Department of Energy

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NOV 10 2010

Ms. Maria Galanti
Ohio Environmental Protection Agency
Southeast District Office
2195 Front Street
Logan, Ohio 43138

PPPO-03-1060489-11

Dear Ms. Galanti:

ENGINEERING EVALUATION/COST ANALYSIS FOR GROUP I BUILDINGS: X-103, X-334, AND X-344B AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO

Enclosed, please find the revised *Engineering Evaluation/Cost Analysis for Group I Buildings X-103, X-334, and X-344B at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE/PPPO/03-0145&D2) that incorporates your comments on the previous version of the document (DOE/PPPO/03-0145&D1), which was submitted on October 7, 2010. The report was prepared in accordance with the *Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action for the Portsmouth Gaseous Diffusion Plant (Decontamination and Decommissioning Project)* [DFF&O].

The U.S. Department of Energy, Portsmouth/Paducah Project Office (DOE/PPPO), is required to provide this report to the Ohio Environmental Protection Agency (Ohio EPA) in accordance with Section VI, Paragraph 18, and Section XV (c), of the DFF&O.

During the past month, Ohio and DOE/PPPO have worked together diligently to produce a document that is expected to meet the requirements of the DFF&O. The Department appreciates the meetings and discussions with Ohio to accelerate the review schedule. As we have discussed throughout this process, acceleration of the schedule will enable DOE to proceed on an expedited basis with work associated with the subject buildings, efficiently utilize existing funding, and mitigate potential adverse workforce impacts.

The enclosed document has been modified and reflects the discussions held between DOE and Ohio on November 4, 2010. As we discussed, DOE is requesting an expeditious review in regards to the reasons outlined in the above paragraph. Your priority review of this document is greatly appreciated.

After we receive your concurrence with this document, a public notice will be published for the public comment period.

If you have any questions or require additional information, please contact me at (740) 897-3822.

Sincerely,

Joel B. Bradburne
Alternative Site Coordinator
Portsmouth/Paducah Project Office

Enclosure:
Engineering Evaluation/Cost Analysis for Group I Buildings: X-103, X-334, and X-344B

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Administrative Record (DFF&O)

DOE/PPPO/03-0145&D2

Engineering Evaluation/Cost Analysis for Group 1 Buildings X-103, X-334, and X-344B at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

This document has been approved for public release:

Henry H. Thomas (signature on file) 10/29/10
Classification & Information Control Officer Date

Restoration Services, Inc. (RSI)

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

DOE/PPPO/03-0145&D2

Engineering Evaluation/Cost Analysis for Group 1 Buildings X-103, X-334, and X-344B at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Date Issued—November 2010

Prepared for
U.S. Department of Energy
Portsmouth/Paducah Project Office

Restoration Services, Inc.
Waverly, Ohio
Task Order DE-AT30-08CC40018
GSA Contract GS-10F-0273S

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CONTENTS

FIGURES

TABLES

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ACRONYMS

ACM	asbestos-containing material
AM	action memorandum
ARAR	applicable or relevant and appropriate requirement
AST	aboveground storage tank
BTEX	benzene, toluene, ethylbenzene, and xylene
CAS/CMS	Cleanup Alternatives Study/Corrective Measures Study
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulation*
CWA	Clean Water Act of 1972
D&D	decontamination and decommissioning
DFF&O	*Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Action for the Portsmouth Gaseous Diffusion Plant (Decontamination and Decommissioning Project)*
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
FY	fiscal year
GC	gas chromatography
GCEP	Gas Centrifuge Enrichment Plant
HVAC	heating, ventilation, and air conditioning
LDR	land disposal restriction
LLW	low-level waste
LPP	LATA/Parallax Portsmouth, LLC
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act of 1969
NNSS	Nevada National Security Site
NPDES	National Pollutant Discharge Elimination System
Ohio EPA	Ohio Environmental Protection Agency
PA	preliminary assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PORTS	Portsmouth Gaseous Diffusion Site
PPE	personal protection equipment
PRG	preliminary remediation goal
RAO	removal action objective
RAWP	Removal Action Work Plan
RCRA	Resource Conservation and Recovery Act of 1976
RCW	recirculating cooling water
RSE	Removal Site Evaluation
RSI	Restoration Services, Inc.
S&M	surveillance and maintenance
SVOC	semivolatile organic compound
TBC	to be considered
TCLP	toxicity characteristic leaching procedure
TLD	thermoluminescent dosimeters
TPMC	Theta Pro2Serve Management Company
TSCA	Toxic Substances Control Act of 1976
USDA	U.S. Department of Agriculture

USEC	United States Enrichment Corporation
UST	underground storage tank
VOC	volatile organic compound
WAC	waste acceptance criteria

EXECUTIVE SUMMARY

Ohio Environmental Protection Agency (Ohio EPA) and the U. S. Department of Energy (DOE) have entered into a formal agreement regarding performance of the decontamination and decommissioning (D&D) process at the DOE Portsmouth (PORTS) Gaseous Diffusion Plant (GDP) located in Piketon (Pike County), Ohio. The term D&D refers to a variety of activities, such as removing structures, dismantling building contents and foundations, and deactivating equipment. The terms of the agreement between Ohio EPA and DOE are contained in the *Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Action for the Portsmouth Gaseous Diffusion Plant (Decontamination and Decommissioning Project)* (Ohio EPA 2010) (hereafter referred to as DFF&O). The DFF&O was effective as of April 13, 2010. Consistent with the provisions of the DFF&O, the evaluation and selection of response actions to conduct D&D activities for support buildings at the PORTS GDP will be conducted in accordance with requirements for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time-critical removal actions.

The purpose of this EE/CA is to evaluate removal action alternatives for the three buildings listed below in accordance with the DFF&O, CERCLA, and National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria:

- X-103 Auxiliary Office Building,
- X-334 Transformer Cleaning and Storage Building, and
- X-344B Maintenance Storage Building.

These buildings are listed in Group 1 of Attachment G, *List of Non-Time Critical Removal Action (EE/CA) Groups*, of the DFF&O. The above-listed buildings will be referred to hereafter as the Group 1 buildings.

