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Department of Energy

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JAN 1 0 2018

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Ms. Julie Corkran
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

Dear Mr. Begley and Ms. Corkran:

TRANSMITTAL OF THE REMOVAL NOTIFICATION FOR DEMOLITION OF THE C-400 CLEANING BUILDING AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY (DOE/LX/07-2420&D1)

Please find enclosed the Removal Notification for Demolition of the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX-07-2420&D1. This removal notification was developed to be consistent with the Comprehensive Environmental Response, Compensation, and Liability Act; Federal Facility Agreement for the Paducah Gaseous Diffusion Plant (FFA); and agreements included in the Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, dated August 8, 2017. In accordance with Section X.B of the FFA, the Kentucky Department for Environmental Protection and the U.S. Environmental Protection Agency have 30 days to respond with comments or approval.

If you have any questions or require additional information, please contact April Ladd at (270) 441-6843.

Sincerely,

Tracey Duncan

Federal Facility Agreement Manager Portsmouth/Paducah Project Office

Enclosures:

- 1. Removal Notification for Demolition of C-400 Cleaning Building, DOE/LX/07-2420&D1
- 2. Certification Page

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Removal Notification for Demolition of the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky



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Removal Notification for Demolition of the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

Date Issued—January 2018

U.S. DEPARTMENT OF ENERGY Office of Environmental Management

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

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ACRONYMS

AM action memorandum AR Administrative Record

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CFR Code of Federal Regulations
DOE U.S. Department of Energy

EE/CA engineering evaluation/cost analysis EPA U.S. Environmental Protection Agency

FFA Federal Facility Agreement

FY fiscal year

MOA memorandum of agreement NTCRA non-time-critical removal action

OU operable unit

PGDP Paducah Gaseous Diffusion Plant

RCRA Resource Conservation and Recovery Act

RN removal notification

SWMU solid waste management unit

1. INTRODUCTION

In accordance with Section X.B of the *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant* (FFA) (EPA 1998), the U.S. Department of Energy (DOE) hereby is providing a written removal notification (RN) for demolition of the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant (PGDP). The bases for undertaking this non-time-critical removal action (NTCRA) are the following: (1) The DOE and U.S. Environmental Protection Agency (EPA) Policy on Decommissioning Department of Energy Facilities (Policy) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (DOE and EPA 1995), which states decommissioning activities at DOE facilities posing a substantial threat of release shall be conducted as an NTCRA unless the circumstances make a NTCRA inappropriate; (2) evaluation of the factors set forth in 40 *CFR* § 300.415(b)(2), which demonstrate that a removal action is appropriate; and (3) per 40 *CFR* § 300.415(b)(4), a planning period of at least six months is required before on-site removal activities will be initiated. The format of this RN is designed to meet the requirements for DOE RN set forth in Section X.B of the FFA.

Removal action alternatives will be evaluated in an engineering evaluation/cost analysis (EE/CA) for demolition of the C-400 Cleaning Building. Sufficient data exist and will be used in the EE/CA to evaluate removal action alternatives. Process knowledge and information pertaining to the nature and extent of contamination, worker health and safety, and the potential threats of releases from the C-400 Cleaning Building are available currently.

The EE/CA will be made available to the public for review and comment once approved by EPA and Kentucky Department for Environmental Protection. Following consideration of comments from the public, the final Action Memorandum (AM) identifying and documenting the selected removal action alternative will be prepared and submitted for regulatory review and approval. The AM will include a summary of comments received during the public comment period.

Following finalization of the AM, DOE will prepare and submit a Removal Action Work Plan for the C-400 Cleaning Building for regulator review and approval. Once approved, DOE will initiate demolition activities at the C-400 Cleaning Building in accordance with the approved work plan. Following completion of the activities, DOE will document completed removal activities in the Removal Action Report, as required by Section X.A. of the FFA.

The following are the remaining scheduled milestones for the C-400 Building NTCRA consistent with the Memorandum of Agreement (MOA) among the FFA parties (DOE 2017a) (see Table 1).

