



Department of Energy
Portsmouth/Paducah Project Office
1017 Majestic Drive, Suite 200
Lexington, Kentucky 40513
(859) 219-4000

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By Jennifer.Howe at 7:06 am, Nov 16, 2021

November 15, 2021

Mr. Brian Begley
Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

PPPO-02-10017310-22

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

Dear Mr. Begley and Mr. Weeks:

**TRANSMITTAL OF THE D1 SITE MANAGEMENT PLAN, PADUCAH GASEOUS
DIFFUSION PLANT, PADUCAH, KENTUCKY, ANNUAL REVISION—FY 2022,
DOE/LX/07-2473&D1**

In accordance with Section XVIII of the Paducah Federal Facility Agreement (FFA), the U.S. Department of Energy (DOE) is submitting the *D1 Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2022, DOE/LX/07-2473&D1* (SMP), for review and comment. Approval of this fiscal year (FY) 2022 SMP will supersede the previously approved FY 2021 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 July 2021 through August 2021. The following are some of the major changes reflected in this annual revision.

- The main body of the SMP indicates that the three-year enforceable periods consist of FY 2022, FY 2023, and FY 2024. The main body also has been updated to include DOE's continued evaluation of per- and polyfluoroalkyl substances (PFAS) at the Paducah Site and DOE's Geographical Area approach as described in Appendix 3.
- Appendix 1 includes an updated status of the removal and remedial actions.

- Appendix 2 includes the required certification that the land use controls for the North-South Diversion Ditch and the C-400 actions are being implemented, as described in their respective Land Use Control Implementation Plans.
- Appendix 3 includes changes to some of the OU scope descriptions. These changes are consistent with the status of various projects and reflect the current site cleanup strategy. A table was added to Appendix 3 that includes the facilities to be removed outside of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), according to the provisions agreed to in the consultation packages. Additionally, the table identifies facilities in the Facility D&D OU with site evaluation (SE) reports that recommend the facility be removed outside of CERCLA and concurred on by EPA and KDEP.
- For certain facilities, text also was added to Appendix 3 which states that consideration will be given to coordinate the timing of an SE for the underlying slab and soils to occur prior to the removal of the aboveground structure. These future SEs are to be performed in concert with the deactivation of the facility.
- Furthermore, as an emerging contaminant, DOE's efforts to appropriately characterize historic PFAS use and releases at DOE sites has been added to Appendix 3, along with current plans to perform additional monitoring at the Paducah Site.
- Appendix 4, Detailed Facility D&D OU Facilities List, was updated according to ongoing SEs.
- Appendix 5 includes enforceable commitments for FY 2022, FY 2023, and FY 2024, which includes the recently signed memorandum of agreement for the resolution of informal dispute concerning EPA's conditional concurrence on the *Remedial Action Work Plan for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2443&D2/R1.
- Appendix 6 table of facilities has been removed because all facilities have received EPA and KDEP concurrence as part of consultation and have been moved to either Appendix 3 or Appendix 4. Text has been added to Appendix 6 explaining the appendix's history and that the determinations are complete.
- Appendix 7 includes the recently revised and approved *Paducah Gaseous Diffusion Plant Data Management Plan*, DOE/LX/07-2458&D2.

DOE appreciates the FFA parties' efforts in scoping the FY 2022 SMP. In accordance with Section XVIII of the FFA, EPA and KDEP have a 30-day review period to provide comments and/or approval of the document.

If you have any questions or require additional information, please contact me at (270) 441-6862.

Sincerely,

Tracey L.
Duncan

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L. Duncan
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Tracey Duncan
Federal Facility Agreement Manager
Portsmouth/Paducah Project Office

Enclosures:

1. Certification Page
2. D1 Site Management Plan, Annual Revision—FY 2022—Clean
3. D1 Site Management Plan, Annual Revision—FY 2022—Redline

Administrative Record File—ARF ARR

cc w/enclosures:

abigail.parish@pppo.gov, PPPO
april.ladd@pppo.gov, PPPO
april.webb@ky.gov, KDEP
arcorrespondence@pad.pppo.gov
bart.schaffer@ky.gov, KDEP
brian.begley@ky.gov, KDEP
bruce.ford@pad.pppo.gov, FRNP
bwhatton@tva.gov, TVA
christopher.travis@ky.gov, KDEP
dave.dollins@pppo.gov, PPPO
dcnorman0@tva.gov, TVA
frnpcorrespondence@pad.pppo.gov
hjlawrence@tva.gov, TVA
jana.white@pad.pppo.gov, FRNP
jennifer.woodard@pppo.gov, PPPO
joel.bradburne@pppo.gov, PPPO
kristan.avedikian@TechLawInc.com, EPA
leanne.garner@pad.pppo.gov, FRNP
leo.williamson@ky.gov, KDEP
mac.mcrae@TechLawInc.com, EPA
myrna.redfield@pad.pppo.gov, FRNP
nathan.garner@ky.gov, KYRHB
pad.rmc@pad.pppo.gov
sebenton@tva.gov, TVA
stephaniec.brock@ky.gov, KYRHB
testher@tva.gov, TVA
tracey.duncan@pppo.gov, PPPO
weeks.victor@epa.gov, EPA

CERTIFICATION

Document Identification: *Site Management Plan Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2022*
DOE/LX/07-2473&D1

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) Digitally signed by MYRNA REDFIELD (Affiliate)
Date: 2021.11.10 16:28:31 -06'00'

Myrna E. Redfield, Program Manager
Four Rivers Nuclear Partnership, LLC

Date Signed

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

Jennifer R. Woodard Digitally signed by Jennifer R. Woodard
Date: 2021.11.15 15:34:55 -06'00'

Jennifer Woodard, Paducah Site Lead
Portsmouth/Paducah Project Office
U.S. Department of Energy

Date Signed

**DOE/LX/07-2473&D1
Primary Document**

**Site Management Plan
Paducah Gaseous Diffusion Plant
Paducah, Kentucky**

Annual Revision—FY 2022



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**DOE/LX/07-2473&D1
Primary Document**

**Site Management Plan
Paducah Gaseous Diffusion Plant
Paducah, Kentucky**

Annual Revision—FY 2022

Date Issued—November 2021

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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ACRONYMS

AFFF	aqueous film forming foam
AOC	area of concern
BGOU	Burial Grounds Operable Unit
bgs	below ground surface
BRA	baseline risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
COPC	chemical or radionuclide of potential concern
CSOU	Comprehensive Site Operable Unit
D&D	decontamination and decommissioning
DMP	data management plan
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
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
IPL	integrated priority list
IRA	interim remedial action
KOW	Kentucky Ordnance Works
KPDES	Kentucky Pollutant Discharge Elimination System
KY	Commonwealth of Kentucky
LLW	low-level waste
LUC	land use controls
LUCAP	land use controls assurance plan
LUCIP	land use control implementation plan
MCL	maximum contaminant level
MOA	memorandum of agreement
NA	not applicable
NCP	National Contingency Plan
NFA	no further action
NPL	National Priorities List
NSDD	North-South Diversion Ditch
NTCRA	non-time-critical removal action
O&M	operation and maintenance
OSWDF	on-site waste disposal unit

OU	operable unit
PFAS	polyfluoroalkyl substances
PGDP	Paducah Gaseous Diffusion Plant
PTW	principal threat waste
RACR	remedial action completion report
RAO	remedial action objective
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
SE	site evaluation
SEE	steam-enhanced extraction
SMP	Site Management Plan
SWMU	solid waste management unit
SWOU	Surface Water Operable Unit
TBD	to be determined
TS	treatability study
TSCA	Toxic Substances Control Act
UCRS	Upper Continental Recharge System
USEC	United States Enrichment Corporation
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 (RCRA) 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.

During fiscal year (FY) 2012, based on projected near-term flat funding assumptions (5 years) and reasonable future funding assumptions for the Paducah Site, the FFA Senior Managers commissioned the FFA Managers to review and reprioritize FFA work, as needed, to achieve continuous progress while ensuring a bias for action. A series of meetings were held among the FFA Managers to evaluate options. The FFA Managers and FFA Senior Managers agreed to the following prioritization for work implementation:

- Optimize plume containment (Northeast Plume);
- Address groundwater sources [C-400; Southwest Plume Sources; Burial Grounds OU Solid Waste Management Unit (SWMU) 4];

- Complete decontamination and decommissioning (D&D) of C-340 and C-410/C-420;
- Continue and prioritize CERCLA Waste Disposal Alternatives activities to support future disposal needs;
- Realign the OUs schedules to coordinate disposal of waste with the availability of a potential CERCLA On-site Waste Disposal Facility (if selected); and
- Implement other work (e.g., Sitewide Evaluation) ensuring continuous progress/bias for action.

At that time, the reprioritization of projects based on projected near-term flat funding assumptions (5 years) and reasonable future funding assumptions for the Paducah Site resulted in the rescheduling of milestones, including out-year completion dates for the pre-gaseous diffusion plant (GDP) shutdown scope OUs. The FY 2013 SMP officially incorporated the changes agreed to by the FFA parties and moved completion dates for the pre-GDP shutdown scope OUs from 2019 to 2032.

In October of 2014, the United States Enrichment Corporation (USEC) terminated its lease agreement for operation of the GDP and returned the leased facilities to DOE. Some of these previously leased facilities contain SWMUs that had not been readily accessible during USEC operation. Because DOE now has control of the formerly leased GDP facilities, DOE has reassessed site cleanup priorities to identify areas offering the greatest opportunity to address significant sources of environmental media contamination. As a result, in 2016, DOE identified that a comprehensive characterization and final response action of the C-400 Building and its adjacent areas (see Appendix 3), hereafter referred to as the C-400 Complex, as its highest cleanup priority at the site. The C-400 Complex contains numerous SWMUs and is the largest source of off-site trichloroethene (TCE) groundwater contamination. The implementation of C-400 Complex as Paducah DOE's highest cleanup priority has resulted in resequencing of other cleanup work at the site to align with the new cleanup priorities and revised time frames projected for implementation. The FY 2016 and FY 2017 SMPs were not finalized in order to allow the FFA Senior Managers time to

evaluate DOE's proposed reprioritization strategy and to reach a consensus on the path forward for the cleanup of the site.

The FFA Senior Managers signed a Memorandum of Agreement (MOA) for the C-400 Complex under the FFA for the PGDP, on August, 8, 2017, to document key aspects of the new strategy for incorporation into the FY 2018 SMP.

The new strategy from the MOA included 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;
- Integration of the pre- and post-GDP shutdown projects and schedules into the overall cleanup scope of the FFA;
- Continuation of the SWMU 211-A groundwater remedial action; and
- Resequencing of all other projects (e.g., CERCLA Waste Disposal Alternatives, Burial Grounds OU, Soils OU, Dissolved-Phase Plumes OU, Surface Water OU, Comprehensive Site OU).

In FY 2018, the FFA parties entered into dispute resolution regarding the FY 2018 SMP. The FFA Senior Executive Committee signed an MOA for the FY 2018 SMP on March 29, 2019, (reflects date of final signature) that resolved the DOE and Kentucky disputes. The FY 2018 SMP was revised consistent with the terms of the MOA, including incorporation of priority project schedules and milestone dates to satisfy the FY 2019 Annual SMP update requirements per the FFA. The FY 2018 SMP was renamed as the FY 2018/FY 2019 SMP, consistent with the MOA and approved by EPA and Kentucky (August 2019). The FY 2018/FY 2019 SMP superseded the previously approved FY 2015 SMP.

In FY 2018, the FFA parties also entered into dispute resolution regarding the C-400 Removal Action. On August 1, 2019 (reflects date of final signature), the FFA Senior Executive Committee signed an MOA for the C-400 Building Non-Time-Critical Removal Action (NTCRA).

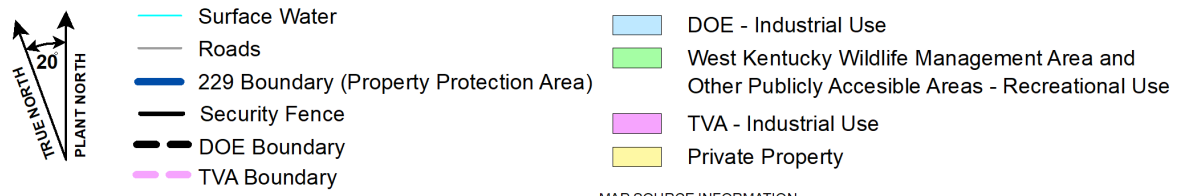
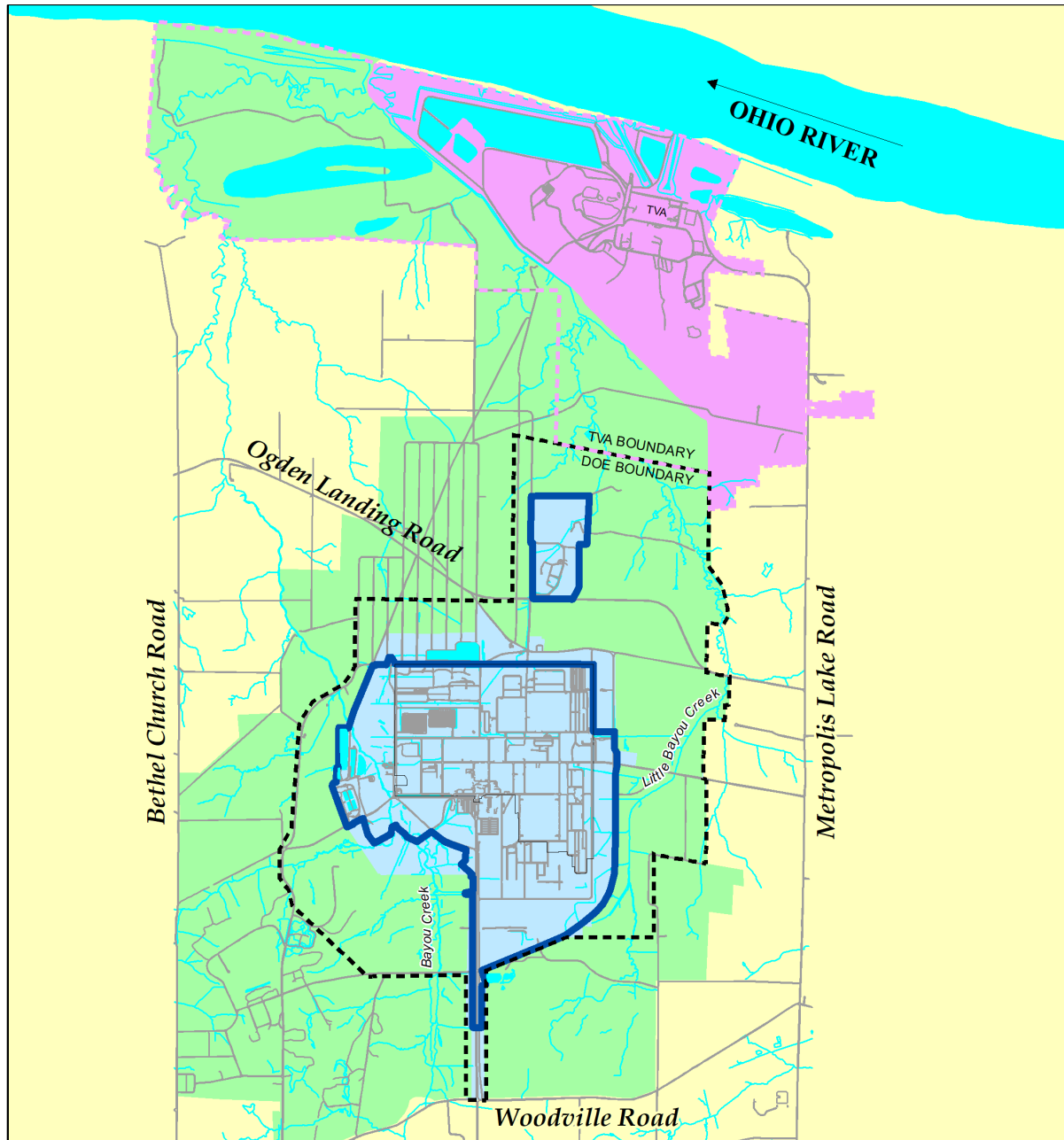
Although the specific issues disputed by DOE were not resolved, the MOA documents suspension of the demolition project (including document reviews), agreement that the C-400 Complex Operable Unit Remedial Investigation/Feasibility Study would proceed, and the delay of physical demolition of the C-400 Building down to slab as an NTCRA until after the C-400 Remedial Investigation Field Start date. The removal action field start date for the C-400 Building demolition is included in Appendix 5.

This annual update of the SMP (FY 2022 SMP) sets forth enforceable milestones for FY 2022, FY 2023, and FY 2024, with near-term emphasis on the C-400 Complex and Southwest Plume SWMU 211-A, consistent with the MOAs signed in August 2017 and August 2019 and the FY 2018/FY 2019 SMP. The scope associated with the overall cleanup strategy for the site includes a series of prioritized response actions, site characterization activities to support future response action decisions, and cleanup and decommissioning of the GDP. After completion of these activities, the Comprehensive Site OU (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.