Per agreement with Ohio EPA, submittal of a separate Removal Site Evaluation (RSE) is not required for the buildings addressed in this EE/CA. Information normally presented in a RSE is incorporated into this EE/CA.

The X-103 Auxiliary Office Building is a 10,000 sf one-story (200 ft × 50 ft), steel-framed building with steel siding set on a concrete slab. The building, which is currently unoccupied, was constructed in 1954. It was used initially as a garage and later as administrative offices (DOE 1993). The building is described as a ~~"b~~utler building" with a gabled metal roof supported by rigid-type steel framing bents spanning the width of the building. The X-103 Auxiliary Office Building also housed the PORTS respirator facility where respirators were issued and cleaned. A concrete vault, located on the west end of the X-103 building, houses two sealed sources [Radium-226 (Ra-226) and Cesium-137 (Cs-137)]. The sources are small containers in which a specified amount of radioactive material is sealed. The two sources, still housed in the X-103 building vault, were used to ~~"ir~~radiate thermoluminescent dosimeters (TLDs) for calibration of onsite TLD readers" (USEC 2009a), which means that the TLDs were exposed to a known level of radiation to aid in calibrating the TLD readers.

Building X-103 contains contaminants within the building structural components, paint, and insulation that would increase risk to human health and the environment if they are released into the environment. Contaminants that could be released from the X-103 building include the following:

- Radiological contamination,
- Polychlorinated biphenyls (PCBs) associated with fluorescent lights,

- Asbestos from the pipe insulation and ceiling and floor tiles, and
- Lead from painted surfaces.

The X-334 Transformer Cleaning and Storage Building was constructed in 1985 and is a 2500 sf steel-framed metal structure on a concrete slab. Operations included repair of equipment from the X-530A and X-533A Switchyards, and storage of PCB equipment and waste oils pending transportation and off-site disposal. The building houses storage tanks containing PCB-mixed oils and a diked cleaning facility. The building contains four 250-gallon portable stainless steel tanks labeled as radioactive/PCB; one 500-gallon portable tank (mounted on cart); and two 2000-gallon stationary yellow tanks labeled as containing PCBs. A 2000-gallon fiberglass reinforced plastic underground storage tank (UST) was installed in the southeast corner, external of the building, to store kerosene.

Building X-334 contains contaminants within tanks, hoses, or other components or structures that would increase risk to human health and the environment if they are released into the environment. Contaminants that could be released from the X-334 building include the following:

- Radiological contamination from the items labeled as radioactive and from storage tanks labeled as PCB/radioactive, if leakage has occurred;

- PCB contamination tanks labeled as PCB and PCB/radioactive, if leakage has occurred;

- Pipe insulation potentially containing asbestos; and

- PCB contamination on the floor due to PCB spills.

The X-344B Maintenance Storage Building, a prefabricated metal ~~–b~~utler building," is 120 ft long and 50 ft wide, encloses 6000 sf on a 6-in. concrete pad, and has truck access doors in each end. The building interior is open and unobstructed for storage. The building was constructed in 1958 and has always been used for storage and a repair shop. The north half of the building was most recently used for repair and modification of cooling tower equipment. The south half was used for roads and grounds equipment storage and materials storage.

Building X-344B contains contaminants within insulation, on the floors, or other components or structures that would increase risk to human health and the environment if they are released into the environment. Contaminants that could be released from the X-344B building include the following:

- Asbestos from pipe insulation,
- Lead from painted surfaces, and
- Radiological contamination associated with the concrete floor, and Tc-99 traps.

Based on the building descriptions and potential hazards identified above, the following removal action objectives (RAOs) have been identified in the DFF&O and developed for these removal actions, and form the basis for identifying and evaluating appropriate response actions:

- Determine the viability of building reuse,
- Meet applicable or relevant and appropriate requirements to the extent practicable,
- Be protective of relevant receptors, and
- Be cost effective.

A reuse alternative was considered for the buildings addressed in this EE/CA. The buildings in their present condition contain materials or items (lead-based paint, radiological contamination, PCB contamination, asbestos, interior deterioration) that pose a potential risk to human health and the environment. To remove the threat of release of potential contamination into the environment and be protective of human health, a reuse alternative would include removing the contents of the building, decontaminating the building structures to address contaminants of potential concern, disposing of any wastes generated, and renovating to meet present-day building codes to support potential reuse. Any renovations made to the buildings would have to meet or exceed goals set forth in *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*, Executive Order 13423 Sect. 2(f). Considering the ages of the buildings (two are more than 50 years old and the other is 25 years old), to meet the criteria of the Executive Order, renovation would include, but not be limited to, installation of new wiring, incorporating energy efficient electrical components, energy efficient lighting, and energy efficient heating, ventilation, and air conditioning equipment.

The total cost for a reuse alternative for the three buildings is $7,400,000. The reuse cost for each building was based on its present use (X-103 as a future office building and X-334 and X-344B as storage buildings).

Additionally, DOE used the excess building screening process to determine if other governmental organizations had an interest in using the buildings. DOE did not receive any request or interest from other governmental organizations to use the buildings, therefore, no reuse functions for these Group 1 buildings have been identified.

Based on the renovation costs and the fact that no interest was shown from other organizations to reuse the buildings, the reuse of the buildings addressed in the EE/CA is not a viable option and was not developed for evaluation as a removal action alternative. DOE has identified two other removal action alternatives that are being carried forward for evaluation to address the RAOs. These removal alternatives are listed below.

- Alternative 1 – No Action; and
- Alternative 2 – Remove and Dispose of Building Contents, Structures, and Concrete Slab.

For Alternative 1, No Action, CERCLA requires a no action alternative to be included as a baseline for comparison to the other alternative. In the no action alternative, the buildings would be left in their current condition, existing controls that limit public and worker access to the on-site buildings would be maintained, no new controls would be implemented, support systems (e.g., fire protection) would be maintained in an operable condition, periodic surveillance and maintenance (S&M) (e.g., light bulb replacement) activities would continue, no major repairs or modifications to the facility would be undertaken, limited deactivation activities likely would be performed as part of other programs to isolate the building from major utility feeds (e.g., water and electric), the buildings would deteriorate, and D&D would not be performed on the buildings.

