SECTION C

Performance Work Statement

Table of Contents

C. OVERVIEW **4**

C.1. INTRODUCTION *4*

C.1.1. Project Purpose and Scope 7
C.1.2. Objectives and Programmatic Requirements 7
C.1.3. Contractor Performance and Key Requirements 8
C.1.4. General End State Requirements 11
C.1.5. Programmatic or Site Requirements Documents 11

C.2. WORK TO BE ACCOMPLISHED *12*

EM.PA.0040.A001.06.DR PADUCAH CONTRACTOR TRANSITION *12*
EM.PA.0040.A001.06.DR.01 Transition 12
EM.PA.0040.A001.06.DR.02 Implementation 12
EM.PA.0040.A001.06.DR.03 Environmental Compliance Review 15
EM.PA.0040.A001.06.DR.04 Material Differences 15

EM.PA.0011.A001.01.DR POLYCHLORINATED BIPHENYLS (PCBs) *16*
EM.PA.0011.A001.01.DR.02 Polychlorinated Biphenyls (PCBs) Operations 16

EM.PA.0020.A001.03.DR SAFEGUARDS AND SECURITY *17*
EM.PA.0020.A001.03.DR.01 Security Program 18
EM.PA.0020.A001.03.DR.02 Protective Force Services 20
EM.PA.0020.A001.03.DR.03 Security Infrastructure 21
EM.PA.0020.A001.03.DR.03.01 New Firing Range 21
EM.PA.0020.A001.03.DR.03.02 Institute Limited Area Islands 22
EM.PA.0020.A001.03.DR.03.03 Protective Force Facilities 23

EM.PA.0040.A001.01.DR ENVIRONMENTAL MONITORING PROGRAM *24*
EM.PA.0040.A001.01.DR.01 Environmental Monitoring and Reporting 24
EM.PA.0040.A001.02.DR.01 Pump and Treat Operations 29

EM.PA.0040.A001.07.DR PROJECT MANAGEMENT SUPPORT *30*
EM.PA.0040.A001.07.DR.02 Project Planning & Integration Support 31
EM.PA.0040.A001.07.DR.02.01 Project Planning, Integration and Interface 31
EM.PA.0040.A001.07.DR.02.02 Regulatory Planning 32
EM.PA.0040.A001.07.DR.02.03 Program Management Support 33
EM.PA.0040.A001.07.DR.03 Project Management 35
EM.PA.0040.A001.07.DR.04 Environment, Safety, Security, Health & Quality 36
EM.PA.0040.A001.07.DR.04.01 Safety Programs 36
EM.PA.0040.A001.07.DR.04.02 Integrated Safety Management 40
EM.PA.0040.A001.07.DR.04.03 Radiological Protection Program 41
EM.PA.0040.A001.07.DR.04.04 Emergency Management & Fire Protection Program 42
EM.PA.0040.A001.07.DR.04.05 Quality Programs 45
EM.PA.0040.A001.07.DR.04.06 Quality System for Nondestructive Assay Characterization (QSNDA) 47

EM.PA.0040.A001.07.DR.11 Real and Personal Property Management 48
EM.PA.0040.A001.07.DR.12 Automated Supply Pilot Project 50
EM.PA.0040.A001.07.DR.13 Asset Recovery and Recycling 51
EM.PA.0040.A001.07.DR.14 Energy Efficiency 52
EM.PA.0040.A001.07.DR.15 Records Management 55
EM.PA.0040.A001.07.DR.16 Continuity Program 58
EM.PA.0040.A001.07.DR.17 DOE Consolidated Audit Program 59
EM.PA.0040.A001.07.DR.18 Project Close-out and Completion 60
EM.PA.0040.A001.07.DR.19 Worker Pensions & Retirement Health Benefits 61
EM.PA.0040.A001.07.DR.20 Nuclear Materials Control and Accountability 61
EM.PA.0040.A001.07.DR.21 Information Services and Communications 62
EM.PA.0040.A001.07.DR.22 Laundry 63

EM.PA.0040.A002.04.DR WASTE OPERATIONS 64
EM.PA.0040.A002.04.DR.01 Waste Operations 64

EM.PA.0040.A002.05.DR LANDFILL OPERATIONS 69
EM.PA.0040.A002.05.DR.01 Operate the Landfills 70
EM.PA.0040.A002.05.DR.02 Landfill Expansion 70

EM.PA.0040.A005.02.DR SOUTHWEST PLUME SOURCES REMEDIATION 71
EM.PA.0040.A005.02.DR.02 SWMUs 211 A&B Remediation 71

EM.PA.0040.A005.10.DR C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE REMEDIATION 73
EM.PA.0040.A005.10.DR.01 C-400 Building Subsurface Groundwater Source Remediation 73

EM.PA.0040.A008.41.DR SURVEILLANCE AND MAINTENANCE 74
EM.PA.0040.A008.41.DR.01 Surveillance and Maintenance of Facilities 74
EM.PA.0040.A008.41.DR.02 Facility Roofs 77

EM.PA.0040.A008.42.DR UTILITIES OPERATIONS 78
EM.PA.0040.A008.42.DR.01 Utility Operations 78
EM.PA.0040.A008.42.DR.02 Steam, Chilled Water, Compressed Air, & Waste Heat Systems 78
EM.PA.0040.A008.42.DR.03 Water Systems 80
EM.PA.0040.A008.42.DR.04 Electric Power Distribution 82
EM.PA.0040.A008.42.DR.04.01 Electric Power Operations and Deactivation of Switchyards 82
EM.PA.0040.A008.42.DR.05 Sewage Treatment Systems 83

EM.PA.0040.A008.43.DR ANALYTICAL LABORATORY 84
EM.PA.0040.A008.43.DR.01 Analytical Laboratory Operations 84

EM.PA.0040.A008.48.DR STABILIZATION AND DEACTIVATION 85
EM.PA.0040.A008.48.DR.01 NDA Characterization for Deposit/Hold-up Removal for the Process Facilities 88
EM.PA.0040.A008.48.DR.01.05 NDA Characterization of C-360 Facility 89
EM.PA.0040.A008.48.DR.01.06 NDA Characterization of Loose Converters/Compressors 90
EM.PA.0040.A008.48.DR.02 Deposit/Hold-up Removal for the Process Facilities 90
EM.PA.0040.A008.48.DR.02.05 Deposit Removal for C-360 93
EM.PA.0040.A008.48.DR.02.06 Deposit/Hold-up Removal for Loose Converters/Compressors 96
EM.PA.0040.A008.48.DR.03 C-400 Deactivation 97
EM.PA.0040.A008.48.DR.04 C-746-Q1 Cold Trap Disposition 99
EM.PA.0040.A008.48.DR.05 Nickel and ^{99}TC Microwave Thermal Treatment Technology Study and Evaluation 99

EM.PA.0040.A008.48.DR.06 R-114 Freon 101

C.3 TECHNICAL OPTION WORK *102*
EM.PA.0040.A008.48.DR.01.07 NDA Characterization of C-310/C-310A Facility 102
EM.PA.0040.A008.48.DR.02.07 Deposit Removal for C-310/C-310A 103
EM.PA.0040.A008.48.DR.01.08 NDA Characterization of C-315 Facility 106
EM.PA.0040.A008.48.DR.02.08 Deposit Removal and Deactivation of C-315/C-620 106
EM.PA.0040.A008.48.DR.07 Deactivation of Fire Systems for the Process Facilities 109

C.4 IDIQ *109*

EM.PA.0040.A009.04.DR.01 C-400 Demolition *110*

EM.PA.0040.A009.04.DR.02 On-Site Waste Disposal Facility (OSWDF) Capital Asset Project *110*
EM.PA.0040.A009.04.DR.02.01 OSWDF Cell 1 and Infrastructure 111

EM.PA.0040.A009.04.DR.03 ^{99}Tc Removal *112*

EM.PA.0040.A009.04.DR.04 Construction of McCaw Road Bridge *114*

EM.PA.0040.A009.04.DR.05 Small Cylinder Disposition *115*

Exhibit No. C-1, PDGP Shutdown Cell Status to Support Deposit & Hold-up Removal 116

Exhibit No. C-3, Technetium Data 118

SECTION C

Performance Work Statement (PWS)

C. OVERVIEW

The Department of Energy, Portsmouth/Paducah Project Office (DOE-PPPO) is deactivating and remediating the Paducah Gaseous Diffusion Plant (PGDP). This scope of work defines requirements to be completed during the Period of Performance (POP). Activities required during the POP are detailed below and include activities to perform uranium removal, perform ^{99}Tc treatment, and continue optimizing facility systems/structures to minimize short-term and long-term Surveillance and Maintenance (S&M) costs. The Contractor shall make every effort to optimize and reduce S&M costs. DOE is pursuing various alternatives for additional office space to permit deactivation of administrative facilities that have historically high S&M costs, such as C-100 and C-720. The Contractor shall fully support these efforts as part of this performance work statement (PWS). Additionally, the Contractor shall continue implementation of the Environmental Remediation Program as described in the Site Management Plan (SMP) under the Federal Facility Agreement (FFA) for the Paducah Site. As the Contractor is able to optimize and drive down S&M costs, it is anticipated that additional stabilization and deactivation and remediation (D&R) activities may be requested as Technical Options. It is expected that these additional activities will be performed consistent with the available funding for each year. The goal of the additional D&R activities is to reduce risk and accelerate reduction in long-term S&M costs and future demolition costs.

C.1.INTRODUCTION

The PGDP is located on a Federal reservation in Western Kentucky, approximately 10 miles west of Paducah, Kentucky, and 3.5 miles south of the Ohio River. The plant is situated on approximately 3,423 acres without easements divided as follows:

- Approximately 615 acres within a fenced limited security area;
- Approximately 822 acres of support area surrounding the limited security area; and
- 1,986 acres licensed to the Kentucky Department of Fish and Wildlife as part of the West Kentucky Wildlife Management Area.

Additionally, there are approximately one hundred thirty-three acres of off-site easements primarily associated with incoming raw water lines and pumps from the Ohio River, emergency notification sirens, and environmental sampling stations. Bordering the Paducah Site to the northeast, between the plant and the Ohio River, is the Tennessee Valley Authority Reservation where the Shawnee Steam Plant is located.

The PGDP is a Government-owned uranium enrichment plant that was constructed in the early 1950's and operated by the DOE and its predecessor agencies for manufacturing

enriched uranium for the fabrication of fuel assemblies to support commercial and military nuclear reactors and to support weapons development activities. Processing operations are currently terminated, and D&R activities are being conducted, but PGDP still includes Hazard Category 2 Nuclear Facilities primarily based on the uranium inventory in those facilities. Other radioactive materials, such as transuranics, are present and contribute to the hazard categorization of the facilities.

The uranium enrichment program utilizing the gaseous diffusion process produced various hazardous, non-hazardous, and radioactive byproducts. These activities resulted in contamination of equipment, facilities, soil and groundwater with radioactive and hazardous constituents, and the generation of various wastes, including those regulated under the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), and the Atomic Energy Act (AEA). These wastes include construction debris; sanitary waste; Hazardous Waste (HW); radioactive Low-Level Waste (LLW); Mixed Low-Level Waste (MLLW); Transuranic Waste (TRU); and Mixed TRU (MTRU) Waste. The most significant contaminants are Trichloroethene (TCE), radionuclides, and Polychlorinated Biphenyls (PCBs).

TCE and Technetium-99 (^{99}Tc) was discovered in residential wells north of the Paducah Site in 1988. There are two off-site groundwater contamination plumes, referred to as the Northwest and Northeast Plumes, and several identified potential on and off-site source areas requiring additional investigation and action. An additional on-site plume has been found to the southwest. A series of Remedial Investigation/Feasibility Studies (RI/FS) were conducted under the FFA, including the evaluation of potential major contaminant sources impacting groundwater and surface water. The project continues to evaluate on-going potential sources of contamination. In accordance with these investigations, DOE implemented interim actions that focused on reducing potential risks associated with off-site contamination. The primary areas that have been associated with the groundwater source remediation are: C-400 Source Remediation; Southwest Plume Sources Remediation; and Burial Grounds Operable Unit.

As a result of the offsite groundwater contamination, the Paducah Site was placed on the NPL in 1994. All site cleanup and remediation activities are conducted in compliance with applicable federal, state, and local laws and regulations. The principal regulating agencies are the EPA Region 4 and the Kentucky Department for Environmental Protection (KDEP).

The approach to site cleanup is outlined in the FFA, where the cleanup is divided into Operable Units (OUs). The OUs are composed of approximately 570 Solid Waste Management Units (SWMUs) which are listed in the Paducah FFA SMP and the RCRA Permit. The active OUs are:

a. Groundwater OU (GWOU);
b. Surface Water OU (SWOU);
c. Soils OU (SOU); and
d. Burial Grounds OU (BGOU).

DOE entered into an FFA with the EPA and the Commonwealth of Kentucky on February 13, 1998. The FFA established one set of consistent requirements for achieving comprehensive site remediation in accordance with the RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), including stakeholder involvement. Remediation activities are performed in accordance with the requirements of this agreement.

The *Community Relations Plan under the Federal Facility Agreement at the U.S. Department of Energy Paducah Gaseous Diffusion Plant* defines public involvement for the environmental remediation program.

The Paducah Citizens Advisory Board (CAB), a Site Specific Advisory Board chartered by DOE under the Federal Advisory Committee Act, is made up of individuals with diverse backgrounds and interests. It meets monthly to focus on early citizen participation in Environmental Management (EM) priorities and related issues at the PGDP. The CAB provides advice on on-going and planned projects at PGDP.

Section 3 155 of Public Law 103- 160, the National Defense Authorization Act for Fiscal Year 1994, authorized the Secretary of Energy to transfer, for consideration, all rights, title, and interest of the United States in and to personal property and equipment if the Secretary determined that such transfers will mitigate the adverse economic consequences that might otherwise arise from the restructuring of the DOE facility. The Paducah Area Community Reuse Organization (PACRO), is the DOE locally designated entity for the receipt of excess DOE property.

PGDP facilities and its ancillary structures and systems are listed in Section J, Attachment J-18, PGDP D&R Facilities/Areas Assignment of Responsibility. In addition to the four (4) large process buildings (C-331, C-333, C-335, and C-337) and the smaller C-310 Purge and Product Withdrawal Building, the C-315 Tails Withdrawal buildings, the C-360 Toll and Transfer Facility, and C-337-A and C-333-A feed facilities, the remaining structures are support facilities such as steam systems, electrical switchyards, cooling towers, cleaning and deactivation facilities, water and wastewater treatment plants, maintenance and laboratory facilities, and office buildings. Finally, the buildings are served and connected by an extensive network of utilities, systems (such as security, safety, and nuclear criticality systems), roads, and sidewalks.

The Paducah site currently has three (3) prime contractors and a technical support services contractor that support DOE with ongoing activities. The contractors and their respective summary level of scope are described below:

a. The D&R Contractor is responsible for ongoing deactivation, surveillance, maintenance, environmental remediation activities, and site-wide utilities at PGDP;

b. The Infrastructure Contractor is responsible for site infrastructure, such as roads and grounds, janitorial services, and security/classification to include Site Officially Designated Security Authority (ODSA) for DOE interests;
c. The DUF_6 Contractor is responsible for the operation of the Depleted Uranium Hexafluoride (DUF_6) Conversion Plant and management of DOE UF_6 cylinders; and
d. The Environmental Technical Services (ETS) contractor provides environmental, technical, and administrative support services directly to DOE.

C.1.1. Project Purpose and Scope

The PGDP D&R Project encompasses managing over 650 structures, properties, or buildings (Section J, Attachment J-18) with approximately 7,500,000 ft^2 of floor space. The Contractor shall perform necessary S&M of these facilities and prepare the facilities for future demolition. The Contractor shall provide utilities to itself and other site tenants as detailed in Section J, Attachment J-12 Government Furnished Services and Items. The Contractor shall perform deactivation and decommissioning in accordance with the PWS. The Contractor shall also assist in transfers/assignment of structures, property or buildings to new tenants for purposes of re-use or re-industrialization, as appropriate. The Contractor shall perform all site and facility environmental remediation and waste management, as outlined in this PWS.

The scope of this Contract focuses on the continued deactivation of the PGDP facilities, preparing the facilities for future demolition, and performing environmental remediation activities required by the FFA and SMP.

C.1.2. Objectives and Programmatic Requirements

The Contractor shall achieve the objectives stated below while continuing to maintain compliance throughout performance of this Contract.

- Achieve continuous cost and process improvements and optimization for contract activities.

- Safely, securely, and cost effectively transition ongoing activities at the PGDP to minimize necessary S&M and utility O&M under DOE safety basis.

- While supporting continuity of on-going site cleanup operations, identify and eliminate systems, processes, etc. that are no longer necessary and maintain safe configuration of the facilities. Reduce systems not directly required to maintain safety and environmental compliance. Identify ways to further reduce requirements to perform the most cost effective approach for operations and S&M.

- Actively pursue activities to re-categorize facilities enabling a minimal level of S&M (e.g., Hazard Category 2 to Radiological Facility).

- Operate support facilities at the capacity necessary to safely support site needs.

- Develop, finalize and implement approved environmental remediation under the Paducah FFA.

- Maintain public and worker safety and health, and environmental protection.

- Reduce the overall DOE Paducah landlord costs.

- Comply with all applicable Federal, State, and local laws and regulations, Executive Orders, DOE Orders (and other types of Directives), and Regulatory Permits, Agreements, Orders and Milestones (both State and Federal) (See Section J, Attachment J-4, Requirements Sources And Implementing Documents (List A) And List Of Applicable DOE Directives (List B)).

- Provide all deliverables to DOE in accordance with all requirements of this Contract and those identified in Section J, Attachment J-13, Deliverables.

The DOE and the Contractor recognize the Paducah D&R Project contract is a cooperative undertaking that requires both parties to seek innovative approaches to achieve the end objectives. The continuation of streamlining and optimizing processes that result in elimination of unnecessary requirements are critical to accomplishing the PWS objectives.

The Contractor shall remediate specific areas on the site, complete deactivation activities, and operate the site waste storage facilities to include waste disposition. The Contractor is responsible for implementation of the overall OU strategy in accordance with the SMP, document number DOE/LX/07-1301&D2/R1 and (its subsequent revisions) under the Paducah FFA. Regulatory milestone dates reflect agreement among DOE and the regulators [i.e., the Kentucky Environmental and Public Protection Cabinet (Kentucky) and the United States Environmental Protection Agency Region 4 (EPA)].

C.1.3. Contractor Performance and Key Requirements

The Contractor shall implement a project structure and shall sequence the work to optimize the project schedule to achieve safe, cost-effective work/cleanup of the site while meeting all regulatory milestone dates. The Contractor shall negotiate agreements with the regulators to facilitate site clean-up and minimize waste. No negotiation or agreement shall be made without prior DOE notification and

consent. No communication with regulators is authorized without prior DOE notification. The Contractor must evaluate the short-term and long-term cost, schedule, legal and regulatory impact resulting from the proposed negotiation/agreement. To achieve the objectives stated below, the Contractor shall use its best efforts and shall cooperate in seeking elimination of as many unnecessary requirements as possible while continuing to maintain compliance throughout performance of this Contract.

The Contractor shall furnish all personnel, facilities, equipment, material, services and supplies (except as set forth in this Contract to be furnished by the Government), and otherwise to do all things necessary to accomplish work in a safe, secure (pursuant to 10 Code of Federal Regulations [CFR] 824), integrated, effective and efficient manner. The Contractor shall operate and perform deactivation and S&M activities for the facilities, buildings, trailers, and other structures and facilities (OSF) assigned in Section J, Attachment J-18. The Contractor shall continuously assess opportunities to eliminate systems and facilities, and pursue consolidation of operations and personnel work areas whenever/wherever a cost benefit is derived. The Contractor shall be responsible for planning, integrating, managing and executing the programs, projects, operations and other activities as described in this PWS. Concurrent with the deactivation process, the contractor shall remediate and disposition specific areas on the site, perform facility deactivation and decommissioning, and operate the site waste storage facilities to include waste disposition.

This contract reflects the application of performance-based contracting approaches and techniques that emphasize results/outcomes and minimize “how to” performance descriptions. The Contractor has the responsibility for total performance under this contract, including determining the specific methods for accomplishing the work.

The Contractor shall develop, implement and maintain a comprehensive, resource-loaded Final Contractor Performance Baseline (CPB) as required by Section H.68 and DOE Order (O) 413.3B, and DOE Office of Environmental Management Memorandum “Policy and Protocol for Office of Environmental Management Operations Activities.” The Contractor shall develop a requirements definition for each subproject to allow for accurate cost estimating, realistic schedule development, and the development of subcontract procurement packages. The Contractor shall evaluate all projects to determine if they are operating activities, General Plant Projects, or Capital Asset projects. Once evaluated, the Contractor will properly schedule and cost the project according to the classification.

The Contractor shall provide general operations oversight and project management functions to enable the safe operation of the site. In addition, the Contractor shall be responsible for the operations, environment, safety, health and quality assurance within its own organization and its subcontractors’

organizations. The Contractor shall provide site health and safety oversight for DOE, DOE technical support contractors and, at DOE's request, other personnel who are on-site in support of the DOE mission at PGDP (e.g., Kentucky Research Consortium for Energy and Environment (KRCEE) activities). The other major DOE contractors provide health and safety oversight for their activities. Furthermore, training program reciprocity/facility access between site contractors/tenants is required. The Contractor shall also ensure emergency response services are provided and available to all site tenants and shall be responsible for the Emergency Operations Center.

The Contractor shall ensure that its technical approach and execution of work is compliant with the applicable statutory and regulatory requirements and shall annually certify and provide to DOE its compliance with environmental requirements. The Contractor shall comply with and provide DOE with services necessary for its compliance with all applicable federal, state, and local requirements and agreements including the protection and preservation of cultural, historic, or archeological resources. The Contractor shall be responsible for all work necessary to obtain regulatory acceptance including legal/regulatory reviews and comment resolution. The Contractor shall recognize and work within the constraints imposed by this Contract and other regulatory agreements between DOE and regulatory agencies. Regulatory documents include, but are not limited to, all applicable laws, regulations, permits, plans, orders, and agreements.

The Contractor shall integrate all activities with other DOE contractors/tenants in areas of joint interface. The site contractors participate in a periodic coordination meeting called the Share Site Committee to address ongoing activities, reduce conflicts and coordinate schedules, and reinforce integration requirements. The Contractor shall lead the site's shared site committee and manage the shared site process.

The Contractor shall be the single point of accountability for the Paducah D&R Project activities, regulatory and DOE-EM interface, and project management in performance of this Contract.

If the Contractor submits a deliverable that DOE determines does not comply with the terms of the contract or regulatory requirements, including but not limited to, laws, regulations, orders, permits, plans, or agreements, the Contractor's revision or correction of the document/submittal shall be at no additional cost to DOE (See Section H.69 Unallowable Cost). This determination shall be at DOE's sole discretion. DOE notes that this compliance determination does not apply to the overall quality of the document (e.g. word processing) unless the errors impact the function and understanding of the document. If all of the contractual requirements are met such as timing of the submittal, inclusion of information required, factual accuracy, etc. are provided, the document will be accepted. Further DOE requires that all submittals to DOE be final documents (even though the Contractor may expect comments from DOE) and shall be signed and certified

when applicable so that DOE understands the approving Manager has read and agrees that the deliverable is technically correct, complies with the contract and applicable DOE Orders, and can be implemented without further action.

C.1.4. General End State Requirements

The applicable deliverables are provided in the PWS and Section J, Attachment J-13 Deliverables. The Contractor shall comply with all deliverables dates and all regulatory milestone dates. Regulatory milestone dates can be found in documents such as the FFA, SMP, Agreed Orders, TCSA, Federal Facility Compliance Agreement (FFCA), and regulatory permits. Deliverables without specific dates identified shall be established by the Contractor during CPB development and throughout the Contract's period of performance as approved by DOE. Changes to regulatory milestones do not alleviate Contractor responsibility to meet contractual or CPB milestone dates without specific approval by DOE.

C.1.5. Programmatic or Site Requirements Documents

Table C.1.5-1 General Project Programmatic or Site Requirements Documents*

Document Number	Title
CP1-NS-3000, R2	Documented Safety Analysis for the Department of Energy Paducah Site Deactivation Project
CP1-NS-3001, R1	Technical Safety Requirements for the U.S. Department of Energy Paducah Site Deactivation Project
BJC/PAD-462/R10	Documented Safety Analysis for the C-746-Q Hazardous and Low-Level Waste Storage Facility, Paducah Gaseous Diffusion Plant, Paducah, Kentucky
BJC/PAD-498/R11	Technical Safety Requirements for the C-746-Q Hazardous and Low-Level Waste Storage Facility, Paducah Gaseous Diffusion Plant, Paducah, Kentucky
DOE/OR/07-1707	Paducah Gaseous Diffusion Plant Federal Facility Agreement
DOE/LX/07-2401&D2/R1	Community Relations Plan, May 2016
DOE/OR/07-1595&D2	Data and Documents Management and Quality Assurance Plan for Paducah Environmental Management and Enrichment Facilities, September 1998
Office of Environmental Management Memorandum	Policy and Protocol for Office of Environmental Management Operations Activities, March 15, 2012
No document number	Training Reciprocity Agreement Between Portsmouth/Paducah Project Office Prime Contractors (example)
BJC/PAD-688/R1	Cultural Resources Survey for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, March 2006
DOE/OR/07-0107&D2/R5/V1	Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 1. Human Health, June 2015

Table C.1.5-1 General Project Programmatic or Site Requirements Documents*	
Document Number	**Title**
DOE/OR/07-0107&D2/R2/V2	Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 2. Ecological, June 2015
DOE/LX/07-1269&D2/R2	Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan, March 2015
DOE/LX/07-1301&D2/R1	Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2015, May 2015

**Table is not all inclusive applicable requirements documents. As documents are updated, the most current version will replace the versions identified in this table.*

C.2. WORK TO BE ACCOMPLISHED

EM.PA.0040.A001.06.DR PADUCAH CONTRACTOR TRANSITION

EM.PA.0040.A001.06.DR.01 Transition

Transition shall be 120 days consistent with Section L. The NTP may occur simultaneously with the contract award date and the Contractor shall be prepared to fully mobilize when the NTP is issued.

EM.PA.0040.A001.06.DR.02 Implementation

The Contractor shall perform all activities to support transition, including, but not limited to, facility walk-downs, engineering and design, procurement, review and acceptance or revision of safety authorization basis, programmatic and operational documents and procedures, and assisting DOE in verifying whether transition requirements have been met prior to the end of transition.

The Contractor shall perform a due diligence review of the facilities, systems, and environmental conditions within its assigned area of responsibility. The Contractor shall provide a written declaration to DOE, of its formal acceptance of responsibility for the assigned scope, facilities, and environmental/regulatory conditions.

The Contractor shall mobilize its Transition Management Team (comprised of the Program Manager, all other Key Position personnel identified in the Contract, and the Human Resource and Business Services personnel necessary to immediately begin transition activities) to site not later than 7 days after NTP. The Contractor shall determine the number of Human Resource and Business Services personnel necessary to support transition. The objective of the transition period is to establish safety, operations, business, and human resources operations that will enable the Contractor to deliver requirements on time and within established funding. At a minimum, the Contractor shall complete the following within the transition period:

a. Transition of responsibility for all facilities, facility operations, and environmental permits,

b. Due diligence walk downs and assessments of facilities and other areas,
c. Modification and DOE approval (as required) of existing program documents (e.g., Worker Safety and Health Program Plan, Nuclear Critical Safety Program, ISMS Description, etc.) see Section J, Attachment J-13 for full listing,
d. Modification and DOE approval (as required) of authorization basis documents,
e. Hiring, training, and transfer of clearances for all required staff,
f. Establish procurement processes for materials, equipment, supplies, parts, and subcontractors for a seamless transition,
g. Acceptance of any contracts, and
h. Any other actions necessary to enable the Contractor to formally accept responsibility for the entire PWS at 120 days after NTP.

Within 48 hours following the NTP, the Contractor shall release on its own website a brief Executive Summary of its offer and must meet the H.40 requirements. The purpose of this Executive Summary is to provide immediate release of relevant information to stakeholders and the public at large. It should include the following elements:

a. Name of Contractor including the identification of any Teaming Partners and Major/Critical Subcontractors (if applicable) and a description of the experience that each brings to the project;
b. Summary/Description of Contractor's Technical Approach (e.g., planned accomplishments, cost savings anticipated);
c. Organizations Structure and Identification of Key Personnel;
d. Commitments to the Community;
e. Total Contract Value Commitment to Small Business Subcontracting; and
f. Brief overview of Contractor's Past Performance (i.e., success stories).

The Contractor shall submit a Transition Plan for DOE approval within 15 days after NTP. The Transition Plan shall include a description of all activities necessary for the Contractor to assume full responsibility for the PWS at 120 days after NTP. The Transition Plan shall include a detailed transition schedule with identified critical path.

The Contractor's Transition Plan shall include a description of the Contractor's implementation of human resources management consistent with Workforce Transition and Contractor Human Resources Management requirements as described in Section H, Clauses H.4 through H.7, including:

a. Expected workforce composition and any immediate or anticipated workforce restructuring;
b. Identification of any existing issues under the National Labor Relations Act (NLRA) and its plan for engaging with any labor representatives;
c. A schedule for preparation and submission of any bargaining parameters requests;

d. Identification of any prevailing wage requirements, including any requirements under section 4(c) of the Service Contract Labor Standards statute as well as any NLRA requirements with respect to determination of wages and benefits;
e. Description of processes for handling labor standards determinations for work packages;
f. Define any obligations with respect to pension and post-retirement benefit plans;
g. A plan for identification and resolution of any legal issues regarding any of the above, including the Contractor's plan for engaging outside counsel, if needed; and
h. A plan for communicating with DOE on these matters.

The Transition plan shall also include: all deliverables, documents, and items that the Contractor is required to submit to DOE (including DOE review periods); the planned submittal dates compliant with contract requirements; and the Contractor's responsible person(s) with his/her contact information. The Contractor is required to give DOE at least 2 weeks to review and comment on all documents submitted during the 120 day Transition Period. Any agreement that requires DOE consent will be subject to a 30 calendar-day review and approval period unless a longer review/approval period is warranted due to the size and complexity of the document. The Transition Plan shall also specifically address all actions necessary to complete items EM.PA.0040.A001.06.DR.02 a. through g. (transition plan requirements above). Coordination with other site contractors/tenants is required to ensure continuation of services by the Contractor as identified in the Section J, Attachment J-12, Government Furnished Services and Items Requirements Matrix. The Plan must ensure there is no loss or degradation of the services that are provided to DOE and its contractors/tenants. Included in this plan, the Contractor shall resolve and gain DOE acceptance of their resolution for all gaps that exist between the Contractor's transition plan and the incumbent contractor's operations turn-over plan(s). The Contractor shall be provided the incumbent contractor's Task Order Close-out Plan no later than 45 days after NTP.

The Contractor is responsible for ensuring that all necessary transition activities are identified and completed during the Contract Transition Period. The Contractor shall provide weekly Transition Status Reports to DOE until Contract transition is completed. The Contractor shall establish routine status meetings with DOE and affected contractors to review Implementation activities and issues.

The Contractor shall become a signatory to the existing co-generator agreement with DOE (referenced in Section J, Attachment J-19). The Contractor shall put into place any agreements it deems necessary between it and other site contractors or any subcontractors for provision of services. Any agreement that requires DOE consent will be subject to a 30 calendar-day review and approval period unless a longer review/approval period is warranted due to the size and complexity of the document.

In accordance with Section H.68, the Contractor shall submit an Initial CPB that matches the Contractor's proposed total contract value and provides work planning

and costs for ALL PWS elements within seven days from the NTP (at the lowest level WBS for cost tracking and reporting and referenced to a CLIN level). Additionally, in accordance with Section H, the Contractor shall submit a Final CPB for DOE approval not later than 6 months from NTP, which provides work planning, measurement, and management details and must be resource loaded at the lowest level WBS for cost tracking and reporting. Where appropriate, information must be updated in the Facility Information Management System (FIMS) to ensure consistency for facility maintenance cost projections.

Table C.2.EM.PA.0040.A001.06.DR.02-1
Contract Transition Milestones/Schedule

Milestone	Date
Executive Summary Placed on Website	Within 48 hours after NTP
Complete mobilization of Transition Management Team	Within 7 days after NTP
Submit Contract Transition Plan	Within 15 days after NTP
Submit Initial CPB	Within 7 days after NTP
Modify all existing regulatory permits to reflect new Contractor	As stipulated by regulation, statute, law, or permit requirements AND prior to conclusion of Transition
Weekly Transition Status Reports	Weekly, through transition
Operational Responsibility Acceptance Declaration	Within 120 days after NTP

EM.PA.0040.A001.06.DR.03 Environmental Compliance Review

The Contractor shall complete a comprehensive environmental compliance due diligence review, certify the results of the review and provide a copy of the report to DOE. At a minimum, this certification shall include, but is not limited to:

a. List of site conditions that pose a potential compliance risk for DOE and/or the Contractor;
b. Declarative statement, by the Contractor, of acceptance of site environmental, waste, and permit conditions, with noted exceptions; and
c. Evidence that all existing site environmental permits have been modified to identify the Contractor as an operator.