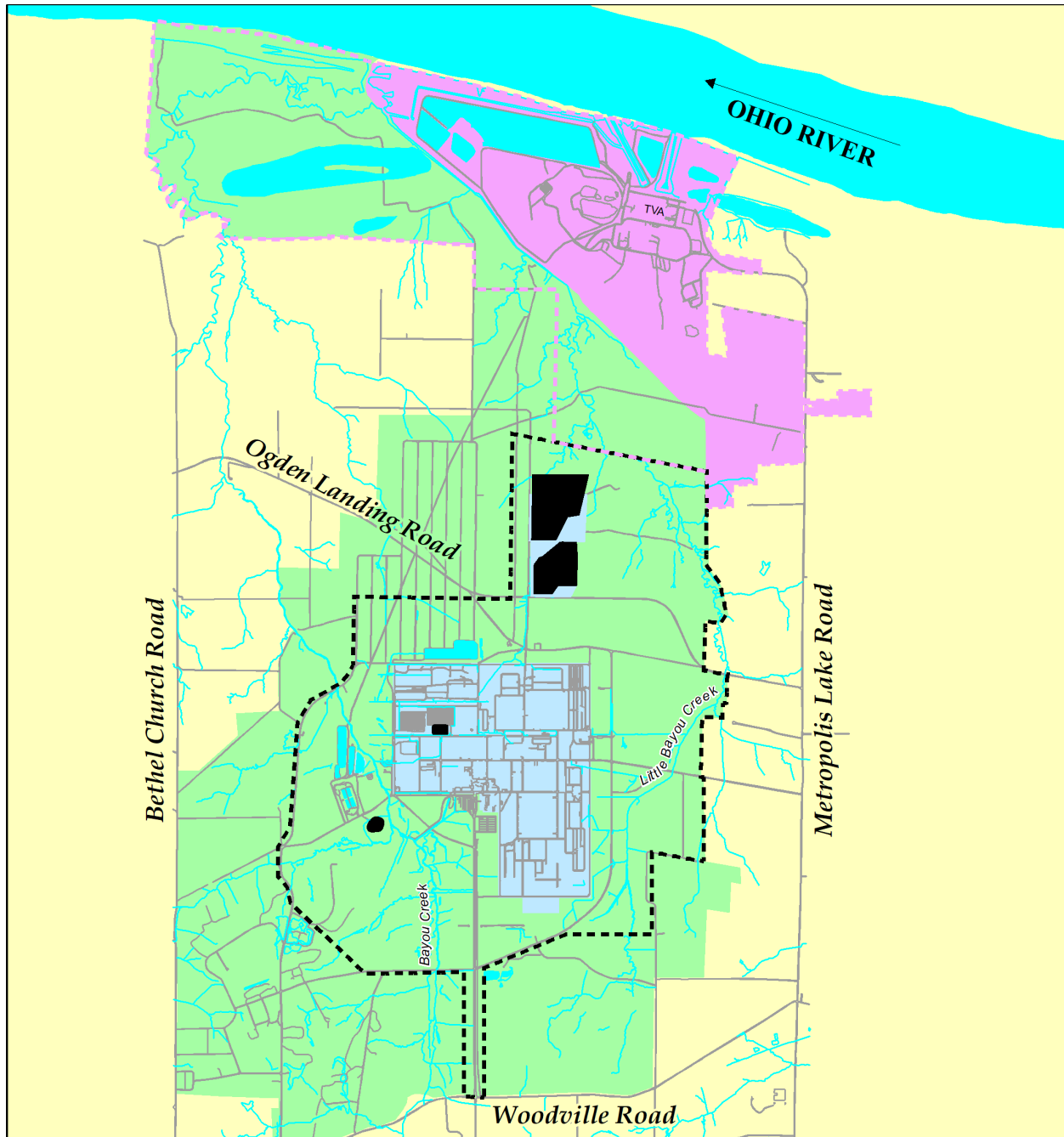
2. LAND USE

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



MAP SOURCE INFORMATION
 Map Generation Date and Location: 7/19/2021 G:\GIS\ARCVIEWS\PROJECTS\SMP\LandUse_Current_20210719.mxd
 WKWMA Boundary: G:\GIS\PEGASIS.gdb\Wildlife_Management_Areas
 DOE Property Boundary: G:\GIS\PEGASIS.gdb\doebnd
 TVA Boundary: G:\GIS\PEGASIS.gdb\lvabnd_official; 229 Boundary: G:\GIS\PEGASIS.gdb\Security_229
 Security Fence: G:\GIS\PEGASIS.gdb\limited_area
 Industrial Area: G:\GIS\SHAPES\BOUNDS\Closed_to_Public_Access.shp (4/26/2021)
 Roads: G:\GIS\PEGASIS.gdb\roadrow;
 Surface Water: G:\GIS\PEGASIS.gdb\streams and G:\GIS\PEGASIS.gdb\l 2007 21145 areawater (for water bodies shown)

Figure 1. Current Land Use at PGDP



- | | | |
|------------------|-------------------|----------------------------------|
| Surface Water | Road | DOE Boundary - Currently Owned |
| Industrial - DOE | Recreational | TVA Boundary - Currently Owned |
| Industrial - TVA | Rural Residential | Waste Management Area (See Note) |

2000 0 2000 4000 Feet



Note: These areas include landfills that are active or certified closed and under long-term custodial care (i.e., C-404, C-746 S&T, C-746-U), or that are under an Interim Remedial Action (i.e., C-746-K). As such, these areas are not amenable to unrestricted future industrial use. As new CERCLA decision documents or permits are issued with deed restrictions/LUCs for waste management areas this map will be updated to include those units.

MAP SOURCE INFORMATION

Map Generation Date and Location:
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 Recreational: G:\gis\IPEGASIS.gdb\Wildlife_Management_Areas and G:\gis\IPEGASIS.gdb\doebnd
 TVA Boundary: G:\gis\IPEGASIS.gdb\lvabnd_official
 Industrial and Waste Management Areas: G:\gis\IPEGASIS.gdb\pgdpbnd; ...facilities (as specified);
 and ...security_229 (as specified)
 Roads: G:\gis\IPEGASIS.gdb\roadrow; Surface Water: G:\gis\IPEGASIS.gdb\streams
 and G:\gis\IPEGASIS.gdb\l_2007_21145_areawater (for water bodies shown)

Figure 2. Reasonably Anticipated Future Land Use at PGDP

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

In past SMPs, the site cleanup activities were divided as follows: (1) pre-GDP shutdown scope, (2) post-GDP shutdown scope, and (3) CSOU scope. The pre-GDP shutdown scope was associated with media-specific OUs initiated prior to shutdown of the operating GDP (i.e., Pre-GDP shutdown Activities).

In the FY 2018/FY 2019 SMP, the site cleanup OUs were integrated and no longer distinguished

between pre- and post-GDP scope. Completion of these OUs is required to achieve delisting of the site from the NPL and the decommissioning of the 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 and planning assumptions for each of the defined OUs. In addition, Appendix 3 contains information regarding geographical areas (GAs). These GAs are boundaries established for the purpose of planning and evaluating areas for future use, deactivation and decommissioning, and remediation integration. GAs are addressed under the Soils and Slabs OU. 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 D&D OU
- Depleted Uranium Hexafluoride (DUF₆) Footprint Underlying Soils OU
- CSOU
- CERCLA Waste Disposal Alternatives OU

In addition, DOE currently is implementing deactivation and utility optimization activities outside of the FFA 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 and Southwest Plume SWMU 211-A, 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 will continue to evaluate the emerging contaminants per- and polyfluoroalkyl substances (PFAS) as potential contamination at

the Paducah Site. The final CSOU evaluation will support the final remedial decision for the site following completion of all 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; technical considerations associated with GDP transition/turnover; funding projections; 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 (NCP), which emphasize the use of accelerated actions to address imminent threats and reduce migration of off-site contamination.

Enforceable milestones for FY 2022, FY 2023, FY 2024, 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 FFA) for those areas where RAOs have been achieved. In cases where a period of operation and maintenance (O&M) 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
<ul style="list-style-type: none">• Mitigate immediate threats, both on- and off-site.• Reduce further migration of off-site contamination.• Address sources contributing to off-site contamination.• Address remaining sources contributing to on-site contamination.• Perform D&D of the GDP/Address Remediation Scope OUs.• Address soils within the DUF₆ Plant footprint once it ceases operations and D&D of the DUF₆ 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*. A total of 681 properties/structures was reviewed and evaluated to identify facilities that should be evaluated under the CERCLA process for decommissioning (Appendix 8 of the FY 2018/FY 2019 SMP). The Facility D&D 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 NTCRA. For some facilities, a removal site evaluation (SE) has determined a NTCRA is not required; for the other facilities included in Appendix 4, a removal site evaluation (SE) is pending to determine if a NTCRA is necessary. Additional facilities at PGDP (previously listed in Appendix 6) have undergone evaluation 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. If it was determined during a facility review that there was a potential release

threat, the facility was included in the Facility D&D OU in Appendix 4. The FFA parties will continue collaboration in FY 2022 to discuss the scope and strategy for Appendix 4 facilities Removal Site Evaluation.

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
	Explanation of Significant Differences (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

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 (Northeast Plume)	IRA	June 15, 1995 DOE/OR/06-1356&D1	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. 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 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 extraction well 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.

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)				
SWMU 91/Soil	IRA	August 10, 1998 DOE/OR/06-1527&D2	<i>In situ</i> 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	<i>In situ</i> 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.	<p>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 treatability study for steam-enhanced extraction conducted and completed June 30, 2015. Treatability Study Report approved June 2016. As a result of the DOE proposed strategy and reprioritization agreed to by the FFA 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).</p> <p>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.</p>

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)	Remedial Action	March 20, 2012 DOE/LX/07-0365&D2/R1	<p>SWMU 1—<i>In situ</i> source treatment using deep soil mixing with interim LUCs.</p> <p>SWMU 211-A—<i>In situ</i> source treatment using enhanced <i>in situ</i> bioremediation with interim LUCs or long-term monitoring with interim LUCs based upon RDSI results.</p> <p>SWMU 211-B—<i>In situ</i> source treatment using enhanced <i>in situ</i> bioremediation with interim LUCs or long-term monitoring with interim LUCs based upon RDSI results.</p>	<p>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 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.</p> <p>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 Remedial Action Work Plan for SWMU 211-A currently is being revised and pending EPA and KY approval. A decision concerning a remedy for SWMU 211-B will be made by the FFA parties after the C-720 Building has been removed and the investigation is complete for the C-720 Building Soils and Slabs action.</p>

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status¹
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.	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
SWMU 59/Sediment	IRA	September 25, 2002 DOE/OR/07-1948&D2	Remedial action for Sections 1 and 2 of the NSDD.	Complete

Operable Unit Summary (Continued)

WAGs/Media	Response Type	ROD/Action Memorandum	Response Description	Status ¹
SURFACE WATER OPERABLE UNIT				
(Continued)				
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 [<i>Waste Area Grouping (WAG) 22 Post-Record of Decision (ROD) Change</i> , 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	Status¹
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.
PRE-GDP SHUTDOWN D&D 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	Status¹
PRE-GDP SHUTDOWN D&D 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; FY = fiscal year; 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; 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; WAG = waste area group

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 (NSDD) 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.

In accordance with Section 2.9 of the LUCAP, DOE annually certifies that requirements of the *Land Use Control Implementation Plan for the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1949&D2/R2, (NSDD LUCIP) and the *Land Use Control Implementation Plan 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/07-2151&D2/R2, (C-400 LUCIP) are being implemented by DOE at PGDP. The NSDD LUCIP was submitted as a stand-alone document, and the C-400 LUCIP was submitted as an appendix (Appendix H) to the *Remedial Design Report, Certified for Construction Design Drawings and Technical Specifications Package, 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/LX/07-0005&D2/R1. The excavation/penetration program for the site was verified in August 2021, not by June 30, 2021, as specified in the C-400 LUCIP. Corrective measures have been implemented by updating the DOE Contractor's Project Assessment Schedule to ensure this verification is completed on time.

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 AND
KEY PROJECT ASSUMPTIONS**

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OPERABLE UNIT SCOPE DESCRIPTIONS AND KEY DOE PLANNING ASSUMPTIONS FROM LIFE CYCLE BASELINE

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 as well as U.S. Department of Energy's (DOE) key planning assumptions. The FFA Managers acknowledge that both the scope and associated assumptions 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). The milestone dates are based on the scope and associated assumptions described in the following sections. Schedules are based on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documentation and review/comment time frames established in the FFA.

Paducah Gaseous Diffusion Plant (PGDP) ceased operations in May 2013, and leased property was returned to DOE in October 2014. Prior to release, site cleanup activities had been divided as (1) pre-Gaseous Diffusion Plant (GDP) shutdown scope, and (2) post-GDP shutdown scope, and (3) Comprehensive Site OU (CSOU) scope. The pre-shutdown scope was associated with media-specific OUs initiated prior to shutdown of the operating GDP. In October of 2014, the United States Enrichment Corporation (USEC) terminated its lease agreement for operation of the GDP and returned the leased facilities to DOE. Some of these previously leased facilities contain solid waste management units (SWMUs) that had not been readily accessible during USEC operation. Because DOE now has control of the formerly leased GDP facilities, DOE has reassessed site cleanup priorities to identify areas offering the greatest opportunity to address significant sources of environmental media contamination. As a result, in 2016, DOE identified a comprehensive characterization and final response action of the C-400 Building and its adjacent areas, hereafter referred to as the C-400 Complex, as its highest cleanup priority at the site. The C-400 Complex contains numerous SWMUs and is the largest source of off-site trichloroethene (TCE) groundwater contamination. The implementation of C-400 Complex as Paducah DOE's highest cleanup priority has resulted in resequencing other cleanup work at the site to align with the new cleanup priorities and revising time frames projected for implementation. The fiscal year (FY) 2018/FY 2019 Site Management Plan (SMP) also integrated all OUs to support a comprehensive cleanup strategy for PGDP. This FY 2022 SMP provides the latest updates to the cleanup strategy.

Scope and Key DOE Planning Assumptions from Life Cycle Baseline have been 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).

Key DOE assumptions from the 2018 Life Cycle Baseline included in this appendix are for DOE's planning purposes. The 2018 Paducah Life Cycle Baseline integrates and logically sequences site projects to remediate environmental media (including slabs); complete operating missions; deactivate facilities and systems; remove equipment and disposition small structures; decommission and demolish facilities; complete the CSOU; achieve National Priorities De-listing; and turnover the site for future use. The 2018 Life Cycle Baseline was established utilizing DOE constraints in funding and schedule and, as a result, the baseline may be subject to periodic updates. Changes in funding levels or site conditions are uncertainty or risks that are monitored as part of DOE management of the baseline. If risks or opportunities are realized,

they may have an impact on the end date for completion (FY 2065) and/or milestone dates referenced within the 2018 Paducah Life Cycle Baseline scope of work. In accordance with the FFA, if PGDP receives funding greater than the projected costs, DOE will propose additional work or an acceleration of scheduled work at PGDP; however, DOE may propose using part or all of the excess funding for activities not covered in this SMP. DOE publishes an integrated priority list (IPL) annually that prioritizes projects and the use of excess or deficiencies in funding. EPA and KY provide input on the IPL annually. DOE's internal baseline change process will capture any necessary cost or schedule changes as a result of project risk management (scope, schedule, and cost). The milestone dates associated with executing the scope of work listed in Appendix 3 are defined in Appendix 5 (Enforceable Timetables and Deadlines; Planning Dates with Long-Term Targets).

While DOE maintains that the assumptions are reasonable for bounding cost and schedule forecasts based on existing information, regulatory approval of the SMP does not constitute approval of assumptions. In the event there is a conflict between an assumption in this SMP and an OU primary document, the OU primary document shall govern.

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 3.1. These previous actions are summarized in Appendix 1 (Actions Taken to Date).

The scope of the GWOU consists of potential sources [e.g., dense nonaqueous-phase liquid (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 records of decision (RODs) have been selected for the identified C-400 source areas and Southwest Plume source areas to address volatile organic compound (VOC) contamination. The remedy in the Southwest Plume ROD for SWMU 1 has been completed, with long-term monitoring in place. The remaining scope of that ROD related to SWMU 211-A and SWMU 211-B was subject to a remedial design site investigation.

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 USEC 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

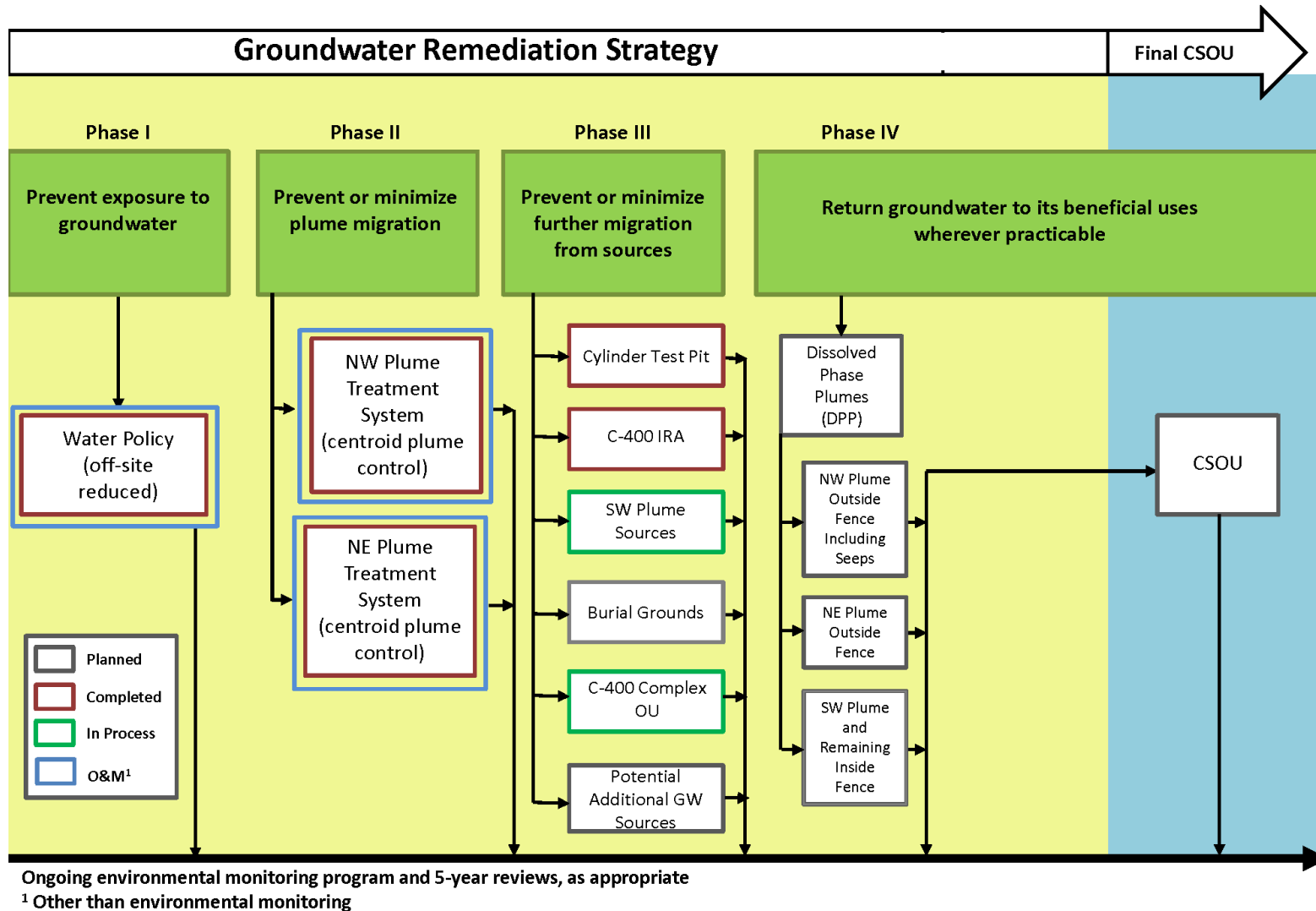


Figure 3.1. Groundwater Remediation Strategy

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 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 (SEE) 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.

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 a remedial design site investigation.

During the remedial design site investigation 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 and implemented after the C-720 Building has been removed and the investigation is completed for the C-720 Building Soils and Slabs action. 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 will be implemented per the milestones established in Appendix 5.