The no action alternative is readily implementable, but it is ineffective in achieving the removal action objectives. No specialized services or equipment are required and no off-site or on-site waste disposal is required. The short-term risks to the public, the workers, and the environment would remain unchanged because this alternative consists of no action. In the long term, a gradual reduction in protection of human health and the environment would result from the deterioration of the structures, with potential risks to on-site worker health and safety resulting from the eventual failure of the structures. The inevitable deterioration of the structures eventually would result in the release of contamination to the environment.

The total estimated annual cost, as described with S&M activities, for Alternative 1 is $28,717. At some future date, the buildings eventually would have to be removed at an estimated cost of $2,550,000. For Alternative 2, Remove and Dispose of Building Contents, Structures, and Concrete Slab, D&D activities would include the removal of the building structures and all contents, the disposal of the structures/contents in appropriate off-site disposal facilities, and removal and disposal of the concrete slab and foundations. Removal of the contents and internal utilities would be sequenced to facilitate dismantling of the building structures. DOE anticipates that under Alternative 2, D&D activities would be completed in two Phases. Phase I would address removal and disposal of the building structures and all contents, and Phase II would include removal and disposal of the concrete slab and underground structures beneath the slab.

Removal of the structures, equipment, slab, and materials would prevent or minimize any migration of hazardous substances, pollutants, and contaminants to the environment. Alternative 2 would meet the RAOs and is implementable and technically feasible. Sufficient on-site equipment and personnel are available for this alternative. Off-site disposal services are available also.

The total estimated cost for Alternative 2 is $2,550,000. The actual cost would be dependent on the actual waste type and volumes generated during the implementation of the removal action, which could vary from the estimates of the EE/CA.

Alternative 2 is the recommended removal action alternative for D&D of the X-103 Auxiliary Office Building, the X-334 Transformer Cleaning and Storage Building, and the X-344B Maintenance Storage Building. Alternative 2 is effective in the short-term and long-term, implementable, and the most cost-effective approach that satisfies the RAOs for D&D of the buildings.

1. INTRODUCTION TO THE DECONTAMINATION AND DECOMMISSIONING PROCESS

1.1 PURPOSE

Ohio Environmental Protection Agency (Ohio EPA) and the Department of Energy (DOE) have entered into a formal agreement regarding performance of the decontamination and decommissioning (D&D) process at the DOE Portsmouth Gaseous Diffusion Plant (PORTS) located in Piketon (Pike County), Ohio. The term D&D refers to a variety of activities, such as removing structures, dismantling building contents and foundations, and deactivating equipment. The terms of the agreement between Ohio EPA and DOE are contained in the *Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action for the Portsmouth Gaseous Diffusion Plant (Decontamination and Decommissioning Project)* (Ohio EPA 2010) (hereafter referred to as DFF&O). The DFF&O was effective as of April 13, 2010. Consistent with the provisions of the DFF&O, the evaluation and selection of response actions to conduct D&D activities for support buildings at the PORTS will be conducted in accordance with requirements for Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) non-time-critical removal actions.

The purpose of this Engineering Evaluation/Cost Analysis (EE/CA) is to evaluate removal action alternatives for the three buildings listed below in accordance with the DFF&O, CERCLA, and National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria:

- X-103 Auxiliary Office Building,
- X-334 Transformer Cleaning and Storage Building, and
- X-344B Maintenance Storage Building.

DOE no longer has an operational need for these buildings and routine maintenance has ceased. These buildings are listed in Group 1 of Attachment G, *List of Non-Time Critical Removal Action (EE/CA) Groups*, of the DFF&O. The above-listed buildings, which are shown on Fig. 1, will be referred to hereafter as the Group 1 buildings.

The Group 1 buildings that are being evaluated for D&D in this EE/CA are being addressed together because they are similar in terms of size, complexity, and types of hazardous constituents. DOE does not have a programmatic or mission need for these buildings.

As required under the DFF&O and CERCLA for each of the buildings, this EE/CA will:

1) Evaluate relevant data to support a determination for the need of a removal action,

2) Define the specific objectives of any necessary removal action,

3) Identify a recommended removal action alternative, and

4) Present the recommended removal action to the public for its review and comment prior to issuing an Action Memorandum (AM) selecting the removal action to be implemented for the Group 1 buildings.

