
C-537-3A	Fire Valve House No. 1	85	Shutdown	8/24/1987	Yes
C-537-3B	Fire Valve House No. 2	85	Shutdown	8/24/1987	Yes
C-537-3C	Fire Valve House No. 3	85	Shutdown	8/24/1987	Yes
C-537-3D	Fire Valve House No. 4	85	Shutdown	8/24/1987	Yes
C-537-4	Test Shop	85	Shutdown	8/24/1987	Yes
C-540-A	Oil Pump House	83	Shutdown	8/24/1987	Yes
C-541-A	Oil Pump House	84	Shutdown	8/24/1987	Yes
Cooling Towers[26]					
Phosphate (Former Chromate) Reduction System Facilities					
C-616-A	Chemical Feed Building	42	Standby	12/18/1991	Yes
C-616-B	Clarifier-East	42	Standby	12/18/1991	Yes
C-616-C	Lift Station	42	Operating	12/18/1991	Yes
C-616-D	Sludge Vault and Valve Pit	42	Operating	12/18/1991	Yes
C-616-H1	Ferrous Sulfate Storage Tank (East)	42	Standby	12/18/1991	Yes
C-616-H2	Ferrous Sulfate Storage Tank (West)	42	Standby	12/18/1991	Yes
C-616-J	Reduction Tank (East)	42	Standby	12/18/1991	Yes
C-616-K	Service Building	42	Standby	12/18/1991	Yes
C-616-L	Effluent Control Vault	42	Standby	12/18/1991; under development	Re-evaluating SE
C-616-M	Clarifier (West)	42	Standby	12/18/1991	Yes
C-616-N	Reduction Tank (West)	42	Standby	12/18/1991	Yes
C-616-P	Sludge Vault and Valve Pit	42	Operating	12/18/1991	Yes
Sewage System and Water Treatment Ancillary Facilities					
C-611-A	Building and Shop Storage	--	Operating	12/1/2021	No[27]
C-611-A1	Activated Carbon Storage Facility		Operating	12/1/2021	No
C-611-B	Head House	--	Operating	12/1/2021	No[28]
C-611-B1	Polymer Feed System Enclosure	--	Operating	12/1/2021	No[28]
C-611-C	Flocculator Basin	--	Operating	12/1/2021	No[28]
C-611-F1	Secondary Coagulation Basin	--	Operating	12/1/2021	No[28]
C-611-F2	Chemical Feed Building for C-611-F1		Operating	12/1/2021	No[28]
C-611-F3	Feed Facility		Operating	12/1/2021	No[28]
C-611-H	Filter Building and Pump Station	--	Operating	12/1/2021	No[28]
C-611-J	Pump House (Settled Water)	--	Operating	12/1/2021	No[28]
C-611-P	Building–Pump House	--	Standby	8/26/2021	No
C-611-S	Storage and Chlorine Facility		Operating	12/1/2021	No[28]

[26] Facilities associated with the cooling towers have undergone consultation. Consultation for the C-631, C-633, C-635, and C-637 pumphouses and cooling towers was completed 1/9/2023, 4/3/2023, 8/29/2022, and 6/22/2023, respectively, and concurrence received 1/24/2023, 4/4/2023, 8/31/2022, 6/22/2023, respectively. The aboveground structures of the facilities associated with the C-631, C-633, C-635, and C-637 pumphouses and cooling towers were agreed to be demolished outside of CERCLA; the concrete pad and/or soils associated with those facilities (SWMUs 86, 87, 88, and 89) will be evaluated as part of the Soils and Slabs OU. The C-631, C-633, C-635, and C-637 facilities were removed from the Facilities Decommissioning OU List and have been listed in Table 3.2.

[27] SE requires investigation of slab and underlying soils, prior to AOC/SWMU determination. Timing of the SE will be incorporated into baseline and will be conducted as part of the GA.

Table 4.2. Detailed Facility Decommissioning OU Facilities List (Continued)

Sewage System and Water Treatment Ancillary Facilities (Continued)					
C-611-T	Booster Pump Station Plant Water[28]	--	Shutdown	8/26/2021	No
C-611-U	Softening Facility (West)	--	Operating	12/1/2021	No[30]
C-611-X	Softening Facility (East)	--	Operating	12/1/2021	No[30]
C-611-Z	Flocculator Basin	--	Operating	12/1/2021	No[30]
C-615-A	Primary Settling Tank/Catch Basin	38	Operating	8/24/1987	Yes
C-615-B	Final Settling Tank/Catch Basin	38	Operating	8/24/1987	Yes
C-615-C	Sewage Plant Monitoring Building	38	Operating	8/24/1987	Yes
C-615-D	Digester	38	Operating	8/24/1987	Yes
C-615-E	Trickling Filter	38	Operating	8/24/1987	Yes
C-615-F	Dry Bed for Trickling Filter	38	Operating	8/24/1987	Yes
Process Laboratory and Maintenance Facilities					
C-709	Plant Laboratory Annex	--	Operating	No	Pending SE
C-710	Technical Services Building/Lab	--	Operating	No	Pending SE
C-720	Maintenance and Storage Building	--	Operating	No	Pending SE
C-720-A	Compressor Shop Addition	--	Standby	No	Pending SE
C-720-B	Machine Shop Addition	--	Standby	No	Pending SE
C-720-C	Converter Shop Addition	--	Operating	No	Pending SE
C-720-C1	Paint Shop	--	Operating	No	Pending SE
C-720-E	Change House Addition	--	Operating	No	Pending SE
C-720-K	Instrument Shop Addition	--	Operating	No	Pending SE
C-724-A	Carpenter Shop Annex	--	Operating	No	Pending SE
C-724-B	Carpenter Shop	--	Operating	3/18/2021	No
C-724-C	Paint Shop	178	Operating	1/25/1993; 3/18/2021	No
C-725	Paint Shop	--	Operating	7/13/2021	No[29]
C-726	Sandblast Building	172	Shutdown	10/29/1992; under development	Re-evaluating SE
C-728	Motor Cleaning Facility	33	Standby	6/2/2015; under development	Re-evaluating SE
Gaseous Diffusion Plant Support Facilities					
C-350	Drying Agent Storage Building	--	Deactivating	2/18/2021	No
C-360	Toll Transfer and Sampling Building	572	Shutdown	6/2/2021	Yes
C-360-A	Toll Transfer and Sampling Building Annex	--	Operating	No	Pending SE
C-606	Coal Crusher Building	--	Shutdown	3/18/2021	Yes
C-620	Air Compressor Room	--	Standby	No	Pending SE
C-729	Acetylene Building	--	Shutdown	2/18/2021	No
C-744	Material Handling Building	--	Operating	2/18/2021	No
C-750	Garage	573	Operating	8/4/2021	No