Evaluation of a final remedial action for non-VOCs COCs associated with direct contact exposure risks will be addressed as part of the Soils OU (see Appendix 4).

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) A remedy will be implemented in source areas [i.e., Oil Land Farm (SWMU 1) and Northeast and Southeast of the C-720 Building (SWMU 211 A & B)].
- (2) The SWMU 1 remedy is soil mixing with interim LUCs. Implementation of this remedy has been completed.
- (3) The SWMU 211-A remedy is *in situ* bioremediation with interim LUCs. Implementation of this remedy is currently ongoing.
- (4) The SWMU 211-B remedy will be reevaluated and implemented after the C-720 Building has been removed and the investigation is completed for the C-720 Building Soils and Slabs action to address fully any identified sources under the slab.
- (5) No further action (NFA) will be required for SWMU 102 (Plant Storm Sewer).
- (6) The action will fulfill the requirements of the *Memorandum of Agreement for Resolution of Informal Dispute for the Focused Feasibility Study for the Southwest Plume Volatile Organic Compound Sources Oil Landfarm and C-720 Northeast and Southeast Sites) at the Paducah Gaseous Diffusion Plant, Paducah, KY (DOE/LX/07-0186&D2), May 20, 2010.*

Dissolved-Phase Plumes Remedial Action⁴

Scope

This project includes conducting a remedial investigation (RI) [including a baseline risk assessment (BRA)], feasibility study (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

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.

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

DOE developed a Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Work Plan and Report to focus on 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. Work plan development began in FY 2019 and was completed in FY 2020. The work plan identifies the information to be obtained and decision criteria for responding to the question of whether vapor intrusion from volatile organic compounds in soils and groundwater poses a potential threat to human health in buildings located over these areas at the Paducah Site and if human exposure to vapor intrusion is under control. Upon completion of the assessment, a Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report was issued by DOE in FY 2021. The 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. The report will specify whether any additional actions are necessary to satisfy the question of potential threat to human health from vapor intrusion and/or to bring human exposure to vapor intrusion under control. Additional FFA actions may include Remedial Investigation, Removal Actions, and early (remedial) actions. EPA and KY reserve the right to request Additional Work (FFA Section XIX) in the absence of either party's concurrence on the Work Plan or Report.

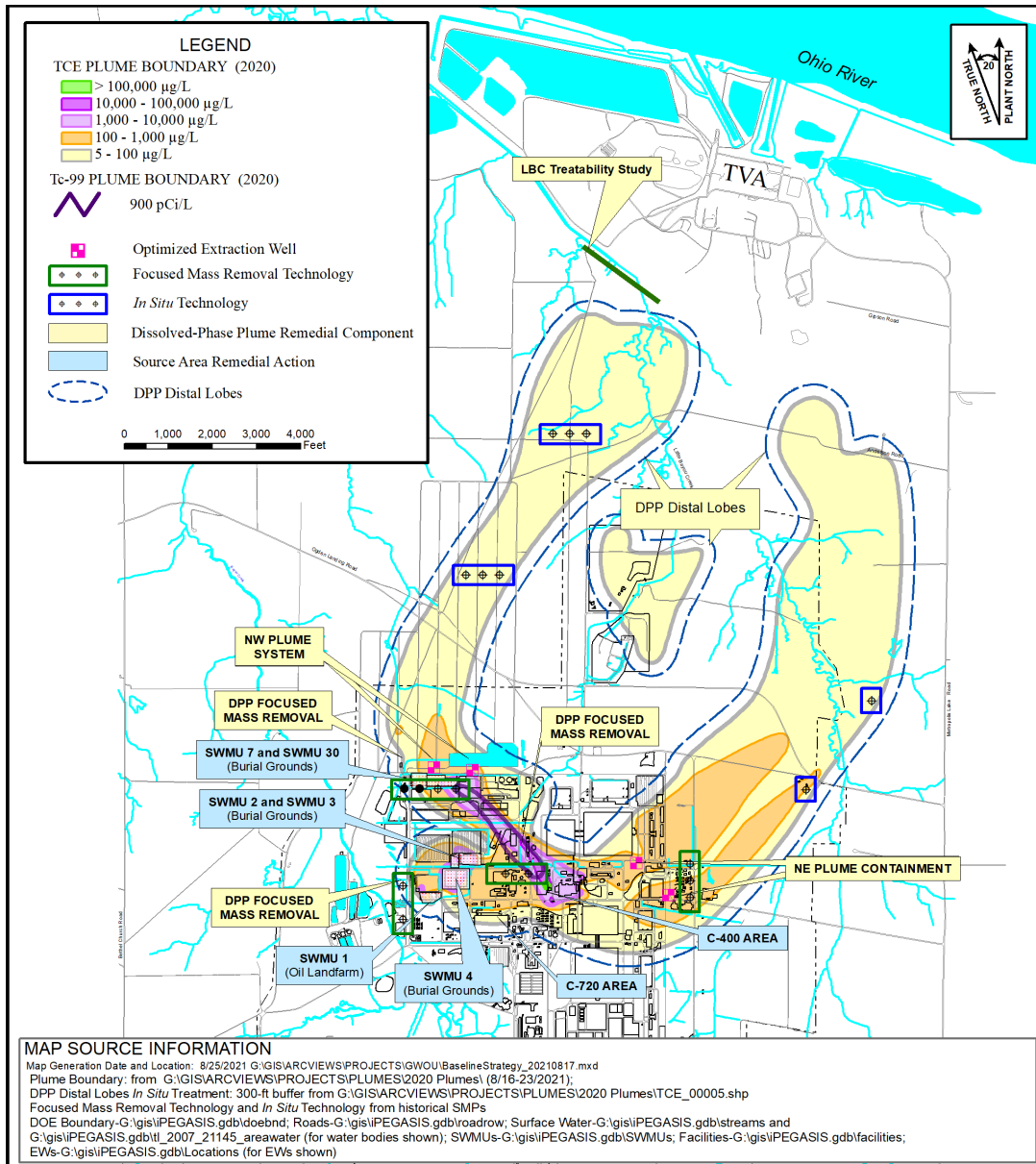
Because plume conditions are dynamic and will change over the next several decades, the Dissolved Phase Operable Unit will include a data quality objective to address the site-wide vapor intrusion pathway for the site. Prior to the Dissolved Phase Operable Unit, a data quality objective to address vapor 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. During FY 2021, data was collected; this data currently is being evaluated. 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.

Key DOE Planning Assumptions from Life Cycle Baseline

The following elements summarize DOE's key planning assumptions and are illustrated in Figure 3.2.

- (1) TCE and Tc-99 are expected to be the primary COCs that will drive the remediation approach.



DOE PLANNING ASSUMPTIONS

Key Source Area Remedial Actions

- C-400 Area
- C-720 Area (Including SWMUs 211-A and 211-B)
- SWMU 1 (Oil Landfarm)
- SWMU 2 and SWMU 3 (Burial Grounds)
- SWMU 4 (Burial Grounds)
- SWMU 7 and SWMU 30 (Burial Grounds)

Northwest Plume Groundwater System

- Operate optimized extraction system near northwest corner of plant site consistent with goals of ROD for IRA and Five-Year review.

Northeast Plume Containment System

- Operate optimized Northeast Plume extraction system, to improve reduction in contaminant mass migrating downgradient of PGDP.

Southwest Plume Sources Remedial

- Continue long-term monitoring associated with *in situ* deep soil mixing at SWMU 1.

Little Bayou Creek Treatability Study

- Exploration of *in situ* treatment or low impact treatment options such as: enhanced bioremediation, passive extraction and treatment (e.g., geosiphon), or engineered wetlands.

Dissolved-Phase Plumes (DPP) Focused Mass Removal

- Implementation of mass removal technology to attain remedial action objectives (e.g., focused extraction, treatment and discharge/reinjection); combined enhanced bioremediation, chemical oxidation, and extraction and treatment; or *in situ* treatment to promote enhanced bioremediation.
- *Note: The locations and number of components representing remedy implementation as depicted above are conceptual and do not represent the actual locations and number of components that may be required.*

DPP Distal Lobes

- *In situ* treatment to attain remedial action objectives (e.g., *in situ* treatment to promote enhanced bioremediation); or combined *in situ* treatment with C-Sparge or groundwater circulation treatment wells.
- *Note: The locations and number of components representing remedy implementation as depicted above are conceptual and do not represent the actual locations and number of components that may be required.*

Figure 3.2. GWOU Baseline Strategy

- (2) Continue operations of the Northwest Plume and the Northeast Plume pump-and-treat systems in accordance with the completed optimizations.
- (3) Conduct a technology demonstration/treatability study at Little Bayou Creek seeps to address the TCE concentrations in surface water contamination resulting from groundwater discharge. The treatability study may include testing technologies that will have broader application to other areas of the dissolved-phase plumes.
- (4) Data collected from the Northwest Plume Groundwater System; the Northeast Plume Containment System; the TS at the Little Bayou Creek seeps; TCE degradation study; and the groundwater flow/transport model will be used to support the RI/FS process and will be documented accordingly.
- (5) The remedial action for the dissolved-phase plumes will include the following: (a) focused mass removal technology to address “high” mass residual volatile organic compounds (VOCs) and Tc-99 in the RGA near source areas in the plant vicinity; (b) operation of groundwater extraction system(s) until they meet shut-down criteria established in the final dissolved-phase plume ROD; and (c) *in situ* treatment (e.g., enhanced bioremediation or alternative technology) for distal lobes of dissolved-phase plumes.
- (6) The extent of dissolved-phase plume groundwater contamination is expected to be limited to those areas already defined, consisting of the Northeast Plume, Northwest Plume, and Southwest Plume.
- (7) A single RI/FS Work Plan will be developed, encompassing all components of the Dissolved-Phase Plume remedial action; however, the remedial investigations may be conducted separately, and the results may be reported in three separate RI Reports—(1) Northwest Plume Outside Fence Including Seeps, (2) Northeast Plume Outside Fence, and (3) Southwest Plume and Remaining Inside Fence.
- (8) In addition to the development and submittal of three separate RI Reports, three separate Feasibility Studies, Proposed Plans, RODs, Remedial Design Work Plans, Remedial Design Reports, Remedial Action Work Plans, and Remedial Action Completion Reports also may be developed and submitted for each subproject—(1) Northwest Plume Outside Fence Including Seeps, (2) Northeast Plume Outside Fence, and (3) Southwest Plume and Remaining Inside Fence.
- (9) Investigation and remediation of the seep areas along Little Bayou Creek will be addressed as part of the Dissolved-Phase Plume remedial action.

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, remedial investigations, 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 is planned to be evaluated as part of the C-400 RI/FS fieldwork.

Key DOE Planning Assumptions from Life Cycle Baseline

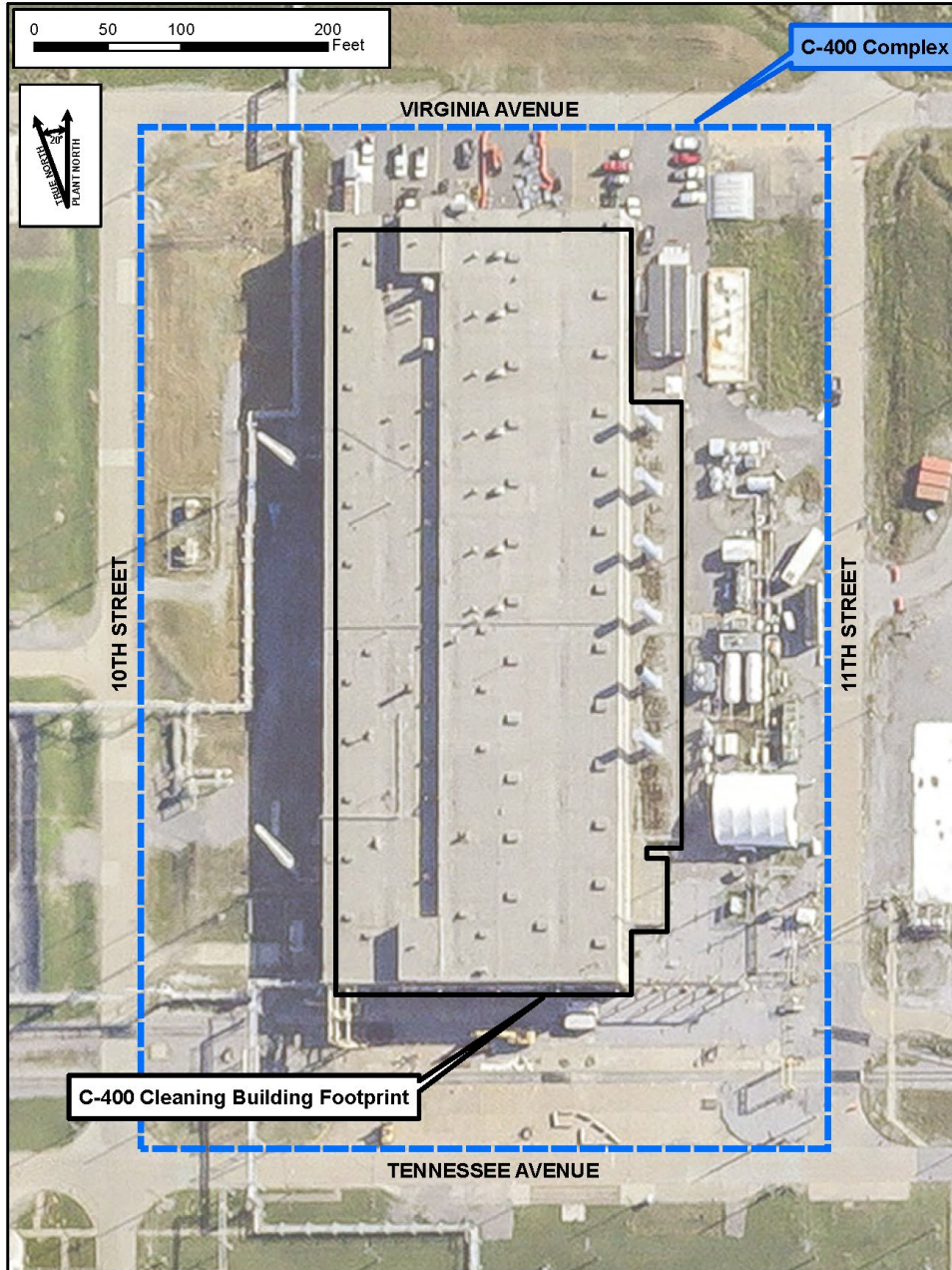
- (1) A site evaluation (SE) will be conducted to determine if additional unknown sources to groundwater contamination are present based on historical and current groundwater data, process knowledge, interviews, and other documentation that suggest a release to groundwater has occurred.
- (2) Conduct an RI and FS (including fieldwork) following completion of the SE for identified sources.
- (3) Complete the necessary CERCLA documents supporting remedy selection (e.g., Proposed Plan, Record of Decision) and remedial design.
- (4) Implementation of the final remedial action for the identified sources, which are planned for VOCs, radionuclides, and polychlorinated biphenyls (PCBs).

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 3.3. The southern side of Tennessee Avenue will be considered as the southern edge of the investigation area for membrane interface probe, dye-enhanced laser induced fluorescence, and/or contingency borings. If analytical, membrane interface probe, and/or dye-enhanced laser induced fluorescence results indicate TCE source zone contamination is present south of Tennessee Avenue, then the conceptual site model is suspect, and the FFA parties will discuss the path forward. This scope is defined to include building demolition, a RI/FS for the entire C-400 Complex, and final remedial action that includes 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 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 currently is in the field, and the report is expected to be 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.



G:\GIS\ARC\VIEW\PROJECTS\C-400\RI-FS\C400Complex.mxd
10/31/2018

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 3.3. C-400 Complex—Scope of Final Action

- Remedy selection (proposed plan and ROD) to document a final remedial action(s) for all source areas and COCs requiring remediation 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.

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 an 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 (NSDD) Disposal Trench (SWMU 145)
- C-746-S: Residential Landfill (SWMU 9)⁵
- C-746-T: Inert Landfill (SWMU 10)⁵

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.

This burial grounds project is grouped as follows: (1) SWMUs 5 and 6; (2) SWMUs 2, 3, 7, and 30; (3) SWMU 4; and (4) SWMUs 9, 10, and 145. To facilitate phased implementation of remedial action, SWMUs 2, 3, 7, and 30 will be divided further, and separate CERCLA documents (i.e., proposed plan, ROD, remedial design work plan, remedial design report, remedial action work plan, and remedial action completion report) will be developed for SWMUs 2 and 3 and SWMUs 7 and 30.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the BGOU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential on-site waste disposal facility (OSWDF). The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the waste disposal alternatives (WDA) project.
- (2) A supplemental RI and the associated RI Report Addendum will precede the SWMUs 9, 10, and 145 FS.
- (3) SWMU 2, SWMU 3, SWMU 4, and SWMU 7 contain PTW.
- (4) Soil cover (18-inch) is expected to be included in the remedy selected for SWMU 145.
- (5) SWMUs 5 and 6 are expected to implement a Kentucky Subtitle D cap if containment is selected as the final remedy.

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

- (6) SWMUs 7 and 30 are expected to implement a Kentucky Subtitle D cap if containment is selected as the final remedy.
- (7) SWMUs 9 and 10 will be evaluated as part of the CERCLA process. Currently only limited actions (e.g., continue current solid waste landfill closure activities) are assumed to be required in the baseline for SWMUs 9 and 10.
- (8) Post-closure monitoring data are assumed to substantiate that capping remedies will provide long-term effectiveness, and supplemental remedial actions will not be required.
- (9) A groundwater monitoring system at each SWMU (e.g., upgradient and downgradient) will be employed to provide indication of future unanticipated releases and collect data on the effectiveness of the caps and *in situ* actions.

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.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the BGOU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.
- (2) Conduct an RI and FS (including fieldwork) for SWMU 472 and SWMU 520.
- (3) Complete the necessary CERCLA documents supporting remedy selection (e.g., Proposed Plan, ROD) and remedial design.
- (4) It is assumed that these SWMUs are not contributing to groundwater contamination.
- (5) The assumed remedial action for these SWMUs is excavation and disposal in a potential OSWDF (if selected).

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 3.4. 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.