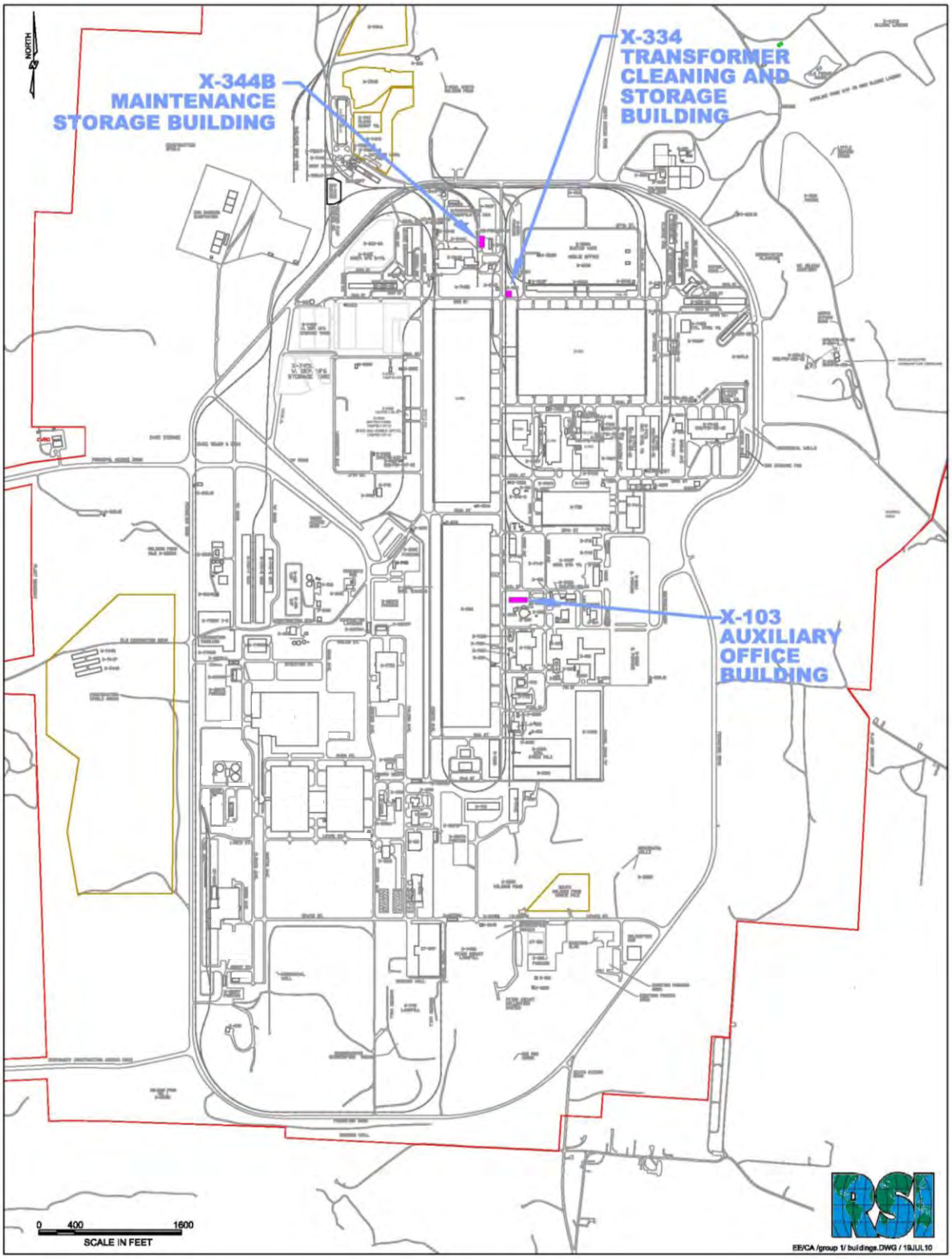


Fig. 1. Location of Group 1 EE/CA buildings.

This action is being documented in an EE/CA in accordance with the DFF&O, CERCLA, and the *Policy on Decommissioning of Department of Energy Facilities under the CERCLA* (DOE and U.S. Environmental Protection Agency [EPA] 1995). This policy states that unless the circumstances at a facility make it inappropriate, decommissioning activities will be conducted as non-time-critical removal actions. Through Presidential delegation of authority, CERCLA authorizes DOE to develop and perform removal actions to abate, minimize, stabilize, mitigate, or eliminate a release or the threat of a release of hazardous substances, pollutants, or contaminants or hazardous wastes and hazardous constituents at DOE sites such as PORTS.

Per agreement with Ohio EPA, submittal of a separate Removal Site Evaluation (RSE) is not required for the buildings addressed in this EE/CA. Information normally presented in a RSE is incorporated into this EE/CA.

A consent decree signed by DOE and the Ohio EPA in 1989 (Ohio EPA and DOE 1989) and an Administrative Consent Order (as amended) with EPA require the investigation and cleanup of soils and groundwater at PORTS in accordance with the Resource Conservation and Recovery Act of 1976 (RCRA) Corrective Action Program. Investigation and cleanup efforts of the soils and groundwater will continue under the RCRA Corrective Action Program and are not part of this non-time-critical removal action.

1.2 PHASES OF THE D&D PROCESS

The D&D process for this EE/CA encompasses activities described in Section III, Paragraph 5.e of the DFF&O. The decision for the Group 1 buildings will be made as a non-time critical removal action pursuant to the DFF&O.

Before implementation of any CERCLA actions, there are pre-D&D actions that are being performed. They include site preparatory activities such as establishing laydown and staging areas; hazard investigations of the facilities; decontamination or fixative application efforts to limit any identified risk to workers; initial asbestos abatement activities, including removal and disposal; and initial equipment removal for reuse or disposal.

An EE/CA is performed to evaluate the need for a removal action and identify potential removal action alternatives, identify a recommended removal action when necessary, and provide the EE/CA to the public for review and comment before making a final decision on a removal action.

- The EE/CA is followed by an AM decision document that includes the following:
    - Authorizes the action,
    - Identifies the action and cleanup goals,
    - Explains the rationale for authorizing the removal response action, and
    - Provides a response to comments received from public review of the EE/CA.

- The AM is followed by submittal of a Removal Action Work Plan (RAWP), which provides the design, construction, operation, and maintenance details of the removal action as set forth in the AM. The RAWP would also identify milestones in accordance with the DFF&O requirements for implementation of the work. Data will be collected to support implementation of the potential actions and will be presented in the RAWP.

- Following the completion of field work activities and receipt of all validated data, a Removal Action Completion Report would be issued.

If this EE/CA and the follow-on AM selects a removal action requiring removal of the building, structures and building slabs, then any required field activities for the removal action would be performed in two phases. Phase I would include removal of the structures to slab and Phase II would include removal of the slab and below-grade structures, such as piping associated with underground utilities within the designated footprint of the building(s). Separate RAWPs would be prepared for each phase and for each building. With the exception of residual soil that adheres to the piping, structures, or slabs, and any soil that must be otherwise excavated as an integral part of the removal action, characterization/remediation of the soils around and beneath the buildings will be addressed under RCRA and are not part of the scope of this EE/CA.

1.3 COMMUNITY PARTICIPATION

Community involvement is a necessary aspect of the CERCLA process and the DFF&O. DOE is required to conduct community relations activities for this removal action project in compliance with the NCP and the DFF&O. State and community involvement and acceptance of this action will be addressed by providing the EE/CA to the public, regulators, consulting parties, and the Site-Specific Advisory Board (SSAB) for information and comment. Specifically, a brief description of this EE/CA and a notice of availability of the entire document will be published in the local newspaper(s). Public stakeholders will have at least 30 days to review the EE/CA and submit written and oral comments. A written response will be prepared addressing significant comments and will be included in the Administrative Record file. DOE also will provide an opportunity for public information exchange during the 30-day public review and comment period. Documents referenced in the EE/CA will be part of the administrative record and available to the public for review.