AOC = area of concern
D&D = deactivation and decommissioning
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
NTCRA = non-time-critical removal action
SE = site evaluation
SWMU = solid waste management unit
Operating—Facility is currently in use supporting U.S. Department of Energy mission activities.
Standby—Facility is currently not in use but may be utilized to support future U.S. Department of Energy mission activities.
Shutdown—Facility is not being maintained for future use and is awaiting disposition (excess property determination is pending).
Deactivating—Interim process where stabilization and deactivation activities have been initiated and are ongoing.

[28] This facility will no longer be used for pumping water; however, it may be used by Fire Services in an emergency situation to fill the C-631 Basin.

[29] SE requires investigation of slab and underlying soils, prior to AOC/SWMU determination. Timing of the SE will be incorporated into baseline and will be conducted as part of the GA.

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APPENDIX 5

ENFORCEABLE TIMETABLES AND DEADLINES; PLANNING DATES WITH LONG-TERM TARGETS

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Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets

Project/ Subproject	Deliverable	Enforceable Timetable and Deadlines[1]		Planning Dates with Long-Term Targets for Decision Documents[2]	Comments
		FY 2025–FY 2027	Out-Year		
Groundwater Operable Unit (GWOU)/ Dissolved-Phase Plumes	D1 Remedial Action Work Plan (RAWP) or Addendum to the RAWP for NW Plume Interim Remedial Action Optimization	11/29/2024			
C-400 Complex Operable Unit (OU)/ C-400 Final Remedial Action	Field Start	11/11/2024			
	D1 C-400 Complex Remedial Investigation Report Addendum	6/16/2025			
	D1 Feasibility Study (FS)	4/13/2026			
C-400 Complex OU/ C-400 Final Remedial Action	D1 Proposed Plan		1st Quarter 2029		Milestones for C-400 Final Remedial Action represent a contingent schedule if the D&D and Environmental Media Proposed Plans and RODs are not proceeding as anticipated.
	D1 Record of Decision (ROD)		3rd Quarter 2029		
	D1 Remedial Design Work Plan		4th Quarter 2029		
	D1 Remedial Design Report (90% Design)		4th Quarter 2030		
	D1 Remedial Action Work Plan		4th Quarter 2030		
	Remedial Action Field Start			1st Quarter 2031	
	D1 Remedial Action Completion Report			4th Quarter 2037	

Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets (Continued)

Project/ Subproject	Deliverable	Enforceable Timetable and Deadlines[1]		Planning Dates with Long-Term Targets for Decision Documents[2]	Comments
		FY 2025–FY 2027	Out-Year		
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Waste Disposal Alternatives	D1 Remedial Investigation (RI)/FS Addendum	10/16/2026			
	D1 Proposed Plan		2nd Quarter 2028		D1 Proposed Plan is submitted 45 days after the U.S. Environmental Protection Agency (EPA) and the Commonwealth of Kentucky (KY) approval of the FS.[3] The Proposed Plan is submitted for public comment within two weeks of approval.
	D1 ROD		2nd Quarter 2029		D1 ROD is submitted 30 days after close of public comment period on the Proposed Plan [Federal Facility Agreement (FFA) Section XIV.D].
	D1 Remedial Design Work Plan			3rd Quarter 2029	
	D1 Remedial Design Report			1st Quarter 2030	Contingent upon on-site waste disposal selection as part of the ROD. The remedial design report addresses site preparation and infrastructure construction.
	D1 Remedial Action Work Plan			1st Quarter 2030	Contingent upon on-site waste disposal selection as part of the ROD. The remedial action work plan addresses site preparation and infrastructure construction.
	Remedial Action Field Start			1st Quarter 2031	Site preparation (i.e., start of substantial, continuous, on-site remedial action), per approved remedial action work plan and remedial design report for Site Preparation and Infrastructure Construction.
	D1 Interim Remedial Action Completion Report			3rd Quarter 2032	The D1 Interim Remedial Action Completion Report is a post-construction report to be issued prior to the start of operations (i.e., Cell 1 Liner Construction Certification Report). A D1 Final Remedial Action Completion Report will be issued when operations cease and closure has been completed.

Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets (Continued)

Project/ Subproject	Deliverable	Enforceable Timetable and Deadlines[1]		Planning Dates with Long-Term Targets for Decision Documents[2]	Comments
		FY 2025–FY 2027	Out-Year		
Environmental Media [Soils OU, Burial Grounds Operable Unit (BGOU), Surface Water Operable Unit (SWOU), Lagoons OU, Soils and Slabs OU, etc.]	D1 Remedial Investigation (RI)/FS Report	12/11/2026			
	D1 Proposed Plan		2nd Quarter 2028		D1 Proposed Plan is submitted 45 days after EPA and KY approval of the FS.[3] The Proposed Plan is submitted for public comment within two weeks of approval.
	D1 ROD		3rd Quarter 2029		D1 ROD is submitted 30 days after close of public comment period on the Proposed Plan (FFA Section XIV.D).
	D1 Remedial Design Work Plan			1st Quarter 2030	Establishes approach for submittal of remedial designs.
	D1 Remedial Design Report for First Area.			4th Quarter 2030	Additional remedial design reports for additional areas.
	D1 Remedial Action Work Plan for First Area			4th Quarter 2030	Additional remedial action work plans will be prepared for additional areas.
	Remedial Action Field Start for First Area			2nd Quarter 2031	15 months after ROD signature (FFA Section XV)

Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets (Continued)

Project/ Subproject	Deliverable	Enforceable Timetable and Deadlines[1]		Planning Dates with Long-Term Targets for Decision Documents[2]	Comments
		FY 2025– FY 2027	Out-Year		
D&D OU	D1 Remedial Investigation (RI)/FS Report	7/6/2026			
	D1 Proposed Plan	9/25/2027			D1 Proposed Plan is submitted 45 days after the EPA and KY approval of the FS.[3] The Proposed Plan is submitted for public comment within two weeks of approval.
	D1 ROD		2nd Quarter 2029		D1 ROD is submitted 30 days after close of public comment period on the Proposed Plan (FFA Section XIV.D).
	D1 Remedial Design Work Plan			1st Quarter 2030	Provides approach for submittal of remedial designs for groups of facilities within a given remediation area to undergo demolition (if selected as the remedy).
D&D OU/ C-400 Area Demolition	Remedial Action Field Start C-400 Area Demolition			1st Quarter 2032	Site preparation (i.e., start of substantial, continuous, on-site remedial action), per approved remedial action work plan and remedial design report.
D&D OU/ C-333 Process Building Demolition	Remedial Action Field Start for C-333 Process Building Demolition			1st Quarter 2033	Site preparation (i.e., start of substantial, continuous, on-site remedial action), per approved remedial action work plan and remedial design report.
D&D OU/ C-337 Process Building Demolition	Remedial Action Field Start for C-337 Process Building Demolition			4th Quarter 2036	Site preparation (i.e., start of substantial, continuous, on-site remedial action), per approved remedial action work plan and remedial design report.

Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets (Continued)

Project/ Subproject	Deliverable	Enforceable Timetable and Deadlines[1]		Planning Dates with Long-Term Targets for Decision Documents[2]	Comments
		FY 2025–FY 2027	Out-Year		
BGOU	BGOU Remedial Action Completion Report		12/31/2046		Out-year enforceable date is a legacy date, and is kept in SMP until new strategy is agreed.
GWOU	D1 Interim Remedial Action Completion Report		9/30/2048		Out-year enforceable date is a legacy date, and is kept in SMP until new strategy is agreed.
Soils OU	D1 Remedial Action Completion Report		12/31/2044		Out-year enforceable date is a legacy date, and is kept in SMP until new strategy is agreed.
SWOU	D1 Remedial Action Completion Report		9/30/2058		Out-year enforceable date is a legacy date, and is kept in SMP until new strategy is agreed.

Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets (Continued)

Other FFA Planning Dates					
		Enforceable Timetable and Deadlines[1]		Planning Dates with Long-Term Targets for Decision Documents[2]	
Subproject	Deliverable	FY 2025–FY 2027	Out-Year		Comments
N/A	D1 Five-Year Review (2028) (Sixth Synchronized Review)			7/16/2028	Because the 2023 Five-Year Review was completed more than three months early, the Sixth Synchronized Five-Year Review for the Paducah Site has a statutory completion due date of April 2, 2029, five years from the date of EPA's protectiveness determinations concurrence letter. (KDEP concurrence received on March 5, 2024)

[1] Enforceable Timetables and Deadlines are based on the planning scope contained in Appendix 3 and DOE assumptions regarding funding levels. Approval of the Site Management Plan (SMP) planning scope does not constitute decision making for the response actions described in this table.
[2] Not enforceable dates. These planning dates are internal US. Department of Energy (DOE) dates used for planning purposes only. The parties further agree that DOE can adjust the planning dates as part of the annual SMP update without having to submit an official request or justify "good cause" in accordance with Section XXIX of the FFA. Note that quarters listed are for FY.
[3] Assumes that final approval is received on the D2 document.

D&D = deactivation and decommissioning
FY = fiscal year
GA = geographical area
N/A = not applicable
SWMU = solid waste management unit

APPENDIX 6

FACILITIES UNDERGOING CERCLA DETERMINATION

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FACILITIES UNDERGOING CERCLA DETERMINATION

Appendix 6 is provided for historical purposes. The appendix formerly was used to list facilities undergoing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) determination. No updates are necessary for Appendix 6.