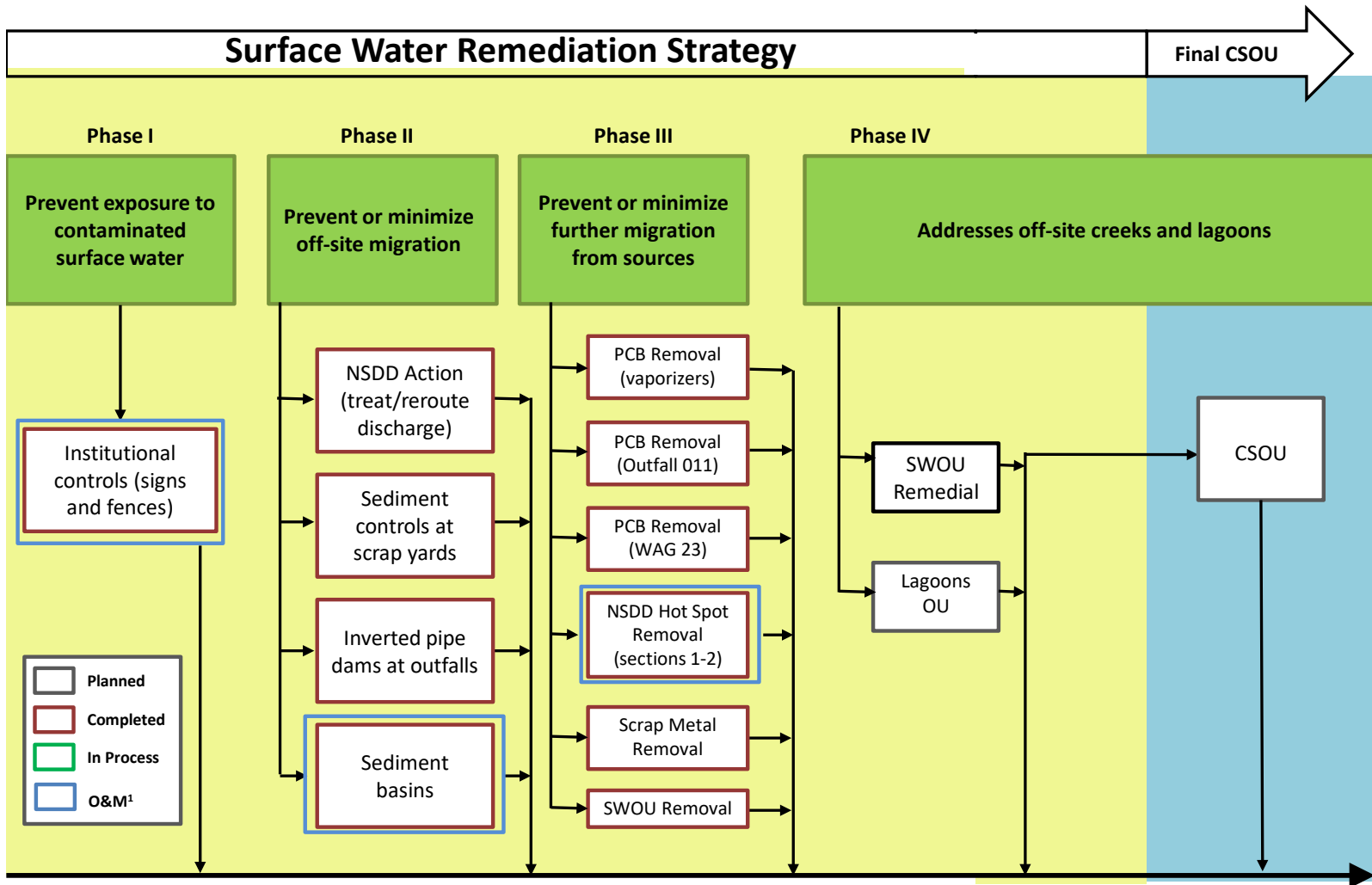
Surface Water Remedial Action

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 (DUF₆) 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 Lagoons OU.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the SWOU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.
- (2) RI characterization will be conducted in a phased approach, with uranium-238, cesium-137, and Total PCBs being used as indicator parameters during the first phase, and will be followed by a more comprehensive list of analyte sampling (i.e., PCBs, metals, radionuclides, and volatile organic analytes during the second phase to be used for risk assessment).



Ongoing environmental monitoring program and 5-year reviews, as appropriate

¹ Other than environmental monitoring

Figure 3.4. Surface Water Remediation Strategy

- (3) DOE's current baseline and budget assume that the use of existing data will be sufficient for final characterization; however, EPA and Kentucky have raised concerns, based upon the extended time frame for implementation of the RI and FS and the potential for changing site conditions as a result of plant activities, that the collection of additional samples is warranted. The FFA parties agree to revisit the scope of characterizing the internal ditches prior to implementation of the RI/FS Work Plan.⁶
- (4) Little Bayou Creek and Bayou Creek will be investigated to the confluence with the Ohio River.
- (5) Biota sampling will be required to support an ecological risk assessment for off-site portions of the SWOU.
- (6) The assumed remedial action is excavation of contaminated sediments in outfalls and creeks and will involve coordination with the U.S. Army Corps of Engineers. No operation and maintenance (O&M) period is assumed to be needed to achieve RAOs.
- (7) The RI/FS Work Plan is comprehensive, encompassing all components of the SWOU remedial action; however, the document is divided by watershed (Little Bayou Creek and Bayou Creek) to support independent execution of sampling and documentation of results by watershed.
- (8) A sitewide ecological risk assessment will be completed for both watersheds and included within the RI/FS Report.
- (9) Individual FSs, Proposed Plans, RODs, Remedial Design Work Plans, Remedial Design Reports, Remedial Action Work Plans, and Remedial Action Completion Reports may be developed and submitted per watershed.
- (10) Investigation and remediation of the seep areas along Little Bayou Creek will be addressed as part of the GWOU.

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, and preparation of required completion documentation.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the Lagoons OU have been resequenced to an out-year activity. The resequencing

⁶ Existing information for internal ditches will be used for characterization. Additional sampling will focus primarily on areas between the KPDES compliance points and drainage into Little Bayou Creek and Bayou Creek.

provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.

- (2) Radionuclides, metals, and PCBs are the primary COCs. Other COCs will be considered on a case-by-case basis.
- (3) RI characterization will be conducted for each lagoon to determine the individual contaminants or radionuclides of potential concern (COPCs).
- (4) The assumed remedial action is excavation of contaminated sediments in the lagoons and disposed in a potential OSWDF (if selected). The areas may be backfilled with clean soil or graded for natural sloping and runoff, depending on the verification sampling results. No O&M period is assumed to be needed to achieve RAOs.
- (5) The RI/FS Work Plan is comprehensive, encompassing all components of the remedial action.
- (6) The RI data will support the sitewide ecological risk assessment conducted as part of the SWOU Remedial Action.
- (7) Complete the necessary CERCLA documents supporting remedy selection (e.g., Proposed Plan, ROD) and remedial design.
- (8) The OU may be divided further into OUs for the C-616-E and C-616-F Lagoons and the C-611 Water Treatment Plant Lagoons due to the timing of shutdown for the two systems being independent of each other. The outfalls formerly under this OU have been moved and will be addressed as part of the SWOU Remedial Action.

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.

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 3.5). 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, and implementation of any necessary response actions for the 63 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 SWOU.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the Soils OU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.
- (2) SWMU 27 was sampled as part of Soils RI. Based upon the sampling results, the contents of the tank were removed to the extent practicable and disposed of in accordance with the approved Time-Critical Removal Notification. A remedial decision for SWMU 27 will be selected as part of the Soils and Slabs OU.
- (3) SWMUs requiring action will be evaluated in multiple FSs that will focus on the following likely response actions: no action, institutional controls, and excavation. Individual Proposed Plans, RODs, Remedial Design Work Plans, Remedial Design Reports, Remedial Action Work Plans, and Remedial Action Completion Reports may be developed and submitted per grouping. It is currently anticipated that the Soils Remedial Action may be divided into two groupings based upon investigation results. Once the RI data are evaluated, the proposed two groupings may be combined or divided further.
- (4) Targeted excavation to a depth of 10 ft below ground surface is the assumed remedy with the majority of the waste being placed in a potential OSWDF (if selected).

Soils OU Removal Action

Scope

This project is contingent upon new sampling results of the RI or newly identified release information for the Soils OU Remedial Action. Scope will include addressing any of the Soils OU SWMUs/AOCs that warrant a removal action. SWMU 27 was the only soil SWMU/AOC that had been identified that required removal action. The following assumptions will remain for project planning purposes should additional soil removal actions be required in the future.

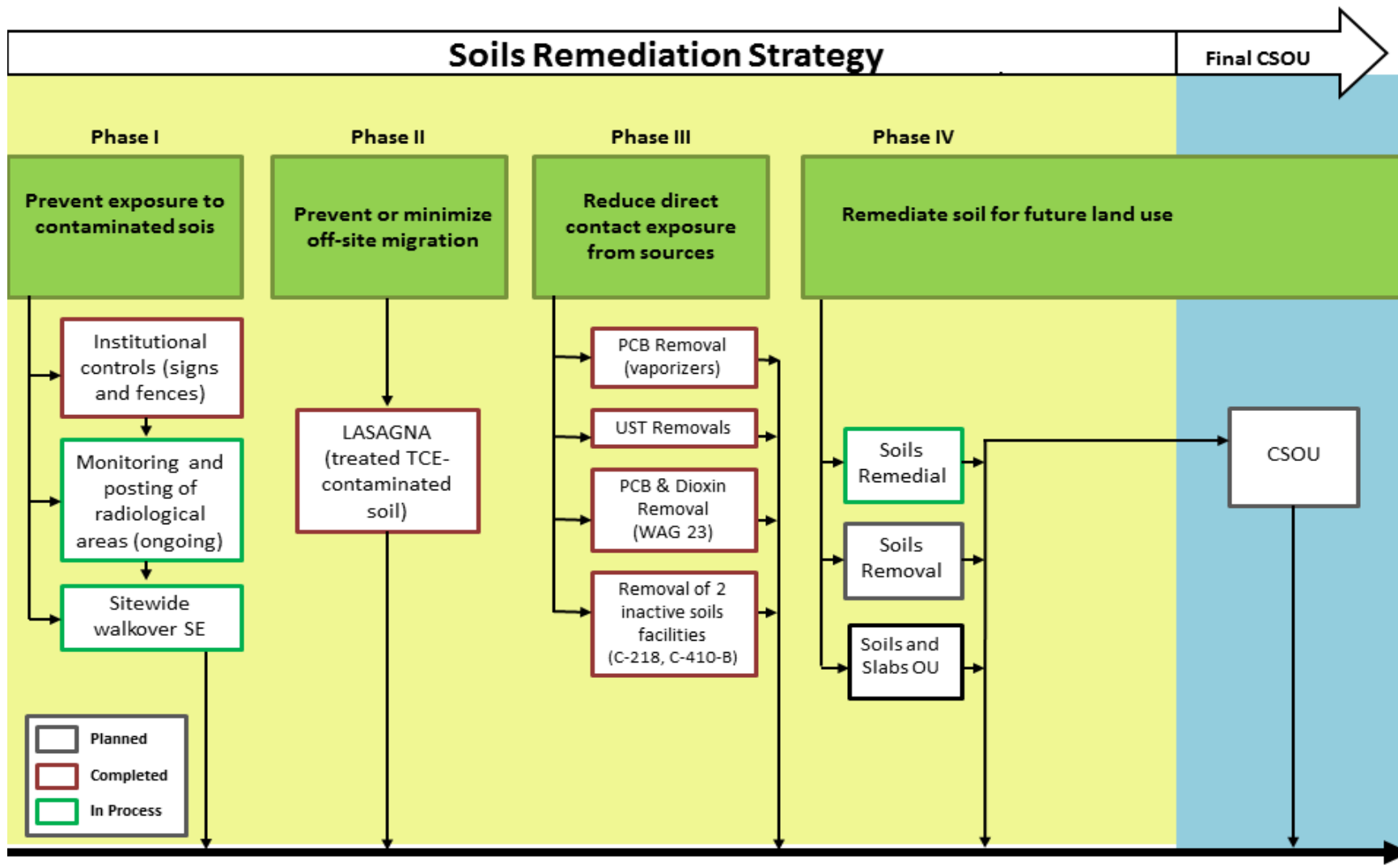


Figure 3.5. Soils Remediation Strategy

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) A single engineering evaluation/cost analysis and Action Memorandum will be developed and submitted for those SWMUs requiring removal action.
- (2) Separate Removal Action Reports may be developed.
- (3) A time-critical removal action is not warranted.

SOILS AND SLABS OPERABLE UNIT

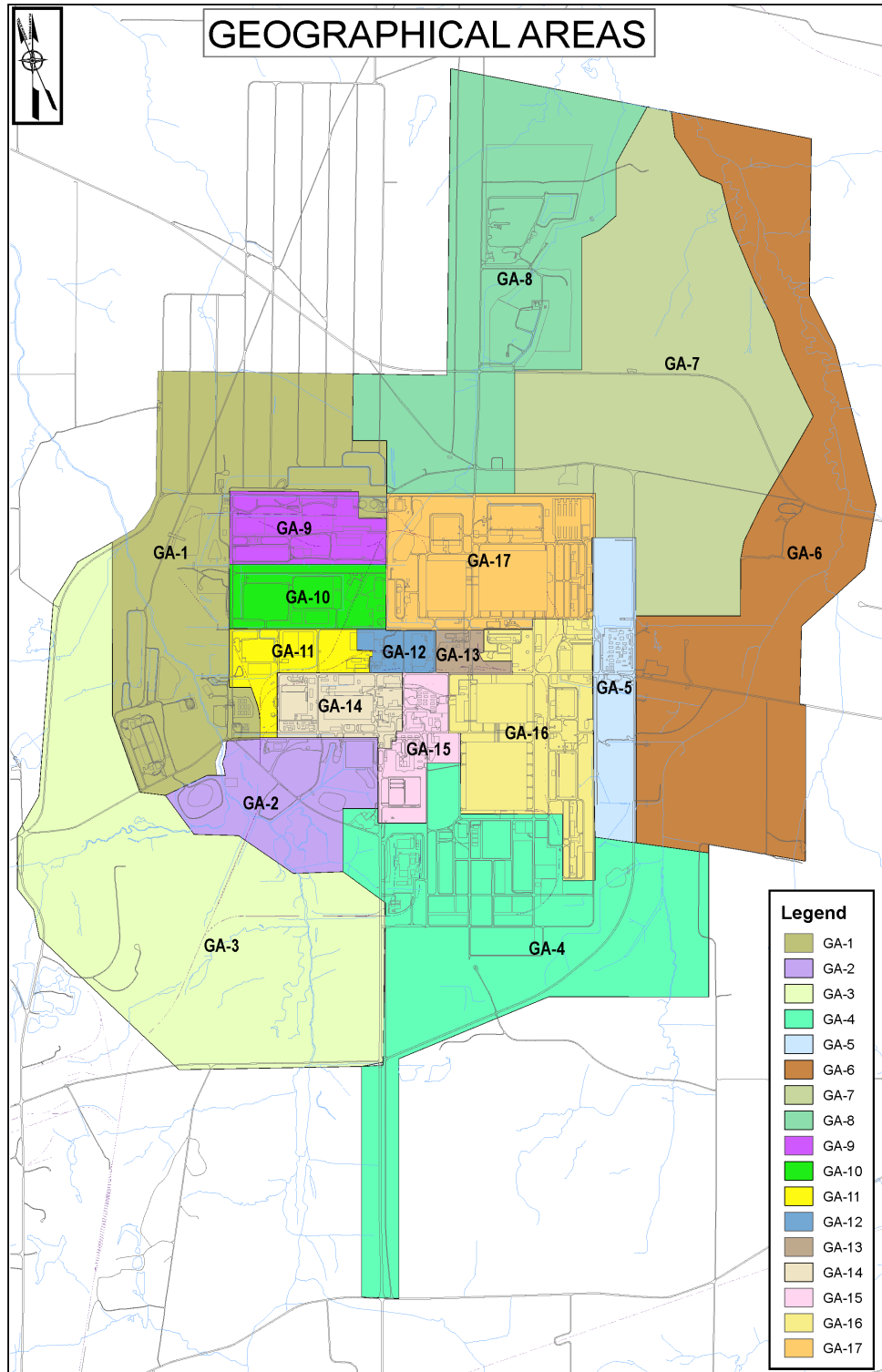
Scope

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, and preparation of required completion closure documentation. Each unit in this OU will be evaluated through the CERCLA process. This OU will be segregated into multiple subprojects. The combination and number of units within each will be defined prior to implementation to take advantage of opportunities that may arise to address a limited subset of units.

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 3.6). GAs are boundaries established for the purpose of planning and evaluating areas for future use, deactivation and decommissioning, 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. As a result, there are no planning documents expected for GAs 6, 7, and 8. Figure 3.6 also includes five sites that have been considered for a potential on-site waste disposal facility (Site 1, 5A, 3A, 9, 11). These have been included for reference purposes only. 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 within their applicable GA as part of the Soils and Slab OU.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the Soils and Slabs OU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.
- (2) Radionuclides, metals, VOCs, and PCBs are the primary COCs. Other COCs will be considered on a case-by-case basis, based on process knowledge.



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

Figure 3.6. DOE Property Geographical Areas

- (3) The SWMUs that require an RI will be evaluated in multiple FSs that will focus on the following likely response actions: no action, institutional controls, and excavation. Additional SWMUs may be identified as facilities are demolished, based on analytical data of the slab and/or surrounding soils or process knowledge that there was a release or high probability of release that would have impacted the soils around or under the slab. SEs will be conducted for those GAs where there has been a known or potential threat of release.
- (4) RI characterization will be conducted to identify the individual COPCs.
- (5) The assumed remedial action is excavation of contaminated soils and slab and disposed in a potential OSWDF (if selected). The assumption includes soils within 3 ft of the slab perimeter and extending to a depth of 10 ft below slab. The areas may be backfilled with clean soil or graded for natural sloping and runoff, depending on the verification sampling results. No O&M period is assumed to be needed to achieve RAOs.
- (6) The RI/FS Work Plan is comprehensive, encompassing all components of the remedial action.
- (7) Complete the necessary CERCLA documents supporting remedy selection (e.g., Proposed Plan, ROD) and remedial design.
- (8) The baseline assumption for the CERCLA remedial action scope for GAs includes identified SWMUs/AOCs in the Soils and Slabs OU and facility slabs and associated soils where there was a potential threat of release. The results of the SE and scoping will determine the appropriate CERCLA action; however, for planning purposes, the RI and FS process through Remedial Action Completion is assumed for GAs, except for GA 6, GA 7, and GA 8. GA 7 does not have facilities or currently identified SWMU/AOCs completely within the GA; therefore, no planning documents are included. GA 6 and GA 8 include a few facilities that are not expected to have any requirements for CERCLA evaluation and discrete SWMUs/AOCs that are covered by other OUs; therefore, no planning documents are included. 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.
- (9) 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 their appropriate GA or OU. Facilities to be removed outside of CERCLA, according to the provisions agreed to in the consultations packages, are listed in Table 3.1. Additionally, facilities identified in the Facility D&D OU with SE Reports that recommend the facility be removed outside of CERCLA and concurred on or pending concurrence by EPA and KY, are included in Table 3.1.