2. SITE CHARACTERIZATION

2.1 PORTSMOUTH FACILITY AND REMOVAL ACTION PROJECT AREA DESCRIPTION AND NATURE AND EXTENT OF CONTAMINATION

2.1.1 Portsmouth Facility Description

PORTS is located in a rural area of Pike County, Ohio, east of the Scioto River on a 5.8 mi^2 area. This site is 2 miles east of the Scioto River in a small valley running parallel to and approximately 130 ft above the Scioto River floodplain (see Fig. 2). The population of Pike County, in which the site is located, was 28,269 persons in 2006. The nearest population center to PORTS is Piketon, Ohio, which is located approximately 5 miles north on U.S. Route 23. In the 2006 census, the population of Piketon Ohio was reported to be 1,907.

The largest city within 50 mi of the plant is Chillicothe, Ohio, with a population of 22,216 persons (based on year 2006 census results). The city of Chillicothe is located approximately 27 miles north of the site in Ross County, Ohio. The other counties within the region of influence reported the following populations: Jackson County, Ohio, 33,543; Ross County, Ohio, 75,556; and Scioto County, Ohio, 76,441 (U.S. Census Bureau 2008).

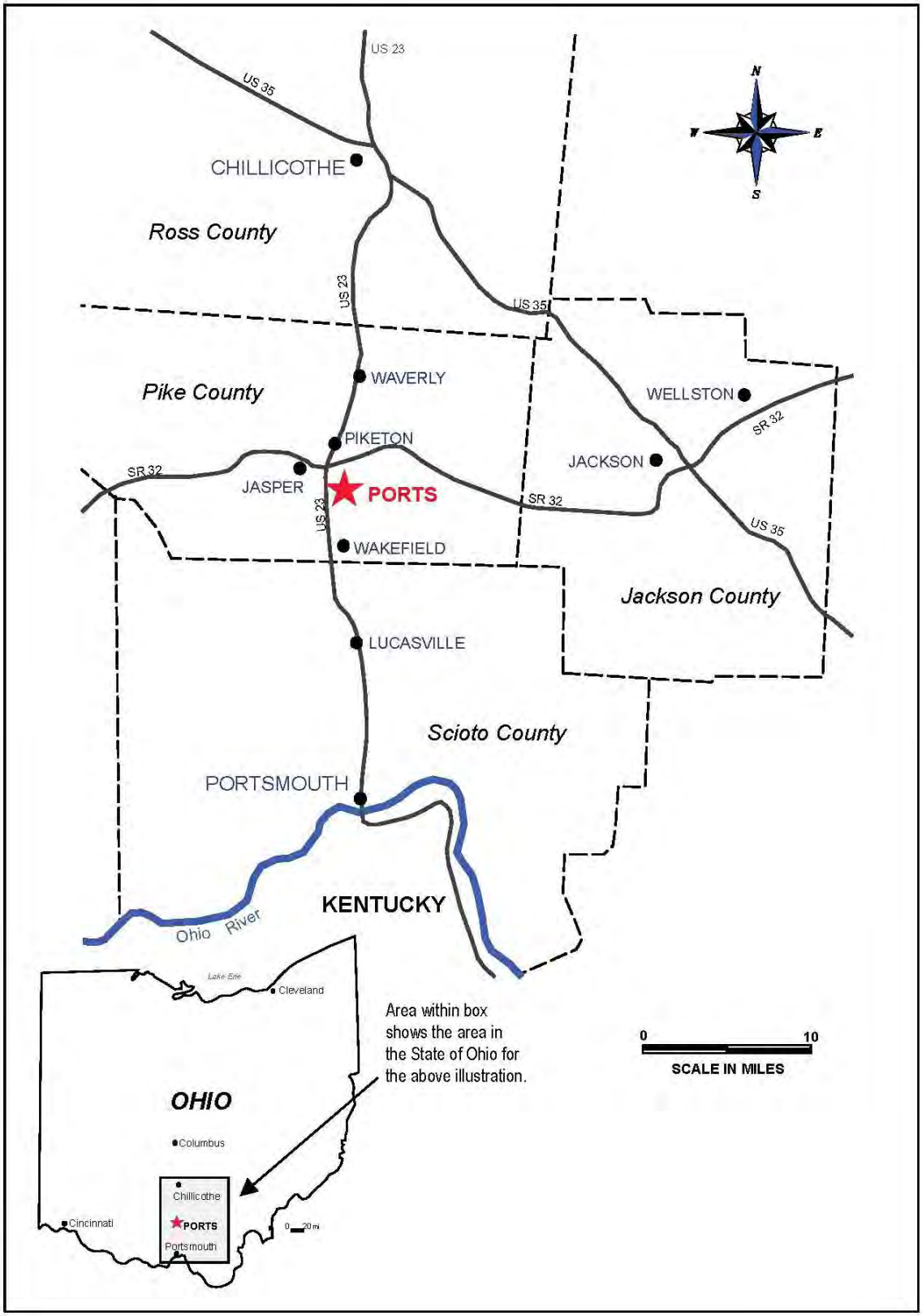
PORTS occupies an upland area of southern Ohio with an average land surface elevation of 670 ft above mean sea level. PORTS sits in a 1-mi-wide abandoned river valley situated above the Scioto River floodplain to the west. In much of the industrialized area of PORTS, the original topography has been modified and graded for construction of buildings and other facility components. Much of the industrialized area of the site is located on fill that was removed from the higher elevations of the site and placed in existing drainage valleys and depressions.

This site is drained by several small tributaries of the Scioto River. Sources of surface water drainage include storm water runoff, groundwater discharge, and effluent from plant processes. The largest stream is Little Beaver Creek, which drains the northern and northeastern portions of the property before discharging into Big Beaver Creek. Big Run Creek is the smaller tributary of the Scioto River that drains the southern portion of the property.

Both Little Beaver Creek and Big Run Creek cut through unconsolidated material and intersect bedrock, and the ancestral Portsmouth River Valley essentially forms a large ~~"b~~owl" around the site. Therefore, groundwater leaving the site through unconsolidated deposits via Little Beaver Creek and Big Run Creek eventually drains to the Scioto River.