Decommissioning of surplus U.S. Department of Energy (DOE) facilities is described in the 1995 DOE and EPA Memorandum, *Policy on Decommissioning DOE Facilities under CERCLA*. A total of 681 properties/structures were reviewed and evaluated to identify facilities that should be evaluated under the CERCLA process for decommissioning [Appendix 8 of the fiscal year (FY) 2018/FY 2019 Site Management Plan (SMP)]. The Facility Decommissioning OU identifies industrial facilities (listed in Appendix 4) that, in some cases, already have been determined to pose a potential threat of release of hazardous substances to the environment and warrants decommissioning be performed as a CERCLA non-time-critical removal action (NTCRA). For some facilities, a removal site evaluation (SE) has determined an NTCRA is not required. For the remaining facilities included in Appendix 4, a removal SE is pending to determine if an NTCRA is necessary. Additional facilities at the Paducah Gaseous Diffusion Plant (previously listed in Appendix 6) have undergone evaluation to determine if there was a release threat to the environment that would warrant an SE to determine if decommissioning should proceed under CERCLA. If it was determined during a facility review that there was a potential release threat, the facility (or portion thereof) has been included in the Facility Decommissioning OU in Appendix 4.

The facilities previously listed in Appendix 6 that were agreed to not be a release threat to the environment and did not warrant action under CERCLA, through consultation with the Federal Facility Agreement parties, have been moved to Table 3.2 in Appendix 3 of this SMP.

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APPENDIX 7

DATA MANAGEMENT PLAN

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DOE/LX/07-2498&D1
Primary Document

Paducah Gaseous Diffusion Plant
Data Management Plan

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DOE/LX/07-2498&D1
Primary Document

Paducah Gaseous Diffusion Plant
Data Management Plan

Date Issued—February 2024

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

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PREFACE

This plan is generated to define the roles, responsibilities, and activities affecting data management, document management, and quality for data collection between the U.S. Department of Energy (DOE) and the regulatory agencies that govern the Paducah Gaseous Diffusion Plant Federal Facility Agreement (FFA) (EPA 1998). Pursuant to Section XXVII, *Quality Assurance/Sampling Availability/Data Management*, of the FFA, all quality-assured data or summaries of all quality-assured data from all samples collected, analyzed, and reported shall be available no later than 30 days after the analyses have been received and validated. Additionally, in accordance with this section, DOE shall maintain one consolidated database for the Paducah Site which includes all data/studies generated pursuant to this agreement. To fulfill this requirement, Paducah DOE has an integrated data system made up of multiple databases managed by one organization. Electronic formats of all data/studies and related documents are available upon request.

In addition to the requirements in the FFA, other agreements require the following consolidated data management process.

(1) Kentucky Energy and Environment Cabinet (EEC) Department for Environmental Protection Division of Waste Management Hazardous Waste Management Facility Permit (KDWM 2020) states:

Condition III.E.9-Monitoring and Recordkeeping "...All environmental monitoring data collected pursuant to Part II and IV of this permit shall be submitted to the Manager in either written or electronic format. Sampling data shall be submitted in accordance with the schedules described in this permit."

(2) Agreement in Principle states the following, with respect to EEC and the Kentucky Cabinet for Health and Family Services (CHFS) (EEC 2020).

"…DOE will promptly furnish to EEC or CHFS environmental monitoring data in electronic format, if available, or paper copies. DOE data reports will be released to EEC or CHFS within ninety (90) days after receipt from the QA/QC validation..."

CONTENTS

ACRONYMS

AIP	Agreement in Principle
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHFS	Cabinet for Health and Family Services
COC	chain-of-custody
DMIP	data management implementation plan
DOE	U.S. Department of Energy
DQO	data quality objective
EDD	electronic data deliverable
EEC	Kentucky Energy and Environment Cabinet
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FSP	field sampling plan
GIS	geographic information system
KDEP	Kentucky Department for Environmental Protection
OREIS	Oak Ridge Environmental Information System
PEGASIS	PPPO Environmental Geographic Analytical Spatial Information System
PEMS	Project Environmental Measurements System
PPPO	Portsmouth/Paducah Project Office
P-QAPP	programmatic quality assurance project plan
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
SMO	sample management office
SOW	statement of work
SWMU	solid waste management unit

1. INTRODUCTION

1.1 PURPOSE

This plan will be used for the U.S. Department of Energy (DOE) Paducah Site projects that are involved in the collection of data under the Federal Facility Agreement (FFA) (EPA 1998). Each section of the plan meets the data quality requirements set forth by the DOE Portsmouth/Paducah Project Office (PPPO) Program and provides a description of the programmatic elements that should occur for each project. This document is to be used in conjunction with the most current version of the Paducah Site Programmatic Quality Assurance Project Plan (P-QAPP) (DOE 2023 or most recent revision). Like the Paducah Site P-QAPP, which is a template for the development of future project-specific quality assurance project plans (QAPPs), this document is not a substitute for the development of project-specific data management implementation plans (DMIPs), or field sampling plans (FSPs), and should not be used to support the performance of individual projects. Project-specific DMIPs and FSPs should include the systematic planning decisions for a given project.

1.2 APPLICABILITY

The requirements of this plan apply to the collection and generation of data by the DOE Paducah Site under the FFA. This plan applies to analytical data; historical data; and location-specific descriptive data, which includes the geographic information system (GIS), lithology, geophysical data, etc. Implementation for projects is based on data collection needs and final use of the data. The requirements of this plan do not apply to data collected by the health and safety program, waste management, personnel data, or financial data. The project-specific waste management plans determine the need for characterization, sampling, and analysis.