Table 1. C-400 Cleaning Building NTCRA Milestone Dates

Documents	Milestones*
D1 Engineering Evaluation/Cost Analysis	5/2/2018
D1 Action Memorandum	8/14/2018
D1 Removal Action Work Plan	8/17/2018
Field Start Date	11/27/2018

^{*}These milestones are consistent with the planning dates from the C-400 MOA for submittal of the CERCLA decision documents. Any extensions for reviewing documents, submitting comments, or responding to comments will impact the schedule. This schedule is included in this document for information purposes only and is not intended to establish enforceable schedules or milestones. Enforcement milestones will be established in the FFA or Site Management Plan and will be updated in accordance with Sections XXIX and/or XXXIX of the FFA.

2. REMOVAL SITE EVALUATION

Section X.B of the FFA requires that the RN include the removal site evaluation or summary of the Administrative Record (AR) constituting an equivalent removal site evaluation. The C-400 Cleaning Building has been the subject of a number of environmental investigations, treatability studies, feasibility studies, and remedial actions since the discovery of off-site groundwater contamination at PGDP in 1988, which provide an extensive AR file supporting the removal action. Each of the investigations and activities resulted in generation of data that documented presence of contamination associated with the C-400 Building. The contamination includes volatile organic and radiological contaminants. The AR includes reports of environmental contamination that is known to be associated with the building and provides a portion of the basis supporting this removal action to demolish the C-400 Cleaning Building. The AR includes the following reports: DOE 1996; DOE 1999a; DOE 1999b; DOE 1999c; DOE 2001; DOE 2005; DOE 2008a; DOE 2008b; DOE 2010; DOE 2012; DOE 2013; DOE 2017b.

The C-400 Cleaning Building removal action is being performed consistent with Section X, Removal Actions, of the FFA which provides that, "Removal actions shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned." Furthermore, the removal action notification is being made consistent with the Terms and Conditions Section of the *Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* signed August 8, 2017 which indicates the, "C-400 Building Decommissioning and Demolition will be addressed by a CERCLA Non-Time Critical Removal Action under the PGDP FFA."

Following the discontinued use of the C-400 Building and consistent with the requirements of the Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, the C-400 Cleaning Building facility is undergoing deactivation.

After deactivation, the remaining portions of the C-400 Building will contain hazardous substances that are present in the construction materials and from use during operation of the facility.

The C-400 Cleaning Building information provided in the remaining portion of this section is presented in the format consistent with Section IX and Appendix D of the FFA, constituting an equivalent removal site evaluation.

This NTCRA addresses the above slab structures associated with the C-400 Cleaning Building. The removal action will not address the remaining solid waste management units (SWMUs) that are located in the building concrete floor slab or those that are located exterior to the building structure.

Unit name—C-400 Cleaning Building

Regulatory status—C-400 Complex Operable Unit (OU)

Location—The C-400 Cleaning Building is located inside the plant Limited Area, near the center of the industrial section of the Paducah Site. The building is between 10th and 11th Streets to the west and east, respectively, and between Virginia and Tennessee Avenues to the north and south, respectively. An inset depicting the location of the C-400 Cleaning Building in relation to the plant site can be found in Figure 1.