Table C.2.EM.PA.0040.A001.06.DR.03-1
Environmental Compliance Review Milestones/Schedule

Milestone	Date
Environmental Compliance Review	Within 60 days after NTP

EM.PA.0040.A001.06.DR.04 Material Differences

The Contractor shall identify any material differences in the systems, facilities, waste sites, property and services described in this PWS and actual conditions. The Contractor shall prepare and submit a Statement of Material Differences. The material differences statement provided to DOE must include the specific material(s) difference tracked to the specific contract section(s) that are impacted and specifically identify the sections of the Contractor's proposal (Technical and Cost Volumes) that

conflict with the site conditions and any/all reference material that the Contractor is relying on. Poor or inaccurate Contractor assumptions do not constitute a material difference.

Table C.2.EM.PA.0040.A001.06.DR.04-1 Material Differences Milestones/Schedule	
Milestone	**Date**
Material Difference Statement	Within 60 days after NTP

EM.PA.0011.A001.01.DR POLYCHLORINATED BIPHENYLS (PCBs)

PCBs were used as part of the uranium enrichment process. The lube oil system in the PGDP facilities leaked oil that migrated into the ventilation systems and came into contact with PCB impregnated gaskets. Although the lube oil has been removed from the lube oil system, residual lube oil remains in the ventilation system and continues to leak. Additionally, as a result of the shutdown of enrichment operations, water in-leakage (primarily rain intrusion) has resulted in water entering the ventilation system and coming into contact with the PCB impregnated gaskets. These systems occasionally leak due to age, vibration, and thermal cycling. Troughs and a collection system have been installed under the areas that have a high potential to leak. There are over 16,000 PCB collection troughs (ranging from 4½ to 6 feet in length) installed inside the cascade buildings (e.g. C-310, C-315, C-331, C-333, C-335, and C-337). There are approximately 260 collection points associated with the troughing system. The process buildings cover approximately 6,400,000 square feet of floor space. Lube oils contaminated with PCBs from the gaskets are continuously collected and dispositioned; maintenance of the trough system is ongoing. PCB lube oils that leak or spill are collected, cleaned-up, sampled, and properly disposed.

EM.PA.0011.A001.01.DR.02 Polychlorinated Biphenyls (PCBs) Operations

The Contractor shall perform all activities below:

a) Perform surveillance and maintenance of the PCB collection and containment trough system including disposition of the collected PCB lube oils/water to the extent necessary. As facilities are shutdown or deactivated the Contractor shall determine how to comply with the TSCA Federal Facilities Compliance Agreement (FFCA) requirements without daily/weekly/monthly access to the process buildings. Since the lube oil has been removed from the originally installed equipment (still present in lube oil skids supporting P&E pump operations for deposit/holdup removal), the source of liquids is residual oils from leaks in the ventilation system or water in-leakage through the roofs.
b) The Contractor shall develop and implement a process to mitigate the continued migration of liquids in the ventilation systems.
c) The Contractor is required to develop and implement a PCB mitigation plan.
d) The Contractor shall clean up, sample, and decontaminate PCB spills and leaks, sample and analyze spill sites (estimated to be 40 small spills per year), and properly disposition the PCBs and PCB contaminated material (e.g., absorbent pads and pigs).

e) The Contractor shall collect quarterly air quality data throughout the process buildings and submit quarterly and annual reports until this is no longer a requirement by U.S. EPA. The Contractor shall successfully gain U.S. EPA approval to discontinue or reduce the frequency of sampling and reporting. For example, the Contractor shall collect and prepare the data needed to conduct the technical/scientific analysis; prepare draft permit or other regulatory document changes; and take any other necessary actions to support successfully obtaining a discontinuance or a reduction in the levels of PCB sampling and reporting to the U.S. EPA.

f) As the Contractor implements actions to deactivate and isolate facilities, the Contractor shall evaluate the requirements under TSCA FFCA and determine how to comply with or modify the agreement in order to minimize cost to DOE and place the facilities in long-term S&M at minimal annual cost to DOE.

Table C.2.EM.PA.0011.A001.01.DR-1
PCB Requirements Documents

Document Number	Title
NA	Compliance Agreement Between the US DOE and the United States Environmental Protection Agency, February 20, 1992
NA	Modification to the Compliance Agreement Between the US DOE and the United States Environmental Protection Agency, September 25, 1997
PPPO-01-3062289-15	TSCA FFCA PPPO's Proposal - Modification to the February 20, 1992, Toxic Substances Control Act Compliance Agreement

Table C.2.EM.PA.0011.A001.01.DR-2
PCB Milestones/Schedule

Milestone	Date
Develop and implement a PCB mitigation plan	30 days after Transition is Complete
Gain U.S. EPA approval to discontinue quarterly air quality reporting or monitoring.	180 days after Transition is Complete
UE TSCA FFCA Annual Compliance Agreement Report to the EPA	Annually Initial Due Date: June 1 Final to DOE for signature: June 23 Due to regulators July 1
UE TSCA FFCA Quarterly Compliance Agreement Report	Initial Due: Feb 1, May 1, August 1, November 1 Final Due: Feb 15, May 15, August 15 November 15

EM.PA.0020.A001.03.DR SAFEGUARDS AND SECURITY

The Infrastructure Contractor is the Officially Designated Security Authority (ODSA) at the Paducah site and considered to be the ODSA pursuant to current DOE directives. As such, it has the primary role for security functions for DOE operations consistent with the scope of the Infrastructure Contract. The ODSA develops and maintains the site security program including the Paducah Site Security Plan (SSP).

The ODSA has the primary responsibility for evaluation of the security posture of the DOE mission at the Paducah Site including, but not limited to asset identification, threat assessments, and risk assessments/vulnerability analyses. The risk assessments/vulnerability analyses may be delegated to the Contractor by the DOE Site Lead or ODFSA. This delegation would be to support the Contractor scope in the event the ODSA does not have the particular skill set on staff or available to perform the work. The ODSA develops the protective strategy for DOE assets at the Paducah Site on a graded basis in accordance with DOE directives, with input and concurrence from the Contractor. ODSA documents the protective strategy in the SSP including, but are not limited to access control, the protection of classified matter, unclassified controlled information (UCI), nuclear material, protective force (PF), personnel security, Security Condition (SECON) measures, and government property. ODSA provides protection requirements to the PF Organization, with input and concurrence from the Contractor, for the protection of DOE assets including classified matter, non-conformance storage, and nuclear materials in accordance with the DOE-approved SSP, Orders, regulations, and laws.

The Contractor is responsible for conducting operations in accordance with the approved security plans supporting their contract responsibilities consistent with the DEAR Clause 952.204-2, Security, of their contract and applicable DOE directives specified in their contracts.

Table C.2.EM.PA.0020.A001.03.DR-1
Security Programs Requirements Documents

Document Number	Title
Addendum B of the 2014 Site Security Plan	*Interim Compensatory Measures for De-leased Non-Conforming Storage of Classified Matter at the Paducah Site, Paducah, Kentucky*
NA	Compliance Assessment for Non-Conforming Storage of Classified Matter at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky
	Paducah Site Security Plan (SSP).

EM.PA.0020.A001.03.DR.01 Security Program

Security plans supporting D&R work required by this Contract shall be prepared by the ODSA in consultation with the Contractor, who shall also be a signatory to the documents. The Contractor shall ensure that the Security Plans meet both near term and long term operational needs prior to signature and shall provide sufficient time and coordination with the ODSA to meet Contractor schedules. The Contractor will be provided sufficient time by the ODSA to review the document prior to comments and/or signatures.

The ODSA has the responsibility to develop, implement, and maintain an Incidents of Security Concern (IOSC) Program. The ODSA also provides the Inquiry officials for the contractor's facility code. The PGDP D&R Contractor shall notify the ODSA of all potential IOSCs at the site or related to the implementation of this Contract. The

ODSA is responsible for providing a site consolidated report on IOSCs to DOE Officially Designated Federal Security Authority (ODFSA). The ODSA provides personnel security (e.g., clearance processing) and badging services for DOE Contractors at the site.

The ODSA is responsible for DOE information security at the site including both classified and unclassified sensitive information. The ODSA maintains a Classification Officer and supporting staff for all DOE classification activities at the site. Derivative classifiers are trained and appointed by the ODSA Classification Officer. The Contractor is responsible for providing its own derivative classifiers, as necessary, to support implementation of this Contract.

The Contractor shall perform all activities to:

a. Comply with site requirements to ensure appropriate levels of protection against: unauthorized access; theft, diversion, loss of custody of special nuclear material; espionage; loss or theft of classified matter or Government property; and other hostile acts that may cause unacceptable adverse impacts on national security or the health and safety of DOE and its Contractor employees, the public, or the environment.
b. Ensure representation on the Performance Assurance Program (PAP) Committee.
c. Maintain a Performance Testing Program and provide all results to the ODSA for incorporation into the PAP.
d. Ensure operations are fully consistent with all approved security plans applicable to the Contractor programs including, but not limited to facility security, physical security, cyber security, Operations Security (OPSEC), and information security.
e. Ensure representation on the OPSEC Committee.
f. Develop, implement, and manage a fully compliant PF operation in accordance with DOE directives.
g. Promptly prepare and submit requests for DOE access authorizations for personnel access to classified matter consistent with the provisions of the Contract Security Classification Specification (CSCS) approved for work under this Contract. The ODSA performs the processing of the security clearance applications, and coordinates with the cognizant personnel security office.
h. Provides an information security program commensurate with the ODSA Information Security Program to include types of information available on-site, such as, but not limited to, proprietary, Privacy Act, Unclassified Controlled Information (UCI), Export Control Information (ECI), Personally Identifiable Information (PII), official use only (OUO), classified and Unclassified Controlled Nuclear Information (UCNI). The Contractor shall coordinate all information security programs with the ODSA who shall adjudicate classification issues.
i. Notifies the ODSA of potential Incidents of Security concern.

j. Ensure an adequate number of Contractor personnel are designated as derivative classifiers and/or UCNI/ECI (Export Controlled Information reviewers in support of the Contractor's project needs.
k. Comply with ODSA security plans. The Contractor has the responsibility to recognize situations in which it shall need to request or develop security plans and work with the ODSA as appropriate to get those plans in place prior to performance of work.
l. Comply with 10 CFR 824.
m. Complete the Initial Survey prior to transition from the current Deactivation/Remediation Contractor. The Initial Survey is a comprehensive review of the security status at a facility that is a candidate for a Facility Security Clearance (FCL) conducted to determine whether the facility in question meets established standards for the protection of the security interests and activities to be covered by the FCL.

Table C.2.EM.PA.0020.A001.03.DR.01-1
Security Programs Milestones/Schedule

Milestone	Date
Submit the Protective Force SSP section to the ODSA	90 days after NTP and Annually thereafter in a schedule agreed to by the ODSA
Successfully complete Initial Survey	At least 30 days prior to the end of Transition Period

EM.PA.0020.A001.03.DR.02 Protective Force Services

The Contractor shall ensure a Protective Force (PF) program compliant with DOE Orders, regulations, and laws. Upon transition of the PGDP facilities and associated realty, the Contractor shall provide PF services for protection of DOE site property and projects in accordance with the Site Security Plan. The Contractor shall maintain a sufficient security staffing plan to ensure all mission requirements (e.g. active shooter, posts, alarm monitoring, patrols) can be met along with all DOE order program requirements. These numbers may be a combination of Security Officers (SO), fixed post readiness Security Police Officer (SPO) or SPO I personnel. Appropriate number of non-uniformed security staff and management should also be sufficient to ensure full implementation and execution of all applicable security programs consistent with this scope and the DOE PF programs.

The Contractor shall maintain a trained PF and shall provide all necessary equipment for use by the workforce (e.g. weapons, body armor, and masks). Basic Security Police Officer Training must be completed by new hires within six months of employee start date. The Contractor shall utilize and maintain site facilities, including training facilities, portals, etc. to implement and maintain compliance with the Site Security Plan.

The Contractor shall develop, in consultation with the ODSA, the PF Section of the SSP and provide it to the ODSA. The Contractor will conduct self-assessments of the PF program and provide annual roll-up self-assessment reports and any resulting

corrective action plans to the ODSA for inclusion in the Annual Comprehensive Site Assessment Report submitted to the DOE ODFSA.

The Contractor shall ensure any mitigating actions deemed necessary by the ODSA or other approved security plans, are in place and properly executed, for any existing non-conforming storage, or any newly discovered non-compliant storage, until compliant storage can be achieved.

The Contractor shall develop and execute annual force-on-force exercises. The Contractor shall ensure it is appropriately staffed including the active shooter scenario, for all facilities and areas on the PGDP reservation. The contractor shall provide staff for 24/7 site alarm monitoring provided to DOE assets. The Contractor shall provide routine access to the DOE Infrastructure Contractor and the DUF_6 Contractor into the Limited Area or other security areas of the Plant in support of their operational needs. Non routine access or special project work shall be staffed at times and locations agreed upon by the Contractor in advance.

The Contractor shall submit quarterly reports documenting overtime hours worked for each Security Police Office (SPO) for that quarter and the projected overtime hours required for the subsequent quarter.

Table C.2.EM.PA.0020.A001.03.DR.02-1
Security Programs Milestones/Schedule

Milestone	Date
Submit Self-assessments Report of Protective Force program and resulting corrective action plans	12 months after conclusion of Transition and Annually thereafter
Submit SPO overtime hours report	Quarterly after transition
Submit Pro Force Qualifications Data	March 25th and September 24th Annually.
Submit Workplace Violence and Active Shooter Training Reports	Annually
Submit Force on Force After Action Reports	45 days after Force on Force Action
Submit Cooperative Agreements with Non-DOE Law Enforcement Agencies	Annually
Submit Security and Emergency Management Performance Metrics Reports	Quarterly

EM.PA.0020.A001.03.DR.03 Security Infrastructure

EM.PA.0020.A001.03.DR.03.01 New Firing Range

Contractor shall design, construct, and install a new modular firing range that would allow a single instructor to conduct firearms training. The range shall be able to support an on-site Basic Security Police Officer Training course and have four (4) firing lanes to allow for increased efficiency in weapons training operations and reduce the time required for semi-annual qualifications. Additionally, a storage area

(e.g., large shipping container) for ammunition and/or range supplies will be located in the vicinity of the new range.

Design, construction and installation of the modular firing range shall comply with all requirements of DOE Order 473.3 "Protection Program Operations", DOE Order 470.4B "Safeguards & Security Program" and the "Range Design Criteria" prepared by U. S. Department of Energy Office of Health, Safety and Security, dated June 4, 2012. In addition, the design shall provide for future security complex considerations such as the utilities and with minimal mitigating measures required.

The Contractor shall submit 30%, 60% and 90% design packages to DOE for review and comment and the Certified for Construction (CFC) design package for DOE concurrence. Additionally, The Contractor shall prepare and gain DOE approval of all required public notifications, environmental permits, certificates, agreements, etc. All work is to be performed utilizing PA-0020 funding.

Table C.2.EM.PA.0020.A001.03.DR.03.01-1
New Firing Range Milestones/Schedule

Milestone	Date
Submit Firing Range 30% Design Package	October 30, 2017
Submit Firing Range 60% Design Package	December 15, 2017
Submit Firing Range 90 % Design Package	January 31, 2018
Submit Firing Range Certified for Construction Package	March 15, 2018
Complete Installation of Modular Firing Range Facility	September 30, 2018

EM.PA.0020.A001.03.DR.03.02 Institute Limited Area Islands

The Contractor shall institute Limited Area (LA) islands for the following areas within the current LA fencing at PGDP.

a. The cell floors in C-310, C-331, C-333, C-335, and C-337. Automated access controls will be included at appropriate access points per building, including stairways and the elevator. The remaining access points will be addressed for access but remain available for emergency access and egress.
b. The northwest quadrant of the plant (undivided area north of Texas Avenue and west of 10th Street) which includes Classified Restricted Data/Secret Restricted Data burial grounds. A separate area bounded by Tennessee and Virginia avenues and 4th and 6th streets is to be included for the C-747 and C-748B facilities. Design and installation of new fencing, gates, to include the ability for Pro Force to patrol (e.g. detect unauthorized access), required signage and posting, as well as, required lighting are to be included.
c. Contractor shall address the need for C-300, C-710 Barrier Lab, and C-720 Seal Shop as possible islands of security. A strategy/report with justification and applicable costs for usage, relocation or elimination (as appropriate) shall be provided by the Contractor.

The Contractor shall submit 50% and 90% design packages to DOE for review and comment and the Certified for Construction design package for DOE concurrence. The Contractor shall obtain the concurrence of the Infrastructure Contractor when establishing the LA islands. Additionally, the Contractor shall prepare and gain DOE approval of all required public notifications, environmental permits, certificates, agreements, etc. All work is to be performed utilizing PA-0020 funding.

Table C.2.EM.PA.0020.A001.03.DR.03.02-1
Institute Limited Area Islands Milestones/Schedule

Milestone	Date
Submit LA Islands 50% Design Package	December 31, 2018
Submit LA Islands 90 % Design Package	March 31, 2019
Submit LA Islands Certified for Construction Package	May 31, 2019
Submit C-300, C-710 Barrier Lab, and C-720 Seal Shop LA Strategy Report	120 days after NTP
Complete Installation of LA Islands	March 31, 2021

EM.PA.0020.A001.03.DR.03.03 Protective Force Facilities

The Contractor shall design, construct, furnish, and implement a protective force modular training complex that would include:

a. Change house and locker facilities for protective force personnel;
b. An armory;
c. Modular office facilities for protective force management and personnel. Consideration for classified conversations should be addressed;
d. A quarter mile exterior running track for the protective force. The design should take into consideration the projected number of PF personnel;
e. A modular training facility with appropriate space, equipment and facilities for the projected number of PF personnel and management; and,
f. A physical fitness center with adequate space and the appropriate exercise equipment to support the PF program fitness requirements. The Contractor shall utilize existing exercise equipment and supplement as needed with new equipment.

Design, construction and installation of the modular units shall comply with all requirements of DOE Order 473.3 “Protection Program Operations” and DOE Order 470.4B “Safeguards & Security Program”. In addition, the design shall provide for future security optimization considerations such as the utilities to ensure minimal mitigating measures in the future. Each item above must be scheduled and costed as separate activities under this PWS.

The Contractor shall submit 30%, 60% and 90% design packages to DOE for review and comment and the Certified for Construction design package for DOE concurrence. Additionally, The Contractor shall prepare and gain DOE approval of

all required public notifications, environmental permits, certificates, agreements, etc. All work is to be performed utilizing PA-0020 funding.

Table C.2.EM.PA.0020.A001.03.DR.03.03-1 Protective Force Training Facility Milestones/Schedule	
Milestone	**Date**
Submit Training Facility 30% Design Package	January 25, 2022
Submit Training Facility 60% Design Package	March 31, 2022
Submit Training Facility 90 % Design Package	May 31, 2022
Submit Training Facility Certified for Construction Package	July 31, 2022
Complete Installation of Change House, Armory, Modular Office Facilities and Running Track	September 30, 2023
Complete Installation of Training Facility and Fitness Center	March 31, 2025

EM.PA.0040.A001.01.DR ENVIRONMENTAL MONITORING PROGRAM

EM.PA.0040.A001.01.DR.01 Environmental Monitoring and Reporting

The Contractor shall perform programmatic Environmental Management System functions. This includes ongoing environmental monitoring of on-site and off-site air, soils, and water, and reporting the results to DOE and regulators. This activity also includes all activities to maintain, repair, or replace the equipment used in support of this work element.

In order to protect the health and safety of the on-site workforce, the public, and the environment, monitoring of on-site and off-site air, soils, and water is continuously performed. Agreements with the regulators have been made on the scope of the exiting EM program. It is DOE's goal to continuously optimize the monitoring requirements through agreements with the regulators; however, the Contractor must obtain DOE and/or regulatory approval prior to reducing any monitoring activities.

The Contractor shall perform all activities to:

a. Coordinate with other site contractors to prepare appropriate transmittals and applications for any new operating and environmental permits, agreements, licenses, contracts, etc. for DOE owned/contractor operated facilities, systems, or processes.
b. Monitor and maintain the structural integrity of approximately 330 groundwater monitoring wells as identified in Appendix B of the current Environmental Monitoring Plan (EMP), CP2-ES-0006/R0. Well maintenance includes, but is not limited to, replacing broken concrete pads surrounding the wells; repairing, replacing, extending the outer protective steel casing; repairing, replacing, installing vehicle guard posts around the wells; repairing and replacing casing covers, lock hasps, and hinges on outer protective

casings; drilling weep holes in the outer protective casing; and painting the outside of the outer protective casings, including well rehabilitation or replacement, and abandonment as required.

c. Monitor and maintain all of the site's outfalls, seeps, in-stream surface water locations, and sediment monitoring locations. Perform all outfall maintenance (except mowing which will be provided by the Infrastructure Contractor).
d. Conduct dosimetry monitoring at an estimated 40 locations including deploying, purchasing, and analyzing dosimetry; aquatic and other biological monitoring; and landfill surface water and leachate monitoring.
e. Manage the C-746-K and C-404 burial grounds in accordance with their O&M/Permit requirements, including collecting and analyzing leachate, conducting monthly inspections and providing corrective maintenance as required. This includes cap maintenance (except mowing which will be provided by the Infrastructure Contractor) and management of the leachate collection sump at C-404. Additionally, the Contractor shall ensure the surface water OU O&M plans are met (e.g., interim corrective measure activities) and updated as needed.
f. Execute the Water Policy (interim control measure) to include management of license agreements (an estimated 101) with local residents and businesses to supply municipal water and license agreements (an estimated 10) to allow DOE to access and sample off-site monitoring and residential wells.
g. Evaluate the available groundwater data and establish the technical and regulatory basis to reduce the size of the Water Policy Box, while maintaining the same level of protectiveness to members of the public. The Contractor shall collect any additional data required to support its technical position. The Contractor shall develop and submit all required regulatory documents for reducing the size of the Water Policy Box. Additionally, upon regulator approval, the Contractor shall implement the reduction, including working with the licensees and the West McCracken Water District to eliminate DOE costs for water services (e.g., both the licenses, as well as the applicable ratio/portion of the bleed line costs). The Contractor shall ensure that all stakeholders are provided sufficient notice and informed of all changes at least one (1) year prior to implementation and that DOE reviews all communications to stakeholders. The Contractor shall gain DOE approval of the technical basis and regulatory submittals prior to submittal of any required regulatory documents to the regulatory agencies.
h. Maintain and update as necessary, the license agreement with Kentucky Fish and Wildlife for management of the approximately 1,986 acres of DOE property not in the industrialized portion or buffer area of the plant. (REEMCBCDOE-03-12-0701)
i. Operate and maintain the Paducah contribution to the PPPO Environmental Geographic Analytical Spatial Information System. Provide a web-based version for access by regulators, Citizens Advisory Board members, and the public.

j. Perform all environmental monitoring tasks necessary to support all site activities, including but not limited to sample collection, and analysis as necessary to prepare and submit reports.
k. Monitor all SWMUs in accordance with the RCRA permit and FFA document requirements.
l. Maintain, input, create reports on, and complete all other activities necessary to manage environmental data generated by the Contractor's activities and data provided by other site Contractors. Ensure the data is current, complete, and compliant with Contract requirements. This includes management of databases (e.g., Oak Ridge Environmental Information System (OREIS), Geographical Information System (GIS), PEGASIS External Web Access System, Paducah Project Environmental Measurement System (Paducah PEMS)) transitioned to the Contractor or included as part of any regulatory agreement(s). This also includes maintaining the site groundwater modeling program(s) and support of routine groundwater modeling meetings with EPA and KDEP.
m. Provide SWMU notifications for work in all SWMUs at PGDP in compliance with all legal requirements.
n. Conduct CERCLA Five Year Reviews in accordance with the Federal Facility Agreement including necessary field activities to prove protectiveness (e.g., vapor intrusion screening).
o. Update, maintain, and comply with the existing Paducah Site Treatment Plan (STP) and obtain DOE approval of the STP prior to submittal to the regulators.
p. Perform site-wide environmental regulatory management for all site-wide permits, permit applications; site-wide NEPA documents; site-wide environmental reports, etc. The Contractor shall administer the site program, provide required environmental information to support regulatory compliance, and comply in areas under its cognizance, including NEPA. The Contractor shall provide required air and liquid effluents and near facility environmental monitoring; and collect, compile, and/or integrate air and liquid effluent monitoring data from operations and activities under its control. The Contractor shall develop and submit for approval the Annual Paducah Environmental Report and integrate its environmental permitting and regulatory compliance activities with the Paducah-wide permitting and compliance framework.
q. Collect ambient air monitoring data to verify radionuclide levels in off-site ambient air in accordance with the current Paducah Gaseous Diffusion Plant Department of Energy National Emissions Standards for Hazardous Air Pollutants (NESHAP) Management Plan. The Contractor shall maintain the air monitors and collect radionuclide samples surrounding the plant to capture airborne radionuclides emitted from all sources including fugitive and diffuse sources.
r. Manage the C-613 Sedimentation Basin in accordance with the Operations and Maintenance Plan, including all required sampling and analysis.

s. Perform any Clean Air Act (CAA) Title V or associated permit sampling/monitoring and analysis and complete required reports. The current CAA Title V is between the Commonwealth of Kentucky and the current deactivation contractor. These activities are only required if the permit is determined to be necessary and transferred to the Contractor.
t. Support DOE in the NEPA evaluation process as appropriate.
u. Submit to DOE the required reports/documentation in accordance with Section J, Attachment J-13, Deliverables.

Table C.2.EM.PA.0040.A001.01.DR.01-2
Environmental Monitoring and Reporting Requirements Documents

Document Number	Title
CP2-ES-0006/R0	Environmental Monitoring Plan, Fiscal Year 2016, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, January 2016
Commonwealth of Kentucky Permit Numbers KY0004049 and KY0102083	Kentucky Pollutant Discharge Elimination System Permit Number KY0004049 for the Paducah Gaseous Diffusion Plant/U.S. Department of Energy Outfalls Under, McCracken County, Kentucky Kentucky Pollutant Discharge Elimination System Permit Number KY0102083 for the Paducah Gaseous Diffusion Plant/United States Enrichment Corporation Outfalls Under, McCracken County, Kentucky
Commonwealth of Kentucky Permit Numbers 073-00045, 073-00014, 073-00015	C-746-U, C-746-S and C-746-T Landfills Solid Waste Permits
REEMCBCDOE-03-12-0701	License Agreements between DOE and the Kentucky Department of Fish & Wildlife Resources for Paducah Gaseous Diffusion Plant
Permit Number KY8-890-008-982	Kentucky Division of Waste Management Hazardous Waste Management Facilities Permit, includes the Hazardous and Solid Waste Amendments permit issued by U.S. EPA
REEMCBCDOE-7-08-0xxx (example)	License (Single Purpose: Groundwater Monitoring Wells, Sampling, Furnishing Municipal Water to Grantor)
Dated March 13, 2006; signed by DOE May 9, 2006	Tennessee Valley Authority – Shawnee Fossil Plant – Paducah Gaseous Diffusion Plant Letter of Agreement
PRS-ENM-0031/R2	C-404 Landfill Source Demonstration Paducah Gaseous Diffusion Plant, Paducah, Kentucky, August 2007
DOE/OR/06-1201&D2	Action Memorandum for the Water Policy at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, June 1994
BJC/PAD-691/R1	Cultural Resource Management Plan for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, March 2006

Table C.2.EM.PA.0040.A001.01.DR.01-3
Environmental Monitoring and Reporting Milestones/Schedule

Due to the extensive number of deliverables/milestones, to avoid discrepancies, the full list is only included in Section J, Attachment J-13 identified as EM.PA.0040.A001.01.DR.01

Milestone	Date

Table C.2.EM.PA.0040.A001.01.DR.01-3 Environmental Monitoring and Reporting Milestones/Schedule Due to the extensive number of deliverables/milestones, to avoid discrepancies, the full list is only included in Section J, Attachment J-13 identified as EM.PA.0040.A001.01.DR.01	
Milestone	**Date**
See Section J, Attachment J-13, Summary of Contract Deliverables, Deliverable References for EM.PA.0040.A001.01.DR.01	Per Section J, Attachment J-13,

EM.PA.0040.A001.02.DR PUMP AND TREAT OPERATIONS

TCE and ^{99}Tc were discovered in residential wells north of the Paducah Site in 1988. DOE, the EPA and Kentucky entered into an Administrative Consent Order under Sections 104 and 106 of CERCLA that required an Investigation of the nature and extent of off-site contamination.
The site investigation delineated two off-site groundwater contamination plumes, referred to as the Northwest and Northeast Plumes, and identified several potential on and off-site source areas requiring additional investigation and action.

Interim remedial actions were developed to mitigate and control the spread of the highest concentration portion of the Northwest and Northeast plumes. To implement these two interim remedial actions, two pump-and-treat facilities have been installed. The Northwest Interim Record of Decision was signed in 1993, and the Northeast Interim Record of Decision was signed in 1995. Both of these systems have been optimized and/or upgraded since the original RODs and both have a subsequent Explanation of Significant Differences.

Table C.2.EM.PA.0040.A001.02.DR-1 Pump and Treat Operations Requirements Documents	
Document Number	Title
DOE/OR/06-1201&D2	Action Memorandum for the Water Policy at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, June 1994
DOE/LX/07-0359&D1	Post-construction Report for the Northwest Plume Optimization at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, January 2011
DOE/LX/07-1280&D2/R2	Remedial Action Work Plan for Optimization of the Northeast Plume Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, February 2016
DOE/OR/06-1143&D4	Record of Decision for Interim Remedial Action of the Northwest Plume, July 1993
DOE/LX/07-0343&D2	Explanation of Significant Differences to the Record of Decision for the Interim Remedial Action of the Northwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

Table C.2.EM.PA.0040.A001.02.DR-1 Pump and Treat Operations Requirements Documents	
Document Number	Title
DOE/OR/06-1356&D2	Record of Decision for Interim Remedial Action at the Northeast Plume, June 1995
DOE/LX/07-1291&D2/R2	Explanation of Significant Differences to the Record of Decision for the Northeast Plume Interim Remedial Action, November 2015
DOE/OR/07-1253&D4/R5	Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, September 2010
DOE/OR/07-1535&D3/R4	Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, August 2013

EM.PA.0040.A001.02.DR.01 Pump and Treat Operations

The Contractor shall perform all activities to:

a. Operate and maintain the two installed groundwater pump-and-treat facilities in accordance with the approved operations and maintenance plans to control the highest concentration portion of the Northeast and Northwest Groundwater Plumes until regulatory approval is attained to cease operations, including preparation, completion and submittal of any applicable regulatory documents.

b. Sample and monitor the three plumes, and conduct analyses to determine the effectiveness of and the need for continued operation of the pump-and-treat system

c. Continue and complete the optimization of the Northeast Plume Pump and Treat System consistent with regulatory agencies negotiated agreements and strategies, as specified in the 2015 Dispute Resolution on the Northeast Plume Pump and Treat System Optimization and the approved Remedial Action Work Plan (RAWP). The Contractor shall develop and issue a report and develop a presentation for the regulators on any existing transect wells findings. The Contractor shall revise and gain approval of the revised RAWP, if necessary, to address the two (2) extraction wells, additional monitoring wells (up to 14) and piezometers, and all associated field work required to complete the optimization of the NE Plume Pump and Treat System. Additionally, the Contractor shall install and operate a second treatment unit provided as Government Furnished Equipment (GFE) similar in size and capacity to the existing unit. Installation shall include all components necessary for the operation of the optimized NE Plume Pump and Treat System, such as the piping, control boxes, logic systems, assembled programming, and electrical wiring. The Contractor shall develop and submit

a revised O&M Plan for both DOE review and regulatory review. The Contractor shall develop all necessary procedures, conduct all necessary training, as-built drawing completion, and perform system testing to ensure the optimized system is fully operational. The Contractor shall develop a Post-Construction Report, for submittal to the regulators. The Contractor shall operate the system with less than 5% downtime. The Contractor shall prepare all CERCLA documents, including RAWP, Technical Reports, and Operations and Maintenance Plan needed to implement the optimization, and shall actively assist DOE in obtaining regulatory approval. This includes all applicable field work and analytical work necessary to support development or implementation of CERCLA documents, and

d. Prepare an updated TCE and ^{99}Tc plume map with current data every two years (currently odd years), including documentation showing how the map has changed and the data/information used to generate the maps.

Table C.2.EM.PA.0040.A001.02.DR.01-1
Pump and Treat Operations Milestones/Schedule

Milestone	Date
Update TCE and ^{99}Tc plume map	To DOE: April 15, 2019 To the Regulators: June 15, 2019
Update TCE and ^{99}Tc plume map	To DOE: April 15, 2021 To the Regulators: June 15, 2021
Submit Transect Well Data to Regulators for the NE Plume	Consistent with the SMP and the approved CPB
Complete all Field Work (including construction, testing, waste disposal, and demobilization) and begin full scale operation	Consistent with the SMP and the approved CPB
Submit D1 O&M Plan for the NE Plume Optimization to Regulators	Consistent with the SMP and the approved CPB
Submit D1 Post-Construction Report for NE Plume Optimization to Regulators	Consistent with the SMP and the approved CPB
Update TCE and ^{99}Tc plume map	To DOE: April 15, 2023 To the Regulators: June 15, 2023
Update TCE and ^{99}Tc plume map	To DOE: April 15, 2025 To the Regulators: June 15, 2025
Update TCE and ^{99}Tc plume map	To DOE: April 15, 2027 To the Regulators: June 15, 2027

EM.PA.0040.A001.07.DR PROJECT MANAGEMENT SUPPORT

The Contractor shall provide all project support activities and resources on-site necessary during the entire POP of this Contract. These support resources include, but are not limited to, the Program Manager, the project management team, and associated support office (e.g., Administrative, QA, HR, Business, Project Controls, Safety, Nuclear Safety, etc.).