Table 3.1. Facilities to Be Removed 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-205	Respirator Issue Facility	11/9/2021	N/A	Evaluation in GA 14

Table 3.1. Facilities to Be Removed Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
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-301	Former Fire Training Building	11/9/2021	N/A	CERCLA evaluation (as part of SWMU 223) conducted under the Soils and Slabs Operable Unit
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)
C-400-A	Shed	5/11/2020	N/A	Evaluation as part of the C-400 Remedial Field Investigation
C-410-D	Fluorine Storage Building	3/4/2021	N/A	Evaluation in GA 13
C-410-K	Fluorine Facility	3/4/2021	N/A	Evaluation in GA 13
C-410-L	Quonset Hut	3/4/2021	N/A	Evaluation in GA 13
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	8/9/2021	SE Report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-A1	Activated Carbon Storage Facility	N/A	8/9/2021	NFA (pending concurrence by EPA and KY)
C-611-B	Head House	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-B1	Polymer Feed System Enclosure	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-C	Flocculator Basin	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-F1	Secondary Coagulation Basin	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)

Table 3.1. Facilities to Be Removed Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-611-F2	Secondary Coagulation Basin	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-F3	Feed Facility	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-H	Filter Building and Pump Station	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-J	Pump House (Settled Water)	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-P	Building—Pump House	N/A	8/26/2021	NFA (concurrence by EPA 9/21/2021; KY 9/21/2021)
C-611-Q	36" Raw Water Line Booster Station	3/24/2021	N/A	Evaluation in GA 8
C-611-S	Storage and Chlorine Facility	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-T	Booster Pump Station Plant Water	N/A	8/26/2021	NFA (concurrence by EPA 9/21/2021; KY 9/21/2021)
C-611-U	Softening Facility (West)	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-X	Softening Facility (East)	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
C-611-Z	Flocculator Basin	N/A	8/9/2021	SE report requires RCRA facility investigation (CERCLA RI) for slab and underlying soils. (pending concurrence by EPA and KY)
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-615-O	Oil Control Building	3/24/2021	N/A	Evaluation in GA 11
C-635-6	Recirculating Heat Utilization Pump House	7/16/2021	N/A	Evaluation in GA 17
C-710-A	Gas Cylinder Storage Building	3/4/2021	N/A	Evaluation in GA 15

Table 3.1. Facilities to Be Removed Outside of CERCLA (Continued)

Facility	Description	Date of Consultation Concurrence	Date of SE Report	Conclusion for Slab and Underlying Soils
C-711	Storage/Former Gas Manifold	3/4/2021	N/A	Evaluation in GA 15
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-721	Gas Manifold Storage	3/4/2021	N/A	SE for the underlying slab and soils*
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-727	90-Day Mixed Waste Accumulation Facility	5/25/2021	N/A	Evaluation in GA 16
C-729	Acetylene Building	N/A	2/18/2021	NFA (concurrence by EPA 3/10/2021; KY 3/18/2021)
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-742	Cylinder Storage Building	7/13/2021	N/A	Evaluation in GA 14
C-742-B	Dry Agent Cylinder Storage Building	5/11/2020	N/A	Evaluation in GA 10
C-744	Material Handling Building	N/A	2/18/2021	NFA (concurrence by EPA 3/10/2021; KY 3/18/2021)
C-745-B1	Cylinder Storage Yard Office	2/7/2020	N/A	Evaluation in GA 10
C-745-R1	Cylinder Changeout Building	7/16/2021	N/A	Evaluation in GA 4
C-746-A	North Warehouse	5/25/2021	N/A	Evaluation in GA 9
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)
C-752-C	Off-site** Decontamination Facility	10/19/2021	N/A	Evaluation in GA 2; SAR 419 revision
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 3.1.

**"Off-site" relates to the name of the facility and is not intended to imply a CERCLA off-site determination.

- (10) Settling basins (e.g., C-611-D, C-611-E, C-611-F, and C-611-G) are in-ground basins (i.e., not an unlined lagoon); these units will be addressed by their appropriate GA or OU. Additionally, C-611-I, a clear well, will be addressed in its appropriate GA or OU.
- (11) In general, aboveground portions of sewage lift stations (e.g., C-615-G, C-615-H1, C-615-H2, C-615-H3, etc.) are operational control panels associated with underground piping and are not facilities. The underground portion of the sewage lift stations will be addressed by their appropriate GA or OU.

FACILITY D&D OPERABLE UNIT

For the Facility Decontamination and Decommissioning (D&D) 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*. Disposition of the GDP consists of two phases: 1) the DOE facilities that were inactive and scheduled for D&D Pre-GDP shutdown, and 2) the facilities previously leased to USEC and/or other DOE facilities planned for D&D after shutdown of the GDP. As part of the lease turnover requirements, USEC (1) shutdown the GDP properly; (2) performed limited deactivation of the USEC leased operations; (3) placed the leased operations into a safe, secure condition and removed any immediate threats to human health and safety; (4) removed all USEC waste, including any hazardous waste; and (5) removed USEC-owned property not accepted by DOE under the terms of the lease turnover.

D&D PRE-GDP SHUTDOWN (Formerly Referenced as Pre-GDP Shutdown Operable Unit)

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 D&D 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).

REMAINING D&D

DOE is proceeding with deactivation work of the remaining facilities not operating to support DOE site activities. The joint policy issued under a DOE and EPA Memorandum dated May 22, 1995, *Policy on Decommissioning DOE Facilities under CERCLA*, establishes a framework for conducting of decommissioning of DOE facilities and provides guidance to EPA Regions and DOE Operations Offices on the use of CERCLA response authority to decommission DOE facilities. Key elements of the Policy provide for the following:

- DOE to conduct CERCLA removal SEs to determine whether a substantial threat of a release exists that warrants a CERCLA NTCRA to protect public health, welfare, or the environment, unless the circumstances at the facilities make in inappropriate;
- DOE to consult with EPA in attempt to reach consensus on decisions regarding the use of CERCLA response actions; and
- Conducting demolition of facilities that pose a substantial release threat as CERCLA NTCRA.

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 purposes of implementing this OU strategy, the “facilities” DOE will evaluate for inclusion in the Facility D&D OU will consist of those permanent structures supported by a concrete slab and/or foundation that have a history of industrial operations. To support this process, 681 DOE properties/structures listed on the PGDP Site Map (Rev. 6) were reviewed and underwent an evaluation to identify those properties/structures that met the above definition of “facilities” [See Appendix 8 (FY 2018/FY 2019 SMP)]. The following categories were established as a result of the evaluation.

- Industrial Facilities that DOE has determined pose a potential threat of release of hazardous substances to the environment that warrant demolition or a removal SE. These facilities are listed as part of the Facility D&D OU in Appendix 4.
- Administrative, nonindustrial, support facilities that have no potential for release and are not subject to a CERCLA response action under the FFA.
- Balance of Plant Facilities are those facilities that 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 3.1.

For those facilities that require a CERCLA response action, NTCRAs will be utilized for demolition, where warranted.⁷

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 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.

Administrative, nonindustrial support facilities have been identified as having no potential for release. Consequently, these administrative, nonindustrial support facilities will not be included as part of the Facility D&D OU scope. DOE reviewed and evaluated the historical and current information to support the conclusion that these facilities do not pose a threat of release. DOE has documented those facilities and relevant information (e.g., description, historical and current use, year constructed) in a listing that has been placed into the administrative record file via the FY 2018/FY 2019 SMP as Appendix 8. These facilities will not be decommissioned under CERCLA. DOE will complete demolition of these administrative/support facilities under applicable laws, regulations, and DOE requirements. As agreed to by the FFA parties, no further consultation with the agencies under the FFA will be conducted for these facilities.

⁷ The Facility D&D OU will employ the CERCLA removal action process to administer decommissioning activities of excess buildings (i.e., inactive with no reuse potential) that have a known or potential release of contamination to the environment. The 1995 DOE and EPA “Memorandum: Policy on Decommissioning DOE Facilities under CERCLA,” establishes that decommissioning activities will be conducted as NTCRAs, unless the circumstances at the facilities make it inappropriate.

Because DOE is in the early stages of deactivation, the listing and categorization in the appendices will be updated to reflect the current status and information with each SMP update. For planning purposes, the Facility D&D OU is using the same geographical divisions described in the Soils and Slabs OU to plan and group the actions that will address the balance of plant facilities determined to be in the Facility D&D OU.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the Facility D&D OU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.
- (2) Radionuclides, metals, and PCBs are the primary COCs. Other COCs will be considered on a case-by-case basis based on process knowledge.
- (3) An SE will be conducted for facilities in Appendix 4 within 120 days from completion of deactivation for each facility (or other time frame agreed to by the FFA parties).
- (4) CERCLA NTCRAs will be conducted for Appendix 4 facilities that already have been designated for demolition down to slab (and/or subsurface structure, as applicable). Contaminated slabs and associated underlying soils will be incorporated into the Soils and Slabs OU. Waste will be dispositioned in either a potential OSWDF (if selected) or non-CERCLA disposal facility.

Similarly, waste from Appendix 3 facilities (i.e., facilities listed in Table 3.1) that are dispositioned under CERCLA will be disposed in a potential OSWDF (if selected) or non-CERCLA disposal facility. Waste from Appendix 3 facilities (i.e., facilities listed in Table 3.1) that are not dispositioned under CERCLA will be disposed in a non-CERCLA disposal facility as the most cost effective option.

- (5) For certain facilities, consideration will be given to coordinate the timing of a SE for the underlying slab and soils to occur prior to the removal of the aboveground structure. These future SEs are to be performed in concert with the deactivation of the facility (with the SE report being submitted 120 days after completion of deactivation unless otherwise agreed to by the FFA parties).
- (6) Administrative, nonindustrial support facilities will not undergo demolition under CERCLA; however, these facilities will be demolished and dispositioned under applicable laws, regulations, and DOE requirements. Facility waste will be disposed of in non-CERCLA disposal facility as the most cost-effective option.
- (7) The CERCLA scope for GAs will include only those facilities that have been determined to pose a potential threat of release. GA 1, GA 10, GA 13, and GA 14 currently are the only ones that include facilities where a potential threat of release during demolition has been determined. The remaining GAs plus Buildings C-750 and C-360 have not undergone deactivation, and evaluations are currently ongoing. GA 3, GA 6, and GA 7 do not have facilities that are expected to have any requirements for CERCLA evaluation. GA 8 includes only C-746-U Landfill support buildings determined not to pose a threat of release, and the buildings will be completed with the landfill closure activities.

DUF₆ FOOTPRINT UNDERLYING SOILS OPERABLE UNIT

Scope

This OU includes the units identified in Appendix 4 under DUF₆ Footprint Underlying Soils OU. This OU currently has 5 SWMUs that are located beneath or immediately adjacent to the DUF₆ facility. These units existed prior to construction of the DUF₆ 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 DUF₆ facility. The project is planned to occur after D&D of DUF₆ 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 DUF₆ OU and the follow-on CSOU. The current baseline estimates that all cylinders at the Paducah Site will be processed by the end of 2050; however, uncertainty remains as to whether other cylinders that DOE is responsible for (additional cylinders that might be sent to Paducah for processing) will impact the DUF₆ facility completion date. Delays in completing the cylinder processing scope could have a potential effect on completion of overall Paducah Site cleanup by 2065.

The project scope includes the management, planning, assessments, CERCLA documents, RIs, final remedial actions per an approved ROD, and preparation of required completion closure documentation. Each unit in this OU will be evaluated through the CERCLA process.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, finalization of the decision documents and implementation of any necessary CERCLA response actions for the DUF₆ OU have been resequenced to an out-year activity. The resequencing provides for any excavation activities (if that alternative is selected) to coincide with availability of a potential OSWDF. The resequencing also assumes the OSWDF alternative would be identified and selected as the preferred alternative under the WDA project.
- (2) The RI investigation for this OU will be sequenced and scheduled for implementation after the DUF₆ facility has ceased operation and undergone D&D.
- (3) Radionuclides, metals, VOCs, and PCBs are the primary COPCs. Other COPCs will be considered on a case-by-case basis, based on process knowledge.
- (4) The RI/FS Work Plan is comprehensive, encompassing all components of the remedial action.
- (5) Complete the necessary CERCLA documents supporting remedy selection (e.g., FS, Proposed Plan, ROD) and remedial design.
- (6) The assumed remedial action is excavation of contaminated soils and slab media and disposed in a potential OSWDF (if selected). The areas may be backfilled with clean soil or graded for natural sloping and runoff, depending on the verification sampling results. No O&M period is assumed to be needed to achieve RAOs.

FINAL COMPREHENSIVE SITE OPERABLE UNIT⁸

The final CSOU evaluation will occur following completion of the Facility D&D OU, Soils and Slabs OU, completion of the DUF₆ Footprint Underlying Soils 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 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.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) 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.
- (2) The FFA parties will reevaluate residual risk for the Paducah Site as part of 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 removal and remedial actions for all of the OUs. 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.

⁸ 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.

Key DOE Planning Assumptions from Life Cycle Baseline

- (1) Based on DOE's recent reprioritization and proposal to focus near-term cleanup efforts on the C-400 Complex, preparation/finalization of the decision documents (i.e., Proposed Plan, ROD) and construction of any OSWDF (if selected as the preferred option under the WDA project) have been resequenced to an out-year activity to coincide with the timing of when waste generation from decommissioning of GDP facilities and remediation of the burial grounds is projected to occur.
- (2) A revised D1 RI/FS Report will be issued with updated information on waste types and volumes and other related data pertinent to remedy selection. Assumed waste types include the following categories: low-level waste (LLW), Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), LLW/RCRA, LLW/TSCA, LLW/RCRA/TSCA, classified wastes, asbestos containing materials, and nonhazardous solid.
- (3) A potential OSWDF (if selected) will not accept transuranic waste or waste from facilities other than PGDP.
- (4) The DUF₆ facility will not be disposed of in the OSWDF (if selected); however, any contamination in the previously defined SWMUs/AOCs that lie beneath the DUF₆ facility will be placed in the OSWDF (if selected).
- (5) Implementation of the ROD⁹ may require resequencing of other site work.
- (6) Final waste acceptance criteria will be defined during the post-ROD design phase.
- (7) The project will fulfill the requirements of the *Memorandum of Agreement for Resolution of the Formal Dispute for the Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0244&D2, February 8, 2017, and the *Memorandum of Agreement for Resolution of Formal Dispute of the Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0244&D2, February 27, 2018.

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 Per- and Polyfluoroalkyl Substances (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

⁹ Regulatory expectations are that sufficient design and waste acceptance criteria information will be available to support the ROD.

PFAS as a sitewide emergent contaminant issue to document a sitewide Paducah Site PFAS Site Evaluation 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 with discussion of sampling strategy in FY 2022.

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APPENDIX 4

SOURCE AREA BY OPERABLE UNIT

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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 D&D	Other	C-400 Building [building foundation (i.e., slab) will remain in place]	
	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) ¹⁰
			61	C-375-E5 Effluent Ditch (KPDES 013) ¹⁰
			62	C-375-S6 SW Ditch (KPDES 009) ¹⁰
			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

¹⁰ 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 (PGDP) 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 (SAP) 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.

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

SURFACE WATER (CONTINUED)					
Operable Unit	Subproject		SWMU No.	Description	
SWOU	Removal Action	SWOU Remedial Action	97	C-601 Diesel Spill	
			102B	Plant Storm Sewer associated with C-333-A, C-337-A, C-340, C-535, and C-537 ¹⁰	
			168	KPDES Outfall Ditch 012 ¹⁰	
			526	Internal Plant Drainage Ditches (includes KPDES 016) ¹¹	
	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)	
	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	

¹¹ Kentucky Pollutant Discharge Elimination System (KPDES) Outfall 016, in its entirety, will be addressed as part of the SWOU Remedial Investigation.

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 ¹²
		14	C-746-E Contaminated Scrap Yard
		15	C-746-C Scrap Yard ¹²
		19	C-410-B HF Neutralization Lagoon
		26	C-400 to C-404 Underground Transfer Line ¹²
		56	C-540-A PCB Waste Staging Area ^{12, 13}
		57	C-541-A PCB Waste Staging Area ¹³
		76	C-632-B Sulfuric Acid Storage Tank
		77	C-634-B Sulfuric Acid Storage Tank ^{12, 14}
		80	C-540-A PCB Spill Site ¹²
		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 (Southside)
		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 ¹²
		211 A	C-720 TCE Spill Site Northeast ¹²
		212	C-745-A Radiological Contamination Area
		213	OS-02
		214	OS-03
215	OS-04		
216	OS-05		
217	OS-06		
219	OS-08		
221	OS-10		
222	OS-11		
224	OS-13 ³		
225A	OS-14 ³		

¹² These SWMUs/areas of concern (AOCs) were evaluated under Soils OU RI 2 and will be addressed by a subsequent Soils OU feasibility study.

¹³ SWMUs 56 and 57 are located within, and will be addressed as part of, SWMUs 80 and 81, respectively.

¹⁴ 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.

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 ¹²
		227	OS-16
		228	OS-17
		229	OS-18 ¹²
		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) ¹²		
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

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 slab and underlying soils
		87	C-633 Pumphouse and Cooling Tower slab and underlying soils
		88	C-635 Pumphouse and Cooling Tower slab and underlying 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.

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 Slab and Underlying Soils		
573	C-750 Garage Slab and Underlying Soils and Associated Outside Areas		
DECONTAMINATION AND DECOMMISSIONING			
Facility D&D OU	Remaining D&D	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 D&D 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
		86*	C-631 Pumphouse and Cooling Tower
		87*	C-633 Pumphouse and Cooling Tower
		88*	C-635 Pumphouse and Cooling Tower
		89*	C-637 Pumphouse and Cooling Tower
		172*	C-726 Sandblasting Facility
		482*	C-415 Feed Plant Storage Building
		572*	C-360 Toll Transfer and Sampling Building

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

DECONTAMINATION AND DECOMMISSIONING (CONTINUED)			
Facility D&D OU (Continued)	Remaining D&D (Continued)	Other Buildings (non-SWMUs)	See Table "Detailed Facility D&D OU Facilities List." Process Building tie-lines and bridges will be included with the appropriate process building.
DUF₆ FOOTPRINT UNDERLYING SOILS			
DUF ₆ Footprint Underlying Soils OU		164	KPDES Outfall Ditch 017 Flume - Soil Backfill
		183	McGraw UST
		193	McGraw Construction Facilities (Southside Cylinder Yards)
		194	McGraw Construction Facilities (Southside)
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 ¹⁹		Fire Training Area
PERMITTED			
Permitted	SWMU No.		Description
	3		C-404 Low-Level Radioactive Waste Burial Ground ²⁰
	9		C-746-S Residential Landfill
	10		C-746-T Inert Landfill
	44		C-733 Hazardous Waste Storage Area
	46A		C-746-Q Hazardous and Low-Level Mixed Waste Storage Facility ²¹
	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 Groundwater contamination associated with SWMU 100 is under evaluation by EPA in response to EPA's CY 2018 Five-Year Review independent assessment.