2. PROGRAM ORGANIZATION, RESPONSIBILITY, AND TRAINING

This information describes the basic organization, responsibility, and training requirements for projects. Specific project plans should be developed and documented in a project-specific DMIP to define individuals and matrix responsibilities. The project will further define training needs based on activities performed in the field.

2.1 ORGANIZATION

The DOE Project Manager and DOE Contractor establish project scope and work priorities to ensure the DOE PPPO Program strategic plans are accomplished. Furthermore, the DOE Project Manager and DOE Contractor serve as the primary interface to ensure project, regulatory agency, stakeholder, and other involved organization objectives are met. They will ensure that requirements in this plan are incorporated into various protocols and other statements of work (SOWs). They will also ensure adequate technical support is in place for the project and that quality assurance (QA) and safety are the top priorities throughout the project's life cycle.

2.2 ROLES AND RESPONSIBILITIES

The functional responsibilities of project staff members and how they relate to the data collection and output process is detailed below. This section identifies project activities and the staff members who will be performing the work. The descriptions of functional responsibilities that project staff perform are listed by title rather than individual staff positions.

2.2.1 Stakeholders

2.2.1.1 DOE Project Manager

The DOE Project Manager has direct communication with the DOE Contractor Project Manager and is responsible for project oversight, overall compliance for the project, and for submitting various reports to, and interfacing with, the U.S. Environmental Protection Agency (EPA) and the Commonwealth of Kentucky.

2.2.1.2 Kentucky Energy and Environment Cabinet

Through the Kentucky Department for Environmental Protection (KDEP), the Commonwealth of Kentucky provides oversight under the FFA and administers the corrective action portions of the Hazardous and Solid Waste Amendments through the FFA. Activities including response actions, enrichment facilities, and waste management of the DOE PPPO Program are reviewed, commented upon, and approved by the Commonwealth of Kentucky.

2.2.1.3 EPA, Region 4

EPA is the federal regulatory stakeholder for the site. Activities, including response actions, enrichment facilities, and waste management of the DOE PPPO Program are reviewed, commented upon, and approved by EPA.

2.2.1.4 Kentucky Agreement in Principle

The Kentucky Agreement in Principle (AIP) reflects the understanding and commitments between DOE and the Commonwealth of Kentucky regarding DOE's provision to provide technical and financial support for the Commonwealth's activities in environmental oversight, surveillance, remediation, and emergency-response activities (EEC 2020). The AIP is intended to support nonregulatory activities and to maintain an independent, impartial, and qualified assessment of the potential environmental impacts of present and future DOE activities at the Paducah Site.

2.2.1.5 FFA

The FFA reflects the understanding and commitments among DOE, EPA, and the Kentucky Division of Waste Management regarding the comprehensive remediation of the Paducah Site. The purpose of the FFA is to provide a set of comprehensive requirements for remediation that coordinates the cleanup provisions of both Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource, Conservation, and Recovery Act.

2.2.2 DOE Contractor

The DOE Contractor is responsible for ensuring the following functions are performed either by staff or by a subcontractor.

2.2.2.1 Data User/Data Reviewer

Data users/data reviewers are members of the project team who require access to project information to perform reviews, analyses, or ad hoc queries of the data. Data users/data reviewers determine project data usability by comparing the data to predefined acceptance criteria and assessing whether the data are sufficient for its intended use.

2.2.2.2 Project Manager

The project manager has direct responsibility for the overall project oversight, including budget, schedule, and milestones. The project manager is responsible for the day-to-day operation of the project and for ensuring the requirements of policies and procedures are met. The project manager, or designee, assesses data in accordance with project-specific DMIPs and the Paducah Site P-QAPP. The project manager is responsible to flowdown data management requirements to subcontractors, as required.

2.2.2.3 Project Team

The project team consists of the technical staff and support staff [including the sample management office (SMO)], which conducts the various tasks required to successfully complete the project.

2.2.2.4 QA Reviewer

The QA reviewer is part of the project team and is responsible for reviewing project documentation to determine if the project team followed applicable procedures.

2.2.2.5 Project Records Custodian

The project records custodian is responsible for the long-term storage of project records. The project team interfaces with the project records custodian and transfers documents and records in accordance with DOE requirements.

2.2.2.6 SMO Manager

The SMO manager is responsible for the long-term storage of project data and for transmitting data to external agencies, according to this plan. The SMO manager ensures compliance with procedures that relate to data management, with respect to the project, and that the requirements of appropriate procedures are followed.

2.2.2.7 SMO

The SMO enters the data into the Paducah Project Environmental Measurements System (PEMS), including chain-of-custody (COC) information, data assessment qualifiers, data validation qualifiers, and any pertinent sampling information. After receiving a notification that a fixed-base laboratory electronic data deliverable (EDD) is available to download, the SMO loads the EDD to Paducah PEMS, performs electronic verification of the data, and then compiles the data assessment package. The SMO also prepares data for transfer from Paducah PEMS to the Paducah Oak Ridge Environmental Information System (OREIS).

The SMO is responsible for contracting any fixed-base laboratory that is utilized during the sampling activities. The SMO also provides coordination for sample shipment to the laboratory, ensures contractual screening of data assessment packages, and coordinates data validation support.