EM.PA.0040.A001.07.DR.02 Project Planning & Integration Support

EM.PA.0040.A001.07.DR.02.01 Project Planning, Integration and Interface

The Contractor shall be responsible for assisting DOE in the planning and integration of the ongoing and planned PGDP D&R activities. The Contractor shall establish, manage and host routine standing integration meetings, with representatives of all Contractors listed in Section C.1, to address common issues and de-conflict issues. An example process is the "Shared Site Process" prepared and managed by the incumbent Contractor.

The Contractor shall establish, appropriately document, and manage the interfaces listed in Section J, Attachment J-12, Government Furnished Services and Items Requirements Matrix.

The Contractor shall provide a weekly deliverables tracking report, identifying the status of in-process and upcoming regulatory and contract deliverables and host a weekly meeting with DOE to review the report. This report shall be provided electronically in advance of the meeting. Hardcopies shall be provided for review at the meeting.

The Contractor shall ensure that Long-Term Stewardship (LTS) issues are considered in the planning and execution of the activities described in this PWS to:

a. Ensure the site's successful transition to future LTS; and
b. Assist DOE with LTS planning, transition coordination, and communication with all involved parties, including local stakeholders and regulators.

The Contractor shall ensure that issues associated with the transfer or leasing of land, facilities, and other assets from DOE to other parties are considered in the planning and execution of the PWS.

The Contractor shall coordinate and interface with other site contractors listed in Section J Attachment J-12, Government Furnished Services and Items Requirements Matrix, in the performance of this PWS. The attachment identifies the key specific tasks and services that require interface and coordination with other site entities.

Table C.2.EM.PA.0040.A001.07.DR.02.01-1
Project Management Milestones/Schedule

Milestone	Date
Deliverables Tracking Report	Weekly

EM.PA.0040.A001.07.DR.02.02 Regulatory Planning

The Contractor shall provide support to DOE relating to regulatory documents and agreements, in the form of technical experts and site specific knowledge of operations, for regulator interactions, independent facilitation services, the development and implementation of regulatory strategies, and the public comment process.

The Contractor shall provide regulatory strategies/planning for re-aligning the site's deactivation and decommissioning activities with currently planned and completed remediation activities, logically sequencing and integrating that work to be protective of safety, health, and the environment while maintaining an overall effective approach. The Contractor shall also consider developing innovative and unique regulatory approaches to executing the work in this PWS and in the out-years, in order to achieve the same levels of clean-up in a more cost effective manner.

The Contractor shall maintain and update, as necessary, the programmatic remedial action documents. As part of maintaining these programmatic documents, the Contract shall coordinate working group communications, scoping meetings, information exchanges, and routine meetings with DOE and the regulatory agencies to jointly identify necessary changes and reach consensus on the contents of the document as part of the updating process. These documents include, but are not limited to:

- Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 1. Human Health, June 2015, DOE/OR/07-0107&D2/R5/V1
- Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Volume 2. Ecological, June 2015, DOE/OR/07-0107&D2/R2/V2
- Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Project Plan, March 2015, DOE/LX/07-1269&D2/R2
- Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2015, May 2015, DOE/LX/07-1301&D2/R1
- Community Relations Plan, May 2016, DOE/LX/07-2401&D2/R1
- Data and Documents Management and Quality Assurance Plan for Paducah Environmental Management and Enrichment Facilities, September 1998, DOE/OR/07-1595&D2
- Modifications to the Paducah Gaseous Diffusion Plant Federal Facility Agreement, DOE/OR/07-1707

Table C.2.EM.PA.0040.A001.07.DR.02.02-1 Project Management Milestones/Schedule	
Milestone	**Date**
Risk Methods Document (Human Health)	As required by the working group
Risk Methods Document (Ecological)	As required by the working group
Programmatic Quality Assurance Project Plan	As required by the working group
Site Management Plan	Annually Initial Due 10/15 Final Due for signature 11/10
Community Relations Plan	Every 2 years beginning in 2019 Initial Due 5/1 Final Due for signature 6/20
Data and Documents Management and Quality Assurance Plan	As needed
FFA Modifications	As needed

EM.PA.0040.A001.07.DR.02.03 Program Management Support

The Contractor shall provide on-site services including management, public affairs including Paducah Site Citizens Advisory Board (CAB) support, business administration (e.g. Contracting, procurement, financial and accounting), legal support, human resources, training, and program management. Additionally, the Contractor shall perform all activities to:

a. Support DOE in responding to Congressional, regulatory and other requests for documents and information; examples of such include: Freedom of Information Act requests; Privacy Act requests; and litigation document requests served upon DOE and its current and former prime contractors. Support shall include, but not be limited to, preparation for briefings, public presentations, and search, review, and reproduction of documents. The Contractor shall ensure all external briefing materials and public presentations are of the highest professional quality to present the current and planned project achievements. The Contractor shall ensure that sufficient time is allotted for DOE (including Headquarters) to review and comment on any external briefing materials and public presentations. External briefing materials and public materials shall be approved by DOE prior to public release.
b. Support DOE in the development of internal presentations, budgets, staff development, and other related services.
c. Provide and support routine (monthly) general and public site tours of the PGDP facilities and projects, including busing U.S. citizens into the site/limited area, providing presentation/handout materials and communicating the status of the project.
d. Host public/stakeholder meetings and working sessions, as needed, to support high interest topics and to educate the community about the work at the site.

e. Support DOE in preparation of presentations and conducting presentations to the Paducah CAB's monthly meetings, as directed.
f. Provide administrative services pertaining to public affairs. These shall include, but not be limited to, development of a project/site external communication strategy to present the current and planned project achievements to DOE's stakeholders, including local and state government and congressional representatives.
g. Support DOE's work with grantees such as the Kentucky Research Consortium for Energy and Environment (KRCEE) consistent with their Financial Assistance Awards.
h. Ensure that all environmental regulatory documents have received adequate legal review for sufficiency, accuracy and strategic impacts before being submitted to DOE and then to the regulatory agencies.
i. Support DOE efforts in site real property transfer, site reindustrialization/reutilization activities, and in Natural Resource Damage Assessments.
j. Provide joint legal support to DOE in connection with legal or regulatory proceedings at DOE's request.
k. Support Contract implementation at the beginning and transition at the end of the Contract.
l. Provide central locations and receptacles for the collection and delivery of site mail by the Infrastructure Contractor.
m. Provide external review and support to DOE by providing support during audits and assessments by entities having oversight responsibility for PGDP D&R Project and its contractors. These entities include:

    i. Defense Nuclear Facilities Safety Board (DNFSB);
    ii. Government Accountability Office (GAO);
    iii. DOE Office of Inspector General (OIG); and
    iv. Other governmental and DOE organizations.

n. The Contractor shall support the DOE, and the DOE Environmental Technical Services (ETS) Contractor in hosting staff from auditing and assessing organizations, providing required presentations, responding to information requests, and providing required subject matter experts to respond to questions and information requests.
o. The Contractor shall support DOE in interfacing with DNFSB, as needed, by:

    i. providing support for the preparation of DOE responses to DNFSB issues and recommendations that affect this Contract,
    ii. cooperating with the DNFSB and providing access to work areas, personnel, and information, as necessary, and

iii. maintaining a document process in accordance with the Contractor Requirements Document (CRD) M 140.1-1B, Interface with the DNFSB (or current version).

p. Support DOE in interfacing with GAO, OIG, and other governmental and DOE oversight organizations by:

i. cooperating with assessors and auditors, and providing access to work areas, personnel, and information, and

ii. providing support during audits and assessments, including delivering information within a specified time, arranging briefings, preparing presentation materials, maintaining a record of documents provided in response to requests, and making this record available to DOE as requested.

q. Provide knowledgeable single points-of-contact for each of the following: DNFSB, OIG, GAO, and other assessing governmental and DOE oversight organizations (including the DOE Office of Enforcement).

r. Support efforts to evaluate various alternatives for additional office space at the site. Efforts may include the use of third party financing or Energy Savings Performance Contracts (ESPC).

s. The Contractor shall provide and track training to DOE and other site contractors required to access/enter its facilities, including respirator training, asbestos awareness, and other specialized training.

EM.PA.0040.A001.07.DR.03 Project Management

The Contractor shall perform all activities to develop and maintain a project management work control system compliant with Integrated Contractor Work Control Systems and Reporting Requirements (July 2012), Section H.68 and FAR 52.234-4, Earned Value Management System (May 2014). Additionally, the Contractor shall prepare, submit and maintain a life-cycle plan (scope, cost and schedule) representing planned site work scope from the beginning of the work scope through final site cleanup and when the site is transferred to the DOE Office of Legacy Management. The Contractor shall be aware of and manage changes to the life-cycle baseline. The current life-cycle plan will be provided for use in electronic format so that the Contractor can incorporate the Contractor's work scope. The Contractors work scope shall be integrated into the life-cycle plan, including any necessary adjustments based on changes in approach affecting the overall site strategy, cost, and schedule. This plan is the basis for the DOE life-cycle baseline and will support DOE Baseline Change Proposals to align the DOE baseline with the Contractor CPB.

The Contractor shall ensure the CPB remains aligned with the Contract terms to include scope, cost and schedule. The Contractor shall ensure timely response to Contract modifications and declaration of changed conditions, through the submission of Contract change proposals and/or baseline change requests to maintain alignment

of the CPB with the Contract. The Contractor shall provide all management and technical information to:

a. Support the budget formulation activities including, but not limited to, emerging work items list, budget formulation inputs (including Integrated Priority List), budget update submissions, budget scenario development, and budget presentations (such as public and regulatory briefings, etc.);
b. Develop and submit Annual Spend Plans, Monthly Spend Plan Reports, Full Time Equivalent (FTE) staffing projections, actual headcount projections, and other similar reporting information;
c. Meet the data requirements of the DOE Integrated Planning, Accountability and Budgeting System;
d. Support audits, evaluations, and external technical reviews; and
e. Support other DOE project performance assessments and information needs.

All project management information developed under this contract shall be provided electronically or be electronically accessible by DOE. In support of the Paducah Integrated Site-wide Federal Lifecycle Baseline, the Contractor shall also provide the Initial and Final CPB information to the ETS Contractor, or other DOE prime contractor, as designated.

Table C.2.EM.PA.0040.A001.07.DR.03-1
Project Management Milestones/Schedule

Milestone	Date
Final CPB aligned to contract value	Within 6 months after NTP
Approvable Life Cycle Plan	9 months after NTP and as requested

EM.PA.0040.A001.07.DR.04 Environment, Safety, Security, Health & Quality

EM.PA.0040.A001.07.DR.04.01 Safety Programs

The Contractor shall:

a. Conduct all activities required for compliance with applicable laws, regulations, permits, agreements and Orders, and DOE Directives including those listed in Section J, Attachment J-4. In accordance with Section H.43, the Contractor's programs shall be operated as an integral, and visible, part of how the Contractor conducts business. This includes, but is not limited to: prioritizing work planning and execution; establishing clear Environmental, Safety, and Health (ES&H) priorities; allocating resources to address programmatic and operational considerations; and correcting non-compliances and addressing all hazards for all facilities, operations, and work. The Contractor shall ensure that cost reduction efforts and efficiency efforts are fully compatible with ES&H performance.

b. Take all actions necessary to preclude serious injuries and/or fatalities; keep worker exposures and environmental releases as low as reasonably achievable and below established limits; minimize the generation of waste; maintain or increase protection to the environment; and maintain or increase public and worker safety and health.
c. Submit a Chronic Beryllium Disease Prevention Program consistent with 10 CFR 850 for DOE review and approval. A study has been completed characterizing the levels of Beryllium within the site (BJC/PAD-581) and shall be considered by the Contractor in the development and implementation of a Chronic Beryllium Disease Prevention Program. This program shall encompass DOE personnel and PGDP Contractors. The Contractor shall be the Site Chronic Beryllium Coordinator.
d. Ensure adequate access to health programs/ambulatory care, and beryllium and radiation worker health surveillance programs. These services are required to assess, monitor, record data, and provide medical support for current site workers who are or may be exposed to radiological and hazardous materials.
e. Maintain a trained workforce necessary for performance of this Contract. The Contractor shall accept other training modules as equivalent to their own and assure reciprocity for, at a minimum, all PGDP Contractors. The Contractor shall also complete site-specific training (provided by the Infrastructure Contractor) necessary for site access, including but not limited to, Consolidated Annual Training, Radiation Worker I and II, General Employee Training, Annual Security Refresher, Workplace Violence Prevention, Diversity Awareness, Employee Conduct Training, Business Ethics/Standards of Conduct, and Fire Extinguisher Training, DOE Orders/Work Smart Standards and ISMS. The Contractor shall be responsible for any job specific training necessary to implement the PWS activities.
f. Establish a training program for implementation of a compliant program in accordance with DOE Order 426.2 requirements and all applicable laws and regulations in support of the work performed under this Contract. The Contractor shall track its employees training status and notify employees of training needs (this includes training provided by other site contractors). Training records shall be maintained and retrievable for current employees. The Contractor shall coordinate with other site contractors to consolidate training modules, where practicable. The Contractor shall ensure that its training program is configured/managed so the personnel who do not have the necessary training (e.g., not trained, not requalified, etc.) are prohibited from performing the work that requires the training.
g. Perform work in accordance with 10 CFR 851. The Contractor's safety program requirements shall include hazard analyses, work permits (as applicable), industrial hygiene monitoring, and trained safety professionals. The Contractor shall manage and perform work in accordance with a documented worker safety and health plan approved by DOE prior to commencement of work.

h. Prepare an Activity Specific Health and Safety Plan and Job Hazards Analysis as needed as part of the overall project safety program. Copies of these documents will be provided to DOE for information.
i. Provide safety and health Personal Protective Equipment for the Contractor, DOE employees, and DOE's ETS Contractor. The Contractor shall be responsible for the subsequent decontamination and disposal of such PPE and shall be responsible for providing respirator pickup and distribution services at the PGDP for the Contractor, ETS contractor, and DOE.
j. Shall develop and implement a process to ensure site personnel adhere to policies, procedures and regulations.
k. Provide investigations and support for ES&H issues/effects resulting from the historical "Work for Others Program" (work for non-DOE entities (sponsors) on a fully reimbursable basis in accordance with DEAR 970.5217-1). The Contractor may encounter materials and historical information that references a "Work for Others Program"; these materials may include classified information. The potential implications shall be addressed consistent with the PWS security requirements.
l. Provide non-emergency spill contamination, clean-up, and other post-emergency response activities. Spills could include, but not be limited to, diesel fuel, oils containing PCBs, and radioactive contamination.
m. Provide programmatic and oversight support to other DOE support personnel/contractors (e.g., technical support contractors, Kentucky Research Consortium for Energy and Environment demonstration projects on DOE property) as requested by DOE.
n. Manage the Site-wide Integrated Lockout & Tagout Program and ensure lock-out/tag-out is properly coordinated with other site contractors. The Contractor shall implement a compliant lock-out/tag-out program in accordance with DOE-STD-1030-96 and all applicable regulations. Each of the site's contractors is required to participate in this Site-wide Integrated Lockout & Tagout Program.
o. Provide medical screening of the DOE employees and DOE's ETS Contractor if required to enter the work areas and meet the requirements of the Worker Safety and Health Program (10 CFR 851), or Radiological Protection Program (10 CFR 835).
p. The Nuclear Safety Program shall be described in safety basis documents in accordance with 10 CFR 830, Nuclear Safety Management. The Contractor shall be responsible for implementing and maintaining any necessary safety basis documents. The Contractor shall develop and implement a Nuclear Criticality Safety (NCS) Program/Procedure compliant with DOE O 420.1C. The Contractor shall ensure proper implementation of its Nuclear Criticality Safety Program by performing annual surveillances as required by ANSI/ANS-8.19, *Administrative Practices for Nuclear Criticality Safety* (required by DOE O 420.1C). The Contractor shall revise the Nuclear Criticality Safety Evaluations (NCSE) to meet current DOE directives and to address current facility conditions,

scope of this PWS, and identified deficiencies in the current controls. Current deficiencies include a less than adequate ability to ensure moisture limits are met for cascade piping.

q. Shall comply with 10 CFR 830 and have programs and procedures that implement the requirements. The Contractor shall review the existing safety basis documents, and accept, modify, or develop, as necessary, for compliance performance per DOE Order requirements and all applicable laws and regulations. To support new or changed operations, the Contractor shall revise or develop documented safety analysis and safety basis documentation compliant with 10 CFR 830 and DOE STD 1027. The Contractor shall obtain DOE approval of the safety basis documents prior to implementation. The Contractor shall update and maintain the safety basis documents in a manner that supports the work required by the Contract and consistent with DOE Orders and applicable requirements. The Contractor shall perform and document a Natural Phenomenon Hazard (NPH) analysis for the entire site, in accordance with DOE Standard 3009 and revise its Authorization Basis (AB) to reflect the results of the analysis. The Contractor shall transmit the results of the NPH analysis to DOE and all of the other site contractors. Additionally, the Contractor shall comply with and implement all actions specified in DOE Office of Health, Safety, and Security (HSS) Operating Experience memo OE-1: 2013-01, April 2013. The Contractor shall assume that no actions have been taken to comply with OE-1: 2013-01.

r. The Contractor shall review the existing procedures, program and performance documents, and accept, modify, or develop, as necessary, for compliance performance per DOE Order requirements and all applicable laws and regulations. The Contractor shall also develop and implement a work planning and control process in accordance with DOE O 412.1A, Work Authorization System, for Contract activities in support of acceptance of turnover of the PGDP Facility. The Contractor shall eliminate all blue-sheeted (i.e. revised or adopted) procedures and performance documents and implement procedures and performance documents in compliance with DOE Orders, no later than 90 days after transition is completed.

Table C.2.EM.PA.0040.A001.07.DR.04.01-1 Safety Programs Requirements Documents	
DOE HSS memo OE-1: 2013-01, April 2013	DOE Health, Safety, and Security (HSS) Operating Experience memo, Improving Department of Energy Capabilities for Mitigating Beyond Design Basis Events

Table C.2.EM.PA.0040.A001.07.DR.04.01-2 Safety Programs Milestones/Schedule	
Milestone	**Date**
Submit a Chronic Beryllium Disease Prevention Program consistent with 10 CFR 850	90 days after NTP

Worker Safety and Health Program Plan	90 days after NTP
Submittal of Nuclear Criticality Safety Program	75 days after NTP
Submit revised Safety Basis documents	90 days after NTP
Annual Safety Basis document submittal to DOE for approval	Annually from date of initial DOE approval
Perform and document a Natural Phenomenon Hazard (NPH) analysis for the entire site	In accordance with revised Safety Basis requirement
Eliminate all blue-sheeted procedures and performance documents	90 days after conclusion of transition
Complete revision of NCSEs to meet current DOE directives and to address current facility conditions, scope of this PWS, and identified deficiencies in the current controls. Current deficiencies include a less than adequate ability to ensure moisture limits are met for cascade piping	30 months after completion of Transition

EM.PA.0040.A001.07.DR.04.02 Integrated Safety Management

The Contractor shall develop and implement an Integrated Safety Management System (ISMS) Program that complies with the Section I Clause DEAR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution. The Contractor's ISMS program shall ensure all work is performed safely and in a compliant manner that protects the workers, public, and environment from adverse consequences. The Contractor shall also establish performance measures, objectives, and commitments (PMOC's) as required by DEAR 970.5223-1. PMOCs shall be submitted annually for DOE approval.

The ISMS program shall include an Operating Experience (e.g., lessons learned) program that is compliant with DOE Orders. The Operating Experience program shall be structured to identify and apply available lessons in safety, quality and performance to this PWS as well as to capture, document, and provide lessons learned from this PWS for future application by others.

The Contractor shall prepare an ISMS Description; including PMOCs to implement the Contractor's ISMS within 90 days after NTP. The ISMS Description shall identify how the Contractor will maintain compliant and safe operations by integrating safety, health, and environmental compliance into all project activities. The initial ISMS Description must be approved by DOE prior to the end of transition.

The ISMS program shall integrate DOE O 436.1, Departmental Sustainability. In accordance with DOE O 436.1, the Contractor shall develop and implement Site Sustainability Plans (SSP) and an Environmental Management System (EMS). These plans shall include recycling and pollution prevention. The Contractor shall be the Environmental Management Systems designated site coordinator.

To continuously improve the ISMS, the Contractor shall perform an initial, and subsequently, annual ISMS effectiveness reviews and submit a report documenting the status of the ISMS program to DOE along with any changes needed to the ISMS Description. In addition, the ISMS program shall be subject to a verification review and approval by a DOE chartered ISMS verification team within 120 days of the NTP.

Table C.2.EM.PA.0040.A001.07.DR.04.02-1
Integrated Safety Management Milestones/Schedule

Milestone	Date
Submit ISMS Description	90 days after NTP
Submit SSP and EMS	90 days after NTP
Contractor's ISMS Verification Review and Report	120 days after NTP
ISMS Annual Effectiveness Review and Report	Annually after the Contractor's ISMS Verifications Review and Report
PMOCs	120 days after NTP, Annually thereafter

EM.PA.0040.A001.07.DR.04.03 Radiological Protection Program

The Contractor shall develop and economically and efficiently implement a Radiation Protection Program (RPP) compliant with the requirements specified in 10 CFR 835 and DOE Order 458.1 (the Environmental Radiation Protection Program (ERPP) is addressed in EM.PA.0040.A001.01.DR.01 and integrated with other contractor programs such as but not limited to; training programs, quality assurance, records management, ISMS, EMS, etc.) The confirmation of the program review and any changes shall be submitted to DOE for approval. Management of radioactive sources onsite the Contractor is responsible for shall be fully compliant with the RPP and DOE requirements upon possession or management of the sources.

The Contractor is responsible for all aspects of:

a. Evaluating, down posting, and controlling radiological conditions and preventing the spread of radioactive materials to the environment above DOE limits;
b. Establishing bioassay and dosimetry requirements for personnel entering Contractor controlled areas in compliance with Technical Basis Documents (TBDs);
c. Implementing Authorized Limits where appropriate and applicable to reduce operational and disposition costs;
d. Distribution and collection of radiation dosimetry and bioassays (including purchasing bioassay kits) in compliance with the site TBD for internal

contamination control and TBD for external dosimetry that are compliant with the DOE Laboratory Accreditation Program (LAP) requirements for its employees, subcontractors and visitors;

e. Economically and efficiently performing radiological surveys as needed to demonstrate compliance with 10CFR835 and DOE Order 458.1, including free release surveys of material and equipment transferred to the Infrastructure Contractor, PACRO or any other entity;
f. Ensuring that documentation of surveys of real property are stored electronically within OREIS; and
g. Reviewing and evaluating all necessary radiological, dosimetry and bioassay data for application to the DOE approved RPP and dose evaluations needed by the Infrastructure Contractor for the Contractor's employees, subcontractors, and visitors.

The Infrastructure Contractor shall perform calibration, routine maintenance, and repair of all field monitoring and surveying equipment as required by manufacturer's instructions and the Contractors Measurement and Test Equipment (M&TE) program. This does not include daily calibration checks or daily/weekly routine maintenance, which shall be performed by the Contractor. The Contractor shall maintain daily calibration check quality control charts. The Contractor shall be responsible for calibration and maintenance of laboratory, non-laboratory, and Non-destructive Assay (NDA) equipment that would be used to measure swipes or samples. The Infrastructure Contractor shall manage the program elements necessary to support GFSI functions that are provided to the Contractor (e.g., radiological survey and monitoring equipment calibration and annual maintenance, dosimetry reading, and bioassay analysis). The Contractors RPP shall be consistent with the site TBDs and other contractors programs. The Infrastructure Contractor shall provide dosimetry, bioassay analysis, exposure database as a GFS. Determinations of dosimetry requirements and evaluation of dosimetry or radiological data is not a GFS and shall be performed by the Contractor.

Table C.2.EM.PA.0040.A001.07.DR.04.03-1
Radiation Protection Program Milestones/Schedule

Milestone	Date
Submittal of the Radiation Protection Program	60 days after NTP

EM.PA.0040.A001.07.DR.04.04 Emergency Management & Fire Protection Program

The Contractor shall maintain and manage the Paducah Site Emergency Management Program Plan in compliance with the DOE order requirements. Per DOE O 151.1D, Comprehensive Emergency Management System, the Contractor shall implement comprehensive emergency management requirements, as they apply to the site/facility/activity, commensurate with the hazards present. General

requirements shall include the implementation of a Comprehensive Emergency Management System designed to:

a. Minimize the consequences of all emergencies involving or affecting facilities and activities (including transportation operations/activities);
b. Protect the health and safety of all workers and the public from hazards associated with site operations and those associated with decontamination, decommissioning, and environmental restoration;
c. Prevent damage to the environment; and
d. Promote effective and efficient integration of all applicable policies, recommendations, and requirements, including Federal interagency emergency plans. An exemption for two-level (site area emergency and alert) emergency classification (versus a three-level required by DOE O 151.1D) was generated by DOE in 2014. The Contractor shall modify the program to come into full compliance with the three levels required by DOE Order 151.1D, eliminating the exemption 24 months after transition is completed. All procedures, authorization basis documents, program documents, and other implementing documents shall be modified.

Activities shall include, but are not limited to the following:

a. Provide initial and refresher Emergency Operations Center (EOC) and Joint Information Center (JIC) training for DOE and DOE Prime Contractors/Subcontractors as needed. Develop and implement a site wide emergency exercise/drill program in compliance with DOE Orders, with support from other DOE Prime Contractors/Subcontractors as needed.
b. Ensure sufficient resources are available to provide emergency response compliant with DOE Orders for the entire site, (Fire Operations, Emergency Squad, Emergency Operations Center, & Joint Public Information Center) including capabilities for fire, rescue, technical rescue, HAZMAT, medical response at the Advanced Life Support (ALS) level, and the capability to notify employees and offsite personnel of an emergency to facilitate safe protective actions. Ensure the proper identification, categorization/classification, notification, and reporting of emergencies to the DOE Paducah office, PPPO Manager, the Headquarters Emergency Operations Center and other organizations in accordance with applicable DOE policies and requirements.
c. Ensure recovery procedures are available that include termination of emergency, and the dissemination of information to Federal, State, and local organizations regarding the emergency and possible relaxation of public protective actions; planning for decontamination actions; establishment of a recovery organization; development of reporting requirements; and establishment of criteria for resumption of normal operations.

The Contractor shall maintain and update documentation establishing an Emergency Planning Zone; Hazard Surveys, Emergency Planning Hazard Assessments (EPHA), and Emergency Plans that document comprehensive emergency management programs; and Emergency Readiness Assurance Plans. The Contractor shall also maintain and update Emergency Action Levels (EALs) and protective actions, review and implement EALs and protective actions from other contractors/subcontractors.

The Contractor shall integrate emergency public information planning with the maintenance of the Paducah Site Emergency Plan. The Contractor shall maintain a coordinated off-site emergency management interface with state and local organizations responsible for off-site emergency response and protection of the public and submit copies of all Mutual Aid Agreements and contracts for offsite assistance annually to DOE-PPPO. The Contractor shall gain DOE concurrence prior to entering into or modifying any Mutual Aid Agreements (e.g., Letters of Agreement, or Memorandums of Understanding) and contracts. The Contractor shall contract for hospital services instead of relying on Mutual Aid Agreements.

Maintain an Emergency Readiness Assurance Program that meets the requirements of DOE Order 151.1D and provides assurances that emergency plans, implementing procedures, and resources are adequate and sufficiently maintained, exercised, and evaluated, and that improvements are made in response to identified needs.

The Contractor shall implement and manage a site-wide (covering the other site tenants/contractors) Fire Protection Program that complies with the CRD of DOE O 420.1C; National Fire Protection Association (NFPA); and OSHA 1910.146.

The Contractor shall provide site-wide (involving site tenants/contractors) active fire protection system inspections, testing and maintenance, fire investigations, and fire department and emergency response. Fire protection system inspection, testing and maintenance shall include a fire protection system impairment strategy. Fire protection systems in facilities shall be inspected, tested and maintained in accordance with National Fire Protection Standards until the facility is shutdown, does not have routine occupancy, and has the fire load eliminated or reduced to minimum possible levels.

The Contractor shall be responsible for providing a Fire Protection Plan and Fire Hazard Analyses (FHA) for approval. A Baseline Needs Assessment (BNA) shall be prepared including details regarding Contractor emergency response capabilities including mission responsibilities, personnel, apparatus, equipment, facilities, programs, incident reporting, etc.

It is recognized that the size and capability of emergency response, including fire protection, programs and facilities are dependent on operational activities at the site. The Contractor shall develop these programs/documents with automatic

triggers that eliminate requirements as the status of the PGDP facilities moves toward shutdown and isolated status.

Table C.2.EM.PA.0040.A001.07.DR.04.04-1 Current Emergency Management & Fire Protection Program Agreements
Letters of Assistance
City Of Paducah
McCracken County
Paducah-McCracken County Office Of Emergency Management
McCracken County Sheriff's Department
Federal Bureau Of Investigation
Kentucky State Police
Mercy Regional Emergency Medical Services
PHI Air Medical
St. Mary's Hospital Lifeflight
Vanderbilt University Medical Center Lifeflight
Purchase District Health Department
United States Department Of The Army Explosive Ordnance Disposal
West McCracken County Fire District
Memorandum Of Understandings
Lourdes Hospital
Western Baptist Hospital
Mutual Aid Agreements
Lone Oak Fire Department
Paducah Fire Department
Memoranda of Agreements
Coroner (No existing agreement)(Required by DOE G 151.1-4)

Table C.2.EM.PA.0040.A001.07.DR.04.04-2 Emergency Management & Fire Protection Program Milestones/Schedule	
Milestone	**Date**
Completion of Contractor Readiness Assessment for Emergency Management Program	105 days after NTP
Submittal of the Emergency Readiness Assurance Plan	Annually Before September 30th
Submittal of Paducah Site Emergency Management Program Plan and other required secondary documentation such as EALs, EPHAs, Hazard Surveys, etc.	60 days after NTP
Submittal of Fire Protection Plan and Fire Hazard Analysis	90 days after NTP
Submittal of Emergency Management and Fire Protection Baseline Needs Assessment	60 days after NTP
Mutual Aid Agreements and Contracts	120 days after NTP and Annually or as changed thereafter

EM.PA.0040.A001.07.DR.04.05 Quality Programs

The Contractor shall comply with 10 CFR 830, other regulations affecting Quality Assurance (QA) and DOE O 414.1D, Change 1, and implement a DOE-approved

Quality Assurance Program (QAP) in accordance with the EM Quality Assurance Program, EM-QA-001, Revision 1 dated June 11, 2012, prior to commencement of work affecting nuclear safety or quality. If there is any inconsistency between the QAP and any other terms of the contract, the more restrictive requirements apply. The Contractor shall submit a QAP to DOE for approval within 90 days of the DOE contract being awarded, and at a minimum, annually review and update the QAP as appropriate. The confirmation of the review and any changes shall be submitted to DOE for approval.

The Contractor's QAP shall describe the overall implementation of the EM QA requirements and shall be applied to all work performed by the Contractor (e.g., research, design/engineering, construction, operation, budget, mission, safety, and health). The Contractor shall ensure it maintains a robust Suspect/Counterfeit Items and Software Quality Assurance program controls.

American Society of Mechanical Engineers NQA-1, 2008, *Quality Assurance Requirements for Nuclear Facility Applications* and addenda through 2009 (referred to as NQA-1a-2009), shall be implemented as part of the Contractor's QA Program for work impacting nuclear safety, consistent with EM-QA-001, Rev.1. The required portions of NQA-1 to be implemented include: Introduction, Part I, and as applicable portions of Part II. NQA-1 Parts III and IV are to be used as guidance for the Contractor's QAP and implementing documents.

In accordance with H.64, the Contractor shall develop and implement a comprehensive Issues Management System using a "zero-threshold" level for the identification, assignment of significance category, and processing of issues identified within the Contractor's organization. The significance assigned to the issues shall be the basis for all actions taken by the Contractor in correcting the issue from initial causal analysis, reviews for reporting to DOE, through completion of Effectiveness Reviews, if required, based on the seriousness of the issue.

The Contractor shall submit for DOE approval a Contractor Assurance System Description as required by DOE O 226.1A, Implementation of DOE Oversight Policy. This document shall identify and address program and performance deficiencies, opportunities for improvement, and processes to report deficiencies to the responsible managers and authorities. The description shall establish and effectively implement corrective and preventive actions, and share lessons learned across all aspects of the work scope. The Contractor shall annually review and update, as appropriate, their Contractor Assurance System Description and resubmit updates to DOE for approval.