²⁰ SWMU 3 was issued only a post-closure permit, was not permitted for construction and operation, and was not an engineered hazardous waste landfill.

²¹ The C-746-Q Facility also includes C-746-Q1.

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

NO FURTHER ACTION²²		
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
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 ²³	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

²² 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.

²³ Radiological contamination associated with the sump in this unit will be addressed under the D&D program for the C-409 Stabilization Building.

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-720 Petroleum Naphtha Pipe	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
102A	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

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

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	C-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	C-611-U-01	KDWM 3/8/2007
397	G-612-01	KDWM 3/8/2007
398	G-612-02	KDWM 3/8/2007

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 2/14/2003
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	G-752-C-01	KDWM 8/28/2007
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 11/23/2004
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

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) 12/4/2007
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/SAA's located outside C-746-A)	KDWM 1/28/2004

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/SAs 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 3/28/2007
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 ENGINEERS²⁴	
95	KOW Burn Area

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
 CSOU = Comprehensive Site Operable Unit
 D&D = decontamination 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
 OU = operable unit
 PCB = polychlorinated biphenyl
 PGDP = Paducah Gaseous Diffusion Plant
 RCW = recirculating cooling water
 ROD = record of decision
 SAA = satellite accumulation area
 SAP = Sampling and Analysis Plan
 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

²⁴ 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.

Detailed Facility D&D 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	--	Deactivating	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	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	Yes
C-600	Steam Plant	--	Operating	No	Pending SE
Switchyards					
C-531-1	Switch House ²⁵	82	Standby	8/24/1987	Yes
C-531-2	Switchyard ²⁵	82	Standby	8/24/1987	Yes
C-531-3A	Fire Valve House No. 1 ²⁵	82	Standby	8/24/1987	Yes
C-531-3B	Fire Valve House No. 2 ²⁵	82	Standby	8/24/1987	Yes
C-532	Relay House ²⁵	82	Standby	8/24/1987	Yes
C-533-1	Switch House ²⁶	83	Standby	8/24/1987	Yes
C-533-2	Switchyard	83	Deactivating	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

²⁵ The C-531 Switchyard and associated support facilities were placed in “Standby” with the new TVA Substation (C-538 Substation) construction complete.

²⁶ 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.

Detailed Facility D&D OU Facilities List (Continued)

Facility Number	Description	SWMU/AOC Number	Facility Status	Integrated Site Evaluation (SE) Complete	CERCLA NTCRA Required
Switchyards (Continued)					
C-535-1	Switch House	84	Shutdown	8/24/1987	Yes
C-535-2	Switchyard	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) ²⁶	84	Standby	8/24/1987	Yes
C-536	Relay House	84	Shutdown	8/24/1987	Yes
C-537-1	Switch House	85	Shutdown	8/24/1987	Yes
C-537-2	Switchyard	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 ²⁵	83	Standby	8/24/1987	Yes
C-541-A	Oil Pump House ²⁶	84	Standby	8/24/1987	Yes
Cooling Towers					
C-631-1	Pump House	86	Operating	8/24/1987	Yes
C-631-2	Cooling Tower	86	Operating	8/24/1987	Yes
C-631-3	Fire Water Pump House	86	Operating	8/24/1987	Yes
C-631-4	Blending Pump House	86	Shutdown	8/24/1987	Yes
C-631-5	Blending Cooling Tower (West) ²⁶	86	Standby	8/24/1987	Yes
C-631-6	Blending Cooling Tower (East) ²⁶	86	Standby	8/24/1987	Yes
C-633-1	Pump House	87	Shutdown	8/24/1987	Yes
C-633-2A	Cooling Tower (South) ²⁶	87	Standby	8/24/1987	Yes
C-633-2B	Cooling Tower (North) ²⁶	87	Standby	8/24/1987	Yes
C-633-3	Blending Pump House	87	Shutdown	8/24/1987	Yes
C-633-4	Blending Cooling Tower (North) ²⁶	87	Standby	8/24/1987	Yes
C-633-5	Blending Cooling Tower (South) ²⁶	87	Standby	8/24/1987	Yes
C-633-6	Sand Filter Building	87	Shutdown	8/24/1987	Yes
C-635-1	Pump House	88	Shutdown	8/24/1987	Yes
C-635-2	Cooling Tower ²⁶	88	Standby	8/24/1987	Yes
C-635-3	Blending Pump House	88	Shutdown	8/24/1987	Yes
C-635-4	Blending Cooling Tower (North) ²⁶	88	Standby	8/24/1987	Yes
C-635-5	Blending Cooling Tower (South) ²⁶	88	Standby	8/24/1987	Yes
C-637-1	Pump House	89	Shutdown	8/24/1987	Yes
C-637-2A	Cooling Tower (South) ²⁶	89	Standby	8/24/1987	Yes
C-637-2B	Cooling Tower (North) ²⁶	89	Standby	8/24/1987	Yes
C-637-3	Blending Pump House	89	Shutdown	8/24/1987	Yes
C-637-4	Blending Cooling Tower (North) ²⁶	89	Standby	8/24/1987	Yes
C-637-5	Blending Cooling Tower (South) ²⁶	89	Standby	8/24/1987	Yes
C-637-6	Sand Filter Building	89	Shutdown	8/24/1987	Yes
Phosphate (Former Chromate) Reduction System Facilities					
C-616-A	Chemical Feed Building	42	Operating	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

Detailed Facility D&D OU Facilities List (Continued)

Facility Number	Description	SWMU/AOC Number	Facility Status	Integrated Site Evaluation (SE) Complete	CERCLA NTCRA Required
Phosphate (Former Chromate) Reduction System Facilities (Continued)					
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	Operating	12/18/1991	Yes
C-616-L	Effluent Control Vault	42	Operating	12/18/1991	Yes
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	8/9/2021 ²⁷	No ²⁸
C-611-A1	Activated Carbon Storage Facility		Operating	8/9/2021 ²⁷	No
C-611-B	Head House	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-B1	Polymer Feed System Enclosure	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-C	Flocculator Basin	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-F1	Secondary Coagulation Basin	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-F2	Chemical Feed Building for C-611-F1		Operating	8/9/2021 ²⁷	No ²⁸
C-611-F3	Feed Facility		Operating	8/9/2021 ²⁷	No ²⁸
C-611-H	Filter Building and Pump Station	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-J	Pump House (Settled Water)	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-P	Building – Pump House	--	Standby	8/26/2021	No
C-611-S	Storage and Chlorine Facility		Operating	8/9/2021 ²⁷	No ²⁸
C-611-T	Booster Pump Station Plant Water ²⁹	--	Standby	8/26/2021 ²⁷	No
C-611-U	Softening Facility (West)	--	Standby	8/9/2021 ²⁷	No ²⁸
C-611-X	Softening Facility (East)	--	Operating	8/9/2021 ²⁷	No ²⁸
C-611-Z	Flocculator Basin	--	Operating	8/9/2021 ²⁷	No ²⁸
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

²⁷ Pending review/approval by EPA and KY.

²⁸ 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.

²⁹ 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.

Detailed Facility D&D OU Facilities List (Continued)

Facility Number	Description	SWMU/AOC Number	Facility Status	Integrated Site Evaluation (SE) Complete	CERCLA NTCRA Required
Process Laboratory and Maintenance Facilities (Continued)					
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 ³⁰
C-726	Sandblast Building	172	Standby	10/29/1992	Yes
C-728	Motor Cleaning Facility	33	Operating	6/2/2015	Yes
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 ³⁰

AOC = area of concern

D&D = Decontamination 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.

Deactivation Complete—Awaiting decommissioning.

³⁰ 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.

APPENDIX 5

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

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Operable Unit Sequencing

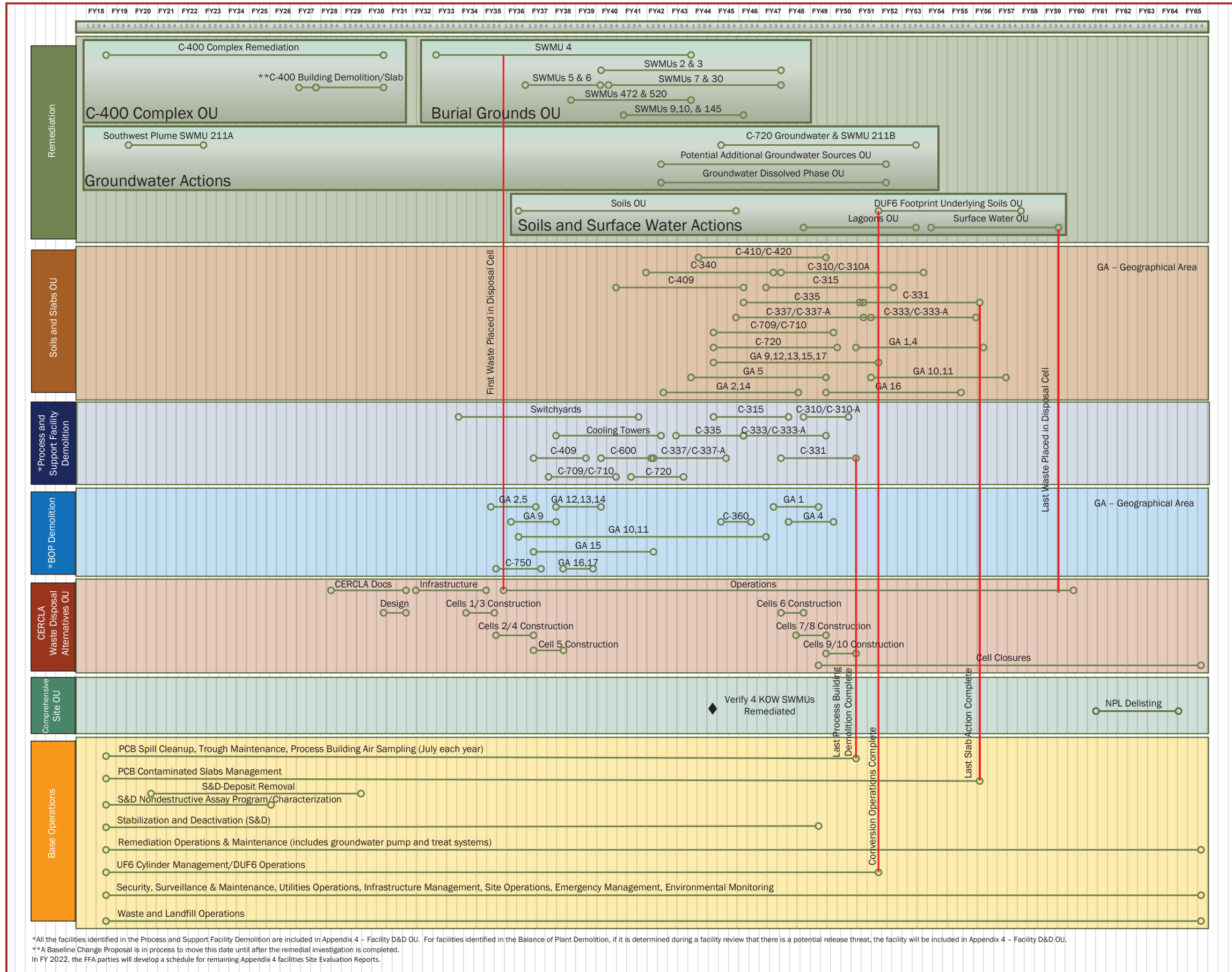
The Paducah Life Cycle Baseline is a non-public U.S. Department of Energy (DOE) document that integrates DOE assumptions regarding technical scope, schedule, and cost for both Federal Facility Agreement (FFA) and non-FFA activities. The Paducah Life Cycle Baseline is a planning and performance monitoring tool that is approved by DOE Headquarters. The Paducah Life Cycle Baseline is considered by DOE when proposing schedules for FFA cleanup activities. Actual funding levels enacted by Congress each year or unexpected site conditions are risks that are monitored by the FFA parties. If risks or opportunities are realized, they may accelerate or delay the end date for completion cleanup at the Paducah Site. The FFA provides collaboration mechanisms, such as consultation on budget and the annual update to the Site Management Plan (SMP), to manage changes in cleanup priorities, scope, and schedule in support of final cleanup of the Paducah Site.

The Paducah Life Cycle Baseline was updated in 2018 to integrate and logically sequence site projects to remediate environmental media (including slabs); complete operating missions; deactivate facilities and systems; remove equipment and disposition small structures; decommission and demolish facilities; complete the Comprehensive Site Operable Unit (CSOU); achieve National Priorities De-listing; and turn over the site for future use. The 2018 Paducah Life Cycle Baseline was established utilizing DOE constraints in funding and schedule and, as a result, the baseline may be subject to periodic updates. Changes in funding levels or site conditions are uncertainties or risks that are monitored as part of DOE management of the baseline. If risks or opportunities are realized, they may have an impact on the end date for completion (FY 2065) and/or milestone dates referenced within the 2018 Paducah Life Cycle Baseline scope of work. In accordance with the FFA, if PGDP receives funding greater than the projected costs, DOE will propose additional work or an acceleration of scheduled work at PGDP; however, DOE may propose using part or all of the excess funding for activities not covered in this SMP. DOE publishes an IPL annually that prioritizes projects and the use of excess or deficiencies in funding. EPA and KY provide input on the IPL annually. DOE's internal baseline change process will capture any necessary cost or schedule changes as a result of project risk management (scope, schedule, and cost). Key DOE planning assumptions regarding project technical scope are described in Appendix 3 for each operable unit. 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).

The following figure shows the major projects and activities in the Paducah Life Cycle Schedule, their sequence, and inter-relationships among projects. This figure shows both non-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site activities and CERCLA activities that are required to complete the decommissioning and remediation scope at the Paducah Site.

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Paducah Project Life Cycle Summary Schedule



*All the facilities identified in the Process and Support Facility Demolition are included in Appendix 4 - Facility D&D OU. For facilities identified in the Balance of Plant Demolition, if it is determined during a facility review that there is a potential release threat, the facility will be included in Appendix 4 - Facility D&D OU.
 **A Baseline Change Proposal is in process to move this date until after the remedial investigation is completed.
 In FY 2022, the FFA parties will develop a schedule for remaining Appendix 4 facilities Site Evaluation Reports.

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

C-400 Complex Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-400 D&D	Removal Notification			2 nd Quarter 2025	Per the Memorandum, <i>Suspension of D1 and D2 Comprehensive Environmental Response, Compensation, and Liability Act Documents Associated with the C-400 Cleaning Building Non-Time-Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky</i> (PPPO-02-5786835-20), dated October 2, 2019, the original documents were not approved and the non-time-critical removal action (NTCRA) was suspended. The FFA parties will determine the appropriate document version (i.e., D1 or D2) and document review process upon resuming the NTCRA.
	Engineering Evaluation/Cost Analysis (EE/CA)			3 rd Quarter 2025	See comment for Removal Notification for document version (i.e., D1 or D2) and document review process upon resuming the NTCRA. D1 EE/CA is submitted upon approval of the RN and in accordance with the schedule in the RN [Federal Facility Agreement (FFA) Section X.E].
	Action Memorandum			1 st Quarter 2026	See comment for Removal Notification for document version (i.e., D1 or D2) and document review process upon resuming the NTCRA. D1 AM is submitted 30 days after close of public comment period on the EE/CA (FFA Section X.E).

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

C-400 Complex Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-400 D&D (Cont.)	Removal Action Work Plan			2 nd Quarter 2026	See comment for Removal Notification for document version (i.e., D1 or D2) and document review process upon resuming the NTCRA. D1 RAWP is submitted 30 days after approval of the AM (FFA Section X.E).
	Removal Action Field Start			3 rd Quarter 2026	Commencement within 15 days after approval of the RAWP (FFA Section X.E).
C-400 Final Remedial Action	D1 Remedial Investigation/Feasibility Study Report	10/7/2022			
	D1 Proposed Plan	4/6/2023			
	D1 Record of Decision (ROD)	11/8/2023			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	12/8/2023			
	D1 Remedial Design Report (90% Design)			1 st Quarter 2025	
	D1 Remedial Action Work Plan			1 st Quarter 2025	
	Remedial Action Field Start		2 nd Quarter 2025		Commencement within 15 months of ROD signature (FFA Section XV).
	D1 Remedial Action Completion Report			1 st Quarter 2032	D1 Remedial Action Completion Report is submitted 150 days after Remedial Action is completed.