2.2.3 Project-Specific QAPP Approval

P-QAPP worksheets #1 and #2 identify the principle points of contact that have decision authority in the projects, and document their commitment to implement QAPPs. Signatories include the delegated organization's project manager, SMO manager, and the QA/quality check (QC) program manager. Signatures indicate that officials have reviewed the QAPP and concur with its implementation as written. DOE, EPA, and KDEP approve project-specific QAPP worksheets through coordinated review and work plan approvals in accordance with the FFA, and subsequent email approval correspondence, when appropriate. This practice is consistent with EPA policy, which specifies that a QAPP should be reviewed and approved prior to initiation of fieldwork. The type of regulatory review and approval required is project-specific. Requirements for such review and approval are specified in the FFA. Approval from DOE, the lead agency, is documented by the Paducah Site FFA Manager's signature on letters transmitting plans and documents to the regulatory agencies. The original DOE, EPA, and KDEP concurrence correspondences are maintained with the final, approved, project-specific QAPP in the project file. It is the responsibility of the lead agency to make sure signatures are in place before work begins.

2.2.4 Training

Personnel assigned to the project, including field personnel and subcontractors, will be trained to perform the tasks to which they are assigned. Training requirements are defined in the project-specific plans.

3. QA OBJECTIVES FOR MEASUREMENT DATA

QA objectives for measurement data are discussed in the Paducah Site P-QAPP. The Paducah Site P-QAPP also discusses data quality objectives (DQOs); internal QC checks (i.e., field QC samples, analytical laboratory QC samples); audits and surveillances; preventative maintenance; precision, accuracy, representativeness, completeness, comparability, and sensitivity; nonconformances and corrective actions; QA reports to management; and field changes. The template for this information in the Paducah Site P-QAPP will be followed, as appropriate, when project-specific QAPPs are developed.

4. APPLICABLE PROTOCOLS AND DOCUMENTS

Company protocols, sampling methods, administrative procedures, etc., utilize hierarchy documents that relate to data quality. Hierarchy documents are listed in the Paducah Site P-QAPP and will be presented, as appropriate, in project-specific QAPPs.

5. SAMPLE CUSTODY

COC is a process used to document the transfer of custody of samples from sample collection until final disposition. COC records are handled in accordance with applicable protocols. Sample residuals are disposed of only after notification is received from the SMO manager, or designee, that the samples are no longer needed for archiving or that holding times have been exceeded. Sample custody protocols are identified in project-specific FSPs and/or QAPPs.

6. CALIBRATION PROTOCOLS AND FREQUENCY

Templates for the presentation of field and laboratory equipment calibration protocols and frequencies are discussed in the Paducah Site P-QAPP. These templates will be used, as appropriate, to prepare the project-specific QAPPs.

7. ANALYTICAL PROTOCOLS

When available and appropriate for the sample matrix, SW-846 Methods will be used. When SW-846 Methods are not available, or required lower detection limits cannot be achieved by SW-846 Methods, other nationally-recognized methods such as those of ASTM, DOE, and EPA will be used. Templates for the presentation of analytical methods, detection limits, sample preservation, holding times, and container requirements for field measurements and analytical parameters are presented in the Paducah Site P-QAPP. These templates will be used, as appropriate, to prepare the project-specific QAPPs.

8. DETAILS OF DATA AND DOCUMENT FLOW

The components of data management include planning, collection, review, archival, and transmittal. Project activities follow identical paths to meet data management requirements. Narratives (i.e., Sections 8 and 9) are provided for each component of data and document flow. The DOE PPPO Program Integrated Data System is discussed first. The data system is the core of each data management component.

8.1 INTEGRATED DATA SYSTEM

The DOE PPPO Program Integrated Data System provides a centralized system for the management and storage of environmental information while allowing easy, yet controlled, access. The basis for the DOE PPPO Program Integrated Data System is to establish and maintain a program to provide the most efficient system of data collection, analysis, storage, and retrieval. DOE, as specified in the FFA, is to maintain one consolidated database for the Paducah Site. All data collected under this agreement (i.e., FFA) are to be routinely submitted electronically in a consistent format to the stakeholders (see Section 9.2). The DOE PPPO Program Integrated Data System meets the regulatory requirements and provides the Paducah Site with a platform to manage its environmental data.

The DOE PPPO Program Integrated Data System is composed of integrated hardware and software to support the collection, management, analysis, and presentation of data associated with environmental response actions, compliance, and monitoring activities at the Paducah Site. All environmental measurements, analyses, and location-specific descriptive information, as applicable per this plan, are included. In addition, an extensive collection of descriptive and reference information about environmental projects and permits are stored.

8.1.1 Paducah PEMS

As part of the DOE PPPO Program Integrated Data System, Paducah PEMS is utilized for cradle-to-grave tracking of sampling and analysis activities, which includes sample scheduling, collection, tracking, and

associated data from the point of collection through final data reporting. Paducah PEMS tracking includes information from field forms, COCs, data packages, and EDDs. Project data is entered as the project progresses. The SMO uses Paducah PEMS to support the following functions:

- Initiating the project;
- Developing a plan for sampling;
- Generating laboratory SOWs;
- Recording sample collection and field measurements;
- Recording the dates of sample shipments to the laboratory;
- Receiving and processing analytical results;
- Verifying data;
- Accessing and analyzing data;
- Assessing data and entering data validation qualifiers; and
- Transferring project data (in ready-to-load format) to Paducah OREIS.