Table C.2.EM.PA.0040.A001.07.DR.04.05-1
Quality Programs Milestones/Schedule

Milestone	Date
Submittal of the Quality Assurance Program	90 days after NTP

QAP Review and Update	Initial update due 1 year after conclusion of transition, and annually thereafter
Contractor Assurance System Description	Initially due 160 days after NTP and Annually thereafter

EM.PA.0040.A001.07.DR.04.06 Quality System for Nondestructive Assay Characterization (QSNDA)

The Contractor shall accept or complete if not yet final/approved and implement the Paducah Site NDA Program that is compliant with DOE Order 414.1D, Quality Assurance. Prior to acceptance, the Contractor shall perform its own compliance verification of the program. Any identified non-compliances shall be brought to the attention of DOE. The Contractor shall comply with QSNDA requirements *DOE/PPPO/03-0235&D0, U.S Department of Energy Portsmouth/Paducah Project Office Quality System for Nondestructive Assay Characterization*. This program shall be capable of measuring waste drums of trapping media generated from the deposit/holdup removal program (5.5 weight % U^{235}) and characterizing cells/piping and identifying deposits/hold-up to a level that supports the implementation of the NCS criticality incredible limits (CI) for the process equipment following deposit/holdup removal.

The Contractor shall ensure the program can be utilized to characterize process equipment within the process facilities including but not limited to:

a. All piping/lines, converters, compressors, valves, instrument lines, expansion joints, etc.;
b. Loose and/or spare converters, compressors, and other UF_6 process equipment such as valves, expansion joints, and piping that were either cut out of operating cells or are spare parts (this equipment is stored in various locations within the process buildings);
c. Auxiliary equipment such as freezer sublimers, surge drums, cold traps, seal exhaust/wet air stations, purge and evacuation pumps, booster pumps/stations, holding drums, jet stations, autoclaves, sampling stations, chemical traps, accumulators, withdrawal stations, Normetex pumps, UF_6 condensers, etc.; and
d. UF_6 instrumentation/monitoring equipment/systems such as line recorders, assay machines, seal exhaust, datum, etc.
e. Any additional process equipment or process support equipment from the process facilities requiring characterization not specifically listed above.

The Contractor shall ensure that all NDA programs comply with DOE Order 414.1D, not just those performing the NDA of trapping material, piping, and cells.

The Contractor shall review these programs for acceptance and continue implementation of the programs during the performance of this PWS. This includes submitting changes to DOE for approval.

Table C.2.EM.PA.0040.A001.07.DR.04.06-1 QSNDA Requirements Documents	
Document Number	**Title**
DOE/PPPO/03-0235&D0	U.S Department of Energy Portsmouth/Paducah Project Office Quality System for Nondestructive Assay Characterization

EM.PA.0040.A001.07.DR.11 Real and Personal Property Management

Administration of the real and personal property program is the responsibility of the Infrastructure Contractor including managing an automated database of all personal property actions related to acquisition, use and disposition. The Infrastructure Contractor is also responsible for managing the property inventory, databases, disposition operations, and providing input to FIMS and the Property Information Database System.

The Contractor shall provide new or updated data to the Infrastructure Contractor for input into FIMS for all facilities assigned under this Contract and shall support the annual FIMS data verification, including correcting any findings. The Contractor shall be responsible for ensuring FIMS data is accurate and up to date throughout Contract period of performance for assigned facilities. The Contractor shall be responsible for supplying FIMS information/updates for ad hoc requests from HQ.

The Contractor shall provide annual updates to the information contained in the PPPO Ten Year Site Plan, and provide support for review and resolution of comments. The Contractor is expected to be the information source authority for the facilities as assigned under this contract, and able to respond to DOE requests for information on real property under its control.

The Contractor shall interface with the PACRO to transfer eligible excess personal property per the PACRO/DOE Property Transition Agreement.

The Contractor shall develop and implement a Real Property Transfer Plan to transfer real property to another party prior to the end of the Base POP. The Contractor should target at least 500 acres for transfer. The Property Transfer Plan shall identify suitable Parcels for transfer along with a detailed cost and schedule for transferring each of the identified Parcels. The Contractor shall support additional property transfers as requested. The contractor shall perform all required work to compile and/or develop all letters; title, activity and records searches; reports; drawings; photographs; and other documentation needed to transfer real property identified by the Contractor in the Property Transfer Plan and approved by DOE. The work performed shall be completed consistent with guidance in Planning and Due Diligence for Real Property Transfer (PPPO-M-3463195, D0) and Protocol for the Environmental Regulatory Processes for the Transfer of Real Property at the DOE

Portsmouth and Paducah Sites, Volume 1: Uncontaminated Property (PPPO-3392287, D0) or their most recent revision. Transfers for economic development will be assumed to be to the Paducah Area Community Reuse Organization (PACRO). All required documentation shall be submitted to DOE for review and approval. Schedules for development of documentation shall be included with any proposed work.

The Contractor shall manage all assigned Government-owned accountable and non-accountable personal property in accordance with the requirements listed below and 41CFR101 and 41CFR109:

a. Control classified equipment and material in accordance with DOE O 471.6, "Information Security,",
b. Control high risk property in accordance with DOE Personal Property Letter 970-3, Rev.1, dated February 3, 1998, and
c. Destruction or "rendering useless" of any component, equipment, and material, which are both surplus to the DOE and identified in the Nuclear Suppliers Group Trigger List or are nuclear weapon components or weapon-like components.

This includes establishing a system to track the assignment and status of high risk property specifically assigned to the Contractor. Prior to providing property to the Infrastructure Contractor for disposition, the Contractor shall characterize the property, maintain characterization records and provide those records at the time of property transfer to the Infrastructure Contractor.

The Contractor shall support DOE working with the Realty Officer or other assigned real estate personnel to receive concurrence or approval prior to executing any real property actions on behalf of this Contract. All Contractor real estate actions shall be accomplished in accordance with the DOE O 430.1B, Real Property and Asset Management.

The Contractor shall work with DOE Property Manager, Fleet Manager and Realty Officer and shall provide the property and vehicle reports in accordance with Section J, Attachment J-4, and Section J, Attachment J-13.

Table C.2.EM.PA.0040.A001.07.DR.11-1
Real and Personal Property Management Milestones/Schedule

Milestone	Date
Submit the FIMS data for site facilities to the Infrastructure Contractor	August 15 and annually thereafter
Real Property Transfer Plan	90 days after transition is complete
Reports of loss, damage, periodic physical inventory data and inventory, & final inventory for Contract completion	1 year after transition is complete and annually thereafter
Motor Vehicle Fleet Reports (FAST)	1 year after transition is complete and annually thereafter

Submit Draft Documents Required for the Transfer of Real Property	As identified in the Contractors DOE approved Property Transfer Plan
Submit Final Documents Required for the Transfer of Real Property	As identified in the Contractors DOE approved Property Transfer Plan
Transfer excess acreage	End of Base POP

EM.PA.0040.A001.07.DR.12 Automated Supply Pilot Project

Historically, projects at PGDP manage large inventories of consumables and parts. Cost and efficiency, however, are not optimized. Costs have not been adequately allocated to users/projects, and large volumes of inventory is warehoused (which requires operational costs of facility management and maintenance) instead of receiving items "just-in-time" for users.In an effort to improve efficiency and reduce logistical cost, the Contractor shall plan and implement a Pilot Project to automatically distribute consumables and parts in support of field activities, (e.g., facility maintenance, vehicle maintenance, operations, and/or small construction projects) from one primary equipment distribution center. The common terminology for this commercially available technology is "Industrial Vending".

The Contractor shall select one equipment distribution center to install "Industrial Vending System(s)". The period for performance of this pilot project begins on day one after transition is complete and continues for 39 (thirty-nine) months. The pilot study shall be divided into three phases.

Phase 1 starts at day one after the Transition Period is complete and concludes after 18 months. The Phase 1 scope includes planning, data collection relative to conventional distribution methods in the planned pilot study area(s) (for comparative analysis of automated distribution data), training/familiarization of site personnel with the "Industrial Vending" equipment and procedures procurement of an "Industrial Vending" technology provider, and deployment of the equipment to provide the automated distribution capability at the beginning of Phase 2.

Phase 2 begins immediately after Phase 1 for a period of 18 months. The Contractor shall use the Phase 2 period to gather cost data and efficiencies to compare the "Industrial Vending" performance of the automated equipment against conventional distribution systems currently in use at the PGDP.

Phase 3 is 90 days in duration and begins immediately following Phase 2. At the end of Phase 3, the Contractor shall deliver, to DOE, a detailed report, comparing conventional equipment/parts distribution methods and "Industrial Vending", including efficiencies (if any), cost benefits (if any), and recommendation(s) for future application of the Industrial Vending technology/process.

Table C.2.EM.PA.0040.A001.07.DR.12-1 Automated Supply Pilot Project Milestones/Schedule	
Milestone	**Date**
Complete Phase 1 of Automated Supply Pilot Project	18 months after completion of Transition
Complete Phase 2 of Automated Supply Pilot Project	36 months after completion of Transition
Complete Phase 3 of Automated Supply Pilot Project	39 months after completion of Transition
Automated Supply Pilot Project Report	39 months after completion of Transition

EM.PA.0040.A001.07.DR.13 Asset Recovery and Recycling

For all activities, the Contractor shall maximize use of recycling excess materials and equipment to reduce project costs in accordance with DOE O 436.1. The Contractor shall support DOE's reindustrialization and asset re-utilization activities at the site and participate in DOE's Paducah Project Investment Recovery Integrated Project Team (IPT Charter – PPPO-02-3330142-16).

The site has a large inventory of excess and obsolete parts and personal property. The Contractor shall develop and implement a Personal Property Transfer/Disposition Plan to identify and transfer/disposition these parts. The Contractor will develop a personal property disposition plan within 180 days along with a detailed cost and schedule for dispositioning excess personal property. The Contractor shall support additional personal property transfers as requested. The Contractor shall perform all required work to compile and/or develop all necessary letters, activity and records searches; reports; drawings, photographs, and other documentation needed to transfer personal property identified by the Contractor in the Personal Property Transfer Plan and approved by DOE. Personal Property Transfers will be assumed to be to the Paducah Area Community Reuse Organization (PACRO).

The Contractor shall actively recycle all non-contaminated recyclables: batteries, rubber, paper, glass, plastics, and metals and work with local and regional recyclers and with PACRO to maximize cost effectiveness. The Contractor shall also establish recycling collection points on-site for other site contractors. The Contractor shall not release, for unrestricted use, any scrap metal from DOE radiological areas into commerce for recycling (Memorandum of "Release of Surplus and Scrap Materials", from Secretary Bill Richardson, dated July 13, 2000). Also, the Contractor shall not release, for unrestricted use, volumetrically-contaminated metal into commerce (Press Release "Energy Secretary Richardson Blocks Nickel Recycling at Oak Ridge", dated January 12, 2000). The Contractor shall comply with DOE policies that are developed to address or update the suspension or the moratorium. The Contractor shall provide an Asset Recovery and Recycling Program Plan within 180 days after NTP. The plan shall include

an inventory of all materials and equipment that can be made available for recycle/reuse as well as volumes of regulated materials. The Contractor shall include those items that were recycled/reused in the previous year as well as those recycle/reuse activities planned for the upcoming year and future years as appropriate. The cost savings/cost avoidance along with volumes and weight of materials/equipment recycled/reused should be included for completed activities. Proceeds from asset recovery or recycling can only be used for the direct costs associated with the Contractor's recycling activities for that material; proceeds cannot be used to fund/supplement other projects. All other proceeds are returned to the Treasury.

Table C.2.EM.PA.0040.A001.07.DR.13.01-1 Asset Recovery and Recycling Milestones/Schedule	
Milestone	**Date**
Personal Property Disposition Plan	180 days after transition is complete, then annually thereafter
Asset Recovery and Recycling Program Plan	180 days after transition is complete, then updated annually

Table C.2.EM.PA.0040.A001.07.DR.13.01- Asset Recovery and Recycling Reference Document	
Document Number	**Title**
PPPO-02-3330142-16	IPT Charter

EM.PA.0040.A001.07.DR.14 Energy Efficiency

The Contractor shall assist DOE through direct participation and other support in achieving DOE's energy efficiency goals and objectives in electricity, water, thermal consumption, conservation, greenhouse gas reduction, climate control, and savings, including goals and objectives contained in Executive Order 13693, Planning for Federal Sustainability in the Next Decade. The Contractor shall maintain and update, as appropriate, its documents to include detailed plans and milestones for achieving site-specific energy efficiency goals and objectives. The Contractor shall maximize the use of Energy Savings Performance Contracts and Utility Energy Services Contracts. The Contractor will implement the Transformation Energy Action Management (TEAM) Goals and Initiatives and report the progress on achieving these goals and initiatives in the Ten Year Site Plan, semi-annually to EM HQ, and upon request. At a minimum, the following initiatives shall be pursued:

a. All purchases of office equipment shall be ENERGY STAR or DOE Federal Energy Management Program top 25th percentile. All new construction and major renovations shall be evaluated to achieve Leadership in Energy and Environmental Design (LEED) Gold certification.
b. Decrease water consumption where practical, in all applicable buildings, trailers, and other structures and facilities.
c. Develop Green purchasing program and incorporate Executive Order 13693 into new subcontracts.

d. Increase energy efficiency by adding meters to buildings that meet the Department's cost-benefit analysis guidelines. Even on non-metered buildings, pursue energy savings opportunities such as fluorescent lighting, low flow shower heads, programmable thermostats, more efficient insulation, and other energy saving projects.
e. Transition all fleet vehicles to alternative fuel as vehicles are replaced. Pursue plug-in hybrid electric vehicles where economically and operationally practical.
f. Develop a Toxicity Reduction Plan. Develop toxicity reduction objectives and targets. Monitor ozone depletion substances, recovery, and recycling.
g. Develop a plan to continually reduce greenhouse gas emissions by reducing energy use and cost, then finding renewable or alternative energy solutions.

Green and Sustainable Remediation and Innovative Technology – It is the DOE EM's goal to consider to the extent practical, Green and Sustainable Remediation (GSR) and Innovative Technology practices in all phases of this PWS and to implement such practices when they reduce costs, expedite project schedules, minimize risk, and maximize effectiveness. GSR and Innovative Technology practices should be evaluated for the phases of the PWS, and beyond, consistent with reducing activity impacts on future generations, resources, and the environment. The Contractor shall, to the extent practical utilize GSR practices to maximize sustainability, including but not limited to:

- reduce the environmental footprint of project activities;
- reduce waste generation, disposal, and landfill space;
- reduce energy and water usage;
- increase energy efficiency and minimize the use of non-renewable energy;
- conserve and efficiently manage resources and materials;
- promote carbon neutrality;
- reduce direct and indirect greenhouse gas and other emissions;
- promote reuse and recycling;
- foster green and healthy communities and working landscapes, which balance ecological;
- economic, and social goals;
- integrate the remedy with the end use;
- encourage green and sustainable re-development;
- maximize habitat value and create habitat;
- protect and preserve land resources; and
- minimize, eliminate, or contain pollution at its source.

As part of the project planning and alternative analyses efforts, the contractor should, to the extent practical, select an appropriate GSR/Innovative Technology practice to utilize to conduct the work scope. The contractor shall, to the extent practical, develop, plan, and implement GSR/Innovative Technology approaches, including examples of technologies listed as follows, but not limited to:

- Passive/no-flow sampling techniques;
- Direct-push drilling;
- Use of clean diesel or biofuels;
- Remote data collection, multi-increment sampling;
- Carbon offsets;
- Renewable energy;
- Field screening;
- Mobile laboratories;
- Waste minimization;
- Recycle/reuse ;
- GSR Best Management Practices (BMP); and
- Innovative approaches to public involvement.

The Contractor shall, to the extent practical develop and submit a life-cycle cost/benefit analysis demonstrating the pros and cons of each alternative analyzed and recommended for the project, including GSR/lnnovative Technology practices. The contractor is encouraged to reference and quote, where possible, industry BMPs where costs and benefits are already known and published for expediency. The analysis shall include the net cost or net savings to the project/program by implementing that particular element. The Government will review the analysis and make the final determination on whether to proceed with implementation of the GSR/Innovative Technology practice or technology. During all phases of the project/program, the contractor shall, to the extent practical, consider and implement GSRI/Innovative Technology practices to achieve an overall sustainable remedy selection to:

- reduce costs;
- expedite project schedules;
- minimize risk; and
- maximize effectiveness.

In some cases, a GSR/Innovative Technology Practice may actually increase project costs, but still be approved by the Government because it helps achieve other DOE EM goals of improving the community or environment. In these cases, the cost increase will not impact the contractor's incentive fee calculation.

To the extent practical, work plans and reports generated by the contractor in performance of work under this contract should document for the relevant scope of work the following:

- the GSR/lnnovative Technology that was considered
- the GSR/Innovative Technology that was implemented
- the reasons that considered GSR/lnnovative Technology was, or was not, implemented (for example, the results of the cost benefit analysis)

Table C.2.EM.PA.0040.A001.07.DR.14-1 Energy Efficiency Milestones/Schedule	
Milestone	**Date**
Develop and implement an Energy Efficiency Plan that incorporates all requirements of Executive Order 13693	90 days after conclusion of Transition
Green and Sustainable Remediation and Innovative Technology Report	Annually

EM.PA.0040.A001.07.DR.15 Records Management

The Contractor shall manage all records (regardless of media) generated/received in the performance of the Contract, including records obtained from a predecessor contractor (if applicable), in accordance with the Paducah Infrastructure Contractors Records Management Program, 44 U.S.C. 21; 44 U.S.C. 29; 44 U.S.C. 31; 44 U.S.C. 33; 44 U.S.C. 36; 36 CFR Chapter XII, Subchapter B, *Records Manage*ment; DOE Order 243.1B, *Records Management Program*; and any other DOE requirements as directed by the CO. All records (in all formats, including email) subject to the management of the contractor (e.g., records in support of its operation), are to be inventoried, scheduled and dispositioned in accordance with federal laws, regulations, DOE Directives, the Infrastructure Contractors Records Management Program and an approved Records Management Plan. The Records Management Plan shall be submitted to the Government for approval within 60 calendar day after NTP and updated thereafter when changes occur.

Except for those defined as contractor-owned (in accordance with Department of Energy Acquisition Regulation (DEAR) 970.5204-3, “Access to and Ownership of Records,” see Section I), all records (see 44 U.S.C. 3301 for the statutory definition of a record) acquired or generated by the Contractor in the performance of this Contract including, but not limited to, records from a predecessor contractor (if applicable) and records described by the Contract as being maintained in Privacy Act Systems of Records shall be the property of the Government.

The Contractor shall ensure all records (including email) are reviewed for classification, properly captured within the D&R of Documentum (Electronic Records Management System managed by the Infrastructure Contractor), and the record copy is officially transferred in a timely manner on a routine basis to the Infrastructure Contractor. The Documentum D&R cabinet must be maintained to identify those records that have been transferred and are retained in the cabinet for “information only.” The filing system for the D&R cabinet of Documentum must be consistent or mapped consistently with the Infrastructure Contractor Electronic Records Management System. All records shall be in electronic format meeting National Archives and Records Administration (NARA) requirements (see below) and validated utilizing the Infrastructure Contractors Image Quality Statistical Sampling Plan. All records must be scheduled, arranged and cutoff by collections

(e.g., case file, project, chronologic, numerical, alphabetical, etc.) for proper disposition in accordance with the NARA-approved DOE Records Disposition Schedules.

a. Transmit record(s) in Portable Document Format (PDF), or other NARA-acceptable format, with a minimum resolution of 300 ppi for temporary records.
b. Transmit record(s) in Portable Document Format (PDF)/Archival PDF/A, or other NARA-acceptable format for permanent records, with a minimum resolution in accordance with NARA guidance based on record (black and white, grey scale, color, digital image, etc.)
c. Transfer shall ensure validation of scanned images (e.g. page count and legibility) and include all back-up data or drafts (if applicable) that would be required to be maintained to adequately document the work performed.
d. Records Management staff to perform image quality statistical sampling on transfers in accordance with a DOE approved plan to ensure:

    - Optical character recognition process performed.
    - All text and markings are clear and legible.
    - All pages are legible or marked as "poor quality original."
    - Pages are rotated correctly.
    - Classification markings are clear and legible.
    - No security settings (e.g., encryption, passwords, and//or permissions) are included/embedded that would prevent opening, viewing, or printing a record.
    - For permanent records, if compression is needed, ensure lossless file compression technique is used (not lossy).
    - Utilize a preferred format (e.g., Portable Document Format/Archival PDF/A).
e. All embedded fonts are identified publically as being legally embeddable in a file.
f. Digital photographs shall meet NARA’s requirements of a minimum resolution of 3,000 pixels across the long dimension; images that are uncompressed or which make use of lossless compression, shall be scheduled, managed and captioned as required.
    - Captioning shall include an index that includes: Photo #, date taken, program category (e.g., Environmental Management), site, detailed description/caption, including names of individuals where possible. Digital photographs can be captioned utilizing the properties feature, but must also include an index to link the two. See 36 CFR 1237 and NARA Bulletin for specific requirements.
g. For permanent records, ensure lossless file compression technique is used,

The Contractor shall manage records contained in electronic information systems (EIS) by incorporating recordkeeping controls into the system or export the records

into Documentum in accordance with 36 CFR Part 1236, Electronic Records Management. The Contractor shall design and implement migration strategies to counteract hardware and software dependencies of electronic records whenever the records must be maintained and used beyond the life of the information system in which the records are originally created and captured. The Contractor shall provide a list of all EIS' to DOE annually utilizing the format provided by DOE.

The Contractor shall develop and maintain up-to-date records inventories and file plan(s) that provide for the identification, location, arrangement, assignment of disposition authority and retrieval of all categories (record series), ownership, quality assurance, etc., of records created and received.

The Contractor shall respond to records management data calls by NARA and DOE as requested and process record requests for the FOIA, the Privacy Act, the former worker medical screening program, the Chronic Beryllium Disease Prevention Program, congressional inquiries, legal discoveries and other record requests (e.g., training, personnel, exposure, project, incident reports, visitor's logs, etc.).

The Contractor shall ensure all records identified for inclusion in the administrative record are turned over to the Infrastructure Contractor for the inclusion in the Paducah Environmental Information Center in both hard copy and electronic format within 30 days of generation. The Contractor shall review any existing open administrative record project files and ensure the documents are appropriate and take necessary actions to correct any omissions or remove items that have been included in error.

At the completion of the project, the Contractor shall transfer all remaining records to the Paducah Infrastructure Contractor; no records will be transitioned to the subsequent contractor, unless they are active records specifically required for transition of responsibilities. Any records not turned over will be specifically identified during future transition and the incoming contractor will be required to acknowledge and accept full responsibility for those records, if retained.

The Contractor shall certify to DOE that all documents transferred to the subsequent Contractor contain no records, unless they are active records specifically required for transition of responsibilities and that all records have been turned over to the Infrastructure Contractor. The Contractor shall provide a list of all contractor-owned records, where they will be shipped and the contact for those records.

The Contractor shall develop, implement and maintain sound document control systems and processes ensuring efficient tracking, retrieval, revision control and distribution of documents, including drawings.

The Contractor shall implement a consolidated Engineering Configuration Management System to ensure that current versions of all site drawings are electronically available and managed as controlled documents. This system should

integrate drawings with Engineering Service Orders, as well as, integrate a controlled document system for drawing revisions (in process and final). This system should also integrate the current versions of drawings that have been separately maintained for the Remediation Program associated with the retained DOE facilities (non-leased) that would be associated with installed modified DOE facilities, including remediation projects (e.g. C-400 Electrical Resistance Heating system, Northwest and Northeast Pump and Treat Systems, C-746-U landfill, C-755 and C-764 Complexes). Additionally, the system should include configuration management of the Solid Waste Management Units for the Paducah Site.

The Contractor is to consolidate the historical Remediation Program drawings and formerly leased facilities into one site-wide Engineering Management System. Historical Remediation Program drawings are available in multiple format such as pdf, raw format (.dwg) and hardcopy will be scanned and submitted as a record to the Infrastructure Contractor as a record copy as part of the process of consolidation. The Contractor shall submit a detailed Engineering Configuration Management System Plan within 30 days after completion of transition for electronic management of historical and current engineering drawings to include the process for storage and retrieval of current and historical documents for future deactivation and remediation program use. The plan should identify the interfaces between the ESO system, the Documentum D&R cabinet, and the Infrastructure Contractor Electronic Records Management System (Documentum). The document will also include a schedule for consolidation of drawings (electronic and hardcopy), submittal of records to the Infrastructure Contractor, and full implementation of the Engineering Configuration Management System for all site-wide engineering drawings.

Table C.2.EM.PA.0040.A001.07.DR.15-1
Records Management Milestones/Schedule

Milestone	Date
Records Management Plan	60 days after NTP
Vital/Essential Records Plan and Inventory	120 days after NTP
Electronic Information System	Annually
Records Management Close-out/Transition Plan	180 days prior to end of the POP
Contractor Document Certification	14 days prior to end of the POP
Engineering Configuration Management System Plan	30 days after completion of Transition

EM.PA.0040.A001.07.DR.16 Continuity Program

The Contractor shall develop implement, and update, as necessary, a Site Wide Continuity of Operations (COOP) Program per DOE Order 150.1. The Contractor shall develop and implement a COOP Implementation Plan or Business Recovery Plan that documents the COOP Program. DOE approval of the Plan is required. The COOP program is designed to:

a. Assist the Department in continuing to accomplish Departmental mission essential functions (MEFs), primary mission essential functions (PMEFs), and essential supporting activities (ESAs);
b. Be integrated with other Paducah contractor organizations and the Emergency Management Program; and
c. Address preparedness and response to epidemic and pandemic events.

Table C.2.EM.PA.0040.A001.07.DR.16-1 Continuity Program Milestones/Schedule	
Milestone	**Date**
Site Wide COOP Program Implementation Plan and updates as necessary	60 days after completion of Transition

EM.PA.0040.A001.07.DR.17 DOE Consolidated Audit Program

The DOECAP is a consolidated audit program with DOE complex-wide participation that conducts annual audits of analytical environmental laboratories and commercial treatment, storage, and disposal facilities (TSDFs) that have contracts or agreements to provide services to DOE. DOECAP audits are performed on behalf of, and with the participation of, sites throughout the DOE complex. The six DOECAP laboratory audit areas include Quality Assurance Management Systems and General Laboratory Practices, Data Quality for Organic Analyses, Data Quality for Inorganic and Wet Chemistry Analyses, Data Quality for Radiochemistry Analyses, Laboratory Information Management Systems and Electronic Data Management, and Hazardous and Radioactive Materials Management. The seven DOECAP TSDF audit areas include Quality Assurance Management Systems, Sampling and Analytical Data Quality, Waste Operations, Environmental Compliance/Permitting, Radiological Control, Industrial and Chemical Safety, and Transportation Management.

The Contractor shall perform all activities to:

a. Provide at least one qualified candidate to participate as an audit team member in as many as four TSDF and five Lab DOECAP audits each year, (a total of nine candidates maximum, but that may also be the same individual(s) so long as no audit schedule is impacted), as requested by DOE.
b. Perform pre-audit activities, including but not limited to, requesting and reviewing pre-audit information from the audited facilities and participating in conference calls.
c. Perform audit activities, including lead auditor activities during laboratory audits.
d. Perform post-audit activities, including but not limited to, completing and issuing audit reports and notifying the audited facility of acceptance of the proposed CAP.
e. Perform work in accordance with applicable DOECAP policies and procedures

EM.PA.0040.A001.07.DR.18 Project Close-out and Completion

The Contractor shall provide all necessary support for a smooth transition/turnover at the end of the Contract. Six (6) months prior to the expiration of the Contract, the Contractor shall submit the Contract Close-out Plan for DOE approval. The Contract Close-out Plan shall include all remaining administrative matters necessary to close out the Contract after the POP, including, but not limited to: resolution of remaining and open agreements, resolution of remaining and open litigation; audit of indirect costs; remaining records disposition required by the Government; or any other activities required by the Contract. The Plan shall identify the costs and provide a schedule and should indicate if the costs are direct or indirect and how they will be charged. Contract closeout activities shall be completed within 180 days after the end of the POP, with the exception of the required accounting and auditing functions.

Ninety days prior to the end of the POP, the Contractor shall submit to DOE, a comprehensive environmental compliance report demonstrating compliance with all applicable environmental regulatory requirements.

One hundred and twenty (120) days prior to the expiration of the contract, the Contractor shall submit a detailed Contract Completion Transition Plan. The Contract Completion Transition Plan shall include the approach the Contractor will take to ensure the successful transfer of responsibility in the following areas, to a follow-on Contractor at the end of the POP:

a. transition of all facilities, facility operations, and environmental permits to the follow-on contractor;
b. support due diligence walk downs of facilities and other areas;
c. transfer of existing program documents to include deactivation and environmental remediation services;
d. transfer of authorization basis documents;
e. transitioning of staff;
f. transferring procurement activities for materials, equipment, supplies, parts, and subcontractors required for a seamless transition;
g. destruction of all non-records that are not desired by the incoming Contractor; and
h. transfer of all records to the Infrastructure Contractor Records Management Center, in accordance with this contract.

The Contractor shall work with the incoming D&R Project Contractor to align transition activities and to support a smooth transition. Any areas that the Contractor believes are being missed shall be brought to DOE’s attention

Table C.2.EM.PA.0040.A001.07.DR.18-1 End of Contract Performance Milestones/Schedule	
Milestone	**Date**
Contract Close-out Plan	180 days before end of POP
Contract Completion Transition Plan	120 days before end of POP
Environmental Compliance Report	90 days before end of POP

EM.PA.0040.A001.07.DR.19 Worker Pensions & Retirement Health Benefits

The Contractor shall become a sponsor/participating employer in the East Tennessee Technology Park Multiple Employer Pension Plan for Grandfathered Employees (ETTP MEPP), the East Tennessee Technology Park Multiple Employer Welfare Arrangement (ETTP MEWA). The requirements associated with this responsibility are set forth in Section H.

The Contractor shall perform the premium remittance (employer cost share) and employer reporting duties for the inactive population of eligible former Remediation Contractor employees (e.g. Retirees, Displaced Workers, Consolidated Omnibus Budget Reconciliation Act (COBRA), and Long-Term Disability). Under the UCOR's prime contact with the DOE, UCOR has the responsibility to administer MEPP/MEWA Pad/Ports benefits, however, the funds will be provided to UCOR through this contract. There will be no fee associated with the pass-through costs paid to UCOR. Consistent with Section B of the RFP, fee applies to administration costs only.

EM.PA.0040.A001.07.DR.20 Nuclear Materials Control and Accountability

The Contractor shall manage and implement the site's Nuclear Materials Control and Accountability (NMC&A) Program. The NMC&A Group will include a balance of staff to include an appropriate mix of accountants, NMC&A Engineers, IT, and other specialties as necessary. The NMC&A group shall be organizationally independent of all site operations management. The Contractor shall comply with DOE Orders including, but not limited to, DOE O 474.2 Change 3 and DOE O 410.2, and optimize the cost-effectiveness of the program for all reportable quantities of accountable of nuclear material in the scope of this contract on the Paducah site, and for use by other Paducah site contractors. The Contractor shall, in consultation with the ODSA, assist with the preparation of the NMC&A Section of the SSP and provide assurance that the NMC&A Section of the SSP is correct and/or provide changes to the ODSA.

The Contractor shall:

a. Provide a NMC&A Plan addressing all accountable nuclear materials in this contract scope and assist in the development of the NMC&A Plan required by other Paducah site contractors performing NMC&A activities;
b. Manage and conduct a centralized NMC&A Program for all accountable quantities of nuclear material on the Paducah site including, but not limited to,

nuclear material accounting, NMC&A Training for the Paducah site, assessments and self-assessments, oversight of measurements required by the NMC&A Program, reporting nuclear material transactions to Nuclear Materials Management and Safeguards System, and assuring necessary site expertise for compliance with DOE NMC&A requirements;

c. Perform NMC&A activities which include warehousing, surveillance, characterization, planning, brokering, packaging, consolidation, preparation, and shipping of the inventory of depleted, normal and enriched Nuclear Materials;
d. Perform final disposition (including but not limited to relocation to other DOE sites or DOE contractors for storage/programmatic use and/or sale to the private sector and/or disposal), as directed by DOE, of all remaining Nuclear Material inventory including product and waste;
e. Provide necessary reports and information to support DOE-HQ Nuclear Materials Management and Safeguard System; and
f. Provide necessary reports to PPPO regarding clarification of the status of the nuclear material inventory.

Table C.2.EM.PA.0040.A001.07.DR.20-1
NMC&A Milestones/Schedule

Milestone	Date
Submittal of NMC&A Plan	90 days after NTP and Annually thereafter or following significant program change
Submit the NMC&A SSP Section to the ODSA	90 days after NTP and Annually thereafter in a schedule agreed to by the ODSA

EM.PA.0040.A001.07.DR.21 Information Services and Communications

The Contractor shall maintain a functioning Information Services Program. The Information Services organization provided by the Contractor shall provide project management for information systems and software asset management. This will also consist of the supporting of Contractor users and applications; database and web application development; technology planning, scheduling, cost estimating, and contracting; and other activities to meet information and communications needs for execution of the Contractor's project scope.