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

Groundwater Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022– FY 2024	Out-Year		
Southwest Plume Sources—SWMU 211-A (Enhanced <i>In Situ</i> Bioremediation)	D1 Interim Remedial Action Completion Report	3/30/2023			<p>A new timeframe has been established based on dispute resolution of the Remedial Action Work Plan.</p> <p>D1 Interim Remedial Action Completion Report is submitted 150 days after Remedial Action is completed.</p> <p>The D1 Interim Remedial Action Completion Report will include components of a Postconstruction Report.</p>

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

CERCLA Waste Disposal Alternatives Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
CERCLA Waste Disposal Alternatives	D1 Remedial Investigation/Feasibility Study			4 th Quarter 2027	
	D1 Proposed Plan			2 nd 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			4 th Quarter 2028	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			3 rd Quarter 2029	
	D1 Remedial Design Report			3 rd Quarter 2030	FFA schedule logic has been modified to account for the complexity of the project.
	D1 Remedial Action Work Plan			3 rd Quarter 2031	FFA schedule logic has been modified to account for the complexity of the project.
	D1 Interim Remedial Action Completion Report			4 th Quarter 2035	The D1 Interim Remedial Action Completion Report is a post-construction report to be issued prior to the start of operations. 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)

Burial Grounds Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
SWMU 4 Remedial Action	D1 Proposed Plan			4 th Quarter 2033	
	D1 ROD			2 nd Quarter 2034	
	D1 Remedial Design Work Plan (Waste Portion)			4 th Quarter 2034	
	D1 Remedial Design Report (Waste Portion)			1 st Quarter 2035	
	D1 Remedial Action Work Plan (Waste Portion)			1 st Quarter 2035	
	D1 Interim Remedial Action Completion Report (Waste Portion)			4 th Quarter 2038	
	D1 Remedial Design Work Plan (Groundwater Treatment)			2 nd Quarter 2038	
	D1 Remedial Design Report (Groundwater Treatment)			4 th Quarter 2038	
	D1 Remedial Action Work Plan (Groundwater Treatment)			1 st Quarter 2039	
	D1 Remedial Action Completion Report (Groundwater Treatment)			3 rd Quarter 2041	

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

Burial Grounds Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022 FY 2024	Out-Year		
SWMUs 2 and 3 Remedial Action	D1 Proposed Plan			1 st Quarter 2040	The Feasibility Study may require revisions to reflect current costs or change in technologies prior to issuing the D1 Proposed Plan due to the significant amount of time that will have passed since approval of the Feasibility Study.
	D1 ROD			3 rd Quarter 2040	
	SWMU 2 D1 Remedial Design Work Plan (Waste Portion)			1 st Quarter 2041	
	SWMU 2 D1 Remedial Design Report (Waste Portion)			2 nd Quarter 2041	
	SWMU 2 D1 Remedial Action Work Plan (Waste Portion)			2 nd Quarter 2041	
	SWMU 2 D1 Interim Remedial Action Completion Report (Waste Portion)			3 rd Quarter 2042	
	SWMU 2 D1 Remedial Design Work Plan (Groundwater Treatment)			2 nd Quarter 2043	
	SWMU 2 D1 Remedial Design Report (Groundwater Treatment)			3 rd Quarter 2043	
	SWMU 2 D1 Remedial Action Work Plan (Groundwater Treatment)			4 th Quarter 2043	
	SWMU 2 D1 Remedial Action Completion Report			2 nd Quarter 2045	
	SWMU 3 D1 Remedial Design Work Plan			1 st Quarter 2041	
	SWMU 3 D1 Remedial Design Report			2 nd Quarter 2041	
	SWMU 3 D1 Remedial Action Work Plan			2 nd Quarter 2041	
	SWMU 3 D1 Remedial Action Completion Report			4 th Quarter 2043	

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

Burial Grounds Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
SWMUs 5 and 6 Remedial Action	D1 Proposed Plan			2 nd Quarter 2037	
	D1 ROD			4 th Quarter 2037	
	D1 Remedial Design Work Plan			2 nd Quarter 2038	
	D1 Remedial Design Report			3 rd Quarter 2038	
	D1 Remedial Action Work Plan			4 th Quarter 2038	
	D1 Remedial Action Completion Report			1 st Quarter 2040	
SWMUs 7 and 30 Remedial Action	D1 Proposed Plan			2 nd Quarter 2041	The Feasibility Study may require revisions to reflect current costs or change in technologies prior to issuing the D1 Proposed Plan due to the significant amount of time that will have passed since approval of the Feasibility Study.
	D1 ROD			4 th Quarter 2041	
	D1 Remedial Design Work Plan (Waste Portion)			2 nd Quarter 2042	
	D1 Remedial Design Report (Waste Portion)			3 rd Quarter 2042	
	D1 Remedial Action Work Plan (Waste Portion)			4 th Quarter 2042	
	D1 Interim Remedial Action Completion Report (Waste Portion)			2 nd Quarter 2044	
	D1 Remedial Design Work Plan (Groundwater Treatment)			2 nd Quarter 2044	
	D1 Remedial Design Report (Groundwater Treatment)			3 rd Quarter 2044	
	D1 Remedial Action Work Plan (Groundwater Treatment)			3 rd Quarter 2044	
	D1 Remedial Action Completion Report			1 st Quarter 2047	

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

Burial Grounds Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022– FY 2024	Out-Year		
SWMUs 9, 10, and 145 Remedial Action	D1 Remedial Investigation Work Plan Addendum			4 th Quarter 2040	
	D1 Remedial Investigation Report Addendum			1 st Quarter 2042	
	D1 Feasibility Study			3 rd Quarter 2042	
	D1 Proposed Plan			1 st Quarter 2043	
	D1 ROD			3 rd Quarter 2043	
	D1 Remedial Design Work Plan			1 st Quarter 2044	
	D1 Remedial Design Report			3 rd Quarter 2044	
	D1 Remedial Action Work Plan			4 th Quarter 2044	
D1 Remedial Action Completion Report			1 st Quarter 2046		

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

Burial Grounds Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
Additional Burial Grounds	SWMU 472 Remedial Investigation Work Plan			1 st Quarter 2039	
	SWMU 472 Remedial Investigation Report			1 st Quarter 2040	
	SWMU 472 D1 Feasibility Study			3 rd Quarter 2040	
	SWMU 472 D1 Proposed Plan			1 st Quarter 2041	
	SWMU 472 D1 ROD			3 rd Quarter 2041	
	SWMU 472 D1 Remedial Design Work Plan			1 st Quarter 2042	
	SWMU 472 D1 Remedial Design Report			2 nd Quarter 2042	
	SWMU 472 D1 Remedial Action Work Plan			2 nd Quarter 2042	
	SWMU 472 D1 Remedial Action Completion Report			4 th Quarter 2043	
	SWMU 520 Remedial Investigation Work Plan			1 st Quarter 2039	
	SWMU 520 Remedial Investigation Report			1 st Quarter 2040	
	SWMU 520 D1 Feasibility Study			3 rd Quarter 2040	
	SWMU 520 D1 Proposed Plan			1 st Quarter 2041	
	SWMU 520 D1 ROD			3 rd Quarter 2041	
	SWMU 520 D1 Remedial Design Work Plan			1 st Quarter 2042	
	SWMU 520 D1 Remedial Design Report			2 nd Quarter 2042	
	SWMU 520 D1 Remedial Action Work Plan			2 nd Quarter 2042	
SWMU 520 D1 Remedial Action Completion Report			4 th Quarter 2043		
BGOU	BGOU Remedial Action Completion Report		12/31/2046		This date reflects the completion report for the last BGOU subproject (SWMUs 7 and 30 Remedial Action).

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

Groundwater Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
Southwest Plume Sources— SWMU 211-B	D1 Remedial Design Work Plan			4 th Quarter 2044	Note: Additional environmental media investigation under the C-720 Soils and Slabs OU will be conducted that will support remedy selection. If additional CERCLA documents are required to modify the remedy, then they will be added as agreed to by the FFA parties.
	D1 Remedial Design Report (90% Design)			2 nd Quarter 2048	
	D1 Remedial Action Work Plan			2 nd Quarter 2048	
	D1 Remedial Action Completion Report			2 nd Quarter 2052	
Potential Additional Groundwater Sources	D1 Site Investigation Work Plan			3 rd Quarter 2042	
	D1 Site Investigation Report			3 rd Quarter 2043	
	D1 Remedial Investigation Work Plan			4 th Quarter 2043	
	D1 Remedial Investigation Report			3 rd Quarter 2044	
	D1 Feasibility Study Report			1 st Quarter 2045	
	D1 Proposed Plan			4 th Quarter 2045	
	D1 Record of Decision			1 st Quarter 2046	
	D1 Remedial Design Work Plan			4 th Quarter 2046	
	D1 Remedial Design Report (90% Design)			2 nd Quarter 2047	
	D1 Remedial Action Work Plan			2 nd Quarter 2047	
D1 Remedial Action Completion Report			4 th Quarter 2048		

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

Groundwater Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022– FY 2024	Out-Year		
Dissolved-Phase Plumes	D1 Remedial Investigation Work Plan			1 st Quarter 2042	
	D1 Remedial Investigation Report			1 st Quarter 2044	
	D1 Feasibility Study Report			3 rd Quarter 2044	
	D1 Proposed Plan			2 nd Quarter 2045	
	D1 ROD			4 th Quarter 2045	
	D1 Treatability Work Plan			2 nd Quarter 2043	
	D1 Treatability Study Report			1 st Quarter 2045	
	D1 Remedial Design Work Plan			1 st Quarter 2046	
	D1 Remedial Design Report			2 nd Quarter 2046	
	D1 Remedial Action Work Plan			3 rd Quarter 2046	
GWOU	D1 Interim Remedial Action Completion Report		9/30/2048		The D1 interim Remedial Action Completion Report will include components of a Postconstruction Report.

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

Soils Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022– FY 2024	Out-Year		
Remedial Action 1	D1 Feasibility Study			2 nd Quarter 2039	
	D1 Proposed Plan			4 th Quarter 2039	
	D1 ROD			2 nd Quarter 2040	
	D1 Remedial Design Work Plan			4 th Quarter 2040	
	D1 Remedial Design Report			1 st Quarter 2041	
	D1 Remedial Action Work Plan			2 nd Quarter 2041	
Remedial Action 2	D1 Feasibility Study			4 th Quarter 2040	
	D1 Proposed Plan			2 nd Quarter 2041	
	D1 ROD			4 th Quarter 2041	
	D1 Remedial Design Work Plan			2 nd Quarter 2042	
	D1 Remedial Design Report			3 rd Quarter 2042	
	D1 Remedial Action Work Plan			4 th Quarter 2042	
Soils OU	D1 Remedial Action Completion Report		12/31/2044		

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

DUF₆ Footprint Underlying Soils Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
N/A	D1 Remedial Investigation Work Plan			4 th Quarter 2051	
	D1 Remedial Investigation Report			4 th Quarter 2052	
	D1 Feasibility Study			3 rd Quarter 2053	
	D1 Proposed Plan			1 st Quarter 2054	
	D1 ROD			4 th Quarter 2055	
	D1 Remedial Design Work Plan			4 th Quarter 2055	
	D1 Remedial Design Report			4 th Quarter 2056	
	D1 Remedial Action Work Plan			4 th Quarter 2056	
D1 Remedial Action Completion Report			2 nd Quarter 2057		

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

Facility Decontamination and Decommissioning Operable Unit⁴					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
Switchyards D&D	D1 Removal Notification (Site Evaluation) Switchyards slabs and soils			2 nd Quarter 2036	
	D1 EE/CA Switchyards slabs and soils			3 rd Quarter 2036	
	D1 Action Memorandum Switchyards slabs and soils			4 th Quarter 2036	
	D1 Removal Action Work Plan Switchyards slabs and soils			1 st Quarter 2037	
Cooling Towers D&D	D1 Removal Notification (Site Evaluation) Cooling Tower Buildings			3 rd Quarter 2038	
	D1 EE/CA Cooling Tower Buildings			4 th Quarter 2038	
	D1 Action Memorandum Cooling Tower Buildings			1 st Quarter 2039	
	D1 Removal Action Work Plan Cooling Tower Buildings			2 nd Quarter 2039	
C-409 D&D	D1 Removal Notification (Site Evaluation) C-409			1 st Quarter 2038	
	D1 EE/CA C-409			2 nd Quarter 2038	
	D1 Action Memorandum C-409			3 rd Quarter 2038	
	D1 Removal Action Work Plan C-409			4 th Quarter 2038	
C-709/C-710 D&D	D1 Removal Notification (Site Evaluation) C-709/C-710			1 st Quarter 2038	
	D1 EE/CA C-709/C-710			2 nd Quarter 2038	
	D1 Action Memorandum C-709/C-710			4 th Quarter 2038	
	D1 Removal Action Work Plan C-709/C-710			1 st Quarter 2039	

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

Facility Decontamination and Decommissioning Operable Unit⁴ (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-600 D&D	D1 Removal Notification (Site Evaluation) C-600			1 st Quarter 2040	
	D1 EE/CA C-600			2 nd Quarter 2040	
	D1 Action Memorandum C-600			3 rd Quarter 2040	
	D1 Removal Action Work Plan C-600			4 th Quarter 2040	
C-720 D&D	D1 Removal Notification (Site Evaluation) C-720 and C-720-A, B, C, C1, E, K			4 th Quarter 2040	
	D1 EE/CA C-720 and C-720-A, B, C, C1, E, K			1 st Quarter 2041	
	D1 Action Memorandum C-720 and C-720-A, B, C, C1, E, K			2 nd Quarter 2041	
	D1 Removal Action Work Plan C-720 and C-720-A, B, C, C1, E, K			3 rd Quarter 2041	
C-337/C-337-A D&D	D1 Removal Notification (Site Evaluation) C-337/C-337A			4 th Quarter 2041	
	D1 EE/CA C-337/C-337A			1 st Quarter 2042	
	D1 Action Memorandum C-337/C-337A			2 nd Quarter 2042	
	D1 Removal Action Work Plan C-337/C-337A			3 rd Quarter 2042	
C-335 D&D	D1 Removal Notification (Site Evaluation) C-335			3 rd Quarter 2043	
	D1 EE/CA C-335			3 rd Quarter 2043	
	D1 Action Memorandum C-335			1 st Quarter 2044	
	D1 Removal Action Work Plan C-335			2 nd Quarter 2044	
C-315 D&D	D1 Removal Notification (Site Evaluation) C-315 and C-620			1 st Quarter 2045	
	D1 EE/CA C-315 and C-620			2 nd Quarter 2045	
	D1 Action Memorandum C-315 and C-620			4 th Quarter 2045	
	D1 Removal Action Work Plan C-315 and C-620			1 st Quarter 2046	

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

Facility Decontamination and Decommissioning Operable Unit⁴ (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-333/C-333-A D&D	D1 Removal Notification (Site Evaluation) C-333/C-333-A			1 st Quarter 2047	
	D1 EE/CA C-333/C-333A			2 nd Quarter 2047	
	D1 Action Memorandum C-333/C-333-A			3 rd Quarter 2047	
	D1 Removal Action Work Plan C-333/C-333-A			4 th Quarter 2047	
C-331 D&D	D1 Removal Notification (Site Evaluation) C-331			4 th Quarter 2047	
	D1 EE/CA C-331			1 st Quarter 2048	
	D1 Action Memorandum C-331			3 rd Quarter 2048	
	D1 Removal Action Work Plan C-331			4 th Quarter 2048	
C-310/C-310-A D&D	D1 Removal Notification (Site Evaluation) C-310/C-310-A			1 st Quarter 2048	
	D1 EE/CA C-310/C-310-A			2 nd Quarter 2048	
	D1 Action Memorandum C-310/C-310-A			4 th Quarter 2048	
	D1 Removal Action Work Plan C-310/C-310-A			1 st Quarter 2049	
GA 1 D&D	D1 Removal Notification (Site Evaluation) GA 1 (includes C-615 Sewage Treatment Plant, C-611 Water Treatment Plant, and C-616 Former Chromate Treatment System)			1 st Quarter 2047	
	D1 EE/CA GA 1 (includes C-615 Sewage Treatment Plant, C-611 Water Treatment Plant, and C-616 Former Chromate Treatment System)			2 nd Quarter 2047	
	D1 Action Memorandum GA 1 (includes C-615 Sewage Treatment Plant, C-611 Water Treatment Plant, and C-616 Former Chromate Treatment System)			4 th Quarter 2047	

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

Facility Decontamination and Decommissioning Operable Unit⁴ (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
GA 1 D&D (continued)	D1 Removal Action Work Plan GA 1 (includes C-615 Sewage Treatment Plant, C-611 Water Treatment Plant, and C-616 Former Chromate Treatment System)			1 st Quarter 2048	
GA 10 D&D	D1 Removal Notification (Site Evaluation) GA 10 (includes C-726)			2 nd Quarter 2041	
	D1 EE/CA GA 10 (includes C-726)			3 rd Quarter 2041	
	D1 Action Memorandum GA-10 (includes C-726)			1 st Quarter 2042	
	D1 Removal Action Work Plan GA 10 (includes C-726)			2 nd Quarter 2042	
GA 12, GA 13 D&D	D1 Removal Notification (Site Evaluation) GA 12 and GA13 (includes C-415 and C-606)			1 st Quarter 2041	
	D1 EE/CA GA 12 and GA 13 (includes C-415 and C-606)			2 nd Quarter 2041	
	D1 Action Memorandum GA 12 and GA 13 (includes C-415 and C-606)			3 rd Quarter 2041	
	D1 Removal Action Work Plan GA 12 and GA 13 (includes C-415 and C-606)			4 th Quarter 2041	
GA 14 D&D	D1 Removal Notification (Site Evaluation) GA 14 (includes C-724-A and C-728)			2 nd Quarter 2037	
	D1 EE/CA GA 14 (includes C-724-A and C-728)			3 rd Quarter 2037	
	D1 Action Memorandum GA 14 (includes C-724-A and C-728)			1 st Quarter 2038	
	D1 Removal Action Work Plan GA 14 (includes C-724-A and C-728)			2 nd Quarter 2038	

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

Facility Decontamination and Decommissioning Operable Unit⁴ (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
GA 16, GA 17 D&D	D1 Removal Notification (Site Evaluation) GA 16 and GA 17 (includes C-360 and C-360-A)			3 rd Quarter 2037	
	D1 EE/CA GA 16 and GA 17 (includes C-360 and C-360-A)			4 th Quarter 2037	
	D1 Action Memorandum GA 16 and GA 17 (includes C-360 and C-360-A)			2 nd Quarter 2038	
	D1 Removal Action Work Plan GA 16 and GA 17 (includes C-360 and C-360-A)			3 rd Quarter 2038	

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

Soils and Slabs Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-409 Slab	D1 Remedial Investigation Work Plan C-409 Slab			4 th Quarter 2040	
	D1 Remedial Investigation Report C-409 Slab			2 nd Quarter 2042	
	D1 Feasibility Study C-409 Slab			4 th Quarter 2042	
	D1 Proposed Plan C-409 Slab			2 nd Quarter 2043	
	D1 ROD C-409 Slab			4 th Quarter 2043	
	D1 Remedial Design Work Plan C-409 Slab			2 nd Quarter 2044	
	D1 Remedial Design Report C-409 Slab			3 rd Quarter 2044	
	D1 Remedial Action Work Plan C-409 Slab			4 th Quarter 2044	
	D1 Remedial Action Completion Report C-409 Slab			1 st Quarter 2046	
C-340 Slab	D1 Remedial Investigation Work Plan C-340 Slab			3 rd Quarter 2042	
	D1 Remedial Investigation Report C-340 Slab			1 st Quarter 2044	
	D1 Feasibility Study C-340 Slab			3 rd Quarter 2044	
	D1 Proposed Plan C-340 Slab			1 st Quarter 2045	
	D1 ROD C-340 Slab			3 rd Quarter 2045	
	D1 Remedial Design Work Plan C-340 Slab			1 st Quarter 2046	
	D1 Remedial Design Report C-340 Slab			2 nd Quarter 2046	
	D1 Remedial Action Work Plan C-340 Slab			2 nd Quarter 2046	
	D1 Remedial Action Completion Report C-340 Slab			3 rd Quarter 2047	