Upon completion of the project, or on a routine basis, data from Paducah PEMS is reviewed (as described in Section 8.4) and transferred to Paducah OREIS for permanent retention. All final data reporting is reported from Paducah OREIS. Additionally, Paducah PEMS data is archived on a specified frequency to ensure data traceability.

The DOE PPPO Program Integrated Data System is accessed by a computer network. The information technology group performs system backups daily. The security precautions and procedures implemented by the SMO are designed to minimize the vulnerability of the data to unauthorized access or corruption. Only members of the SMO have access to Paducah PEMS and data files.

8.1.2 Paducah OREIS

Paducah OREIS is the centralized, standardized, quality assured, and configuration-controlled data management system that is the long-term repository of environmental data (e.g., measurements, geographic data) for Paducah environmental projects. Paducah OREIS is comprised of hardware, commercial software, customized integration software, an environmental measurements database, a geographic database, and associated documentation. Each project uses Paducah OREIS for the following functions:

- Access to existing data;
- Spatial analysis;
- Report generation; and
- Long-term storage of project data (as applicable).

8.1.3 PEGASIS

Using a web browser, the PPPO Environmental Geographic Analytical Spatial Information System (PEGASIS) application provides a systematic approach to retrieve, display, and download analytical, geotechnical, and hydrological data, maps, and geophysical information for PPPO sites, regulators, and the public. The information includes analytical sample results from various environmental studies, restoration reports and supporting documents, maps, facility drawings, and photography.

PEGASIS is a website that allows data users to have access to sampling data for hundreds of investigative wells and sampling events, solid waste management units (SWMUs), and site-specific GIS features from environmental studies at the Paducah Site (e.g., from FFA projects and environmental management program activities) completed since 1989. Analytical data available on PEGASIS are copied from

Paducah OREIS on a quarterly basis, with more frequent updates to facilitate project reports as needed. GIS layers, such as plumes and SWMUs, are updated in PEGASIS as the layers are updated in the GIS system, with more frequent updates to facilitate project reports as needed.

PEGASIS fulfills the requirement in Section XXVII of the FFA for the provision of quality-assured data.

8.2 DATA PLANNING

8.2.1 Initiation of Data Collection

The need for data collection is determined by the project manager to satisfy applicable regulatory requirements and/or DOE Orders. The project manager and project team identify the need for collection of data to support the project and are responsible for the development of applicable documents that outline the specific objectives of the data collection activity.

8.2.2 Historical Data Gathering

A substantial effort should be made by the project team to acquire and analyze all historical data and documents that are relevant to the project (in numeric, spatial, attribute, and textual form) prior to the DQO process and/or data generation. For example, these documents and data might include prior work done for preliminary assessments, site characterization tasks, response actions, annual monitoring reports, or data summaries provided by previous analysts. In addition, information specialists who would know of relevant documents, GIS information, and data sets should be consulted to acquire a comprehensive project background. In many cases, descriptive and qualitative information about the data (e.g., metadata) may be required. This is often the case with electronic files that may be received without the basic information provided through proper documentation. Some research may be required to prepare these metadata statements, which are essential to the determination of data quality and usability.

8.2.3 Data Quality Criteria

Historical data, along with elements from the DQO process, such as contaminants of concern, QA/QC requirements, data review options, and the sampling design are used to generate applicable plans.

FSPs, project-specific QAPPs, and analytical SOWs are developed in support of field preparation. An FSP describes the field activities to be undertaken and subsequent work to be performed. A project-specific QAPP outlines the data quality criteria and DQOs. An analytical SOW includes analytical parameters, methods, and detection limits. A validation SOW is prepared when validation services are required to ensure the analytical laboratory's performance is acceptable.

Information from each of the SOWs and FSPs is used to initiate sampling field forms, labels, and other required field documentation. Documentation generated by the data collection activity shall be forwarded electronically to the project records custodian.

8.3 DATA COLLECTION

Data collection information is recorded and maintained for all data collection activities. This information includes station information, lithologic information, sample information, field measurements, analytical data, monitoring structure information, and GIS information and is explained below.

8.3.1 Station Information

Station information is data describing the location from where a sample is taken. Station information includes plant coordinates (surveyed or estimated, as appropriate), station description, and station type. This information is input directly into Paducah OREIS. Methods for determining coordinates and relevant information necessary to determine and document accuracy should be recorded.

8.3.2 Lithologic Information

Lithologic information is data used to describe the size, texture, composition, and any other physical characteristics of materials derived from the earth. In most cases of investigation at the site, this will include material derived from boreholes. This information is stored electronically with the project information.

8.3.3 Sample Information

Sample information is environmental data describing the collection of materials for testing. Such data consists of the following: station, date collected, time collected, and any other notable information (e.g., weather). This information is recorded in field forms and may be included on the COC or sample labels. This information is input directly into Paducah PEMS.

8.3.4 Field Measurements

Field measurements are measurements that are collected real-time in the field. Field measurements may include water level measurements, pH, conductivity, flow rates, temperature, dissolved oxygen, and analytical results from the use of X-ray fluorescence or field portable gas chromatography equipment. Field measurements are taken and recorded on appropriate field forms or in logbooks and are input into Paducah PEMS.

8.3.5 Analytical Data

The SMO tracks progress of analytical samples as fieldwork continues. COCs are reviewed and the lab receipt of samples is verified. Once samples have entered the laboratory, the laboratory is responsible for sample analysis and data reporting. The analytical data will be checked for completeness and reasonableness. A system is set up within the Paducah DOE Program Integrated Data System to log shipment of samples and receipt of data packages.