Other technical activities performed by Contractor shall include:

- Provide IT management, planning, and coordination for the Contractor's project scope;
- Communicate project computing and telecommunications requirements to the Infrastructure Contractor;
- Provide for the development and implementation of non-enterprise applications, web sites, and databases, in support of the Contractor's project work scope;

- Provide user support, maintenance, and administration of non-enterprise software applications, in support of the Contractor's project work scope;
- Support implementation of software quality assurance requirements specified DOE Order 414.1D, *Quality Assurance*, as well as guidance provided in DOE Guide 414.1-4, Safety Software Guide for Use with 10 Code of Federal Regulations (CFR) 830 Subpart A, Quality Assurance Requirements, and in DOE O 414.1C, Quality Assurance; and
- Support project management of IT hardware and software projects, as specified in DOE O 415.1.

The Contractor's Information Services organization shall also provide IT Project Management that includes the following:

- Provide IT management for non-enterprise project-specific software systems, as specified in DOE O 200.1A, Information Technology Management;
- Coordinate and support Infrastructure Contractor information security planning and site-wide reporting requirements; and
- Ensure procedure and process compliance to management directives, procedures, and standards.

The Cyber Security Program and implementation of the program is provided by the Infrastructure Contractor. The Contractor shall support the Infrastructure Contractor in complying with DOE N 205.1, Department of Energy Cyber Security Management Program and 206.4, Personal Identity Verification Program, which includes, but is not limited to, classified cyber security, unclassified cyber security, and telecommunications security.

The Contractor is responsible for providing radios for emergency and routine day-to-day use. Radios should be compatible with an 800 MHz EDACS trunking radio system. Operating frequencies are between 810MHz and 861MHz.

The Infrastructure Contractor is responsible for enterprise applications and installed hardware, providing telephones (landline and cellular), copiers, and computers and hardware maintenance consistent with Section J, Attachment J – 12, Government Furnished Services and Items. The Contractor should attain Infrastructure Contractor approval for any required changes to these information and communication systems. The Infrastructure Contractor is responsible for reviewing and approving the changes.

EM.PA.0040.A001.07.DR.22 Laundry

The Contractor shall be responsible for laundry services for work performed under the PWS. The Contractor shall also provide these services to the ETS contractor and DOE.

The Contractor shall provide pickup and distribution of laundry across the Paducah site. The Contractor shall provide subcontracted off-site laundry services or self-performing laundry services, whichever is determined to be the best value to the Government, for work performed under the PWS, including:

- Providing materials, services, testing devices, and all items necessary for the laundering, disinfecting, sanitizing, transporting, testing, evaluating, and ensuring quality of the Laundry Service;
- Providing resources necessary for radiological support for collection and redistribution of Laundry;
- Suppling adequate labor, supervision, tools, equipment, etc. for on-site pickup and delivery to and from Paducah facilities; and
- Providing laundry services for DOE and the ETS contractor.

EM.PA.0040.A002.04.DR WASTE OPERATIONS

EM.PA.0040.A002.04.DR.01 Waste Operations

The Contractor, to the extent necessary to comply with regulatory and DOE requirements, shall operate and maintain a compliant Waste Management Program. Waste is considered disposed of when it has been shipped to and accepted for final disposition at a properly licensed and permitted disposal site. The Contractor shall avoid generating waste from any operations within the PWS with no pathway for disposal. The Contractor shall take all reasonable actions to minimize waste generation and to preclude the generation of TRU and MTRU wastes from any operations within the PWS. The Contractor shall obtain DOE approval prior to generation of TRU or MTRU waste. The Contractor shall assist DOE in evaluating disposal site alternatives (e.g., cost/benefit analyses, NEPA documentation).

The Contractor shall utilize any facilities available for cost-effective storage and processing to comply with nuclear safety requirements (e.g., storage of fissile waste). However, the contractor shall try to maximize the use of satellite storage areas, satellite accumulation areas, and 90 Day Storage Areas, while minimizing the need to keep and process waste in waste storage facilities.

The Contractor shall compliantly manage, characterize, process, and package all waste generated with certification as required during this Contract. The Contractor shall also be responsible for dispositioning all waste generated or received prior to 90 days before this Contract expires. This includes final characterization, packaging, labeling, and final disposition of all acceptable waste (e.g. not sanitary waste) from the Infrastructure Contractor, Tennessee Valley Authority (TVA) (primarily expected to be MLLW), or that which was left behind by the incumbent contractor. Waste generated and in process for disposition by previous contractors is expected to exist. The Contractor shall disposition the wastes from the previous contractors, and notify

DOE upon completion. For all activities, the Contractor shall maximize use of recycling excess materials and equipment to reduce project costs.

Waste generated from environmental remediation activities using the CERCLA process (in accordance with Executive Order 12580, Superfund Implementation) shall comply with the requirements of DOE O 435.1 (and subsequent revision e.g., DOE O 435.1A), Radioactive Waste Management, DOE M 435.1-1, Radioactive Waste Management Manual, and any other requirements, as specified in the CERCLA ARARs for the projects.

The Contractor shall manage the generated CERCLA Project wastes, including all secondary wastes, such that the waste disposal is ongoing during the remediation/removal activity, all waste disposal is completed within 45 days after the completion of the remedial/removal process, and waste disposal is completed prior to submittal of the D1 Remedial Action Completion Report (RACR) or D1 Completion Notice to DOE.

All waste management activities shall meet the appropriate waste acceptance criteria with certification, as appropriate, for approved waste disposition/disposal options. The Contractor, in compliance with DOE M 435.1-1 requirements, shall prepare exemption requests for use of non-DOE treatment, storage, and disposal facilities, which includes lifecycle cost analysis for disposition (non-DOE treatment, storage, or disposal) options considered. The Contractor has access to the national IDIQ disposal and Basic Ordering Agreement treatment contracts (i.e., DOE LL/ MLLW Disposal Services IDIQ Contracts and DOE LL/ MLLW Treatment Services Basic Ordering Agreements) as needed for the execution of waste management activities.

The Contractor shall development, submit, and maintain a Waste Management Plan in accordance with DOE M 435.1 Chg 1 and obtain DOE approval. The Waste Management Plan should reflect an integrated overarching approach to waste management that minimizes generation, maximizes recycling and reuse, and moves the site toward elimination of waste processing and storage at the PGDP as early as possible.

The Contractor shall ensure operation of storage and treatment areas or facilities, and comply with all permits, orders, and regulatory requirements. The Contractor shall, to the extent possible, minimize the number of facilities used for waste storage and waste/materials in storage.

The Contractor shall establish an accounting system and baseline (i.e., CPB) such that Waste Operations costs (fully burdened) are distributed to the projects generating the wastes and utilizing these services, other than those costs directly associated with the management and disposition of: 1) the previous contractor’s wastes (90 Day inventory), 2) TVA waste, 3) other site contractor waste, and 4) programmatic costs that cannot specifically be attributed to a particular project.

The Contractor may distribute the S&M and associated regulatory compliance activities required for having the facilities to either the S&M WBS or WBS where project management support is captured in lieu of allocating the costs to the projects that are generating the wastes.

The Contractor shall perform all activities to:

a. Operate and maintain the waste storage facilities identified in Table C.2.EM.PA.0040.A002.04.DR.01-1 in compliance with applicable permits, and restrictions. Any facilities not required or effective for operations shall be compliantly placed into STANDBY mode and DOE concurrence gained prior to deactivation shutdown.
b. The Contractor shall continue any waste determination efforts regarding De-Listing Waste and as described within the 2003 Agreed Order Site-Wide Contained-In determinations.
c. Comply with the agreement with the Tennessee Valley Authority (TVA) Shawnee Fossil Plant for DOE to accept certain ^{99}Tc contaminated waste associated with the PDGP ^{99}Tc groundwater plume.
d. Waste generated during the execution of this Contract may require treatment prior to final disposition. Subject to regulatory requirements to meet the waste acceptance criteria for disposal, treatment services may be performed on-site, off-site, or at other DOE facilities. The Contractor, in compliance with DOE M 435.1-1 requirements, shall prepare exemption requests for use of non-DOE treatment, storage, and disposal facilities, which includes lifecycle cost analysis for disposition (non-DOE treatment, storage, or disposal) options considered.
e. The contractor shall also develop and maintain summary information for Nevada National Security Site (NNSS) on waste stream life-cycle projections planned for treatment facilities, including forecasts and updates as requested by NNSS throughout the year.
f. The Contractor shall perform all activities associated with the characterization, packaging, handling and hauling/transportation of waste to various facilities with waste certification as appropriate. This includes the transport to off-site and on-site treatment and/or storage facilities and off-site and on-site disposal facilities. All packaging and transportation practices shall be in accordance with applicable Federal, state, and local regulations and requirements. In addition, the Contractor shall:
    i. Consider the DOE-negotiated tender for transportation services.
    ii. Procure necessary packaging and carrier services for transport to/from treatment facilities and to disposal facilities;
    iii. Make the appropriate requests and gain approval from the DOE ODSA for classified shipments;
    iv. Develop appropriate transportation plans, including transportation security plans, for various waste types, obtain appropriate transport permits, and coordinate with DOE as appropriate; and

v. Receive and manage the disposal certificates for all wastes shipped off-site.
vi. Establish or accept the current existing program for meeting the NNSS waste certification process.
vii. Annually report LLW/MLLW volumes for prior year actual and forecast shipments as requested by the DOE Office of Environmental Management.
viii. Provide auditor support for DOECAP audits of commercial facilities if non-DOE treatment and disposal services are used.

Table C.2.EM.PA.0040.A002.04.DR.01-1
Waste Storage Facilities

Building Number	Building Title	FT^2	Bldg. Description	Waste Type			
				RCRA	RCRA / TSCA	TSCA	LLW
C-733	Waste Oil and Chemical Storage Facility	4,224	Covered structure enclosed by a wall on one side and fencing on the other sides. This building is RCRA permitted and holds the flammable/ignitable hazardous material.	X	X		X
C-746-B1	Staging Area	71,000	Waste staging area west of C-746-A. Gravel pad used to store scrap metal, pallets, etc. for size reduction prior to going for disposal.				X
C-746-H3	Storage Area	56,150	Concrete slab for 90-day storage of RCRA material. Two clean shell structures are located on the pad for storing LLW and solid waste.	X			X
C-746-Q	Hazardous and Low-Level Waste Storage Facility	33,165	Prefabricated metal building that stores RCRA and LLW. Material that requires nuclear criticality storage is located here. Some USEC waste is stored in the building. This is a Haz Cat 2 Facility.	X	X	X	X
C-746-V	Waste Staging Area	10,000	Outside gravel pad. LLW and solid waste is temporarily stored here.				X
C-752-A	Waste Storage Facility	43,600	Prefabricated metal building used for operations and storage of waste. This	X	X	X	X

Table C.2.EM.PA.0040.A002.04.DR.01-1
Waste Storage Facilities

Building Number	Building Title	FT^2	Bldg. Description	Waste Type			
				RCRA	RCRA / TSCA	TSCA	LLW
			building is permitted for RCRA storage and treatment. The southeast corner of the building has a structure for waste treatment that can be isolated from the rest of the building and hooked to air containment systems. Treatment for wastewater occurs here by activated carbon or a low capacity ultraviolet light system. The building is also used for sorting and packaging waste.				
C-753-A	TSCA Storage	31,600	Prefabricated metal building used for storage of TSCA waste. Sorting and packing operations also occur here.			X	X
C-754	Low Level Waste Storage	7872	Sprung Structure				X
C-757	Solid and LL Waste Processing	10,000	Waste management staging & processing				X
C-759	Staging Area	124,893	Gravel pad for waste staging and processing				X
C-760	Pad	104,822	90-day accumulation area				X
C-761	Staging Area	71,046	Gravel pad for waste staging and processing				X
C-746-Q1		16,335	This unit is part of the C-746-Q facility designed to manage both solid and liquid hazardous wastes. Wastes are stored in containers. This unit currently is permitted for the crushing of light bulbs and for chemical treatment of hazardous wastes in containers. This is a Haz Cat 2 Facility.	X	X		X`

Table C.2.EM.PA.0040.A002.04.DR.01-1 Waste Storage Facilities							
Building Number	Building Title	FT^2	Bldg. Description	Waste Type			
				RCRA	RCRA / TSCA	TSCA	LLW

LLW = low-level waste
RCRA = Resource Conservation and Recovery Act of 1976
TSCA = Toxic Substances Control Act of 1976, Public Law 94-469, October 11, 1976, 15 USC Section 2622
Source: DOE/LX/07-0035&D1, Scoping Document for CERCLA Waste Disposal Alternatives Evaluation Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

Table C.2.EM.PA.0040.A002.04.DR.01-2 Waste Operations Requirements Documents	
Document Number	**Title**
DWM-31434-042	2003 Agreed Order Site-Wide Contained-In Determinations
NA	Agreement with Tennessee Valley Authority (TVA) Shawnee Fossil Plant for DOE to accept Certain ^{99}Tc contaminated wastes
CP2-WM-0011/R0	Waste Acceptance Criteria for the Treatment, Storage, and Disposal Facilities at the Paducah U.S. Department of Energy Site, December 2015
DWM-30039-042	1997 Agreed Order for Site Treatment Plan
Permit Numbers 073-00045, 073-00014, 073-00015	Kentucky Division of Waste Management C-746-U, C-746-S and C-746-T Landfills Solid Waste Permits
Permit Number KY8-890-008-982	Kentucky Division of Waste Management Hazardous Waste Management Facilities Permit, includes the Hazardous and Solid Waste Amendments permit issued by U.S. EPA

Table C.2.EM.PA.0040.A002.04.DR.01-3 Waste Management Operations Milestones/Schedule	
Milestone	**Date**
Submit Waste Management Plan	90 days after NTP
Complete disposition of wastes remaining from previous contractors and TVA	180 days after transition is complete

EM.PA.0040.A002.05.DR LANDFILL OPERATIONS

The Paducah Site has one 60-acre Subtitle D landfill (approximately 22 acres are permitted for disposal) that is currently operational and is designated as the C-746-U landfill. The landfill waste acceptance criteria prohibits the disposal of classified, hazardous, or LLW. However, waste within authorized limits for radionuclides may be disposed in the C-746-U landfill. The location of the landfill is outside the security fence. Five of 23 cells within the C-746-U landfill are currently active. The landfill has a capacity to accept an estimated 1.18 million cubic yards of waste, and currently contains an estimated 115,000 cubic yards. C-746-S and C-746-T are two closed landfills that are currently permitted.

EM.PA.0040.A002.05.DR.01 Operate the Landfills

The Contractor shall perform all activities to operate and maintain the three landfills (C-746-U, C-746-S, and C-746-T) in accordance with Kentucky regulations, DOE requirements (e.g., authorized limits), closure and post-closure requirements, and the operating permit, to include but not limited to, the following:

a. Accept waste (including waste from other site contractors or TVA) that meets the requirements of the permit.
b. Operate and maintain the leachate collection and treatment systems at C-746-U and C-746-S (Note: C-746-T does not have a leachate collection system). Collect, characterize, transport, treat as necessary, and discharge all leachate, (including leachate from any new cells constructed/operated) estimated at 825,000 gallons of leachate annually (five year trending average) from the C-746-U Cells 1-5 (798,000 gallons) and C-746-S (27,000 gallons) at an approved wastewater treatment facility. C-746-U leachate is collected and pumped into leachate storage tanks. Leachate from C-746-S is collected in a sump and transferred into tanker trucks where it can be transferred to the leachate storage tanks. Leachate is treated in the C-746-U leachate treatment system. Treatment of the leachate (transferred via tanker trucks) at C-615 is allowed by the site's various permits when the C-746-U treatment system is unavailable or leachate treatment demands exceed the C-746-U treatment system capacity (such as during maintenance or discharges into outfall 19).
c. Be named as the operator on the permit for the C-746-U, C-746-S and C-746-T landfills, the RCRA permit, and the KPDES permit. If this work is subcontracted out, the Contractor shall remain named as the operator. Additionally, the Contractor shall be designated as the waste generator and responsible for making waste determinations at the site. The Contractor shall enter into a RCRA co-generator agreement with DOE consistent with the existing agreement at the Paducah Site.
d. Operate and maintain buildings and structures.

EM.PA.0040.A002.05.DR.02 Landfill Expansion

As indicated above, five (5) of 23 cells within the C-746-U landfill are currently active. DOE has projected the need for two (2) additional cells to be designed and constructed. The Contractor shall perform all activities necessary to complete the design and gain regulatory approval (via permit modification) for design and construction of two new cells at the C-746-U Landfill. The two additional cells need to be available based on the Contractor's estimated need for additional disposal space.

Table C.2.EM.PA.0040.A002.05.DR.02-1
C-746-U Landfill Expansion Reference Documentation

Reference Number	Title
KDWM Solid Waste Permits SW07300015, SW07300014, and SW07300045	Solid Waste Permit for C-746-S, C-746-T, and C-746-U Landfills, July 21, 2015

Table C.2.EM.PA.0040.A002.05.DR.02-1 C-746-U Landfill Expansion Reference Documentation	
Reference Number	**Title**
N/A	C-746-U Technical Application for a Solid Waste Landfill (August 1994)

Table C.2.EM.PA.0040.A002.05.DR.02-2 C-746-U Landfill Expansion Milestones/Schedule	
Milestone	**Date**
Submit C-746-U Landfill Expansion Design and Permit Modification Package for DOE Approval	Consistent with the approved CPB
Complete design and construction of two new cells and any necessary changes to the leachate treatment system. Cells must be operational.	NLT the end of FY22

EM.PA.0040.A005.02.DR SOUTHWEST PLUME SOURCES REMEDIATION

EM.PA.0040.A005.02.DR.02 SWMUs 211 A&B Remediation

The Contractor shall complete the installation of the Bio-Remediation delivery system and monitoring system, including monitoring wells at SWMU 211A needed to implement long-term monitoring of the source areas. The Contractor shall implement the Bio-Remediation remedy as specified in the applicable CERCLA documents. The Contractor shall complete the Remedial Action Completion Report (RACR) for SWMU 211A and implement long-term monitoring. The Contractor shall perform all activities supporting the long-term monitoring of the Southwest Plume Sources, including sampling and analyses necessary to: demonstrate the effectiveness of the treatment; the development and submittal of all regulatory documents and reports; and compliant waste disposal. All wastes generated up to 90 days prior to the end of the Contract must be disposed of prior to the end of the period of performance.

As a result of the successful completion of the active treatment of the SW Plume Source (SWMU 211A), the contractor shall perform long-term monitoring of the source area for one year under the project and then incorporate additional years of monitoring into the Paducah Site EMP. All data shall be included in the CERCLA 5-Year Site Review and the FFA Semi-annual Report. The initial deliverables submitted to DOE shall be of sufficient quality, depth, thoroughness, and format to support DOE approval.

The current ROD alternatives for SWMU 211B (Long-Term Monitoring or Bio-Remediation) are no longer appropriate based on recent data collected in support of remedy selection. The Contractor shall support future planning, as well as any scoping that is necessary, and regulatory activities for a path forward for SWMU 211B. No regulatory documents or fieldwork is included in this PWS.

Table C.2.EM.PA.0040.A005.02.DR.02-1 SWMUs 211 A&B Remediation Requirements Documents	
Document Number	**Title**
DOE/LX/07-0186&D2	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 South East Sites) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, 2010
DOE/LX/07-0365&D2/R1	Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, March 2012
DOE/LX/07-1288&D2	Final Characterization Report for Solid Waste Management Units 211-A and 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, December 2013
DOE/LX/07-1268&D2/R2/A1	Addendum to the Remedial Design Work Plan for Solid Waste Management Units 1, 211-A, and 211-B Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Sampling and Analysis Plan, February 2015
DOE/LX/07-1288&D2/A1	Addendum to Final Characterization Report for Solid Waste Management Units 211-A and 211-B Volatile Organic Compound for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, December 2015
PPPO-02-3287657-16	Final Characterization Notification for Solid Waste Management Unit 211-A and Solid Waste Management Unit 211-B at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, December 17, 2015

Table C.2.EM.PA.0040.A005.02.DR.02-2 SWMUs 211 A Remediation Milestones/Schedule	
Milestone	**Date**
D1 Remedial Design Work Plan for SWMU 211A	Consistent with the SMP and the approved CPB
30% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
60% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
90% Remedial Design Report for SWMU 211A	Consistent with the SMP and the approved CPB
D1 Remedial Action Work Plan for SWMU 211A	Consistent with the SMP and the approved CPB
Field Start for SWMU 211A Remedial Action	Consistent with the SMP and the approved CPB
D1 Post Construction Report	Consistent with the SMP and the approved CPB
D1 Operation and Maintenance Plan	Consistent with the SMP and the approved CPB
Complete waste disposition for SWMU 211A Remedial Action	Consistent with the SMP and the approved CPB
D1 Remedial Action Completion Report(s) for SWMU 211A	Consistent with the SMP and the approved CPB

EM.PA.0040.A005.10.DR C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE REMEDIATION

EM.PA.0040.A005.10.DR.01 C-400 Building Subsurface Groundwater Source Remediation

The C-400 Cleaning Building has historically been found to be a major source of TCE in the Northwest and Northeast Plumes. TCE and other related Volatile Organic Compounds (VOC) as well as ^{99}Tc have been found in the vadose zone from the surface down to the water table. Now that the facility has been returned to DOE, all of the contaminants of concern (COCs) in the soils surrounding and underneath the buildings and groundwater need to be determined. The C-400 Complex is being defined as the area bounded by the streets Virginia Avenue to the north, 11th Street to the east, 10th Street to the west, and Tennessee Avenue to the south.

The Contractor shall complete a full investigation of the C-400 Complex, including any and all regulator documents and sampling, to determine the nature and extent of all COCs in the groundwater, soils surrounding the buildings, and beneath the buildings. The investigation includes all slabs, soils, and groundwater within the area specified above (C-400 Complex). The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation, including any sampling and analysis plans necessary to complete the investigation and reach a final remediation Record of Decision (ROD) addressing all COCs instead of an Interim ROD addressing only the TCE contamination. The Contractor shall work to gain DOE and regulatory agency approval of the CERCLA documentation, including the results of the investigation. The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

The Contractor shall develop and submit to DOE and the regulatory agencies all applicable CERCLA documentation (e.g., Remedial Investigation/Feasibility Study (RI/FS) Work Plan, Proposed Plan, Records of Decision, Design Packages, Remedial Design Work Plans, Remedial Action Work Plans, Remedial Action Reports, etc. necessary to complete remediation within the C-400 Complex, which would include any contamination that extends beneath the C-400 Cleaning Building. The Contractor shall work to gain DOE and regulatory agency approval of the applicable CERCLA documentation. The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

Upon completion of the remediation, the Contractor shall prepare the Remedial Action Completion Report (RACR). The Contractor shall comply with the FFA and other applicable regulatory agreements/requirements.

Table C.2.EM.PA.0040.A005.10.DR.01-1 C-400 BUILDING SUBSURFACE GROUNDWATER SOURCE INVESTIGATION Milestones/Schedule	
Milestone	**Date**
D1 C-400 Complex RI/FS Work Plan	Within 6 months after completion of Transition
Begin field RI activities	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 RI/FS	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 Proposed Plan	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 Record of Decision	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 Remedial Action Work Plan	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
D1 Remedial Design Work Plan	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.
Complete the remediation of COC contamination throughout the C-400 Complex including contamination that extends beneath the C-400 Cleaning Building,	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP
D1 RACR	As established in the Contractor's CPB and approved by DOE. Dates must be consistent with the latest approved version of the FFA SMP.

EM.PA.0040.A008.41.DR SURVEILLANCE AND MAINTENANCE

EM.PA.0040.A008.41.DR.01 Surveillance and Maintenance of Facilities

The Contractor shall perform routine surveillance and maintenance of all DOE-owned facilities assigned to the Paducah D&R Contractor in FIMS and identified in Section J, Attachment J-18. The Contractor shall perform all S&M activities associated with these facilities through the end of the Contract. While not an all-inclusive list, examples of S&M activities are: system monitoring, routine inspections, calibrations, certifications, corrective maintenance, facility repairs necessary to maintain the integrity of the facility, combustible removal, cleanup of spills/leaks, control of loose contamination and airborne particles, isolation of utilities, etc.

Additionally, the Contractor shall minimize the size/footprint of occupied facilities to

the greatest extent practical. The goal of this action is to reduce utility and S&M costs and maximize productivity of personnel. The Contractor shall submit annually a Site Facility Occupational Status Report that documents which facilities are occupied and the plans associated with the unoccupied. The report shall include a plan and schedule to reduce the number of occupied facilities by 20% over the life of the contract while meeting all PWS requirements and tasks. A facility shall be considered occupied, consistent with DOE Orders and the Life Safety Code (NFPA-101), if the facility is occupied by personnel on a regular basis (more than just making rounds or walk-throughs of the facility). If operations are performed in a facility, it shall be considered occupied. The Contractor shall implement that plan to the extent practical.

The Contractor shall also, to the extent practicable, remove and disposition permanently unoccupied temporary facilities (e.g. trailers) or small structures to preclude degradation that would result in increased cost to DOE. DOE approval is not required prior to implementing such actions but DOE notification is required since GFSI services will be impacted. However, CERCLA and other applicable regulatory requirements processes shall be adhered to. Additionally, the Contractor shall maximize the transfer to PACRO for excessing any such facilities.

The Contractor shall develop, document, and maintain an S&M Program Plan as appropriate for all facilities that are within the Contractor's responsibility.

The S&M activities shall be tailored during the facility life-cycle in accordance with DOE O 430.1B, Real Property Asset Management, and 10 CFR 851, Worker Safety and Health Program. Other areas that may require S&M include closed areas, remediated areas, capped areas (e.g., landfill), open areas, etc.

The Contractor shall provide preventive and corrective maintenance using a graded approach on buildings, trailers and Other Structures and Facilities (OSF) assigned to the Contractor in FIMS and identified in Section J, Attachment J-18. A graded approach is defined as the process of ensuring that actions used to comply with a requirement are commensurate with:

a. the relative importance of safety and safeguards and security,
b. the magnitude of any hazard(s) involved,
c. the life cycle stage of the facility,
d. the programmatic mission of the facility,
e. the particular characteristics of the facility,
f. the relative importance of the radiological and non-radiological hazards, and
g. any other relevant factor.

The Contractor shall ensure that an electronic S&M tracking/work processing software package is used to integrate historical S&M data with S&M work requests for subsequent scheduling. The Contractor shall accept, utilize, and optimize the existing electronic system. Further, the Contractor shall ensure that no systems,

equipment, or items related to safety (including defense in depth) are degraded for more than 30 days without written DOE consent. The Contractor shall ensure that long-lead or critical spares are in on-site inventory where practical. The Contractor shall ensure mitigating actions are put in place within 24 hours of identifying a degraded system, equipment, or item related to safety.

The Contractor shall review the Authorization Basis, the Technical Safety Requirements (TSR), and the defense-in-depth safety related programs and shall present to DOE within 45 days after Transition completion, a comprehensive, itemized list of systems, equipment, and items related to safety (including those items credited for defense-in-depth or other safety related systems). The Contractor shall implement and adhere to the guidance provided in DOE memoranda *Deferred Maintenance Report Recommendations and Implementation Plan, June 25, 2015* and *Deferred Maintenance PPPO-02-2742794-15, March 30, 2015*. The Contractor shall actively work with DOE safety personnel and reach agreement on the list within 60 days after Transition completion. As such, there shall be no deferred maintenance of safety related systems, equipment, or items greater than 30 days without express written consent from DOE.

The Contractor shall perform all S&M activities including, but not limited to, the following:

a. Minimize and reduce the occupation of facilities to the maximum extent possible;
b. Maintain the operability of critical equipment such as the criticality accident alarm systems (CAAS), monitor radiological conditions, and check and maintain safety-related items. As facility conditions change, the Contractor shall reduce or eliminate critical equipment or use of critical systems that are no longer required for compliance with DOE requirements.
c. Perform minimally required facility inspections including equipment and/or structure;
d. Conduct preventive, predictive, and corrective maintenance actions only necessary to support near-term Contractor or site tenants/contractors operations. As operational activities change, the Contractor shall annually assess if continued preventative, predictive, and corrective maintenance is still warranted.

Table C.2.EM.PA.0040.A008.41.DR.01-2
Surveillance and Maintenance of Facilities Milestones/Schedule

Milestone	Date
Develop and Submit a S&M Program Plan for facilities within the Contractors responsibility	NLT 30 days after transition is complete
Annual Site Facility Occupational Status Report	90 days after conclusion of transition and annually thereafter
Comprehensive list of systems, equipment, and items related to safety	Within 45 days after transition completion and reach agreement with DOE safety personnel within 60 days after transition completion.

EM.PA.0040.A008.41.DR.02 Facility Roofs

The Contractor shall ensure that all Category 2 nuclear facility roofs do not leak. If a leak is discovered the Contractor shall take immediate mitigation action(s) and pursue full repair actions to ensure all temporary repair actions are replaced with permanent repair(s) within 60 days of leak identification. This includes any and all structural aspects of the roofs. Further, the Contractor shall ensure that roof leaks do not impact operational activities (defined as taking any type of action that adjusts the operation from pre-leak condition/configuration, including modifying operator PPE) in non-Category 2 nuclear facilities and shall permanently repair such leaks within 90 days of identification. Permanent repairs are defined as returning the roof to its original pre-leak configuration or equivalent. The Contractor shall submit a non-Category 2 facility operations roof list to DOE 45 days after Transition is complete. The Contractor shall gain DOE approval of the list within 60 days after Transition is complete.

The Contractor shall assess the integrity of all of the PGDP facility roofs 30 days after Transition is complete and annually thereafter. The Contractor shall provide DOE a report of the integrity of facility roofs within 30 days of completing its assessment, including the costs and schedule for repair of the roofs by facility. (Note: The cost for roof repair is informational; the Contractor is responsible for funding those repairs.) All repairs shall be completed in a compliant, timely manner and shall prevent water leakage.

Further, the roofs for C-310, C-310-A, C-331, C-333, C-335, and C-337 were replaced with a fire resistant structural membrane system. These roofs shall be maintained in a sound condition that does not invalidate the warranty of the roofs. In the event leaks are identified, the Contractor shall work with the installer to resolve warranted deficiencies.

Non-Category 2/Category 3 facilities that are: 1) shutdown, 2) do not have routine personnel access, 3) have utilities isolated, and 4) do not have authorization basis requirements associated with facility safety should be evaluated on a graded approach . This exemption does not apply to facilities with structural membrane systems (C-310, C-310-A, C-331, C-333, C-335, and C-337). The roof structural membrane must be maintained in accordance with warranty requirements.

Table C.2.EM.PA.0040.A008.41.DR.02-1
Facility Roofs Reference

Document Number	Title
FPAD-16-1257	2015 Annual Process Facilities Roof Structural Integrity Assessment
FPAD-16-1430	Performance Based Incentive No 3c C-335 and C-331 Roof Replacement and Warranties

Table C.2.EM.PA.0040.A008.41.DR.02-2 Facility Roofs Milestones/Schedule	
Milestone	**Date**
Submit Roof Integrity Assessment	60 days after Transition is complete and annually thereafter
Submit a List of Non-Category 2 Facilities	NLT 45 days after Transition is complete

EM.PA.0040.A008.42.DR UTILITIES OPERATIONS

EM.PA.0040.A008.42.DR.01 Utility Operations

The Contractor shall operate and maintain utilities and ensure utility services are provided to site tenants for the utilities described within this section. The Contractor shall work with the other site tenants/contractors to ensure that decisions to provide these services are based on overall cost effectiveness. The Contractor shall evaluate the existing Nitrogen system to determine if there are any modifications required to optimize/minimize the nitrogen usage at PGDP. The Contractor shall provide DOE with the analysis of the system along with detailed cost and schedule for any recommendations. Natural gas is provided from off-site via two main utility lines; one to the north that services PGDP facilities and one to the south for DUF_6 facilities.

Additionally, the tracking and metering of utilities in Federal Buildings is maintained by Section 103 of the Energy Policy Act of 2005. Since DOE will be performing clean-up operations in portions of the facility for the foreseeable future, the Contractor shall install and track meters for the usage of power, natural gas, water, and other fuels, when repairs are made to the utility service for a building/group of buildings, such that installation of the meters is practicable to DOE annually (unless the facility(ies) is/are actively undergoing or, has completed deactivation).

Table C.2.EM.PA.0040.A008.42.DR.01-1 Utility Operations Milestones/Schedule	
Milestone	**Date**
List of facility meters added or deleted	12 months after transition is complete and annually thereafter
Nitrogen System Evaluation Report	90 days after transition

EM.PA.0040.A008.42.DR.02 Steam, Chilled Water, Compressed Air, & Waste Heat Systems

The Contractor shall operate and maintain the existing five (5) package boilers units (nominal 20,000 pounds/hour each) to meet the site demands, including deposit/hold-up removal, of up to 40,000 pounds/hour. A connection for a sixth package boiler is available should the Contractor determine that additional steam capacity is required to support the Contractor's operational needs. The Contractor will be responsible for the costs of natural gas and/or fuel oil for boilers. The Contractor shall remove the package boilers as demand is reduced site-wide.

The Contractor shall ensure that the facilities currently using steam for heating have a replacement heat supply installed if the facility is going to continue to be occupied/operated. The Contractor shall ensure that the ductwork needed to distribute the heating/cooling is properly configured and sized as part of the replacement heating/cooling. The Contractor shall develop and submit to DOE the plan and schedule for replacing the heat source to facilities that are going to remain operational.