Two ditches drain the western and southwestern portions of the PORTS property. Flow in these ditches is low to intermittent. The West Drainage Ditch receives water from surface water runoff, storm sewers, and plant effluent. The unnamed southwestern drainage ditch receives water mainly from storm sewers and groundwater discharge. These two drainage ditches continue west and ultimately discharge into the Scioto River.

The subsurface in the site area consists of approximately 30 to 40 ft of unconsolidated Quaternary clastic sediments unconformably overlying Paleozoic bedrock that dips gently toward the east. In stratigraphic order, bedrock is overlain by fluvial Gallia Sand and Gravel (Gallia) and by the lacustrine Minford Clay and Silt (Minford) of the Teays Formation.



Source: Survey of Pike County, Ohio (USDA 1990)

Fig. 2. PORTS vicinity map.

Bedrock consisting of clastic sedimentary rocks underlies the unconsolidated sediments beneath the site. The geologic structure of the area is very simple, with the bedrock (Cuyahoga Shale, Sunbury Shale, Berea sandstone, and Bedford Shale) dipping gently to the east-southeast. No known geologic faults are located in the area; however, joints and fractures are present in the bedrock formations.

According to the Soil Survey of Pike County, Ohio, 22 soil types occur within the PORTS property boundary. The predominant soil type at the site is Omulga Silt Loam (U.S. Department of Agriculture 1990). Most of the area within the active portion of PORTS is classified as urban land-Omulga complex with a 0-6% slope, which consists of urban land and a deep, nearly level, gently sloping, moderately well-drained Omulga soil in preglacial valleys. The urban land is covered by roads, parking lots, buildings, and railroads making identification of the soil series difficult. The soil in these areas are so obscured or disturbed that assignment of specific soil series is not feasible. Well developed soil horizons may not be present in all areas inside the perimeter road because of cut and fill operations related to construction.

The climate of the PORTS area can be described as humid-continental. It is characterized by warm, humid summers and by cold, humid winters. Daily temperature averages are 22.2^{o}C or 72^{o}F in the summer and 0^{o}C (32^{o}F) in the winter. The average annual temperature is 12.7^{o}C (55^{o}F). Record high and low temperatures are 39.4^{o}C (103^{o}F) and -32^{o}C (-25^{o}F), respectively (National Climatic Data Center [NCDC] 2002).

Precipitation is distributed relatively evenly throughout the year and averages approximately 40 in. per year. The month with the highest average amount of precipitation is May. Groundwater recharge and flood potential are greatest during this time. Fall is the driest season. Snowfall averages 20.4 in. per year. Although snow amounts vary greatly from year to year, an average of 8 days per year have snowfall in excess of 1 in. (NCDC 2002).

Prevailing winds are from the south-southwest at approximately 5 miles per hour (mph). The highest average monthly wind speed of 11 mph typically occurs during the spring.

The terrain surrounding the plant, with the exception of the Scioto River floodplain, consists mainly of marginal farmland and densely forested hillsides. The Scioto River floodplain is extensively farmed. The PORTS site is situated on a 3,777-acre parcel of DOE-owned land. Twelve hundred acres of this area are located with in the facility's Perimeter Road, and comprise the centrally developed area. Five hundred acres of this area are fenced for controlled access. Approximately 190 buildings are located within the site along with numerous utility structures. The DOE-owned land outside Perimeter Road is used for a variety of purposes, including a water treatment plant, holding ponds, sanitary and inert landfills, and open and forested buffer areas. The majority of the site improvements associated with the gaseous diffusion plant (GDP) is located within the fenced area. Within this area are three large process buildings and auxiliary buildings currently leased to United States Enrichment Corporation (USEC). A second, large developed area covering about 300 acres contains the buildings built for the Gas Centrifuge Enrichment Plant (GCEP). These areas are largely devoid of trees, with grass and paved areas dominating the open space. The remaining area within the perimeter road has been cleared and is essentially level.

The uranium enrichment and production and operations buildings at PORTS are leased by USEC. The lease between DOE and USEC is active through July 1, 2016, although some buildings may be returned to DOE on an earlier date. In addition to the leased buildings, USEC also leases common areas that include ditches, creeks, ponds, and other areas such as roads and rail spurs that are necessary for ingress, egress, and proper maintenance of buildings. A site map identifying current primary land interests at the site is shown in Fig. 3.