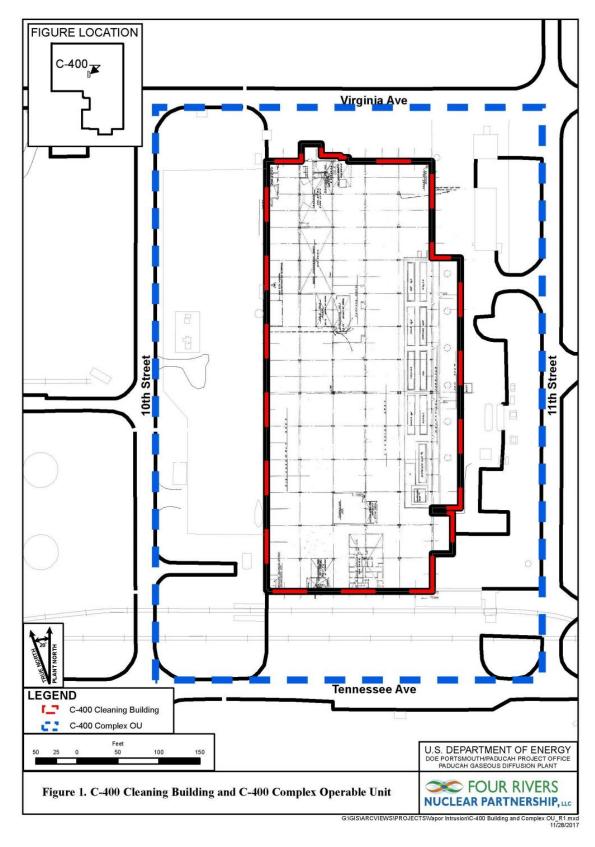


Figure 1. C-400 Cleaning Building

Approximate dimensions—The C-400 Cleaning Building floor space is approximately 134,000 ft², which takes into account the ground floor, basement floor, and the mezzanine floor. The C-400 Cleaning Building is a rectangular structure with a footprint of approximately 116,000 ft² and is divided into two sections, east and west. The east section of the building, as well as the central and southern portions of the west half of the building, housed disassembly and part cleaning equipment. The northwest section encompassed the former laundry area. The C-400 Cleaning Building is constructed of approximately 12-inch-thick concrete exterior walls for approximately the first 8 ft of height. Above the concrete walls, the walls consist of windows and corrugated Transite[®] panels on steel framing.

Function—The primary function of the C-400 Cleaning Building included cleaning, metal etching and plating, radioactive materials stabilization and recovery, metals recovery, uranium hexafluoride (UF₆) cylinder washing, uranium trioxide production, diffusion process equipment testing, and uranium tetrafluoride (green salt) pulverization.

Operational status—Inactive

Dates operated—1952 until 2014

Brief history and process description—The history that is provided focuses on long-term processes and operations of the facility. The C-400 Cleaning Building construction was completed in 1953. The building housed secondary maintenance areas that were dedicated to specialized disassembly required prior to decontamination.

The main purpose of the C-400 Cleaning Building was cleaning new components prior to installation and use, chemical treatments and general decontamination of equipment for reuse or discard, material recovery operations, plant laundry, cascade equipment testing, and pulverizing uranium tetrafluoride (UF_4) . Cleaning activities included degreasing (including chemical and vapor), pickling, neutralizing, removing oxidation products, and for gaseous cleaning and passivation processes of components (MMES 1995).

General decontamination was performed on removed equipment to support component disposal or refurbishment activities. Components typically were disassembled by maintenance crews in designated areas prior to beginning decontamination that included mining, steaming, chemical rinsing, or blasting. Liquid waste from decontamination processes allowed the metals to be separated from the liquid, resulting in two different waste streams, solid and liquid.

The building also housed other processes, including the plant laundry, which processed respirators, clothing issued for general use and special clothing such as anti-contamination clothing. The test-loop provided for an area where cascade-type equipment was tested online using gaseous UF_6 to simulate potential cascade conditions, and the pulverizer that transformed existing UF_4 into a finely divided powder (MMES 1995).

The former plant laundry remained stationed in the building until July 2016 before moving to the C-720 complex. The C-400 Deactivation Project began in July 2015 and is forecast to be complete November 2018. Complete deactivation will leave the C-400 Cleaning Building in a demolition-ready state, which includes the following:

- Building structure intact, including exterior and internal walls, windows, and roof;
- Floor and foundations intact; and
- Utility systems isolated.

In addition, during deactivation, the floor drains will have been sealed shut with controlled, low-strength cement material, and the basements and subsurface ducts will have been sealed with controlled, low-strength cement material (i.e., flowable fill cement mix).

Waste description—Demolition of the C-400 Cleaning Building structure will generate debris that is radiologically contaminated. Small quantities of Resource Conservation and Recovery Act (RCRA) and/or Toxic Substances Control Act regulated wastes also could be generated.

Waste quantity—Approximately 500,000 ft³

Summary of environmental sampling data—The scope of this NTCRA is to address the C-400 Cleaning Building and not the underlying slab or adjacent environmental media. The elements of the structure and its contents will be characterized for waste disposal as part of this removal project.