Heat and chilled water will still be required for certain facilities that currently utilize the recirculating heat systems (formerly the Waste Heat System tied to the Recirculating Cooling Water System). The Contractor shall operate and maintain these systems until shutdown of end user facilities or until end user facilities that will continue to be occupied/operated have replacement heating/cooling installed. The following facilities use chilled water: C-100; C-101; C-102; C-200; C-205; C-300; C-600; C-709; C-710; and C-720. The following facilities use the recirculating heat system to provide heat (including estimated percentage of total load used): C-100 (8%); C-200 (2%); C-400 (40%); C-710 (6%); and C-720 (44%) buildings.

The Contractor shall ensure that those facilities using chilled water or the recirculating heat system have replacement heating/cooling installed if the facility is going to continue to be occupied/operated. The Contractor shall ensure that the ductwork needed to distribute the heating/cooling is properly configured and sized as part of the replacement heating/cooling. The Contractor shall develop and submit to DOE the plan and schedule for replacing the heating/cooling service to facilities that are going to remain operational. Upon completion of replacing the heating/cooling services to those facilities, the Contractor shall shut-down the plant chiller (located in C-602) and the heat exchanger east of C-600. The Contractor shall work with DOE and PACRO to excess the heat exchanger.

There are several air compressors of varying age, reliability, and capacity that provide dry compressed air to a plant-wide dry air distribution system. The Contractor shall operate and maintain, as necessary, dry compressed air distribution system and associated air compressors until the Contractor can modify the system to facilitate shutdown and discontinue use of the plant-wide dry air distribution system. The Contractor shall utilize local air compressors or air compressors within the building to provide any required dry compressed air. No air compressors shall use once-through cooling from the plant/sanitary water system. The air compressors in C-620 and in C-602 shall be shut down.

Table C.2.EM.PA.0040.A008.42.DR.02-2
Steam, Chilled Water, Compressed Air, and Waste Heat Systems Milestones/Schedule

Milestone	Date
Heating/Cooling Service Replacement Plans and Schedule	12 months after Transition is complete
Shut down of the Plant Compressed Air Distribution System and air compressors in C-620 and C-602	24 months after Transition is complete

Table C.2.EM.PA.0040.A008.42.DR.02-2 Steam, Chilled Water, Compressed Air, and Waste Heat Systems Milestones/Schedule	
Milestone	**Date**
Discontinue use of the Plant Dry Air /Compressed Air System and any air compressors that use once through cooling from plant/sanitary water	24 months after Transition is complete
Complete Installation of the Replacement Heating/Cooling Service for the Chiller and Recirculating Heat System and Shutdown the Chiller and Recirculating Heat System.	30 months after Transition is complete
Complete Installation of Replacement Heat Service for Steam	42 months after Transition is complete

EM.PA.0040.A008.42.DR.03 Water Systems

The Contractor shall ensure the operation and maintenance of the permitted C-611 Water Treatment Facilities and provide potable and non-potable (process) water to the site's contractors/tenants. This includes maintenance of associated raw water lines, distribution lines to the individual site facilities, water towers, pump, housings, etc. The raw water treatment process is based on conventional water treatment techniques which include softening, coagulation, flocculation, sedimentation, and chlorination. Raw water is obtained from the Ohio River through an intake station and pumped through water-softening units at the facility.

The Contractor shall continue to operate the existing on-site water treatment facilities and raw water supply lines until a commercial/community water supplier connects and begins to provide water to the entire site.

The Contractor shall provide support to DOE to obtain an off-site potable (sanitary) water supply (one million gallons per day). The process to acquire potable water from one of the local water districts has been initiated. The Contractor shall complete this effort. This support shall include the following:

1. Support DOE on working with the Stakeholders as needed to form agreements with an Off-Site Service Provider to provide the PGDP with long term sanitary water service.
2. Support the design by an Off-Site service provider. This includes providing the Off-Site Service Provider technical interface information, data, specifications, and/or drawings as requested.
3. The contractor shall support DOE in pursuing alternative financial arrangements with the Off-Site Service Provider for the design and construction of the water line and associated equipment and tie-ins to provide sanitary water to PGDP.
4. Review design packages and specifications as requested by the Off-Site Service Provider.
5. Support interface, coordination, and technical support (radiological surveys, line locations, and penetration permits) for the Off-Site Service Provider construction on site as necessary.

6. Coordination of tie-in of the Off-Site Service Provider's potable (sanitary) water line to the new Contractor installed storage tank(s).
7. Status Meetings and Briefing materials and meeting notes on an ad-hoc basis as requested by DOE

The Contractor shall design and construct a water storage tank(s) of not less than 500,000 gallons for sanitary water and the installation of an underground line from the new tank(s) to the site potable (sanitary) water system. The new configuration would initially supply the DUF_6 Plant Area and the C-103 DOE Building with sanitary water and fire protection services. The storage tank(s) are to include all piping, pumps, valves, controls, and connections required to allow tie-in of a future water supply line from an off-site supplier as described above.

The Contractor shall complete all actions, including design, procurement, and construction necessary to place the in-coming water lines from the local water district into service, while minimizing the operation and maintenance of existing on-site water treatment facilities and systems. The Contractor shall develop and submit to DOE a plan and detailed schedule that identifies the facilities/systems to be shut down and those required to continue to operate after connection to the local water district. The Contractor shall shut down, de-energize, isolate, and drain liquids, from all water treatment facilities/systems (including ancillary systems) no longer required to be operated. The Contractor shall ensure sufficient water capacity remains on-site in support of fire suppression systems and firefighting response actions.

The Contractor shall design, construct, and make modifications to and/or replace the appropriate sections of the on-site potable water distribution system as needed. As part of the changes, the Contractor shall ensure that the distribution system lines are right sized to have sufficient flow in the lines to maintain a sanitary condition (e.g., maintain residual chlorine content with minimum flushing of lines) of the water service. The Contractor shall also ensure that any existing lines used for distribution of the potable water shall be in good condition and have all leaks eliminated. Finally, the Contractor shall air gap (permanently isolate) parts of the existing distribution system/area that do not require continued potable water.

Table C.2.EM.PA.0040.A008.42.DR.03-1
Water Systems Milestones/Schedule

Milestone	Date
Water Facility Shutdown Plan	12 months after Transition is complete
Provide a Plan for Optimization of the onsite Sanitary Water Distribution system	24 months after Transition is complete
Complete transition of the Site’s sanitary/plant water systems to a local water district.	24 months after Transition is complete

Complete the shut down, de-energization, isolation, and draining of liquids, of the unnecessary facilities/systems (including ancillary/support systems)	30 months after Transition is complete

***Note:** Transfer of facilities may involve multiple steps, including lease prior to completing all necessary facility transfer requirements.*

EM.PA.0040.A008.42.DR.04 Electric Power Distribution
In 2015, the site completed the reconfiguration of the site's 14kV power distribution system allowing the shut-down of the low-side of the C-533, C-535, and C-537 switchyards. All power currently is distributed out of the C-531 switchyard.

The Contractor shall:

a. ensure power is provided to all on-site tenants/contractors (does not include commercial power provided to remote areas of the site that are managed by the Infrastructure Contractor);
b. operate and maintain the high side of the site's four switchyards until TVA, Electric Energy Inc. (EEI), or Kentucky Utilities (KU) have migrated the 161kV lines away from the switchyards; and
c. project the power needs for all site operations (including infrastructure and DUF_6 needs) for a five-year period and update that projection quarterly.

EM.PA.0040.A008.42.DR.04.01 Electric Power Operations and Deactivation of Switchyards

The Contractor shall maintain and operate the 14kV Power Distribution systems at the site. The Contractor shall operate and maintain the high side of the site's four switchyards in accordance with the requirements established by the regional reliability coordinator (TVA), until TVA, EEI, or KU have migrated the 161kV lines away from the switchyards. The reconfiguration of the 161 kV lines away from the C-533, C-535, and C-537 switchyards are expected to be completed by December 31, 2017. Once TVA, EEI, and KU have completed the migration of the 161kV power lines coming into the site's four switchyards, the Contractor shall shutdown and isolate the high side of the switchyards and eliminate all power (including any ancillary or station power) and other utility services to the switchyards and associated ancillary facilities. All oils shall by drained and compliantly dispositioned and fire suppression systems shall be deactivated. Upon completion of this activity all C-500 series facilities shall be shutdown, de-energized, drained of liquids, and unoccupied.

A new switchyard will be constructed by others including the installation of 14kV cables between the new switchyard and the existing 14kV distribution systems. Final ties will be made by others with an expected completion date of February 2019. The Contractor shall coordinate and interface with the entities performing these tasks to ensure site accessibility, impacts to the electrical system are minimized, and the new system is commissioned and operable. The Contractor will operate the new 14kV systems once placed into service. The new switchyard will be operated by others.

The Contractor shall have the ability to collect the fully burdened costs for maintaining and operating the high-side of each switchyard by month starting in FY18. The costs shall include an apportionment of supporting utilities (e.g., power, steam, fire suppression, water) and program management cost in addition to overhead, fringe, and fee. DOE may recover costs from the electrical utilities.

The Contractor is not responsible for purchasing power (DOE purchases power).

Table C.2.EM.PA.0040.A008.42.DR.04-1
Electric Power Distribution Milestones/Schedule

Milestone	**Date**
Complete shut-down, isolation, de-energization, and draining of the C-533, C-537 and C-535 Switchyards and associated ancillary/support facilities	6 months after EEI and TVA complete re-configuration of the 161 kV lines to migrate away from C-533, C-537 and C-535
Complete shut-down, isolation, de-energization, and draining of the C-531 switchyard and associate ancillary/support facilities	6 months after completion of the tie-ins of the new 14kV cables to the existing 14kV distribution system and to the new switchyard equipment.
Quarterly Site Power Projections	The 15th of January, April, July, and October for each preceding quarter

Table C.2.EM.PA.0040.A008.42.DR.04-2
Electric Power Distribution Reference Documents

Document Number	Document Title
N/A	14kV Design Package
N/A	Power Contracts

EM.PA.0040.A008.42.DR.05 Sewage Treatment Systems

The Contractor shall provide sewage handling and treatment (e.g. C-615 Sewage Disposal Plant) services for the site's contractors/tenants. The C-615 Sewage Treatment Plant provides secondary treatment and consists of primary and secondary settling basins, trickling filter, sludge digester and settling beds, chlorinator, and contact chamber.

The Contractor shall continue isolation of low use or damaged sewer lines, and transition to the use of contractor supplied self-contained restroom facilities.

The Contractor shall assess the capabilities of the on-site sewage collection and treatment systems and facilities for purposes of replacing these facilities with more efficient modular treatment systems or with use of local community sewage treatment districts. Additionally, the Contractor shall assess the site's near-term and long-term operational needs as the DUF_6 operations continue, environmental remediation activities continue, the PGDP continues to be deactivated, and include as a part of its assessment the needs of

other on-site tenants/contractors. The sewage facilities and associated infrastructure have historical radiological contamination, and any recommendation provided by the Contractor must ensure no migration of contamination off-site. The Contractor shall prepare an alternatives analysis to replace, modify, repair, optimize or supplement the existing sewage treatment system, the existing sewage lines, and the existing sewage collection and treatment systems and facilities. A field study (i.e., smoke test, dye and flush test, closed circuit TV, etc. or any combination) is being conducted by the current Contractor to determine the source of infiltration and inflow (I&I) to the sewage collection system (including manholes) due to cross connections, point source inflow, faulty connections, and sewer system integrity. The Contractor is required to evaluate the results of the Field Study (Reference the Sanitary Sewer Evaluation Study (SSES)) and incorporate the results into the alternative analysis. As part of the alternatives analysis, the Contractor shall include dry chemical and other environmentally friendly sewage systems, and all costs necessary to implement and operate the various alternatives. The analysis shall include an evaluation of all of the cost/benefits for each alternative and a schedule of implementing each alternative, including key milestones.

Table C.2.EM.PA.0040.A008.42.DR.05-1
Sewage Treatment Systems Milestones/Schedule

Milestone	Date
Submittal of the Sewage Alternatives Analysis	24 months after transition is complete

***Note:** Transfer of facilities may involve multiple steps, including lease prior to completing all necessary facility transfer requirements.*

Table C.2.EM.PA.0040.A008.42.DR.05-2
Sewage Treatment System Reference Documents

Document Number	Document Title
	Sanitary Sewer Evaluation Study (SSES)

EM.PA.0040.A008.43.DR ANALYTICAL LABORATORY

Onsite laboratory facilities C-709, C-710 and associated ancillary facilities will become the responsibility of the Contractor.

EM.PA.0040.A008.43.DR.01 Analytical Laboratory Operations

Costs for all analytical services shall be assigned to the applicable projects/PWS activities and not included within this PWS. The Contractor's projects/PWS activities and other site tenants/contractors are expected to pay the fully burdened costs for performance of the analytical analysis/services. The costs for analytical testing associated with the analytical services shall be included in the fully burdened rates. Only a prorated amount of the programmatic laboratory management costs or laboratory disposition activities shall be included within this PWS.

The operation of on-site analytical facilities to provide analytical laboratory services will be at the discretion of the Contractor. In the event the Contractor performs some

analytical services on-site, the services shall be available to other DOE on-site contractors.

Samples (waste or otherwise) shall be disposed of within six (6) months of the acceptance of the Analytical Laboratory deliverable/data. The Contractor shall arrange for and coordinate the disposition of GFE laboratory equipment no longer needed, chemicals, samples, waste resulting from its services, and any other materials associated with laboratory services.

If the Analytical Laboratory is utilized, the Contractor shall participate in Performance Evaluation Studies (PES) for its self-performed laboratory services provided through industry standard vendors and/or control programs. The PES programs include, but are not limited to:

a. Mixed Analyte Proficiency Evaluation Report Program (MAPEP),
b. American Industrial Hygiene Association and National Institute of Occupational Safety and Health Asbestos Proficiency Testing Programs,
c. Environmental Resource Associates (ERA) Proficiency Testing Program, and Discharge Monitoring Report – Quality Assurance (DMR-QA) study.

The Analytical Laboratory may also be subject to blind PES submittals at the discretion of DOE. The Contractor shall submit to on-site audits led by DOECAP or their designees within the DOE and Contractor organizations. Audit teams will typically consist of personnel from the DOECAP, and other DOE contractors. The audits will be performed periodically as identified by the DOECAP.

Regardless of the Contractor's decision to continue laboratory operations, the Contractor shall disposition samples and/or waste from analytical services provided by the previous contractor that may be present and associated with C-709 and C- 710 laboratory facilities within 6 months of transition. The Contractor shall disposition all sources, fissionable/fissile materials, chemicals, other materials, and excess GFE equipment remaining in the facility (does not include small cylinders) that the Contractor does not use to support its operation of the Analytical Laboratory (including ancillary facilities) or remains after transition from the previous contractor within 6 months of transition. The Contractor shall ensure compliant storage for any remaining small cylinders not dispositioned by the incumbent contractor.

EM.PA.0040.A008.48.DR STABILIZATION AND DEACTIVATION

The Contractor shall perform stabilization, as appropriate, to ensure the PGDP uranium processing facilities are in a safe configuration (including meeting criticality incredibility (CI)) with minimal S&M activities required until decommissioning begins and shall be addressed as part of the Contractor's Stabilization and Deactivation Plan.

In general "stabilization" refers to the early stages of the deactivation process when nuclear and hazardous materials are removed from the facility, shutting facility systems down, de-energizing

equipment in preparation for long-term S&M (EM.PA.0040.A008.41), completely isolating (i.e. "air gapping") the facility from site utilities, removal of all fire loading, and preparing the facility for long-term surveillance awaiting demolition.

The PGDP enrichment facility consists of 1820 stages by design. The stages are arranged in two cascades. The cascade buildings are designated as C-331 (400 stages), C-333 (480 stages), C-335 (400 stages), C-337 (480 stages) and C-310 (60 stages). The C-331 and C-333 stages are placed in series to form what is known as the "Lower Cascade" and similarly the C-335 and C-337 stages are place in series to form the "Upper Cascade". The Uranium Hexafluoride (UF_6) enriched product and lighter molecular weight gases are separated and removed in the C-310 facility. The depleted UF_6 is removed in the C-315 facility which does not contain operating stages.

In C-310 (purge cascade), the facility contains one Unit. Unit 1 has ten (10) Cells. Each C-310 Cell has six (6) "XX" sized converters (i.e., 60 stages). In C-331 and C-335, each facility contains four (4) Units. Each C-331 and C-335 Unit has ten (10) Cells, each Cell has ten (10) "00" sized converters (i.e., 400 stages each). In C-333 and C-337, each facility has six (6) Units. Each C-333 and C-337 Unit has ten (10) Cells, each Cell has eight (8) "000" sized converters (i.e., 480 stages each).

Under Section 4.4 of the Lease Agreement between DOE and USEC, USEC was required to *"remove solid "Greater than Safe Mass" (GSM) deposits, of UO_2F_2/UF_4 to the extent necessary to prevent criticality, using an in-place removal process, such as the chemical fluorination treatment; and ensure that nothing adversely affects the operability of the purge cascade, the coolant, storage systems, HVAC systems, and air filtration systems"*. To comply with the turnover requirements of the Lease Agreement, USEC performed the following activities during the shutdown of operations to establish a Uranium Hexafluoride (UF_6) negative condition:

a. Isolation of each of the "units" from the remaining process via a series of valves in the process piping;
b. Evacuation of the Uranium Hexafluoride (UF_6) gas in the equipment and the system flushed with air; and
c. Follow-up sampling to ensure the individual components contain only minimal amounts of UF_6.

Even though the above processes were followed, it would not be unusual for absorbed UF_6 on equipment surfaces to be transferred to the gas phase resulting in UF_6 concentrations above the UF_6 negative definition.

Uranium-containing materials are deposited on the surfaces of the PGDP UF_6 systems by three mechanisms: adsorption, metal corrosion, and hydrolysis. An initial deposition of uranium as UF_6 occurs almost instantaneously because of chemisorption on the equipment surfaces. The quantity of chemisorbed material does not change with exposure time; it is always present. A relatively small additional amount of physically adsorbed material UF_6 was present when the plant was in operation but most of this material was removed during normal cascade shutdown, evacuation, and purging. The internal structural materials of the cascade include nickel,

aluminum, nickel plated steel, copper, and small quantities of iron which were corroded by UF_6. The corrosion process produces a solid deposit, reduced uranium fluoride, which can be UF_5, UF_4, or U_2F_9. Deposition of these reduced uranium compounds have occurred and thus these compounds are present to some degree throughout the cascade. This deposited uranium is referred to as the in process uranium "hold-up".

Solid uranium-containing material (referred to as "deposits") can also be deposited on the cascade surfaces, in the form of uranium oxy-fluorides principally as UO_2F_2 but possibly others as well by the reaction of UF_6 with moisture that entered the cascade through small leaks in the process and equipment failures such as seals, valves, and expansion joints. Most of the material formed by this mechanism is deposited on surfaces in the vicinity of the in-leakage point. Removal of the uranium within the process equipment will facilitate reducing the categorization of the uranium processing facilities from Nuclear Category 2 to Radiological Facilities. This will reduce the long-term S&M costs associated with the facilities and subsequent waste characterization and waste disposal associated with Decommission and Demolition (D&D) activities.

There are a number of converters and compressors that have been removed from the process that contain deposits/hold-up. Some of these components are located on outside storage pads in addition to being stored within the process buildings. Although these items are no longer connected to the cascade, the Contractor shall ensure deposit/hold-up removal has been performed on these components. After successful deposit/hold-up removal, these items may remain within the process building for future dispositioning. If those components stored on outside storage pads are required to be brought into a process building to conduct deposit/hold-up removal, they may remain within the process building where deposit/hold-up removal occurred for future dispositioning, based on available floor loading.

There are ten (10) Portable Cell Treatment Cart (PCTC) Systems that are available as GFSI and may be used by the Contractor to conduct in-situ chemical treatment (ICT) activities of the PGDP process equipment. The PCTC consists of a large oven containing eight (8) sodium fluoride filled traps for trapping out UF_6 recovered during ICT. This is referred to as the NaF trap cart or NTC. The system also contains an analytical test buggy (ATB) used for gas sampling and analysis along with associated support equipment (pumps; temperature, pressure, and flow instrumentation; etc.). The Contractor shall be responsible for completion of all design, testing, or operational activities required to ensure effective operation of the PCTC systems for deposit removal from the cells, associated UF_6 piping, valves, expansion joints, bellows, etc. The Contractor shall collect the resulting/ regenerated UF_6 material, handling it as product (in large UF_6 cylinder) for transfer to the DUF_6 Contractor. If additional PCTC systems are deemed necessary to support the stabilization approach, the Contractor may procure more PCTCs.

Deposit/Holdup Removal activities are primarily focused on C-310, C-310-A, C-331, C-333/C-333A, C-335, C-337/C-337A, C-360, and the associated process facility tie lines. The Contractor shall implement its technical approach to effectively and efficiently remove uranium deposits. The Contractor shall ensure that the chosen approach (e.g., ICT, mechanical removal, cut and cap for offsite disposal, etc.), and sequencing of activities for deposit/hold-up removal

takes into consideration uranium deposit/hold up removal in adjacent facilities and the need to perform, and the approach for, future Technetium-99 (^{99}Tc) treatment activities.

Table C.2. EM.PA.0040.A008.48.DR-1 STABILIZATION AND DEACTIVIATION OF PROCESS FACILITIES	
Milestone	**Date**
Develop and Submit a Stabilization and Deactivation Plan	NLT 30 days after transition

EM.PA.0040.A008.48.DR.01 NDA Characterization for Deposit/Hold-up Removal for the Process Facilities

The Contractor shall propose the sequence of operations and identify the appropriate lower level WBS elements to allow the Government to understand what work is being proposed and what the proposed cost is for each of the four (4) process facilities (C-331, C-333/C-333A, C-335, and C-337/C-337A) *(NOTE: C-337A and C-333A are considered part of C-337 and C-333 respectively).*

The Contractor shall perform characterization of process equipment in the four process facilities in support of DOE's mission including but not limited to, achieving CI and meeting the Waste Acceptance Criteria (WAC) for an OSWDF. All characterization data will be electronically managed in a manner that facilitates easy retrieval, is traceable to the building and process equipment, and is capable of passing an independent validation by a 3rd party.

In accordance with the QSNDA program, the Contractor shall characterize all process equipment within the process facilities including but not limited to:

a. All cell piping/lines, converters, compressors, valves, instrument lines, expansion joints, etc. (including cells which are partially connected or have not operated);
b. All tie line, by-pass, and auxiliary lines/piping including expansion joints, valves, and manifolds, etc.;
c. Loose and/or spare converters, compressors, and other UF_6 process equipment such as valves, expansion joints, and piping that were either cut out of operating cells or are spare parts (this equipment is stored in various locations within the process buildings);
d. Auxiliary equipment such as freezer sublimers, surge drums, cold traps, seal exhaust/wet air stations, purge and evacuation pumps, booster pumps/stations, holding drums, jet stations, autoclaves, sampling stations, chemical traps, etc.; and
e. UF_6 instrumentation/monitoring equipment/systems such as line recorders, assay machines, seal exhaust, datum, etc.

Table C.2. EM.PA.0040.A008.48.DR.01-1 CHARACTERIZATION OF THE PROCESS FACILITIES	
Milestone	**Date**
Complete development of NDA capability for characterizing "00" facilities in a manner that supports achieving CI and meeting the WAC for an OSWDF. DOE Performance Demonstration Program (PDP) test (or DOE approved alternative approach) must be passed.	NLT 30 months after transition
Complete development of the CI limits for the "00" facilities. The technical basis for the CI limits must be accepted by DOE.	NLT 30 months after transition
Complete all NDA measurements for the "00" facilities in support of achieving CI and meeting the WAC for an OSWDF. Measurement data must be presented in an electronic form that is capable of passing an independent validation by a 3rd party.	NLT 60 months after transition
Complete development of NDA capability for characterizing "000" facilities in a manner that supports achieving CI and meeting the WAC for an OSWDF. DOE Performance Demonstration Program (PDP) test (or DOE approved alternative approach) must be passed.	NLT 60 months after transition
Complete development of the CI limits for the "000" facilities. The technical basis for the CI limits must be accepted by DOE.	NLT 60 months after transition
Complete all NDA measurements for the "000" facilities in support of achieving CI and meeting the WAC for an OSWDF. . Measurement data must be presented in an electronic form that is capable of passing an independent validation by a 3rd party.	NLT 84 months after transition

EM.PA.0040.A008.48.DR.01.05 NDA Characterization of C-360 Facility

The Contractor shall perform characterization of process equipment in C-360 in support of DOE's mission including but not limited to, achieving CI and meeting the WAC for an OSWDF. All characterization data will be electronically managed in a manner that facilitates easy retrieval, is traceable to the building and process equipment, and is capable of passing an independent validation by a 3rd party.

In accordance with the QSNDA program, the Contractor shall characterization all process equipment within C-360 facility including, but not limited to:

a. All equipment associated with sampling activities (i.e., sample cabinets, valves, lines/piping, tubing instrumentation, etc.);
b. All equipment associated with transfer activities (i.e., autoclave piping/lines, valves and instrumentation, transfer piping/lines, valves and instrumentation);
c. Technetium traps located at each autoclave and in downstairs transfer station; and
d. Loose and/or spare UF_6 process equipment such as valves, joints, and piping, that were either cut out of operating equipment or are spare parts

Table C.2. EM.PA.0040.A008.48.DR.01.05-1 CHARACTERIZATION OF C-360	
Milestone	**Date**
Complete development of NDA capability for characterizing C-360 in a manner that supports achieving CI and meeting the WAC for an OSWDF. DOE Performance Demonstration Program (PDP) test (or DOE approved alternative approach) must be passed.	NLT 24 months after transition
Complete development of the CI limits for C-360. The technical basis for the CI limits must be accepted by DOE.	NLT 24 months after transition
Complete all NDA measurements for the C-360 facility in support of achieving CI and meeting the WAC for an OSWDF. Measurement data must be presented in an electronic form that is capable of passing an independent validation by a 3rd party.	NLT 48 months after transition

EM.PA.0040.A008.48.DR.01.06 NDA Characterization of Loose Converters/Compressors

The Contractor shall perform characterization of loose converters/compressors stored outside of process facilities in support of DOE's mission including but not limited to, achieving CI and meeting the WAC for an OSWDF. All characterization data will be electronically managed in a manner that facilitates easy retrieval, is traceable to the building and process equipment, and is capable of passing an independent validation by a 3rd party.

In accordance with the QSNDA program, the Contractor shall characterization all loose converters/compressors stored outside of the process facilities.

Table C.2. EM.PA.0040.A008.48.DR.01.06-1 CHARACTERIZATION OF LOOSE CONVERTERS/COMPRESSORS	
Milestone	**Date**
Complete all NDA measurements for the Loose Converters/Compressors in support of achieving CI and meeting the WAC for an OSWDF. Measurement data must be presented in an electronic form that is capable of passing an independent validation by a 3rd party.	NLT 72 months after transition

EM.PA.0040.A008.48.DR.02 Deposit/Hold-up Removal for the Process Facilities

The Contractor shall propose the sequence of operations and identify the appropriate lower level WBS elements to allow the Government to understand what work is being proposed and what the proposed cost is for each of the four (4) process facilities (C-331, C-333/C-333A, C-335, and C-337/C-337A) *(NOTE: C-337A and C-333A are considered part of C-337 and C-333 respectively).*

The Contractor shall complete the removal and disposition of any remaining lube oils, Freon, or other hazardous materials (e.g., mercury switches, cesium sources, etc.) and complete the shutdown and isolation of the facilities, supporting long-term S&M in the four process facilities. The Contractor shall complete the performance of the necessary

facility stabilization and deactivation activities including, but not limited to, the following:

a. Evaluate and determine the need for the continued safety requirements for monitoring and/or maintaining systems; and
b. Perform deactivation and/or verification activities that support facilities stabilization, per DOE O 420.1C, Facility Safety and contractor safety basis documentation; and
c. Remove fire loading from each facility; and
d. Ensure a Transitional Hazard Facility Analysis (THFA) is developed and approved.

In support of the hazard reduction objectives of stabilization, the Contractor shall perform deposit/holdup removal for all process equipment, valves, and process piping (both installed and removed/loose) to ensure the facilities are in a safe configuration with minimal S&M activities required until decommissioning begins. The criteria for successful deposit/holdup removal is to disposition nuclear materials in uranium processing facilities in a manner that presents a CI condition and that when the facility is eventually decommissioned, that the resulting waste is compliant with applicable waste acceptance criteria for an on-site CERCLA Cell (e.g., the OSWDF).

The overall goal is to remove uranium deposits to a level that results in CI for the facility throughout the process of dispositioning the process equipment (CI for S&M, debris piles and onsite disposal in a CERCLA Cell, if approved). The uranium removal in the uranium processing facilities and associated tie lines allows for the elimination of the criticality safety concerns in each of the process facilities and tie lines, shut down the CAAS in each facility, and to be able to air gap utilities and associated support systems to reduce S&M costs. A secondary goal is to be able to avoid the need for additional uranium treatment to meet Waste Acceptance Criteria for an on-site CERCLA Cell (if approved) during deactivation and decommissioning activities. Exhibit C-1, PDGP Shutdown Cell Status to Support Deposit & Hold-up Removal, is available for reference.

The Contractor shall also design, procure, install and test any required PGDP facility modifications necessary to support the proposed deposit/hold-up removal approach.

The Contractor shall develop any additional protocols (NDA, visual inspections, sampling and testing, statistical analysis, etc.) that will be used to demonstrate that the post treatment condition of the equipment and piping will meet completion thresholds for deposit/hold-up materials removal activities. These protocols need to include identification of specific data that will be collected, how it will be collected and how it will be used to assess post treatment conditions. The data collected will also be utilized in the future to support development of final waste acceptance criteria for the process equipment and piping and identify/evaluate removal of unneeded CAAS Clusters once the deposit/holdup removal activities are completed. The evaluation should address serviceability through completion of future deactivation and decommissioning activities.

The Contractor shall dispose of any fissile equipment and not return the item to the facility after the fissile material has been removed, unless agreed to by DOE. Relocation to another on-site facility for storage is not authorized without DOE approval.
The Contractor shall remove the deposit and hold-up materials from all equipment in the process facilities. This includes but is not limited to:

a. All cell piping/lines, converters, compressors, valves, instrument lines, expansion joints, etc. (This includes cells which are partially connected or have not operated);
b. All tie line, by-pass, and auxiliary lines/piping including expansion joints, valves, manifolds, etc.;
c. Loose and/or spare converters, compressors, and other UF6 process equipment such as valves, expansion joints, and piping, that were either cut out of operating cells or are spare parts (This equipment is stored in various locations within the process buildings);
d. Auxiliary equipment such as freezer sublimers, surge drums, cold traps, seal exhaust/wet air stations, purge and evacuation pumps, booster pumps/stations, holding drums, jet stations, autoclaves, sampling stations, chemical traps, etc.;
e. UF_6 instrumentation/monitoring equipment/systems such as line recorders, assay machines, seal exhaust, datum, etc.; and
f. Technetium traps located in storage containers inside C-331 and adjacent to C-337A.

The Contractor shall complete deposit/holdup removal of the uranium processing equipment in the process facilities. This includes but is not limited to:

a. Removal of all deposits/hold-up to below levels needed to achieve incredibility of criticality and removal/shutdown of CAAS in each facility for all phases of disposition and to meet the potential WAC for On-site CERCLA Waste Disposal Facility;
b. If ICT is utilized, transfer of any large UF_6 cylinders generated as part of deposit/hold-up removal to the DUF_6 Contractor when the cylinder is full;
c. Modify all applicable safety basis documents of facilities/systems that support elimination of the CAAS for facilities including, but not limited to, C-331, C-335, C-310/C-310A, C-337/C-337-A, C-333/C-333-A, and C-360 AND obtain approval of all documentation necessary to support criticality incredibility, including safety authorization basis changes to downgrade the uranium processing facilities from Category 2 Nuclear Facilities to Radiological facilities, and gain DOE approval;
d. Deactivate/shutdown the CAAS in the uranium production facilities; and
e. Isolate and air gap all utilities not required to support the facility post uranium removal and once CI is achieved (high pressure fire water will remain in service therefore the facility will require heating in the winter).

Completion Thresholds for uranium deposit/hold-up removal are as follows:

- Removal of uranium to allow the shutdown of the CAAS for the given areas treated; AND
- Removal of uranium to allow the process equipment and piping to be placed in an On-site Disposal Facility (e.g. On-Site CERCLA Cell) without further processing. (Assume a target waste acceptance criteria for total elemental uranium of 100,000 mg/kg);
  AND
- Removal of uranium and re-categorization of the processing facilities from Category 2 Nuclear Facilities to Radiological Facilities.