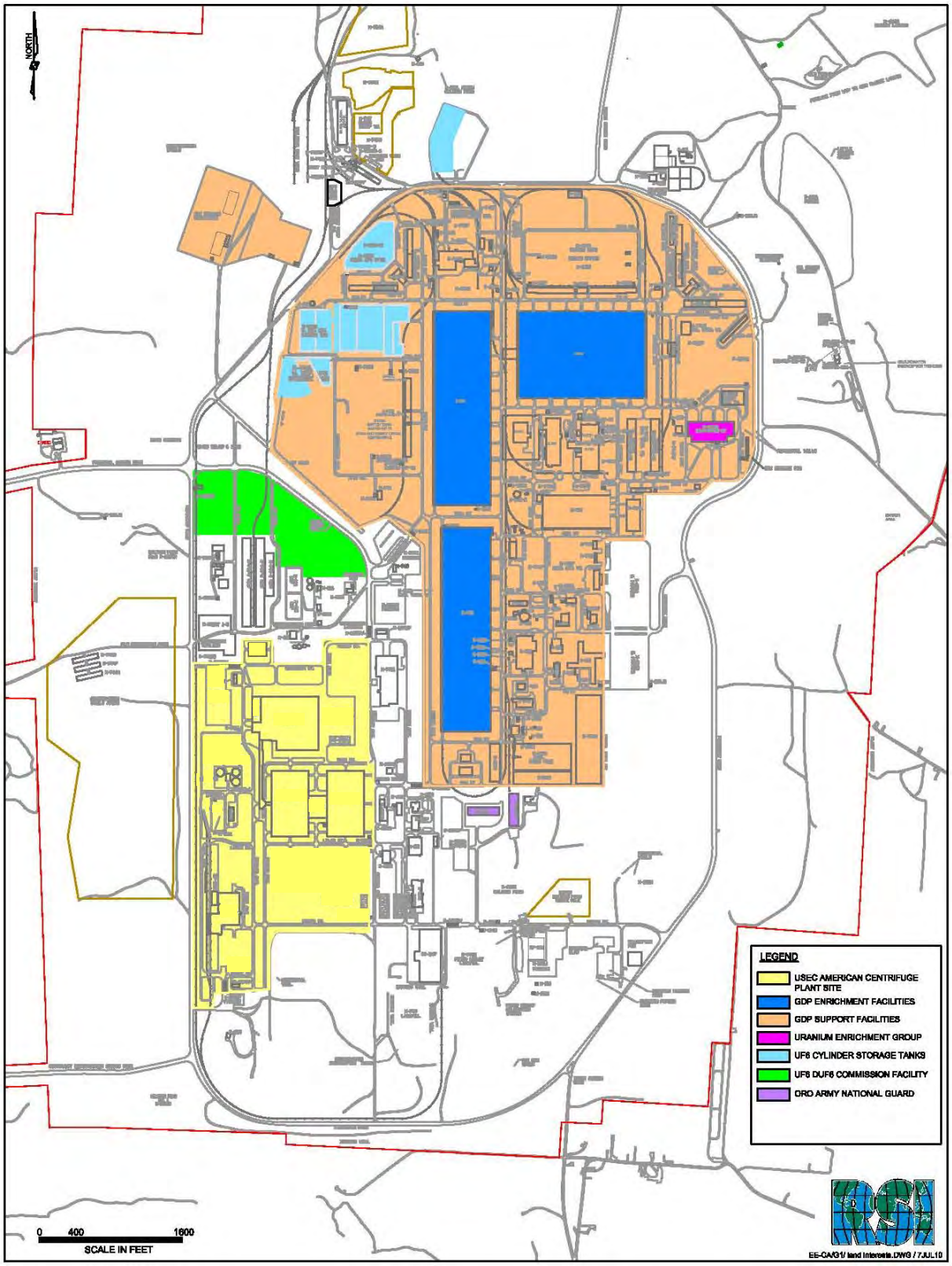


Fig. 3. PORTS primary land interests.

2.1.2 Description of the Removal Action Project Area at the Site

This EE/CA addresses three of the buildings that are identified in Group 1 of Attachment G of the DFF&O. The following sections provide a facility description, nature and extent of contamination, previous removal actions, and preliminary assessment of releases for each building. A streamlined risk evaluation is presented in Sect. 2.1.5 for each building.

2.1.2.1 Building X-103 Auxiliary Office Building

2.1.2.1.1 Building description

The X-103 Auxiliary Office Building is a 10,000-sf, one-story (200 ft × 50 ft), steel-framed building with steel siding set on a concrete slab. The building, which is currently unoccupied, was constructed in 1954. It was used initially as a garage and later as administrative offices (DOE 1993). The X-103 Auxiliary Office Building also housed the PORTS respirator facility where respirators were issued and cleaned. A concrete vault, located on the west end of the X-103 building, houses two sealed sources (Radium-226 [Ra-226] and Cesium-137 [Cs-137]). The sources are small containers in which a specified amount of radioactive material is sealed. The two sources in the X-103 building vault were used to ~~"ir~~radiate thermoluminescent dosimeters (TLDs) for calibration of onsite TLD readers" (USEC 2009a), which means that the TLDs were exposed to a level of known radiation to aid in calibrating the TLD readers.

The building is described as a ~~"b~~utler-type building" with a gabled metal roof supported by rigid-type steel framing bents spanning the width of the building. The interior of the building consists of gypsum wall board on wood furring attached to the exterior framing and a suspended ceiling that provides a room height of 12 ft 3 in. A central corridor extends from the east entrance of the building to about 17 ft from the west end where it opens into an end room that serves offices, toilets, vaults, and other areas (DOE 1957).

In general, the X-103 Auxiliary Office Building floors are concrete covered in asphalt tile, with the exception of the floors in the utility room and vaults, which are smooth-finished concrete. Glazed-metal type partitions were installed to divide the building interior into a corridor and offices. Partitions associated with the toilet room and utility room are wall board on wood stud framing. The walls of the vault are concrete block.

Heating is provided by radiators installed on exposed steam piping along the exterior walls. Gravity-type ventilators mounted on the ridge of the roof provide attic ventilation (DOE 1957).

The building was serviced by two air conditioning units; a large unit located approximately 12 ft from the north wall of the building and a smaller unit located approximately 2 ft from the north wall of the building.

Photos taken in May 2010 of the exterior and the interior contents are shown in Fig. 4 and a general floor layout of the facility is included in Fig. 5. Appendix A includes additional photos taken in May 2010 of the X-103 building.

2.1.2.1.2 Nature and extent of contamination

This section includes a summary of any known or potential radiological and chemical contamination associated with the building.

Fig. 4. Building X-103 exterior and general floor layout.