All data packages received from the fixed-base and screening/field laboratories are tracked, reviewed, and maintained in a secure environment. The SMO is primarily responsible for these tasks. The following information is tracked: sample delivery group number, date received, number of samples, sample analyses, receipt of EDD (if applicable), and comments. The SMO compares the contents of the data package with the COC form and identifies discrepancies. Discrepancies are immediately reported to the laboratory and the data validators. All data packages are stored as records.

8.3.6 Monitoring Structure Information

Monitoring structure information is data describing the monitoring wells and boreholes installed during the project. Information includes well screen depth; borehole and well diameter; screened aquifer; and datum information. This information is stored electronically.

8.3.7 GIS Information

GIS information is metadata that is visually descriptive of the area around the location of a project. Information may include maps of roads, streams, underground utilities, etc. Projects creating new GIS information or causing required updates to existing GIS information supply the information to the Paducah DOE Program Integrated Data System.

8.4 DATA REVIEW

8.4.1 Laboratory Contractual Screening

Laboratory contractual screening is the process of evaluating a set of data against the requirements specified in the analytical SOW to ensure that all requested information is received. The contractual screening includes, but is not limited to, the COC, number of samples, analytes requested, total number of analyses, methods used, QC samples analyzed, EDDs, units, holding times, and reporting limits achieved. The SMO conducts the screening upon receipt of data from the analytical laboratory.

8.4.2 Data Verification

Data verification is the process for comparing a data set against a set standard or contractual requirement. The Paducah Site P-QAPP presents general guidance on the requirements for data verification. Verification is performed by the SMO electronically, manually, or a combination of both methods. Data verification includes contractual screening and can include other data quality checks established by the project team. Applicable project-specific plans define the specific verification to be performed. Data is flagged as necessary. Verification qualifiers may be applied to the data based on holding time exceedance, criteria exceedance, historical exceedance, or background exceedance. Verification qualifiers are stored in Paducah PEMS, transferred with the data to Paducah OREIS, and copied to PEGASIS.

8.4.3 Data Validation

Data validation is the process for evaluating the laboratory adherence to analytical-method requirements. The Paducah Site P-QAPP presents general guidance on the requirements for data validation, including what fraction of data is to be subjected to independent third-party validation. This is performed by a qualified individual for a data set and is independent from sampling, laboratory, project management, or other decision-making personnel for the project. Data validation is managed and is coordinated with the SMO. The data validator performs data validation according to data validation plans. The percentage and type of data validation is determined by the project and is specified in the project-specific QAPP. Data validation is documented in a formal deliverable from the data validator. Validation qualifiers are input and stored in Paducah PEMS, transferred to Paducah OREIS, and copied to PEGASIS.

8.4.4 Data Assessment

Data assessment is the process for assuring that the type, quality, and quantity of data are appropriate for their intended use. The Paducah Site P-QAPP presents general guidance on the requirements for data assessment. Data assessment allows for the determination that a decision (or estimate) can be made with the desired level of confidence, given the quality of the data set. Data assessment follows data verification and data validation (if applicable) and is performed for all data sets to ensure data is usable.

The data assessment is conducted by the project according to appropriate procedures. Assessment qualifiers are stored in Paducah PEMS, transferred with the data to Paducah OREIS, and copied to PEGASIS. Any problems found during the review process are resolved and documented in the data assessment package.

8.5 DATA ARCHIVAL

Data archival refers to the long-term storage of electronic data generated by a project in the Paducah DOE Program Integrated Data System. Long-term storage in a central repository assures maximum accessibility by the environmental community. To ensure its future usability, sufficient documentation, including the associated metadata, must accompany archived data to describe the source, contents, and structure of the data. Paducah OREIS is the database that stores archived data for future use. Paducah PEMS and the back-ups for Paducah OREIS are archived by the Paducah Site's Infrastructure Contractor personnel.

9. DATA RELEASE AND TRANSFER

Once data has undergone verification, validation (if validation is required), and data assessment, it may be released to external agencies. Data rejected during validation or data assessment will not be used, but will remain with the dataset for completeness. Environmental data are copied from Paducah OREIS to PEGASIS (as described in Section 8.1.4), allowing regulators and the public to access the data using a web browser. Data copied to PEGASIS includes information collected from response actions, permitted sampling, and routine sampling. In addition, environmental data can be requested from the SMO or by contacting PegasisAdmins@pad.pppo.gov.

Field QC data are not copied with the data to PEGASIS; however, this information is available from the SMO upon request and is included with the appropriate CERCLA documents (e.g., remedial action investigation report).

10. REFERENCES

DOE (U.S. Department of Energy) 2023. *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan*, DOE/LX/07-2490&D1, U.S. Department of Energy, Paducah, KY, April.

EEC (Energy and Environment Cabinet) 2020. *Grant # DE-EM0005189 Attachment C Agreement in Principle for Environmental Cleanup at the United States Department of Energy's Paducah Gaseous Diffusion Plant with the Commonwealth of Kentucky*, Office of Environmental Management, Washington, DC, effective January 16.

EPA (U.S. Environmental Protection Agency) 1998. *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1707, U.S. Environmental Protection Agency, Atlanta, GA, February.

KDWM (Kentucky Division of Waste Management) 2020. *Hazardous Waste Management Facility Permit for the U.S. Department of Energy, Paducah Gaseous Diffusion Plant*, KY8-890-008-982, effective February 21.