Table C.2. EM.PA.0040.A008.48.DR.02-1 DEPOSIT/HOLD-UP REMOVAL FOR THE PROCESS FACILITIES	
Milestone	**Date**
A THFA shall be developed and approved for each of the four Process Facilities (C-331, C-333/C-333A, C-335, C-337/C-337A)	NLT 72 months after transition
Complete deposit removal to be less than CI limits for each process equipment component (assuming 5% of all process equipment components will be above the CI limits) and also meet target waste acceptance criteria for total elemental uranium of 100,000 mg/kg	NLT 116 months after transition

EM.PA.0040.A008.48.DR.02.05 Deposit Removal for C-360

The Contractor shall complete the removal and disposition of any remaining lube oils, Freon, or other hazardous materials (e.g., mercury switches, cesium sources, etc.) and complete the shutdown and isolation of the facilities, supporting long-term S&M in the C-360 facility. The Contractor shall complete the performance of the necessary facility stabilization and deactivation activities including, but not limited to, the following:

a. Evaluate and determine the need for the continued safety requirements for monitoring and/or maintaining systems; and
b. Perform deactivation and/or verification activities that support facilities stabilization, per DOE O 420.1C, Facility Safety and contractor safety basis documentation; and
c. Remove fire loading from each facility; and
d. Ensure a Transitional Hazard Facility Analysis (THFA) is developed and approved.

In support of the hazard reduction objectives of stabilization, the Contractor shall perform deposit/holdup removal for all process equipment, valves, and process piping (both installed and removed/loose) to ensure the facilities are in a safe configuration with minimal S&M activities required until decommissioning begins. The criteria for successful deposit/holdup removal is to disposition nuclear materials in uranium processing facilities in a manner that presents a CI condition and that when the facility is

eventually decommissioned, that the resulting waste is compliant with applicable waste acceptance criteria for an on-site CERCLA Cell (e.g., the OSWDF).

The overall goal is to remove uranium deposits to a level that results in CI for the facility throughout the process of dispositioning the process equipment (CI for S&M, debris piles and onsite disposal in a CERCLA Cell, if approved). The uranium removal in the uranium processing facilities and associated tie lines allows for the elimination of the criticality safety concerns in each of the process facilities and tie lines, shut down the CAAS in each facility, and to be able to air gap utilities and associated support systems to reduce S&M costs. A secondary goal is to be able to avoid the need for additional uranium treatment to meet Waste Acceptance Criteria for an on-site CERCLA Cell (if approved) during deactivation and decommissioning activities. Exhibit C-1, PDGP Shutdown Cell Status to Support Deposit & Hold-up Removal, is available for reference.

The PCTC Systems that are available as GFSI and may be used by the Contractor to conduct in-situ chemical treatment (ICT) activities of the PGDP process equipment. The Contractor shall be responsible for completion of all design, testing, or operational activities required to ensure effective operation of the PCTC systems for deposit removal from the cells, associated UF_6 piping, valves, expansion joints, bellows, etc. The Contractor shall collect the resulting/ regenerated UF_6 material, handling it as product (in large UF_6 cylinder) for transfer to the DUF_6 Contractor. If additional PCTC systems are deemed necessary to support the stabilization approach, the Contractor may procure more PCTCs.

The Contractor shall also design, procure, install and test any required PGDP facility modifications necessary to support the deposit/hold-up removal approach.

The Contractor shall develop any additional protocols (NDA, visual inspections, sampling and testing, statistical analysis, etc.) that will be used to demonstrate that the post treatment condition of the equipment and piping will meet completion thresholds for deposit/hold-up materials removal activities. These protocols need to include identification of specific data that will be collected, how it will be collected and how it will be used to assess post treatment conditions. The data collected will also be utilized in the future to support development of final waste acceptance criteria for the process equipment and piping and identify/evaluate removal of unneeded CAAS Clusters once the deposit/holdup removal activities are completed. The evaluation should address serviceability through completion of future deactivation and decommissioning activities.

The Contractor shall dispose of any fissile equipment and not return the item to the facility after the fissile material has been removed, unless agreed to by DOE. Relocation to another on-site facility for storage is not authorized without DOE approval.

The Contractor shall remove the deposit and hold-up materials from all equipment in the C-360 facility. This includes, but is not limited to:

a. All equipment associated with sampling activities (i.e., sample cabinets, valves, lines/piping, tubing instrumentation, etc.); and
b. All equipment associated with transfer activities (i.e., autoclave piping/lines, valves and instrumentation, transfer piping/lines, valves and instrumentation; and
c. Technetium traps located at each autoclave and in downstairs transfer station; and
d. Loose and/or spare UF_6 process equipment such as valves, joints, and piping, that were either cut out of operating equipment or are spare parts.

The Contractor shall complete deposit/holdup removal of the uranium processing equipment in the C-360 facility. This includes but is not limited to:

a. Removal of all deposits/hold-up to below levels needed to achieve incredibility of criticality and removal/shutdown of CAAS in each facility and to meet the WAC for On-site CERCLA Waste Disposal Facility;
b. If ICT is utilized, transfer of any large UF_6 cylinders generated as part of deposit/hold-up removal to the DUF_6 Contractor when the cylinder is full;
c. Submit all documentation necessary to support criticality incredibility, including authorization basis changes to downgrade the uranium processing facilities from Category 2 Nuclear Facilities to Radiological facilities, and gain DOE approval;
d. Deactivate/shutdown the CAAS in the uranium production facilities; and
e. Isolate and air gap all utilities not required to support the facility post uranium removal and once CI is achieved (high pressure fire water will remain in service therefore the facility will require heating in the winter).

Completion Thresholds for uranium deposit/hold-up removal are as follows:

- Removal of uranium to allow the shutdown of the CAAS for the given areas treated; AND
- Removal of uranium to allow the process equipment and piping to be placed in an On-site Disposal Facility (e.g. On-Site CERCLA Cell) without further processing. Assume a target waste acceptance criteria for total elemental uranium of 100,000 mg/kg;
  AND
- Removal of uranium and re-categorization of the processing facilities from Category 2 Nuclear Facilities to Radiological Facilities.
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Table C.2. EM.PA.0040.A008.48.DR.02.05-1 DEPOSIT/HOLD-UP REMOVAL FOR C-360	
Milestone	**Date**
A THFA shall be developed and approved for C-360	NLT 60 months after transition
Complete deposit removal to be less than CI limits for each process equipment component (assuming 5% of all process equipment components will be above the CI limits) and also meet target waste acceptance criteria for total elemental uranium of 100,000 mg/kg	NLT 96 months after transition

EM.PA.0040.A008.48.DR.02.06 Deposit/Hold-up Removal for Loose Converters/Compressors

The Contractor shall complete the performance of the necessary stabilization and deactivation activities including, but not limited to, the following:

a. Evaluate and determine the need for the continued safety requirements for monitoring and/or maintaining systems; and
b. Perform deactivation and/or verification activities that support facilities stabilization, per DOE O 420.1C, Facility Safety and contractor safety basis documentation.

In support of the hazard reduction objectives of stabilization, the Contractor shall perform deposit/holdup removal activities to ensure loose converters/compressors stored outside process buildings on outside storage pads/areas are in a safe configuration with minimal S&M activities required until decommissioning begins. The criteria for successful deposit/holdup removal is to disposition nuclear materials in loose converters/compressors in a manner that presents a CI condition and that when the equipment is eventually dispositioned, that the resulting waste is compliant with applicable waste acceptance criteria for an on-site CERCLA Cell (e.g., the OSWDF).

The overall goal is to remove uranium deposits to a level that results in CI throughout the process of dispositioning the process equipment (CI for S&M, debris piles and onsite disposal in a CERCLA Cell, if approved). The uranium removal in the loose converters/compressors allows for the elimination of the criticality safety concerns in the equipment, eliminates the need for CAAS coverage, and to reduce S&M costs. A secondary goal is to be able to avoid the need for additional uranium treatment to meet Waste Acceptance Criteria for an on-site CERCLA Cell (if approved) during deactivation and decommissioning activities.

The PCTC Systems that are available as GFSI and may be used by the Contractor to conduct in-situ chemical treatment (ICT) activities of the PGDP process equipment. The Contractor shall be responsible for completion of all design, testing, or operational activities required to ensure effective operation of the PCTC systems for deposit removal from the equipment. The Contractor shall collect the resulting/ regenerated UF_6 material, handling it as product (in large UF_6 cylinder) for transfer to the DUF_6 Contractor. If additional PCTC systems are deemed necessary to support the stabilization approach, the Contractor may procure more PCTCs.

The Contractor shall also design, procure, install and test any required PGDP facility modifications necessary to support the deposit/hold-up removal approach.

The Contractor shall develop any additional protocols (NDA, visual inspections, sampling and testing, statistical analysis, etc.) that will be used to demonstrate that the post treatment condition of the equipment and piping will meet completion thresholds for deposit/hold-up materials removal activities. These protocols need to include

identification of specific data that will be collected, how it will be collected and how it will be used to assess post treatment conditions. The data collected will also be utilized in the future to support development of final waste acceptance criteria for the process equipment and piping and identify/evaluate removal of unneeded CAAS Clusters once the deposit/holdup removal activities are completed. The evaluation should address serviceability through completion of future deactivation and decommissioning activities.

The Contractor shall complete deposit/holdup removal for loose converter/compressor store outside the process facilities. This includes but is not limited to:

a. Removal of all deposits/hold-up to below levels needed to achieve incredibility of criticality and removal/shutdown of CAAS in each facility and to meet the WAC for On-site CERCLA Waste Disposal Facility;
b. If ICT is utilized, transfer of any large UF_6 cylinders generated as part of deposit/hold-up removal to the DUF_6 Contractor when the cylinder is full;
c. Submit all documentation necessary to support criticality incredibility, including authorization basis changes to downgrade the storage pad/area from Category 2 Nuclear Facilities to Radiological facilities, and gain DOE approval; and
d. Eliminate the need for CAAS coverage of the loose converter/compressors.

Completion Thresholds for uranium deposit/hold-up removal are as follows:

- Removal of uranium to allow the shutdown of the CAAS for the given areas treated; AND
- Removal of uranium to allow the process equipment and piping to be placed in an On-site Disposal Facility (e.g. On-Site CERCLA Cell) without further processing. Assume a target waste acceptance criteria for total elemental uranium of 100,000 mg/kg.
  AND
- Removal of uranium and re-categorization of the processing facilities from Category 2 Nuclear Facilities to Radiological Facilities.
-

Table C.3.2 EM.PA.0040.A008.48.DR.02.06-1 DEPOSIT/HOLD-UP REMOVAL FOR LOOSE CONVERTERS/COMPRESSORS	
Milestone	**Date**
Complete deposit removal to be less than CI limits for each process equipment component (assuming 5% of all process equipment components will be above the CI limits) and also meet target waste acceptance criteria for total elemental uranium of 100,000 mg/kg	NLT 96 months following transition

EM.PA.0040.A008.48.DR.03 C-400 Deactivation

The Contractor shall complete full deactivation of the C-400 Cleaning Facility Work Zones 7, 8, 9 and 12 through 18 (see Exhibit C-2 for map of Work Zones) by removing all hazardous equipment and materials, all fissile materials and

equipment, and other items necessary to leave the facility in a demolition-ready state. These activities include, but are not limited to, completion of the following:

a. Clean-out of all tanks, pits, piping, etc., including all basement areas associated with the work zone, physical verification that no liquids or solids remain in the items above contamination levels or levels that would require the materials to be managed as hazardous;
b. Removal of facility equipment, personal property/fixtures, tanks, drums, all asbestos in the building including wiring insulation (excluding interior transite panels), LLW PCB contaminated items, etc. that cannot be left behind for building demolition;
c. Cleanout of the work zones to maximize open floor space for sampling associated with EM.PA.0040.A005.10.DR.01;
d. Evaluation of contents within the facility for reuse or excessing in according with the Asset Recovery and Recycling Program;
e. Fill subgrade areas and basements with controlled low strength materials (CLSM) after all equipment and materials have been removed and characterization is complete (including sampling under EM.PA.0040.A005.10.DR.01);
f. Complete NDA characterization and NCS safety basis revisions for Work Zones 9 and 14 to allow for deactivation of all equipment;
g. Complete air gapping all underground and above-ground utilities to the facility, including support structures, back to the nearest active junction/tie-in.; and
h. Characterization and disposal of all generated wastes either off-site or in the C-746-U Landfill, should the waste meet the landfill waste acceptance criteria.

The Contractor shall develop a schedule for deactivating the different work zones that is integrated with the schedule for remedial investigation activities associated with PWS EM.PA.0040.A005.10.DR.01.

As part of the Contractor's safety and health oversight activities, the Contractor shall perform air monitoring (or other applicable monitoring) within C-400 to address the potential for trichloroethylene [TCE] vapor intrusion resulting from the underlying TCE contaminated groundwater plume. All activities, including schedules, shall be fully coordinated with the Contractor’s Environmental Monitoring organization to ensure that all Federal and State commitments are met.

Table C.2. EM.PA.0040.A008.48.DR.03-1
C-400 Deactivation

Reference Document Number	Title
KY/ERWM-38	C-400 Process and Structure Review, May 3, 1995.

Table C.2. EM.PA.0040.A008.48.DR.03-2 C-400 Deactivation	
Milestone	**Date**
Detailed Schedule Integrated with Planned C-400 Subsurface Soil Investigation Activities for DOE Approval	First Quarter FY18
Complete deactivation of Work Zones per Approved Schedule	TBD
Complete deactivation of all Work Zones and Disposition of All Wastes	NLT end of FY20

EM.PA.0040.A008.48.DR.04 C-746-Q1 Cold Trap Disposition

In C-746-Q1, there are 20 UF_6 Cold Traps that were removed from the C-410 Feed Plant, packaged into boxes and placed into storage. These cold traps are not expected to contain greater than 0.722 weight % U^{235} (NU). However, they are believed to contain uranium and small quantities of transuranic compounds such as neptunium and plutonium, plus ^{99}Tc requiring additional radiological controls. Additionally, there are 2 UF_6 Cold Traps stored in C-746-Q1 that were previously stored in C-746-B Doors 1&2 and that are believed to have originated from Oak Ridge and were temporarily used in the PGDP process. The Contractor shall complete disposition of all 22 cold traps. In the event that the Portable Cell Treatment Carts (PCTC) systems are used to support disposition of the cold traps, the Contractor shall ensure that any radiological contaminants such as transuranic compounds and ^{99}Tc are not re-introduced into the process facilities or into the cylinder collecting the regenerated UF_6 from the uranium process facility deposit/hold-up removal. Any such off-spec uranium generated from the cold traps shall be dispositioned as waste.

Table C.2. EM.PA.0040.A008.48.DR.04-1 C-746-Q1 COLD TRAP DISPOSITION	
Reference Document Number	**Title**
S7DC7460BA001-1	10’x25’ Top Loader Container Fabrication Details (1 of 2)
S7DC7460BA001-2	10’x25’ Top Loader Container Fabrication Details (2 of 2)
	Cold Trap Storage Containers Certificate of Conformance
	Cold Trap Sketches

Table C.2. EM.PA.0040.A008.48.DR.04-2 C-746-Q1 COLD TRAP DISPOSITION	
Milestone	**Date**
Complete Disposition of 22 Cold Traps stored in C-746-Q1	NLT 24 months after transition

EM.PA.0040.A008.48.DR.05 Nickel and ^{99}TC Microwave Thermal Treatment Technology Study and Evaluation

Within the 30 months after transition, the contractor shall complete activities to investigate the use of microwave technology to thermally treat the ^{99}Tc contained in the nickel barrier and subsequently melt the metal nickel for recovery purposes.

All personnel performing this evaluation must possess (at a minimum) an "L" Clearance.

The goal of the Nickel and ^{99}Tc Microwave Thermal Treatment Technology Study and Evaluation is to determine if the use of microwave technology to in-situ thermally heat and melt the nickel in an installed converter, allowing the release and capture of ^{99}Tc in the barrier, is practical. As such, this technology potentially allows for nickel recycling, reduces the weight loading of the converters, and allows them to be removed during facility demolition.

The Nickel and ^{99}Tc Microwave Thermal Treatment Technology Study and Evaluation must evaluate Microwave Thermal Treatment with the following specific requirements and objectives:

a. Thermally smelt 100% of classified barrier material to permit declassification. Smelting of other metals (e.g. Copper, Aluminum) within the converter shall also be demonstrated;
b. Reduce ^{99}Tc concentrations within the converter to permit material to be disposed of in an on-site CERCLA Cell;
c. Remove 95% of the nickel and 95% of the other recyclable metals in the converter;
d. Ensure treated converter can be left "in-place" for removal at facility demolition;
e. Demonstrate capability in a "000" converter;
f. Prevent re-deposit of the released ^{99}Tc in other portions of the converter/cascade;
g. Capture of the ^{99}Tc using PCTC (or similar/simulated trapping method) with recommendations for improving the trapping process; and
h. Removal (draining) of smelted metals from the installed converter to allow for removal and storage elsewhere.

The Contractor will design and complete a bench scale test study to demonstrate the safety and potential implementation success of microwave thermal treatment, prior to conducting a pilot scale test scenario under field conditions.

The Contractor shall issue a report to DOE upon completion of the bench scale study. The report shall provide DOE with a detailed description of the study, an evaluation of the feasibility data and the associated technology, identification of the advantages and disadvantages of the technology, validation of the results in regards to the technologies ability to meet the goals in regards to ^{99}Tc removal and metal melt, opportunities to enhance the technologies performance, evaluation of the economic viability of the technology in regard to pilot scale implementation.

Upon gaining approval from DOE, the Contractor shall continue the Nickel and ^{99}Tc Microwave Thermal Treatment Technology Study and Evaluation by conducting a Pilot Scale Study and Evaluation. The pilot scale study shall be conducted based on parameters that closely simulate the field conditions at PGDP process buildings including the various forms of Tc suspected to be present (TcO_3F, $HTcO_4$, $TcOF_4$, TcF_6 and oxides Tc_2O_7, TcO_2). The pilot scale study shall include the development of the test equipment, procedures, test parameters, sampling, and analysis of data and information (including

data on the volatilization temperature of the various Tc compounds). The pilot scale study shall utilize PGDP barrier materials, be constructed to simulate other parameters, variables (including ambient temperature, space limitations, power loading, etc.) and contaminates expected to be encountered in actual field conditions. The pilot scale study shall specifically address possible in-situ application of the treatment at PGDP.

The Contractor shall issue a report to DOE upon completion of the pilot scale study. The report shall provide DOE with a detailed description of the study, an evaluation of the feasibility data and the associated technology, identification of the advantages and disadvantages of the technology, validation of the results in regards to the technologies ability to meet the goals in regards to ^{99}Tc removal and metal melt, opportunities to enhance the technologies performance, evaluation of the economic viability of the technology in regards to full scale field implementation, and a detailed cost and schedule for full scale implementation. This shall allow the Contractor and DOE to determine the economic viability of the technology, and to determine the feasibility of scaling up the technology to accommodate a full size process converter.

Table C.2.EM.PA.0040.A008.48.DR.05-1
Nickel and ^{99}Tc Microwave Thermal Treatment Technology Study & Evaluation

Milestone	Date
Design and complete a bench scale test study to demonstrate the safety and potential implementation success of microwave thermal treatment	In accordance with Contractor's technical proposal
Issue a report upon completion of the bench scale study for DOE approval to proceed to Pilot Study activity	In accordance with Contractor's technical proposal
Conduct a Pilot Scale Study and Evaluation	In accordance with Contractor's technical proposal
Issue a Nickel and ^{99}Tc Microwave Thermal Treatment Technology Study & Evaluation Pilot Study Report	NLT 30 months after transition

EM.PA.0040.A008.48.DR.06 R-114 Freon

The Contactor shall manage, inspect, and disposition, the existing R-114 inventory. Historically, PGDP has maintained approximately 8.5 million pounds of R-114 Freon on site. The bulk of the R-114 Freon is contained in the Process Building (C-310, C-331, C-333, C-335, and C-337) coolant systems and in the process equipment (e.g., drain tanks, condensers, etc.). The remaining (approximately 2-3 million pounds) R-114 is contained in approximately 15-18 rail cars on-site There are up to 10 International Organization for Standardization (ISO) containers (for on-site storage only) available. Some of the R-114 Freon has been removed from the C-337 Building. The Contractor shall perform any regulatory required inspections, which may include leak checks and level checks to ensure the rail cars and ISO containers are not leaking to the atmosphere. The railcars are not DOT compliant.

Consistent with the Secretary of Energy's directives pertaining to the reuse/recycling of materials/chemicals, a competitive subcontract is expected to be awarded to disposition the R-114 Freon. The Contractor shall accept assignment of all such contracts and continue disposition of the R-114 Freon. The Contractor shall ensure that all of the R-

114 Freon at the Paducah Site is drained and completely dispositioned within the performance period of the contract. This includes any and all R-114 Freon rejected for recycling/reprocessing.

Table C.2.EM.PA.0040.A008.48.DR.06-1 R-114 Freon Milestones/Schedule	
Milestone	**Date**
Disposition all Paducah Site R-114 Freon	NLT 116 months after transition

Table C.2.EM.PA.0040.A008.48.DR.06-2 R-114 Freon Reference Documents	
Document Number	Title
NA	Hatton e:mail May 12, 2015 to vendors, subject: *"Request for an Expression of Interest – R-114"* with one Attachment (EOI)
	Disposition Agreement

C.3 TECHNICAL OPTION WORK

As funding becomes available the Contractor may be asked to pursue various options for some scope elements that currently do not appear in the PWS. These options will be managed under unique CLINs if released by the Contracting Officer.

EM.PA.0040.A008.48.DR.01.07 NDA Characterization of C-310/C-310A Facility

The Contractor shall perform characterization of process equipment in C-310/C-310A in support of DOE's mission including but not limited to, achieving CI and meeting the WAC for an OSWDF. All characterization data will be electronically managed in a manner that facilitates easy retrieval, is traceable to the building and process equipment, and is capable of passing an independent validation by a 3rd party.

In accordance with the QSNDA program, the Contractor shall characterize all process equipment within the C-310/C-310A including but not limited to;

a. All cell piping/lines, converters, compressors, valves, instrument lines, expansion joints, etc. (This includes cells which are partially connected or have not operated.)
b. All tie line, by-pass, and auxiliary lines/piping including expansion joints, valves, manifolds, etc.
c. Loose and/or spare converters, compressors, and other UF_6 process equipment such as valves, expansion joints, and piping that were either cut out of operating cells or are spare parts (This equipment is stored in various locations within the process buildings).
d. Auxiliary equipment such as UF6 condensers and accumulators, cold traps, seal exhaust/wet air stations, Normetex pumps, booster pumps/stations, withdrawal stations, jet stations, autoclaves, sampling stations, chemical traps, etc.,

e. UF_6 instrumentation/monitoring equipment/systems such as line recorders, assay machines, seal exhaust, datum, etc.
f. Technetium traps

Table C.2. EM.PA.0040.A008.48.DR.01.07-1 CHARACTERIZATION OF C-310/C-310A	
Milestone	**Date**
Complete development of NDA capability for characterizing C-310/C-310A facilities in a manner that supports achieving CI and meeting the WAC for an OSWDF. DOE Performance Demonstration Program (PDP) test (or DOE approved alternative approach) must be passed.	Consistent with Exercise of Option
Complete development of the CI limits for the C-310/C-310A facilities. The technical basis for the CI limits must be accepted by DOE.	Consistent with Exercise of Option
Complete all NDA measurements for the C-310/C-310A facilities in support of achieving CI and meeting the WAC for an OSWDF. Measurement data must be presented in an electronic form that is capable of passing an independent validation by a 3rd party.	Consistent with Exercise of Option

EM.PA.0040.A008.48.DR.02.07 Deposit Removal for C-310/C-310A

The Contractor shall complete the removal and disposition of any remaining lube oils, Freon, or other hazardous materials (e.g., mercury switches, cesium sources, etc.) and complete the shutdown and isolation of the facilities, supporting long-term S&M in the C-310/C-310A facility. The Contractor shall complete the performance of the necessary facility stabilization and deactivation activities including, but not limited to, the following:

a. Evaluate and determine the need for the continued safety requirements for monitoring and/or maintaining systems; and
b. Perform deactivation and/or verification activities that support facilities stabilization, per DOE O 420.1C, Facility Safety and contractor safety basis documentation; and
c. Remove fire loading from each facility; and
d. Ensure a Transitional Hazard Facility Analysis (THFA) is developed and approved.

In support of the hazard reduction objectives of stabilization, the Contractor shall perform deposit/holdup removal for all process equipment, valves, and process piping (both installed and removed/loose) to ensure the facilities are in a safe configuration with minimal S&M activities required until decommissioning begins. The criteria for successful deposit/holdup removal is to disposition nuclear materials in uranium processing facilities in a manner that presents a CI condition and that when the facility is eventually decommissioned, that the resulting waste is compliant with applicable waste acceptance criteria for an on-site CERCLA Cell (e.g., the OSWDF).

The overall goal is to remove uranium deposits to a level that results in CI for the facility throughout the process of dispositioning the process equipment (CI for S&M, debris piles and onsite disposal in a CERCLA Cell, if approved). The uranium removal in the uranium processing facilities and associated tie lines allows for the elimination of the criticality safety concerns in each of the process facilities and tie lines, shut down the CAAS in each facility, and to be able to air gap utilities and associated support systems to reduce S&M costs. A secondary goal is to be able to avoid the need for additional uranium treatment to meet Waste Acceptance Criteria for an on-site CERCLA Cell (if approved) during deactivation and decommissioning activities. Exhibit C-1, PDGP Shutdown Cell Status to Support Deposit & Hold-up Removal, is available for reference.

The PCTC Systems that are available as GFSI and may be used by the Contractor to conduct in-situ chemical treatment (ICT) activities of the PGDP process equipment. The Contractor shall be responsible for completion of all design, testing, or operational activities required to ensure effective operation of the PCTC systems for deposit removal from the cells, associated UF_6 piping, valves, expansion joints, bellows, etc. The Contractor shall collect the resulting/ regenerated UF_6 material, handling it as product (in large UF_6 cylinder) for transfer to the DUF_6 Contractor. If additional PCTC systems are deemed necessary to support the stabilization approach, the Contractor may procure more PCTCs.

The Contractor shall also design, procure, install and test any required PGDP facility modifications necessary to support the deposit/hold-up removal approach.

The Contractor shall develop any additional protocols (NDA, visual inspections, sampling and testing, statistical analysis, etc.) that will be used to demonstrate that the post treatment condition of the equipment and piping will meet completion thresholds for deposit/hold-up materials removal activities. These protocols need to include identification of specific data that will be collected, how it will be collected and how it will be used to assess post treatment conditions. The data collected will also be utilized in the future to support development of final waste acceptance criteria for the process equipment and piping and identify/evaluate removal of unneeded CAAS Clusters once the deposit/holdup removal activities are completed. The evaluation should address serviceability through completion of future deactivation and decommissioning activities.

The Contractor shall dispose of any fissile equipment and not return the item to the facility after the fissile material has been removed, unless agreed to by DOE. Relocation to another on-site facility for storage is not authorized without DOE approval.

The Contractor shall remove the deposit and hold-up materials from all equipment in the process facilities. This includes but is not limited to:

a. All cell piping/lines, converters, compressors, valves, instrument lines, expansion joints, etc. (This includes cells which are partially connected or have not operated)
b. All tie line, by-pass, and auxiliary lines/piping including expansion joints, valves, manifolds, etc.

c. Loose and/or spare compressors, and other UF_6 process equipment such as valves, expansion joints, and piping, that were either cut out of operating cells or are spare parts (This equipment is stored in various locations within the process buildings.)
d. Auxiliary equipment such as UF6 condensers and accumulators, cold traps, seal exhaust/wet air stations, Normetex pumps, booster pumps/stations, withdrawal stations, jet stations, autoclaves, sampling stations, chemical traps, etc.,
e. UF_6 instrumentation/monitoring equipment/systems such as line recorders, assay machines, seal exhaust, datum, etc., and
f. Technetium traps.

The Contractor shall complete deposit/holdup removal of the uranium processing equipment in the process facilities. This includes but is not limited to:

a. Removal of all deposits/hold-up to below levels needed to achieve incredibility of criticality and removal/shutdown of CAAS in each facility and to meet the WAC for On-site CERCLA Waste Disposal Facility;
b. If ICT is utilized, transfer of any large UF_6 cylinders generated as part of deposit/hold-up removal to the DUF_6 Contractor when the cylinder is full;
c. Submit all documentation necessary to support criticality incredibility, including authorization basis changes to downgrade the uranium processing facilities from Category 2 Nuclear Facilities to Radiological facilities, and gain DOE approval;
d. Deactivate/shutdown the CAAS in the uranium production facilities
e. Isolate and air gap all utilities not required to support the facility post uranium removal and once CI is achieved (high pressure fire water will remain in service therefore the facility will require heating in the winter)

Completion Thresholds for uranium deposit/hold-up removal are as follows:

- Removal of uranium to allow the shutdown of the CAAS for the given areas treated; AND
- Removal of uranium to allow the process equipment and piping to be placed in an On-site Disposal Facility (e.g. On-Site CERCLA Cell) without further processing. Assume a target waste acceptance criteria for total elemental uranium of 100,000 mg/kg.
  AND
- Removal of uranium and re-categorization of the processing facilities from Category 2 Nuclear Facilities to Radiological Facilities.

Table C.2. EM.PA.0040.A008.48.DR.02.07-1 DEPOSIT/HOLD-UP REMOVAL FOR C-310/C-310A	
Milestone	**Date**
A THFA shall be developed and approved for C-310/C-310A	Consistent with Exercise of option

Complete deposit removal to be less than CI limits for each process equipment component (assuming 5% of all process equipment components will be above the CI limits) and also meet target waste acceptance criteria for total elemental uranium of 100,000 mg/kg	Consistent with Exercise of option

EM.PA.0040.A008.48.DR.01.08 NDA Characterization of C-315 Facility

The Contractor shall perform characterization of process equipment in C-315 in support of DOE's mission including but not limited to meeting the WAC for an OSWDF. All characterization data will be electronically managed in a manner that facilitates easy retrieval, is traceable to the building and process equipment, and is capable of passing an independent validation by a 3rd party.

In accordance with the QSNDA program, the Contractor shall characterize all process equipment within the C-315 facility including but not limited to;

a. All piping/lines, centrifugal compressors, valves, instrument lines, expansion joints, tie lines, etc.
b. Loose and/or spare compressors, and other UF_6 process equipment such as valves, expansion joints, and piping that were either cut out of operating equipment or are spare parts,
c. Auxiliary equipment such as UF_6 condensers and accumulators, hortonsphere, seal exhaust stations, Normetex pumps, withdrawal stations, jet stations, sampling stations, chemical traps, etc.,

Table C.2. EM.PA.0040.A008.48.DR.01.08-1 CHARACTERIZATION OF C-315	
Milestone	**Date**
Complete development of NDA capability for characterizing C-315 in a manner that supports meeting the WAC for an OSWDF. DOE Performance Demonstration Program (PDP) test (or DOE approved alternative approach) must be passed.	Consistent with Exercise of Option
Complete all NDA measurements for characterizing the C-315 facility in a manner that supports meeting the WAC for an OSWDF. Measurement data must be presented in an electronic form that is capable of passing an independent validation by a 3rd party.	Consistent with Exercise of Option

EM.PA.0040.A008.48.DR.02.08 Deposit Removal and Deactivation of C-315/C-620

The Contractor shall complete the removal and disposition of any remaining lube oils, Freon, or other hazardous materials (e.g., mercury switches, cesium sources, etc.) and complete the shutdown and isolation of the facilities, supporting long-term S&M in the C-315/C-620 facility. The Contractor shall complete the performance of the necessary

facility stabilization and deactivation activities including, but not limited to, the following:

a. Evaluate and determine the need for the continued safety requirements for monitoring and/or maintaining systems; and
b. Perform deactivation and/or verification activities that support facilities stabilization, per DOE O 420.1C, Facility Safety and contractor safety basis documentation; and
c. Remove fire loading from each facility; and
d. Ensure a Transitional Hazard Facility Analysis (THFA) is developed and approved.

In support of the hazard reduction objectives of stabilization, the Contractor shall perform deposit/holdup removal for all process equipment, valves, and process piping (both installed and removed/loose) to ensure the facility is in a safe configuration with minimal S&M activities required until decommissioning begins. The criteria for successful deposit/holdup removal is to disposition nuclear materials in uranium processing facilities in a manner that supports downgrading the facility from a Nuclear Category 3 facility to a Radiological facility, and that when the facility is eventually decommissioned, the resulting waste is compliant with applicable waste acceptance criteria for an on-site CERCLA Cell (e.g., the OSWDF).

The overall goal is to remove uranium deposits to a level that results in CI for the facility throughout the process of dispositioning the process equipment (CI for S&M, debris piles and onsite disposal in a CERCLA Cell, if approved). The uranium removal in the uranium processing facilities and associated tie lines allows for the elimination of the criticality safety concerns in each of the process facilities and tie lines, shut down the CAAS in each facility, and to be able to air gap utilities and associated support systems to reduce S&M costs. A secondary goal is to be able to avoid the need for additional uranium treatment to meet Waste Acceptance Criteria for an on-site CERCLA Cell (if approved) during deactivation and decommissioning activities. Exhibit C-1, PDGP Shutdown Cell Status to Support Deposit & Hold-up Removal, is available for reference.

The PCTC Systems that are available as GFSI and may be used by the Contractor to conduct in-situ chemical treatment (ICT) activities of the PGDP process equipment. The Contractor shall be responsible for completion of all design, testing, or operational activities required to ensure effective operation of the PCTC systems for deposit removal from the cells, associated UF_6 piping, valves, expansion joints, bellows, etc. The Contractor shall collect the resulting/ regenerated UF_6 material, handling it as product (in large UF_6 cylinder) for transfer to the DUF_6 Contractor. If additional PCTC systems are deemed necessary to support the stabilization approach, the Contractor may procure more PCTCs.