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-709/C-710 Slab	D1 Remedial Investigation Work Plan C-709/C-710 Slab			2 nd Quarter 2044	
	D1 Remedial Investigation Report C-709/C-710 Slab			4 th Quarter 2045	
	D1 Feasibility Study C-709/C-710 Slab			2 nd Quarter 2046	
	D1 Proposed Plan C-709/C-710 Slab			4 th Quarter 2046	
	D1 ROD C-709/C-710 Slab			2 nd Quarter 2047	
	D1 Remedial Design Work Plan C-709/C-710 Slab			4 th Quarter 2047	
	D1 Remedial Design Report C-709/C-710 Slab			1 st Quarter 2048	
	D1 Remedial Action Work Plan C-709/C-710 Slab			1 st Quarter 2048	
	D1 Remedial Action Completion Report C-709/C-710 Slab			3 rd Quarter 2049	
C-720 Slab	D1 Remedial Investigation Work Plan C-720 Slab (includes SWMU 211-B)			2 nd Quarter 2044	
	D1 Remedial Investigation Report C-720 Slab (includes SWMU 211-B)			3 rd Quarter 2045	
	D1 Feasibility Study C-720 Slab (includes SWMU 211-B)			1 st Quarter 2046	
	D1 Proposed Plan C-720 Slab			3 rd Quarter 2046	
	D1 ROD C-720 Slab			1 st Quarter 2047	
	D1 Remedial Design Work Plan C-720 Slab			3 rd Quarter 2047	
	D1 Remedial Design Report C-720 Slab			4 th Quarter 2047	
	D1 Remedial Action Work Plan C-720 Slab			4 th Quarter 2047	
	D1 Remedial Action Completion Report C-720 Slab			2 nd Quarter 2049	

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-410/C-420 Slabs	D1 Remedial Investigation Work Plan C-410/C-420 Slab			4 th Quarter 2043	
	D1 Remedial Investigation Report C-410/C-420 Slab			2 nd Quarter 2045	
	D1 Feasibility Study C-410/C-420 Slab			4 th Quarter 2045	
	D1 Proposed Plan C-410/C-420 Slab			2 nd Quarter 2046	
	D1 ROD C-410/C-420 Slab			4 th Quarter 2046	
	D1 Remedial Design Work Plan C-410/C-420 Slab			2 nd Quarter 2047	
	D1 Remedial Design Report C-410/C-420 Slab			3 rd Quarter 2047	
	D1 Remedial Action Work Plan C-410/C-420 Slab			3 rd Quarter 2047	
	D1 Remedial Action Completion Report C-410/C-420 Slab			1 st Quarter 2049	
C-337/C-337-A Slab	D1 Remedial Investigation Work Plan C-337/C-337A Slab			4 th Quarter 2046	
	D1 Remedial Investigation Report C-337/C-337A Slab			3 rd Quarter 2047	
	D1 Feasibility Study C-337/C-337A Slab			1 st Quarter 2048	
	D1 Proposed Plan C-337/C-337A Slab			3 rd Quarter 2048	
	D1 ROD C-337/C-337A Slab			1 st Quarter 2050	
	D1 Remedial Design Work Plan C-337/C-337A Slab			3 rd Quarter 2050	
	D1 Remedial Design Report C-337/C-337A Slab			4 th Quarter 2050	
	D1 Remedial Action Work Plan C-337/C-337A Slab			1 st Quarter 2051	
D1 Remedial Action Completion Report C-337/C-337A Slab			3 rd Quarter 2052		

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-335 Slab	D1 Remedial Investigation Work Plan C-335 Slab			1 st Quarter 2047	
	D1 Remedial Investigation Report C-335 Slab			4 th Quarter 2047	
	D1 Feasibility Study C-335 Slab			3 rd Quarter 2048	
	D1 Proposed Plan C-335 Slab			1 st Quarter 2049	
	D1 ROD C-335 Slab			3 rd Quarter 2049	
	D1 Remedial Design Work Plan C-335 Slab			1 st Quarter 2050	
	D1 Remedial Design Report C-335 Slab			2 nd Quarter 2050	
	D1 Remedial Action Work Plan C-335 Slab			3 rd Quarter 2050	
	D1 Remedial Action Completion Report C-335 Slab			3 rd Quarter 2051	
C-310 Slab	D1 Remedial Investigation Work Plan C-310 Slab			4 th Quarter 2048	
	D1 Remedial Investigation Report C- C-310 Slab			4 th Quarter 2049	
	D1 Feasibility Study C-310 Slab			2 nd Quarter 2050	
	D1 Proposed Plan C-310 Slab			4 th Quarter 2050	
	D1 ROD C-310 Slab			2 nd Quarter 2051	
	D1 Remedial Design Work Plan C-310 Slab			4 th Quarter 2051	
	D1 Remedial Design Report C-310 Slab			1 st Quarter 2052	
	D1 Remedial Action Work Plan C-310 Slab			1 st Quarter 2052	
	D1 Remedial Action Completion Report C-310 Slab			2 nd Quarter 2053	

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-315 Slab	D1 Remedial Investigation Work Plan C-315 Slab			4 th Quarter 2047	
	D1 Remedial Investigation Report C-315 Slab			2 nd Quarter 2049	
	D1 Feasibility Study C-315 Slab			4 th Quarter 2049	
	D1 Proposed Plan C-315 Slab			2 nd Quarter 2050	
	D1 ROD C-315 Slab			4 th Quarter 2050	
	D1 Remedial Design Work Plan C-315 Slab			2 nd Quarter 2051	
	D1 Remedial Design Report C-315 Slab			3 rd Quarter 2051	
	D1 Remedial Action Work Plan C-315 Slab			3 rd Quarter 2051	
	D1 Remedial Action Completion Report C-315 Slab			4 th Quarter 2052	
C-333/C-333-A Slab	D1 Remedial Investigation Work Plan C-333/C-333-A Slab			3 rd Quarter 2050	
	D1 Remedial Investigation Report C-333/C-333-A Slab			2 nd Quarter 2051	
	D1 Feasibility Study C-333/C-333-A Slab			4 th Quarter 2051	
	D1 Proposed Plan C-333/C-333-A Slab			2 nd Quarter 2052	
	D1 ROD C-333/C-333-A Slab			4 th Quarter 2052	
	D1 Remedial Design Work Plan C-333/C-333-A Slab			2 nd Quarter 2053	
	D1 Remedial Design Report C-333/C-333-A Slab			3 rd Quarter 2053	
	D1 Remedial Action Work Plan C-333/C-333-A Slab			3 rd Quarter 2053	
	D1 Remedial Action Completion Report C-333/C-333-A Slab			1 st Quarter 2055	

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
C-331 Slab	D1 Remedial Investigation Work Plan C-331 Slab			1 st Quarter 2051	
	D1 Remedial Investigation Report C-331 Slab			1 st Quarter 2052	
	D1 Feasibility Study C-331 Slab			3 rd Quarter 2052	
	D1 Proposed Plan C-331 Slab			1 st Quarter 2053	
	D1 ROD C-331 Slab			3 rd Quarter 2053	
	D1 Remedial Design Work Plan C-331 Slab			1 st Quarter 2054	
	D1 Remedial Design Report C-331 Slab			2 nd Quarter 2054	
	D1 Remedial Action Work Plan C-331 Slab			2 nd Quarter 2054	
	D1 Remedial Action Completion Report C-331 Slab			3 rd Quarter 2055	
GA 9, GA 12, GA 13, GA 15, GA 17 Slabs	D1 Remedial Investigation Work Plan GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			1 st Quarter 2044	
	D1 Remedial Investigation Report GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			3 rd Quarter 2045	
	D1 Feasibility Study GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			1 st Quarter 2046	
	D1 Proposed Plan GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			3 rd Quarter 2046	
	D1 ROD GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			1 st Quarter 2047	
	D1 Remedial Design Work Plan GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			3 rd Quarter 2047	
	D1 Remedial Design Report GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			4 th Quarter 2047	
	D1 Remedial Action Work Plan GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			4 th Quarter 2047	

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
GA 9, GA 12, GA 13, GA 15, GA 17 Slabs (Continued)	D1 Remedial Action Completion Report GA 9, GA 12, GA 13, GA 15, GA 17 Slabs			1 st Quarter 2050	
GA 10, GA 11 Slabs	D1 Remedial Investigation Work Plan GA 10, GA 11 Slabs			4 th Quarter 2049	
	D1 Remedial Investigation Report GA 10, GA 11 Slabs			2 nd Quarter 2051	
	D1 Feasibility Study GA 10, GA 11 Slabs			4 th Quarter 2051	
	D1 Proposed Plan GA 10, GA 11 Slabs			2 nd Quarter 2052	
	D1 ROD GA 10, GA 11 Slabs			4 th Quarter 2052	
	D1 Remedial Design Work Plan GA 10, GA 11 Slabs			2 nd Quarter 2053	
	D1 Remedial Design Report GA 10, GA 11 Slabs			3 rd Quarter 2053	
	D1 Remedial Action Work Plan GA 10, GA 11 Slabs			3 rd Quarter 2053	
	D1 Remedial Action Completion Report GA 10, GA 11 Slabs			4 th Quarter 2054	
GA 5 Slabs	D1 Remedial Investigation Work Plan GA 5 Slabs			4 th Quarter 2041	
	D1 Remedial Investigation Report GA 5 Slabs			2 nd Quarter 2043	
	D1 Feasibility Study GA 5 Slabs			4 th Quarter 2043	
	D1 Proposed Plan GA 5 Slabs			2 nd Quarter 2044	
	D1 ROD GA 5 Slabs			4 th Quarter 2044	
	D1 Remedial Design Work Plan GA 5 Slabs			1 st Quarter 2045	
	D1 Remedial Design Report GA 5 Slabs			2 nd Quarter 2045	
	D1 Remedial Action Work Plan GA 5 Slabs			3 rd Quarter 2045	
D1 Remedial Action Completion Report GA 5 Slabs			4 th Quarter 2046		

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
GA 16 Slabs	D1 Remedial Investigation Work Plan GA 16 Slabs			3 rd Quarter 2048	
	D1 Remedial Investigation Report GA 16 Slabs			1 st Quarter 2049	
	D1 Feasibility Study GA 16 Slabs			3 rd Quarter 2050	
	D1 Proposed Plan GA 16 Slabs			1 st Quarter 2051	
	D1 ROD GA 16 Slabs			3 rd Quarter 2051	
	D1 Remedial Design Work Plan GA 16 Slabs			1 st Quarter 2052	
	D1 Remedial Design Report GA 16 Slabs			2 nd Quarter 2052	
	D1 Remedial Action Work Plan GA 16 Slabs			3 rd Quarter 2052	
	D1 Remedial Action Completion Report GA 16 Slabs			3 rd Quarter 2053	
GA 2, GA 3, GA 14 Slabs	D1 Remedial Investigation Work Plan GA 2, GA 3, GA 14 Slabs			1 st Quarter 2041	
	D1 Remedial Investigation Report GA 2, GA 3, GA 14 Slabs			3 rd Quarter 2042	
	D1 Feasibility Study GA 2, GA 3, GA 14 Slabs			1 st Quarter 2043	
	D1 Proposed Plan GA 2, GA 3, GA 14 Slabs			2 nd Quarter 2043	
	D1 ROD GA 2, GA 3, GA 14 Slabs			4 th Quarter 2043	
	D1 Remedial Design Work Plan GA 2, GA 3, GA 14 Slabs			2 nd Quarter 2044	
	D1 Remedial Design Report GA 2, GA 3, GA 14 Slabs			3 rd Quarter 2044	
	D1 Remedial Action Work Plan GA 2, GA 3, GA 14 Slabs			4 th Quarter 2044	
	D1 Remedial Action Completion Report GA 2, GA 3, GA 14 Slabs			1 st Quarter 2046	

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

Soils and Slabs Operable Unit (Continued)					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
GA 1, GA 4 Slabs	D1 Remedial Investigation Work Plan GA 1, GA 4 Slabs			2 nd Quarter 2050	
	D1 Remedial Investigation Report GA 1, GA 4 Slabs			3 rd Quarter 2052	
	D1 Feasibility Study GA 1, GA 4 Slabs			1 st Quarter 2053	
	D1 Proposed Plan GA 1, GA 4 Slabs			3 rd Quarter 2053	
	D1 ROD GA 1, GA 4 Slabs			1 st Quarter 2054	
	D1 Remedial Design Work Plan GA 1, GA 4 Slabs			3 rd Quarter 2054	
	D1 Remedial Design Report GA 1, GA 4 Slabs			4 th Quarter 2054	
	D1 Remedial Action Work Plan GA 1, GA 4 Slabs			4 th Quarter 2054	
	D1 Remedial Action Completion Report GA 1, GA 4 Slabs			4 th Quarter 2055	

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

Lagoons Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
Process Lagoons	D1 Remedial Investigation Work Plan			4 th Quarter 2048	
	D1 Remedial Investigation Report			2 nd Quarter 2050	
	D1 Feasibility Study			4 th Quarter 2050	
	D1 Proposed Plan			1 st Quarter 2051	
	D1 ROD			3 rd Quarter 2051	
	D1 Remedial Design Work Plan			2 nd Quarter 2052	
	D1 Remedial Design Report			3 rd Quarter 2052	
	D1 Remedial Action Work Plan			3 rd Quarter 2052	
	D1 Remedial Action Completion Report			3 rd Quarter 2053	
Water Treatment System Lagoons	D1 Remedial Investigation Work Plan			4 th Quarter 2048	
	D1 Remedial Investigation Report			2 nd Quarter 2050	
	D1 Feasibility Study			4 th Quarter 2050	
	D1 Proposed Plan			2 nd Quarter 2051	
	D1 ROD			4 th Quarter 2051	
	D1 Remedial Design Work Plan			2 nd Quarter 2052	
	D1 Remedial Design Report			3 rd Quarter 2052	
	D1 Remedial Action Work Plan			3 rd Quarter 2052	
	D1 Remedial Action Completion			3 rd Quarter 2053	

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

Surface Water Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
Remedial Action (Little Bayou and Bayou Creek Watersheds)	D1 Remedial Investigation Report			3 rd Quarter 2054	
	D1 Feasibility Study Report			1 st Quarter 2055	
	D1 Proposed Plan			3 rd Quarter 2055	
	D1 ROD			1 st Quarter 2056	
	D1 Remedial Design Work Plan			3 rd Quarter 2056	
	D1 Remedial Design Report			2 nd Quarter 2057	
	D1 Remedial Action Work Plan			2 nd Quarter 2057	
SWOU	D1 Remedial Action Completion Report		9/30/2058		
Comprehensive Site Operable Unit					
Subproject	Deliverable	Enforceable Timetable and Deadlines¹		Planning Dates with Long-Term Targets for Decision Documents²	Comments
		FY 2022–FY 2024	Out-Year		
N/A	D1 Remedial Investigation Work Plan			1 st Quarter 2062	
	D1 Remedial Investigation/Feasibility Study Report			3 rd Quarter 2062	
	D1 Proposed Plan			1 st Quarter 2063	
	D1 ROD			3 rd Quarter 2063	

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

Other FFA Planning Dates					
Subproject	Deliverable	Enforceable Timetable and Deadlines ¹		Planning Dates with Long-Term Targets for Decision Documents ²	Comments
		FY 2022–FY 2024	Out-Year		
N/A	D1 Five-Year Review (2023) (Fifth Synchronized Review)			7/16/2023	This is a statutorily required document that must be approved by 6/4/2024. EPA and KY identified additional actions and deferred protectiveness for Northwest Plume Interim Remedial Action, the Northeast Plume Interim Remedial Action, Water Policy Removal Action, and the Fire Training Interim Remedial Action (SWMU 100) during the CY 2018 Five-Year Review that will be addressed as part of the CY 2023 Five-Year Review.

¹ Enforceable Timetables and Deadlines are based on the planning scope assumptions contained in Appendix 3 and DOE assumptions regarding funding levels. Approval of the SMP planning scope assumptions does not constitute decision making for the response actions described in this table.

² Not enforceable dates. These planning dates are internal 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.

³ Assumes that final approval is received on the D2 document.

⁴ A removal action report, which is a secondary document under the FFA, will be completed for each facility or groups of facilities contained within the Facility D&D OU, using the outline and content that was developed and agreed to by the FFA Managers in April 2010.

BGOU = Burial Grounds Operable Unit
 D&D = decontamination and decommissioning
 EPA = U.S. Environmental Protection Agency
 FY = fiscal year
 GA = geographical area
 GWOU = Groundwater Operable Unit

N/A = not applicable
 OU = operable unit
 RI = remedial investigation
 SWOU = Surface Water Operable Unit
 SWMU = solid waste management unit

APPENDIX 6

FACILITIES UNDERGOING CERCLA DETERMINATION

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FACILITIES UNDERGOING CERCLA DETERMINATION

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 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process for decommissioning [Appendix 8 of the fiscal year (FY) 2018/FY 2019 Site Management Plan (SMP)]. The Facility D&D 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 D&D 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 3.1 in Appendix 3 of this SMP.

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APPENDIX 7

DATA MANAGEMENT PLAN

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**Paducah Gaseous Diffusion Plant
Data Management Plan**



CLEARED FOR PUBLIC RELEASE

**Paducah Gaseous Diffusion Plant
Data Management Plan**

Date Issued—August 2021

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

CLEARED FOR PUBLIC RELEASE

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 many databases managed by one organization. Electronic formats and/or hard copies 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...”

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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	Energy and Environment Cabinet
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FSP	field sampling plan
GIS	geographic information system
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 2021 or most recent revision). Like the Paducah Site P-QAPP, which is a template for the development of future project-specific 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, 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 users 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 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 Specialist

The QA specialist 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, 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 packages, and coordinates data validation support.

2.2.3 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 quality control (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 quality assurance project plans (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, each project utilizes a Paducah PEMS for sample scheduling, collection, tracking, and associated data from the point of collection through final data reporting. Each Paducah PEMS is established on a project-specific basis. Paducah PEMS tracking includes 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;
- 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 each 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 the project's 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 Paducah Analytical Project Tracking System

The Paducah Analytical Project Tracking System is the business management information system that manages analytical sample analyses for Paducah Site environmental projects. The Paducah Analytical Project Tracking System provides cradle-to-grave tracking of sampling and analysis activities. The Paducah Analytical Project Tracking System generates the SOW, tracks collection and receipt of samples by the laboratory, flags availability of the analytical results, and allows invoice reconciliation. The Paducah Analytical Project Tracking System interfaces with Paducah PEMS (output from the Paducah Analytical Project Tracking System is automatically transferred to Paducah PEMS).

8.1.4 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 and/or in hard copy 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 PEMS. 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 and are transferred with the data to Paducah OREIS.

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 and transferred to Paducah OREIS.

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 and are transferred with the data to Paducah OREIS. 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. The archive of Paducah PEMS and the back-ups for Paducah OREIS, are stored as records.

9. DATA RELEASE AND TRANSFER

Once data has undergone verification, validation, and data assessment, it may be released to external agencies. 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) 2021. *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan*, DOE/LX/07-2459&D1, U.S. Department of Energy, Paducah, KY, April.

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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.