Description of release and media affected—This RN is specific to the removal action, which will remove the C-400 Cleaning Building above the concrete slab structure. The scope of the NTCRA does not address environmental media. Environmental media associated with the southern end of the C-400 Cleaning Building has been the subject of an Interim Remedial Action and will be the subject of a future final remedial action as part of the C-400 Complex OU (DOE 2017a).

Radiological contamination—Post-deactivation radiological inventory of the C-400 Cleaning Building is comprised of surface contamination from the historical processes performed in the facility. The activity associated with the uranium radionuclides constitutes the majority of the radiological inventory present in the facility. Various radionuclides are present as surface contamination. Some recycled uranium or reactor returns were processed at the Paducah Site in the 1960s and 1970s, resulting in the potential for the presence of fission and activation products. Beta-gamma contamination that may be present consists of uranium daughter products and technetium-99. Alpha contamination that may be present includes uranium and thorium, and transuranic elements, including plutonium, americium, and neptunium.

Chemical contamination—The chemical hazards that are known to exist in the C-400 Cleaning Building include lead and/or other heavy metals; asbestos-containing materials in the original building construction; PCBs; and volatile organic compounds.

Impact on or by other SWMUs—The NTCRA at the C-400 Cleaning Building will address all of the building structure located above the concrete floor slab. Appendix A of the Site Management Plan Paducah Gaseous Diffusion Plant, Annual Revision 2018, indicates there is one remaining SWMU that is within the C-400 Building, but it is located in the subsurface below the building slab elevation (DOE 2017c). This removal action will occur above ground level and will not be detrimental to the existing condition of this SWMU.

3. REMOVAL ACTION JUSTIFICATION

Table 2 identifies the eight factors under 40 *CFR* § 300.415(b)(2) that are considered to determine whether a removal action is appropriate and summarizes each factor's applicability. The presence of hazardous substances in the C-400 Cleaning Building has been determined to pose an actual or potential threat of release to the environment and relates to the factors set forth in 40 *CFR* § 300.415 (b)(2)(i)(v)(viii).

Table 2. Factors for Consideration for a Removal Action

Factors for Consideration for a Removal Action	Applicability	
per 40 <i>CFR</i> § 300.415 (b)(2)	Yes	No
(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants	√	
(ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems	✓	
(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release		✓
(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate		✓
(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released	✓	
(vi) Threat of fire or explosion		✓
(vii) The availability of other appropriate federal or state response mechanisms to respond to the release		✓
(viii) Other situations or factors that may pose threats to public health or welfare of the United States or the environment	✓	

Details of applicable factors for consideration, (i), (ii), (v), and (viii), are as follows.

- (i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants
- (ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems

Building degradation over time could result in potential structural failure and contaminant migration. This degradation, including roof and wall deterioration, could allow rainwater to infiltrate the buildings. Infiltration of rainwater could wash transferable or soluble contaminants out of the building through cracks in the floor or walls impacting underlying groundwater. Furthermore, there is an increased potential for site personnel not involved with surveillance and maintenance activities to be exposed to hazardous substances, including radiological contamination, associated with deteriorating structural components. There is a potential risk from hazardous substances, including radiological contamination that could be released to the environment if the structural elements that contain the contamination were to fail. Demolition and appropriate disposal of the resulting wastes will reduce the risk of exposure to workers located near these deteriorating facilities.

(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released

As the facilities continue to age, they will become more susceptible to damage from weather, thereby increasing the likelihood of a contaminant release. The structural instability of the deteriorating C-400 Cleaning Building will make it more difficult to repair should it be damaged by a weather-related event, such as high winds and/or ice, thereby increasing the probability of a contaminant release. High-risk repairs could lead to a higher potential for other site personnel to be exposed to chemical and radiological hazards.

(viii) Other situations or factors that may pose threats to public health or welfare of the United States or the environment

The controlled demolition of this facility will ensure that risks to human health and the environment from actual or potential exposure to hazardous substances, including radiological contamination, are reduced or eliminated. Controlled demolition using engineered safety measures is safer and reduces the probability of risks posed by releases of hazardous substances, including radiological contamination that would result from an uncontrolled collapse (i.e., building "falling in on itself"). Uncontrolled collapse likely would result in spread of hazardous substances and radiological contamination to site personnel and the environment because contamination in buildings no longer would be contained by structures.