The Contractor shall also design, procure, install and test any required PGDP facility modifications necessary to support the deposit/hold-up removal approach.

The Contractor shall develop any additional protocols (NDA, visual inspections, sampling and testing, statistical analysis, etc.) that will be used to demonstrate that the post treatment condition of the equipment and piping will meet completion thresholds for deposit/hold-up materials removal activities. These protocols need to include identification of specific data that will be collected, how it will be collected and how it will be used to assess post treatment conditions. The data collected will also be used in the future to support development of final waste acceptance criteria for the process equipment and piping and identify/evaluate re-categorizing the facility from Nuclear Category 3 to Radiological once the deposit/holdup removal activities are completed. The evaluation should address serviceability through completion of future deactivation and decommissioning activities.

The Contractor shall dispose of any uranium equipment and not return the item to the facility after the uranium material has been removed, unless agreed to by DOE. Relocation to another on-site facility for storage is not authorized without DOE approval.

The Contractor shall remove the deposit and hold-up materials from all equipment in the process facilities. This includes but is not limited to:

a. All piping/lines, centrifugal compressors, valves, instrument lines, expansion joints, tie lines, etc.
b. Loose and/or spare compressors, and other UF_6 process equipment such as valves, expansion joints, and piping that were either cut out of operating equipment or are spare parts,
c. Auxiliary equipment such as UF_6 condensers and accumulators, hortonsphere, seal exhaust stations, Normetex pumps, withdrawal stations, jet stations, sampling stations, chemical traps, etc.,

For each process facility, the Contractor shall complete deposit/holdup removal of the uranium processing equipment in the process facilities. This includes but is not limited to:

a. Removal of all deposits/hold-up to below levels needed to meet the WAC for On-site CERCLA Waste Disposal Facility;
b. Removal of deposit/hold-up to levels that support re-categorizing the facility from Nuclear Category 3 to Radiological
c. If ICT is utilized, transfer of any large UF_6 cylinders generated as part of deposit/hold-up removal to the DUF_6 Contractor when the cylinder is full;
d. Isolate and air gap all utilities not required to support the facility post uranium removal

Completion Thresholds for uranium deposit/hold-up removal are as follows:

- Removal of uranium to allow the process equipment and piping to be placed in an On-site Disposal Facility (e.g. On-Site CERCLA Cell) without further processing.

Assume a target waste acceptance criteria for total elemental uranium of 100,000 mg/kg.
AND

- Removal of uranium and re-categorization of the facility from Category 3 Nuclear Facility to a Radiological Facility.

Table C.2.EM.PA.0040.A008.48.DR.02.08-1 DEPOSIT REMOVAL AND DEACTIVATION OF C-315/C-620	
Milestone	**Date**
A THFA shall be developed and approved for C-315/C-620	Consistent with Exercise of option
Complete deposit removal to be less than CI limits for each process equipment component and also meet target waste acceptance criteria for total elemental uranium of 100,000 mg/kg	Consistent with Exercise of option

EM.PA.0040.A008.48.DR.07 Deactivation of Fire Systems for the Process Facilities

The Contractor shall propose the sequence of operations and define the appropriate lower level WBS elements to allow the Government to understand what work is being proposed and what the proposed cost is for each of the process facilities (C-331, C-333/C-333A, C-335, C-337/C-337A, C-310, C-315/C-620 and C-360) *(NOTE: C-337A, C-333A, and C-310A are considered part of C-337, C-333, and C-310 respectively).*

Consistent with the Transitional Hazard Facility Analysis (THFA), all fire systems in process facilities shall be deactivated or configured in a manner that eliminates the need for freeze protection and reduces S&M costs. Modification of facilities to eliminate the need to provide fire suppression is an acceptable approach. This requires the Contractor to submit all supporting documentation and authorization basis changes for deactivation of the fire suppression systems in these facilities.

Table C.2.EM.PA.0040.A008.48.DR.07-1 Deactivation of Fire Systems for Process Facilities Milestones/Schedule	
Milestone	**Date**
Deactivation of Fire Systems for Process Facilities with independent verification	Consistent with exercise of the technical option

C.4 IDIQ

Contract requirements which are not included above may be included in the IDIQ CLIN. Such work, tasks, and activities may include, but are not limited to, the following general areas of the PWS:

- Facilities maintenance, alterations, and recapitalization;
- Facility deactivation, decontamination or demolition;

- Safeguards and security support;
- Engineering support;
- Facility construction; and
- Remedial investigations and regulatory documents.

The scope of work and period of performance will be specified in each task order.

EM.PA.0040.A009.04.DR.01 C-400 Demolition

Should this PWS element be required; the Contracting Office will issue a Task Order Request.

The Contractor shall complete the demolition of the C-400 Facility. This includes all above ground and below ground structures associated with the C-400 Facility and support systems in direct contact with the C-400 Facility such as: HVAC systems, material and equipment supply lines to and from the C-400 Facility, and other structures and equipment to ensure the complete removal of C-400 from other surrounding facilities. Transite panels will be manually removed. The slab will be left in place; however, the sumps, basement areas and low areas are required to be filled with flowable fill. Drain lines and piping will be plugged before filling with flowable fill. Slab will be decontaminated and/or sealed. All waste must be disposition onsite or offsite.

Table C.4.EM.PA.0040.A009.04.DR.01-1
C-400 BUILDING DEMOLITION
Milestones/Schedule

Milestone	Date
Complete filling of sumps, basements and low areas with flowable fill	Consistent with Exercise of Task Order
Complete removal of both interior and exterior transite panels	Consistent with Exercise of Task Order
Complete C-400 Demolition	Consistent with Exercise of Task Order
Complete disposition of all waste	Consistent with Exercise of Task Order

EM.PA.0040.A009.04.DR.02 On-Site Waste Disposal Facility (OSWDF) Capital Asset Project

Should this PWS element be required; the Contracting Office will issue a Task Order Request.

The DOE estimates a future need for disposal of approximately 3.7 million cubic yards of radioactively contaminated, non-radioactively contaminated, and hazardous material (soil and building debris), including sanitary waste through the end of deactivation and decommissioning of the PGDP. The majority of this waste will be disposed of outside of the period of performance of this Contract as it is currently associated with deactivation and decommissioning of the PGDP. Approximately 2,000 yd^3 of these volumes are classified waste.

Table C.4.EM.PA.0040.A009.04.DR.02-1
Estimated Disposal Volume, by Waste Form, for Waste Disposition Options Project through 2040 in 1000YD^3

Waste form	LLW	LLW/ RCRA	LLW/ RCRA/ TSCA	LLW/ TSCA	RCRA	TSCA	Sanitary	Total
Asbestos	4	1	25	0	0	4	1	35
Concrete	377	1	0	0	0	0	393	771
General Construction Debris	425	3	0	1	0	3	235	667
Other Dry Solids	46	1	5	1	1	1	4	59
Scrap Metal	408	1	0	0	0	4	69	482
Soil	1,286	29	1	0	16	2	376	1,710
Total	**2,546**	**36**	**31**	**2**	**17**	**14**	**1,078**	**3,724**

LLW = low-level waste
RCRA = Resource Conservation and Recovery Act of 1976
TSCA = Toxic Substances Control Act of 1976, Public Law 94-469, October 11, 1976, 15 USC Section 2622

Source: DOE/LX/07-0035&D1, Scoping Document for CERCLA Waste Disposal Alternatives Evaluation Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, April 2008

EM.PA.0040.A009.04.DR.02.01 OSWDF Cell 1 and Infrastructure

The Contractor shall assume responsibility for all ongoing activities for OSWDF approvals and design. This project is a Capital Asset Project and all Critical Decision processes shall be completed by the Contractor.

Consistent with the FFA schedules, the Contractor shall prepare regulatory documents including, but not limited to, CERCLA documentation required per the regulatory agreement(s). The Contractor shall develop the necessary CERCLA documentation, and develop the necessary subsequent work plans and supplemental documents under the agreed-upon CERCLA process.

In addition, the Contractor shall be responsible for developing and coordinating all regulatory documentation necessary to support other activities associated with the onsite waste disposal facility (e.g., sampling, monitoring, waste treatment, disposal, and storage) as defined in the Task Order. The Task Order will, at a minimum, include scope to revise the existing RI/FS to include updated information, which includes but is not limited to, Paducah-specific waste profiles for the process building and equipment, additional data obtained from the burial ground efforts, design features, and cost estimates for the various alternatives. This document will be issued as a D1 for regulatory reviews per the FFA. The task order may include other tasks associated with completion of all CERCLA documentations necessary for decision making and for design and operations of the OSWDF (e.g., Proposed Plan, Record of Decision, Remedial Design Work Plan/Remedial Design Support, Remedial Design

Support Investigation, Remedial Design Report, Remedial Action Work Plan, O&M Plan, etc.). The Task Order may also include the development of Critical Decision Documents, DOE 435.1 required LFRG documents (e.g. performance assessment, annual reviews and composite analysis), and the necessary designs (consistent with the planned lifecycle waste projections) for OSWDF Cell 1.

Table C.3.EM.PA.0040.A009.04.DR.02.01-1 OSWDF Cell 1 and Infrastructure Milestones/Schedule	
Milestone	**Date**
Complete D1 RI/FS	Consistent with Exercise of Task Order
Complete remaining Task Order CERCLA Documentations	Consistent with Exercise of Task Order

EM.PA.0040.A009.04.DR.03 ^{99}Tc Removal

Should this PWS element be required; the Contracting Office will issue a Task Order Request.

Technetium-99 (^{99}Tc) is a high-yield fission product. Some ^{99}Tc accompanies uranium during reprocessing of spent reactor fuel and forms a gas during fluorination. Hence, recycled uranium is contaminated with ^{99}Tc. In the cascade, the relatively light ^{99}Tc moves toward the enrichment end. One of the concerns for the Paducah Deactivation and Decommissioning phase is the uncertainty of the actual levels of ^{99}Tc which will be encountered in the disposition of the process equipment. Considerable amounts of UF_6 were produced at Paducah from reactor return uranium. Estimates have been made that approximately 550 kilograms of ^{99}Tc were fed into the PGDP cascade as a contaminant in the UF_6 between 1953 and 1977 (Reference the Smith Report and the PGDP Mass Balance Report).

The typical trace levels of ^{99}Tc compounds in the operating GDP's is below the minimum detectable limit for any of the process gas analyzers. Consequently, it cannot be definitively stated which technetium compounds are present in the operational cascades. The only gas phase technetium compound that has been reported to have been detected in the cascade gas stream is the pertechnetyl fluoride, TcO_3F, which was detected in the purge cascade during treatments to unplug the barrier. The technetium compounds that should be considered as potential cascade vapor phase compounds would consist of TcO_3F, $HTcO_4$, $TcOF_4$, and TcF_6. The oxides Tc_2O_7, and TcO_2, could also possibly exist as condensed species, along with the liquid or solid pertechnetic acid, $HTcO_4$, and the oxyfluoride TcO_2F_3. (Reference the Simmons Report)

Technetium hexafluoride (TcF_6), technetium oxide tetrafluoride ($TcOF_4$), technetium trioxide fluoride (TcO_3F), and technetium dioxide tri-fluoride (TcO_2F_3) have sufficient volatility to be in the cascade gas streams of an operating gaseous diffusion plant, but TcO_3F is the only compound of technetium to be identified. There are also non-volatile and less volatile compounds such as TcO_2 and $HTcO_4$, respectively. The formation of

TcO_2 on steel surfaces is one effect which can retard the release of technetium. The volatile compound TcO_3F has been prepared from the non-volatile solid TcO_2 by use of fluorine at 300°F (degrees Fahrenheit). (Reference the Simmons Report)

It has been demonstrated at the three former gaseous diffusion plants that technetium can be removed from the process surfaces by heating the metals to sufficient temperatures (i.e., approximately 250 degrees Fahrenheit). The more volatile ^{99}Tc compounds have been removed to a certain extent from process equipment by heating the cell with the cell off stream and the compressors running using air to volatize the technetium into the gas phase and trapping it using accepted methods standard to the diffusion process. However, due to the limitations of heating the process equipment while it was operating the heat was limited to approximately 250 degrees Fahrenheit and at this temperature complete removal of ^{99}Tc was not accomplished. The heated air is circulated through the converters by the compressors. The volatilized ^{99}Tc is then captured using cold traps, magnesium fluoride, or activated alumina. This technique has been done with moderate success at the GDPs to unplug cells and to prepare cells for maintenance thus reducing worker exposure to ^{99}Tc. This method has not been used with a goal of meeting the sites disposal Waste Acceptance Criteria (WAC). The final WAC's for Paducah and Portsmouth Plants have not officially been determined, however, the Oak Ridge Environmental Management Waste Management Facility (EMWMF) ^{99}Tc WAC is 172 pCi/g.

Should it be chosen for deposit removal, the use of ICT will not completely remove ^{99}Tc from the equipment. Therefore additional activities will be necessary to remove the ^{99}Tc in order to meet waste disposal limits. The ^{99}Tc limits are more restrictive than uranium due to the difference in mobility of the compounds of the two elements. The ultimate goal is to remove the technetium to sufficient levels that the remaining radioactive contamination is below the free release levels and/or meet the Paducah WAC once it is established. Graph and spreadsheets illustrate known ^{99}Tc concentrations by facility and unit and is provided in Exhibit C-3.

The Contractor shall characterize equipment, develop, select and implement an approach to remove ^{99}Tc from the converters in the process facilities (C-310, C-331, C-333, C-335, and C-337), including converters no longer connected to the process system and those stored on outside storage pads. The Contractor shall ensure the implemented technique provides the most cost effective approach for the lifecycle.

Table C.2. EM.PA.0040.A009.04.DR.03-1
^{99}Tc Removal

Milestone	Date
Complete ^{99}Tc Removal in the Four Process Facilities	Consistent with exercise of Task Order
Complete ^{99}Tc Removal in the Loose Converters Stored Outside the Process Facilities	Consistent with exercise of Task Order
Complete ^{99}Tc Removal in the C-310 Process Facility	Consistent with exercise of Task Order

EM.PA.0040.A009.04.DR.04 Construction of McCaw Road Bridge

Should this PWS element be required; the Contracting Office will issue a Task Order Request.

A two-lane, three-sided (bottomless) box culvert (rectangular opening) was constructed circa 1950 allowing McCaw Road to cross Little Bayou Creek, which is located in Paducah, Kentucky. This bridge was removed in early 2012 after an inspection and subsequent report recommended that it be replaced due to the state of disrepair and conclusion that the bridge was structurally deficient. After the bridge was removed, the Little Bayou Creek bank was fortified with riprap in the footprint of the removed bridge. The new bridge shall be constructed in the footprint of the previous bridge, reopening McCaw Road, and providing local emergency response vehicles/equipment with a shorter route to the Paducah Site thereby decreasing the emergency response time. The new bridge size and configuration shall be of similar size as the previous bridge, and the load rating capacity shall be sufficient to handle the fire and emergency response vehicles/equipment.

The McCaw Road bridge is located on the Paducah Site property west of the county property line along McCaw Road. Neither the county nor the state have jurisdiction over this bridge. The U.S. Army Corps of Engineers (USACE) has jurisdiction over the Little Bayou Creek (waterway) and the permitting for this bridge. There are contaminated soils along the streambed. Radiological controls/procedures concerning working with, temporary stockpiling, reuse, and/or disposal of the contaminated soils will need to be identified and followed by the bridge contractor. The current Contractor is designing the replacement bridge.

The Contractor shall review the existing McCaw Road Bridge design, construct the McCaw Road bridge spanning Little Bayou Creek, reestablish McCaw Road, erect guardrails and signage at the crossing, and place erosion/scour riprap. The Contractor shall ensure that all of the appropriate regulatory documents are in place and any outstanding regulatory issues have been addressed for the construction of the bridge. The Contractor shall issue as-built drawings of the bridge, road, and streambed within the project boundaries. The Contractor shall provide an as-constructed bridge rating.

Table C.2. EM.PA.0040.A009.04.DR.04-1
Construction of McCaw Road Bridge

Milestone	Date
Complete Construction of McCaw Road Bridge	Consistent with exercise of Task Order

EM.PA.0040.A009.04.DR.05 Small Cylinder Disposition

Should this PWS element be required; the Contracting Office will issue a Task Order Request.

The Contractor shall disposition all small diameter (5 inch nominal diameter or less) UF_6 cylinders at PGDP that are no longer needed to support deactivation activities. The amount remaining at transition is estimated to be 1,500. This includes disposal of all secondary wastes. The Contractor is not required to recover the UF_6 in these cylinders.

Table C.2. EM.PA.0040.A009.04.DR.05-1
Small Cylinder Disposition

Milestone	Date
Complete Disposition of Small Cylinders	Consistent with exercise of Task Order

Exhibit No. C-1, PDGP Shutdown Cell Status to Support Deposit & Hold-up Removal

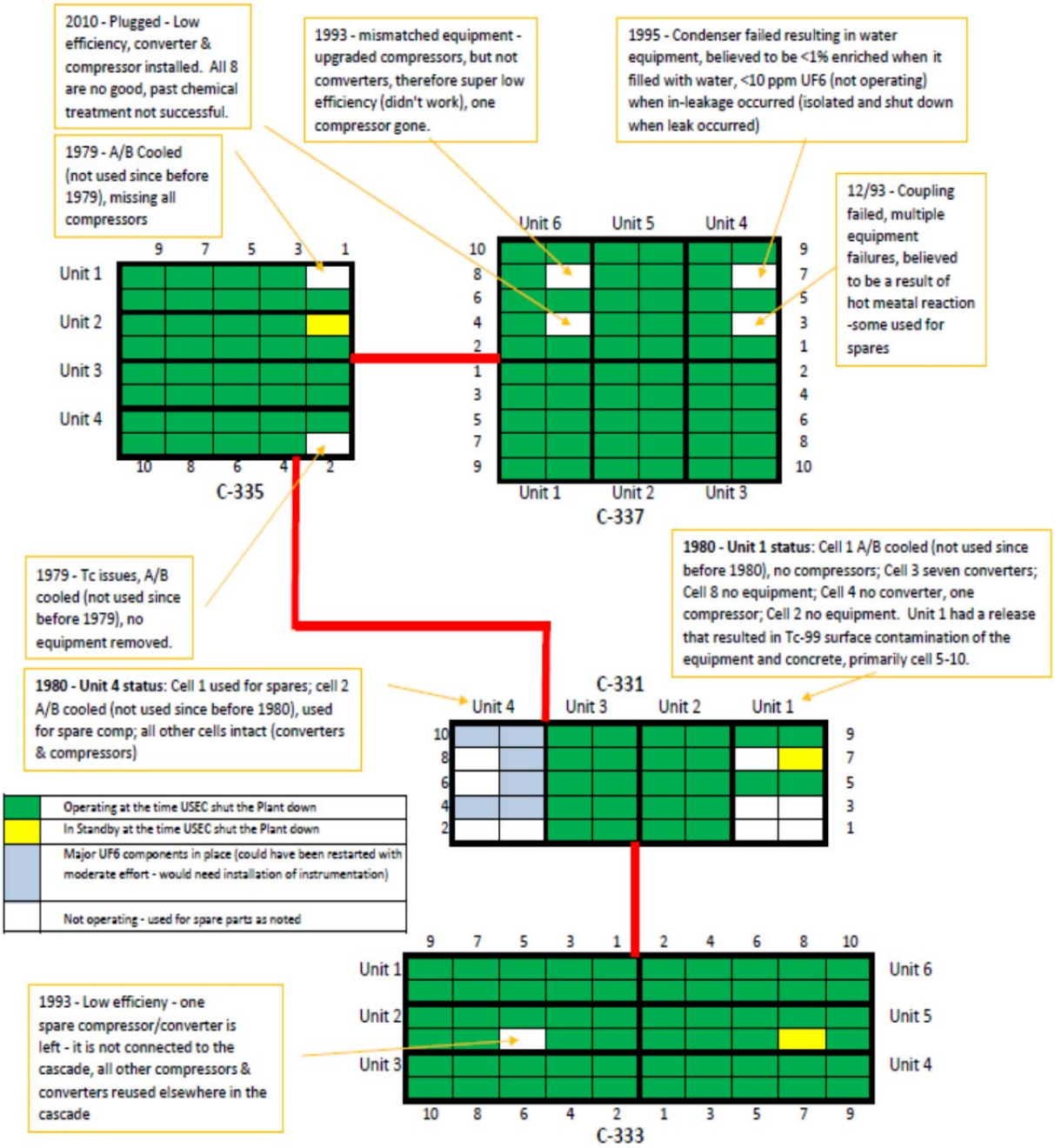


Exhibit No. C-2, C-400 Work Zone Map

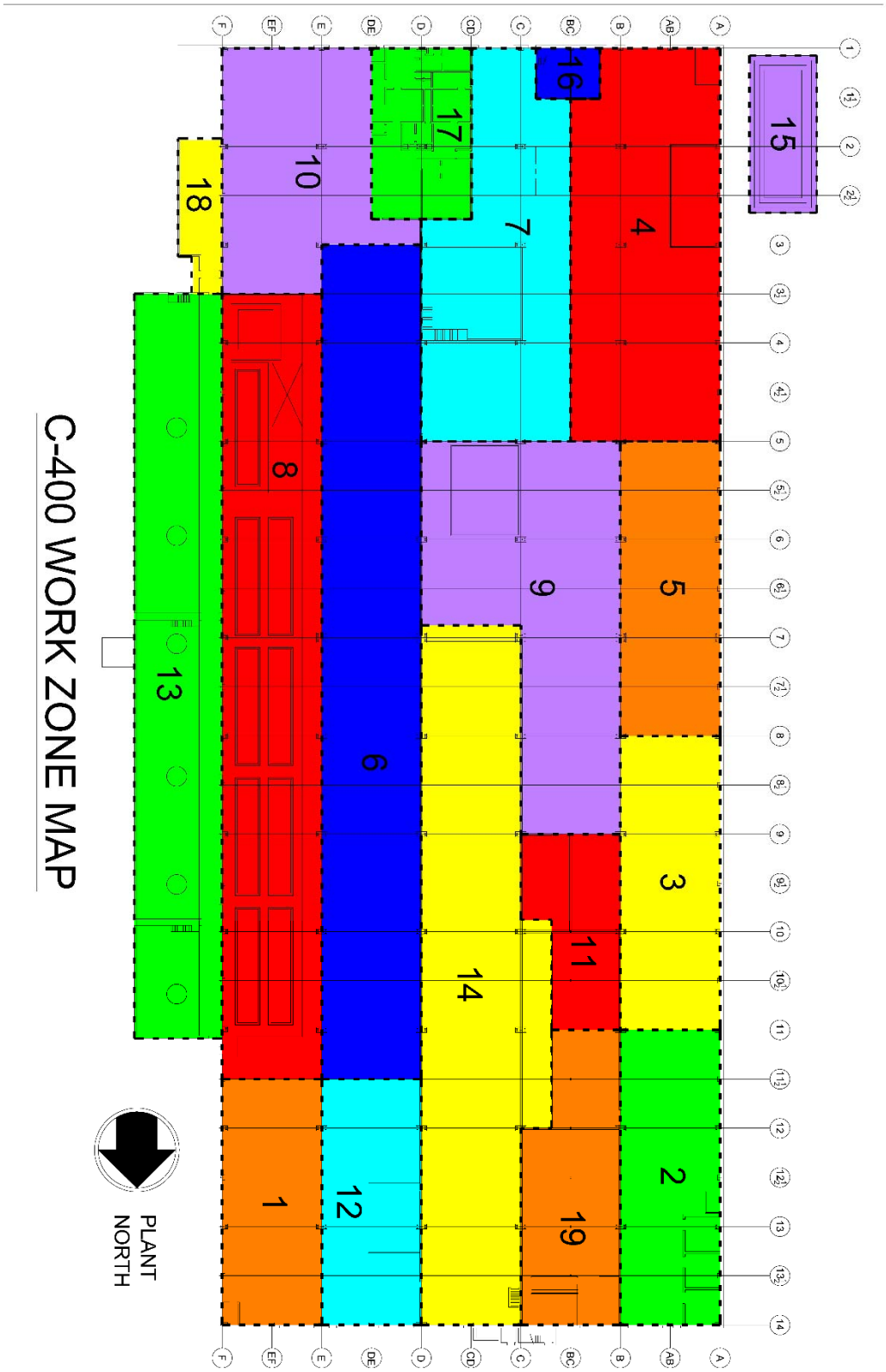


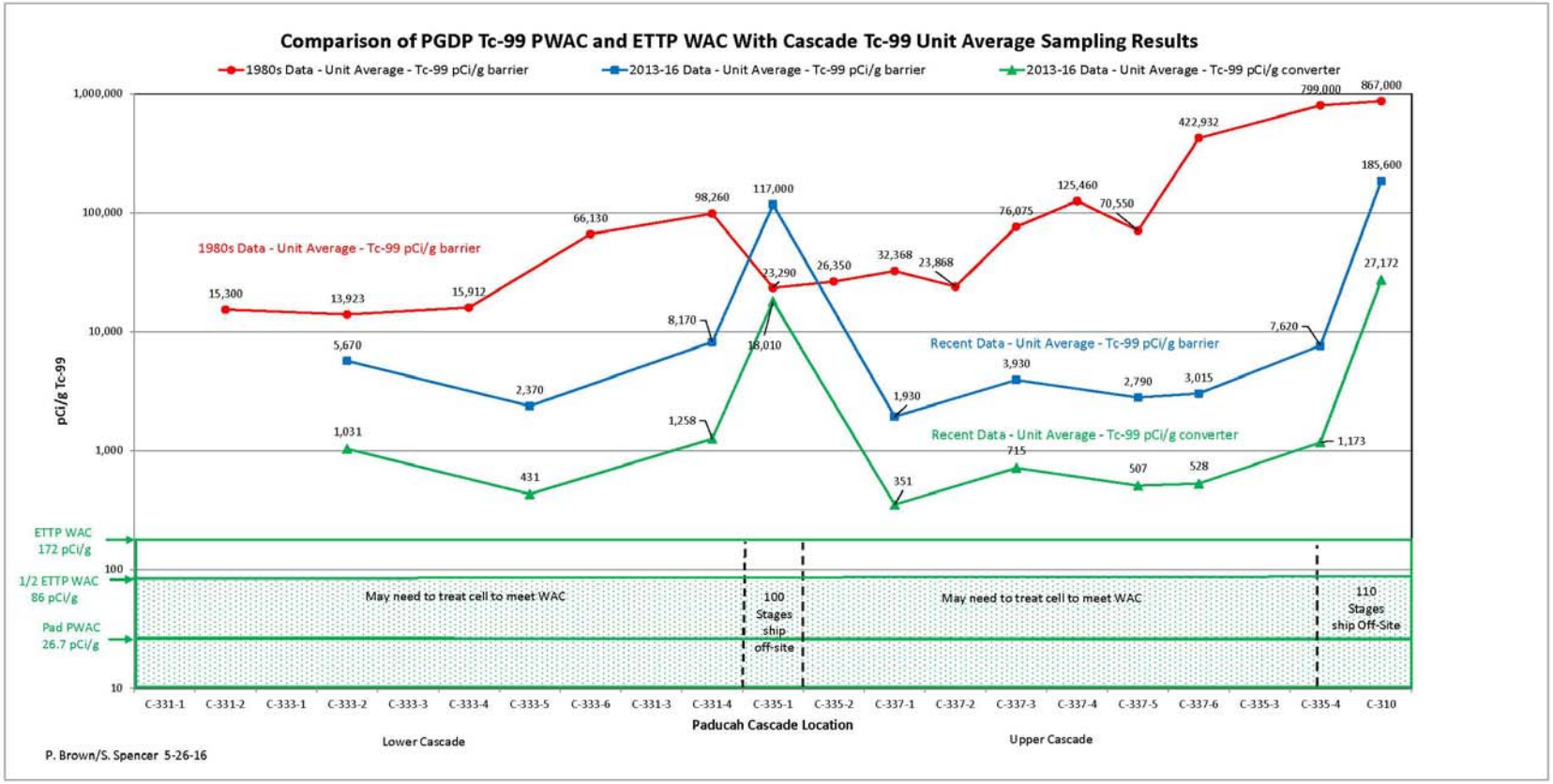
Exhibit No. C-3, Technetium Data

1980 Technetium Data

Location	Tc-99 (ppb)	Tc-99 (pCi/g)	Calculated Tc-99 (pCi/g)	Unit Avg. Tc-99 (pCi/g)
C-331-2.2	900	15,284	15,300	15,300
C-333-2.3	819	13,908	13,923	13,923
C-333-4.3.2	872		14,824	15,912
C-333-4.7.7	1000		17,000	
C-333-6.4.1	3,890		66,130	66,130
C-331-4.9	5780		98,260	98,260
C-335-1.1	1,370	23,286	23,290	23,290
C-335-2.1	1,500		25,500	26,350
C-335-2.8	1,600		27,200	
C-337-1.5	1,480	4,398	25,160	32,368
C-337-1.7	977		16,609	
C-337-1.9	4,900		83,300	
C-337-1.10.3	259		4,403	
C-337-2.3	2,400		40,800	23,868
C-337-2.5.1	1,350	22,025	22,950	
C-337-2.7.2	1,200	20,378	20,400	
C-337-2.7	1,460	24,794	24,820	
C-337-2.2	610	10,359	10,370	
C-337-3.8	2,200		37,400	76,075
C-337-3.6	6,750		114,750	
C-337-4.10	15,100	256,427	256,700	125,460
C-337-4.6.1	3,700		62,900	
C-337-4.4	3,720		63,240	
C-337-4.2	7,000		119,000	
C-337-5.1	4,150		70,550	70,550
C-337-6.7	19,270	436,437	327,590	422,932
C-337-6.10	18,340		311,780	
C-337-6.8.8	25,700		436,900	
C-337-6.8	26,660	452,740	453,220	
C-337-6.6	25,200		428,400	
C-337-6.2	34,100		579,700	
C-335-4.6	47,000		799,000	799,000
C-310 average	51,000		867,000	867,000

2013/2014 Technetium Data

Tc-99 2013/2014 Barrier Sample Results From C-310, C-331, C-335, and C-337					
Customer Sample ID	Paducah LIMS #	Location	Concentration Tc-99 (pCi/g)	Unit Avg - Tc-99 pCi/g Barrier	Unit Avg - Tc-99 pCi/g Converter
C-00758	C14181010001	C-331 Unit 4 Cell 3	6,160		
13041501	C13254002001	C-331 Unit 4 Cell 6	7,600		
C-00662	C14147005001	C-331 Unit 4 Cell 6	1,520		
C-00575	C14181011001	C-331 Unit 4 Cell 9	17,400	8,170	1,258
C-713	C14147004001	C-335 Unit 1 Cell 6	117,000	117,000	18,010
C-15207	C14147003001	C-337 Unit 1 Cell 6	1,930	1,930	351
C-15088	C14147007001	C-337 Unit 3 Cell 1	3,930	3,930	715
C-15485	C14147006001	C-337 Unit 5 Cell 3	2,790	2,790	507
13020401	C13035028001	C-337 Unit 6 Cell 3 Sample 1	2,140		
13020402	C13035030001	C-337 Unit 6 Cell 3 Sample 2	3,890	3,015	548
C-20096	C14147001001	C-335 Unit 4 Cell 1	10,200		
C-759	C14147002001	C-335 Unit 4 Cell 7	5,040	7,620	1,173
SP-1307	C12311014001	C-310 Cell 7 Sample 1	55,400		
SP-1308	C12311014002	C-310 Cell 7 Sample 2	191,000		
SP-1309	C12311014003	C-310 Cell 7 Sample 3	175,000		
SP-1310	C12311014004	C-310 Cell 7 Sample 4	321,000	185,600	27,172


Comparison of PGDP Tc-99 PWAC and ETTP WAC With Cascade Tc-99 Unit Average Sampling Results
1980s Data - Unit Average - Tc-99 pCi/g barrier
2013-16 Data - Unit Average - Tc-99 pCi/g barrier
2013-16 Data - Unit Average - Tc-99 pCi/g converter
pCi/g Tc-99
1,000,000
100,000
10,000
1,000
100
10
1980s Data - Unit Average - Tc-99 pCi/g barrier
Recent Data - Unit Average - Tc-99 pCi/g barrier
Recent Data - Unit Average - Tc-99 pCi/g converter
15,300
13,923
15,912
66,130
98,260
23,290
26,350
32,368
23,868
76,075
125,460
70,550
422,932
799,000
867,000
5,670
2,370
8,170
117,000
1,930
3,930
2,790
3,015
7,620
185,600
1,031
431
1,258
18,010
351
715
507
528
1,173
27,172
ETTP WAC
172 pCi/g
1/2 ETTP WAC
86 pCi/g
Pad PWAC
26.7 pCi/g
May need to treat cell to meet WAC
100
Stages
ship
off-site
May need to treat cell to meet WAC
110
Stages
ship Off-Site
C-331-1
C-331-2
C-333-1
C-333-2
C-333-3
C-333-4
C-333-5
C-333-6
C-331-3
C-331-4
C-335-1
C-335-2
C-337-1
C-337-2
C-337-3
C-337-4
C-337-5
C-337-6
C-335-3
C-335-4
C-310
Paducah Cascade Location
Lower Cascade
Upper Cascade
P. Brown/S. Spencer 5-26-16