4. ADMINISTRATIVE RECORD FOR THE C-400 CLEANING BUILDING

A new AR file will be started upon approval of this RN. No CERCLA activities have been initiated for demolition action at the C-400 Cleaning Building prior to this RN. This RN and the ensuing EE/CA and Action Memorandum will be the initial documents in the AR for the C-400 Cleaning Building demolition action; the AR also will include any other documents or information used for response selection.

5. SUMMARY AND PATH FORWARD

DOE is notifying EPA and Kentucky that DOE intends to proceed with an NTCRA of the C-400 Cleaning Building. Upon EPA and Kentucky approval, DOE will prepare an EE/CA that will evaluate removal action alternatives for the NTCRA for submittal, consistent with the date set forth in Table 1.

6. REFERENCES

- DOE (U.S. Department of Energy) and EPA (U.S. Environmental Protection Agency) 1995. Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act, Washington, DC, May.
- DOE 1996. Phase I: Paducah Gaseous Diffusion Plant Waste Area Group 6 Industrial Hydrogeologic Study, DOE/OR/07-1478&D1, U.S. Department of Energy, Paducah, KY, July.
- DOE 1999a. Remedial Investigation Report for Waste Area Grouping 6 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1727&D2, U.S. Department of Energy, Paducah, KY, May.
- DOE 1999b. Surfactant Enhanced Subsurface Remediation Treatability Study Report for the Waste Area Grouping 6 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1787&D1, Secondary Document, KY8-890-008-982, U.S. Department of Energy.
- DOE 1999c. Bench Scale In-Situ Chemical Oxidation Studies of Trichloroethene in Waste Area Grouping 6 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1788&D1, Secondary Document, U.S. Department of Energy, February.
- DOE 2001. Feasibility Study for the Groundwater Operable Unit at Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1857&D2, U.S. Department of Energy, August.

- DOE 2005. Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky DOE/OR/07-2150&D2/R2, U.S. Department of Energy, July.
- DOE 2008a. Land Use Control Implementation Plant: Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2151&D2/R2, U.S. Department of Energy, February.
- DOE 2008b. Remedial Design Report, Certified for Construction Design Drawings and Technical Specification package for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0005&D2/R1, U.S. Department of Energy, July.
- DOE 2010. Remedial Action Work Plan for the Interim Remedial Action for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0004&D2/R2/A1, U.S. Department of Energy, November.
- DOE 2012. Remedial Design Report, Certified for Construction Design Drawings and Technical Specifications Package, for the Groundwater Operable Unit for the Phase IIa Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, U.S. Department of Energy, August.
- DOE 2013. Remedial Action Work Plan for Phase IIa of the Interim Remedial Action for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/1271&D2/R3, U.S. Department of Energy, October.
- DOE 2017a. Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, U.S. Department of Energy, Paducah, KY, August.
- DOE 2017b. PGDP Administrative Record for the Paducah Gaseous Diffusion Plant, www.paducaheic.com, Index Search: (ARF 6 Phase) and (6PHASE-PD), U.S. Department of Energy, Paducah, KY, December.
- DOE 2017c. Site Management Plan Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—2018, DOE/LX/07-2418&D1, U.S. Department of Energy, Paducah, KY, November.
- EPA (U.S. Environmental Protection Agency) 1998. Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, DOE/OR/07-1707, U.S. Environmental Protection Agency, Atlanta, GA, April.
- MMES (Martin Marietta Energy Systems, Inc.) 1995. *C-400 Process and Structure Review*, KY/ERWM-38, Martin Marietta Energy Systems, Inc., Kevil, KY, May.

CERTIFICATION

Document Identification:

Removal Notification for Demolition of the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, DOE/LX/07-2420&D1, dated January

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

Four Rivers Nuclear Partnership, LLC

Deputy Program Manager

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

U.S. Department of Energy

lennifer Woodard, Paducah Site Lead

Portsmouth/Paducah Project Office