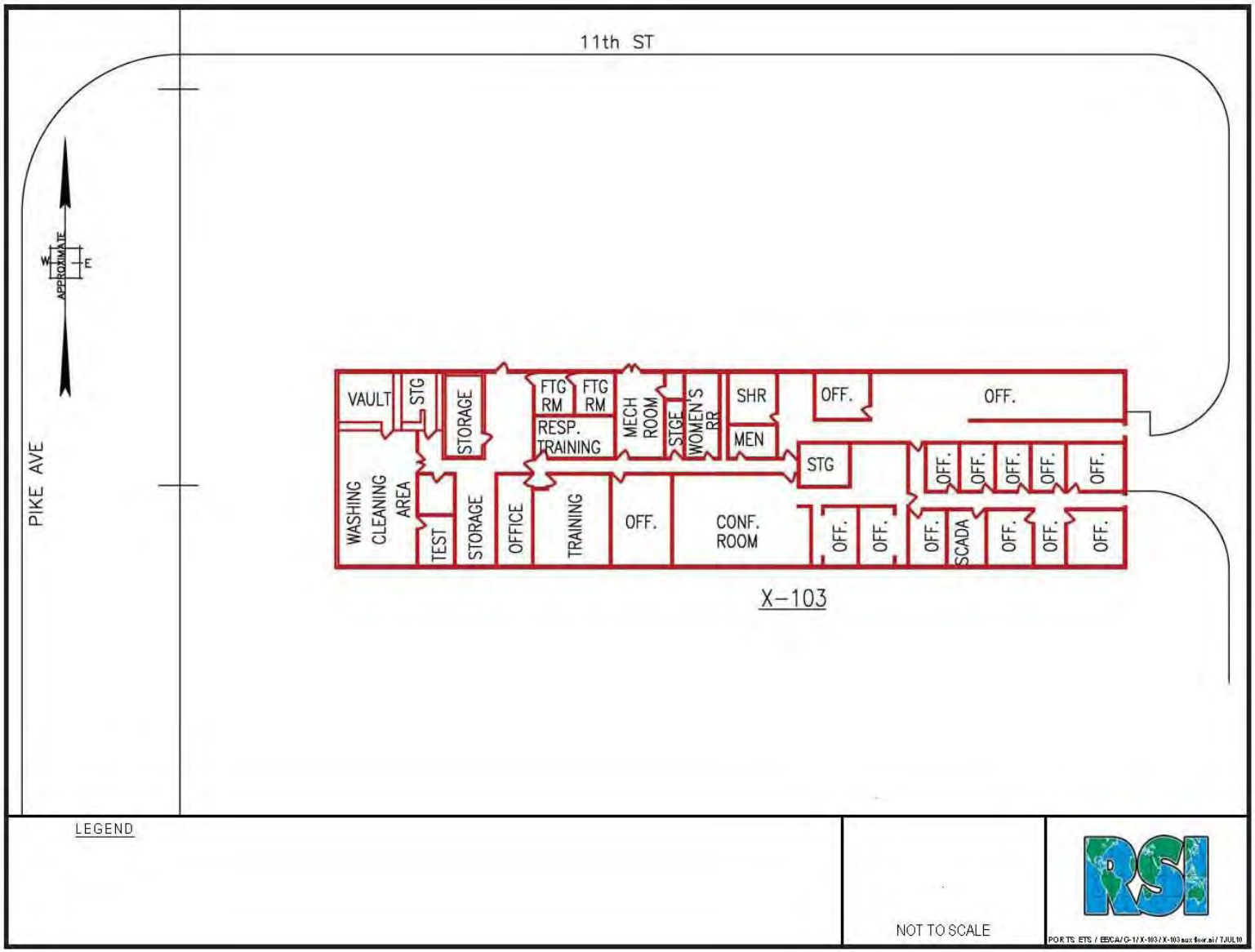


Fig. 5. Building X-103 Auxiliary Office Building floor plan.

Known or potential radiological contamination. In November 2009, USEC personnel performed a verification of the sources in the X-103 facility (USEC 2009a) and verified that two radioactive sealed sources currently are located in a source vault inside the X-103 facility. A Ra-226 source is located in a shielded bunker and a Cs-137 source is located in a shielded machine within the vault. These sources were used in the calibration of TLDs. The responsibility for the radioactive sources was transferred to DOE with the transfer of the facility from USEC. Because building X-103 houses these two sources, there is the potential of Ra-226 and Cs-137 within the area where the sources are kept.

Known or potential chemical contamination. Known or potential chemical contamination associated with this facility includes the following:

- Based on the age of the building, lead-based paint was possibly applied to interior and exterior surfaces. No testing has occurred at the facility for lead in paint (DOE 1993).

- Asbestos-containing material (ACM) is present in thermal insulation associated with the recirculating cooling water (RCW) lines and in the ceiling tiles (DOE 1993).

- Based on the age of the building, fluorescent lights with PCB ballasts are potentially present at the facility (DOE 1993).

2.1.2.1.3 Building walkdown

The Ohio EPA, LATA/Parallax Portsmouth, LLC (LPP), and Restoration Services, Inc. (RSI) representatives performed a walkdown of the X-103 building on June 2 and 3, 2010, to confirm the historical information relating to radiological and chemical contamination and to the building contents. The following items were confirmed during the walkdown:

- Ra-226 and Cs-137 radiological sources are still in the facility;
- The possibility exists for asbestos in the ceiling tile, floor tiles, and pipe insulation;
- Floor drains exist;
- Stained areas exist on the floors; and
- Paint of various colors is chipping from the interior walls.

Additional sample collection is not required to evaluate the removal action alternatives included in this EE/CA. However, in the event the selected removal action requires removal of the building, additional samples would be collected to support implementation of the chosen removal action alternative.

2.1.2.2 Building X-334 Transformer Cleaning and Storage Building

2.1.2.2.1 Building description

The X-334 Transformer Cleaning and Storage Building was constructed in 1985 and is a 2500 sf steel-framed metal structure on a concrete slab. The building is no longer used as a transformer cleaning or storage facility and is currently unoccupied (TPMC 2006b). Operations included repair of equipment from the X-530A and X-533A Switchyards, and storage of PCB equipment and waste oils pending transportation and off-site disposal. The building houses storage tanks containing PCB-mixed oils and a diked cleaning facility. The building contains four 250-gallon portable stainless steel tanks labeled as radioactive/PCB; one 500-gallon portable tank (mounted on cart); and two 2,000-gallon stationary yellow tanks labeled as containing PCBs. A 2,000-gallon fiberglass reinforced plastic underground storage tank (UST) was installed in the southeast corner, external of the building, to store kerosene. The UST has

been removed and the two ASTs have been emptied but remain inside the building. Also contained within the building are rubber hoses labeled radioactive.

A utility pole, outside the southeast corner of the building mounts three non-PCB transformers (DOE 1993). Recent information (September 2010) received from PORTS personnel indicated that universal wastes were stored in the X-334 building from 2007 to 2010.

Recent photographs (taken May 2010) showing the exterior of the X-334 building structure and some of the internal contents are included in Fig. 6. The location of the building in relation to site roads is shown in Fig. 7. Appendix A includes additional recent photos (taken May 2010) of the X-334 building.

2.1.2.2.2 Nature and extent of contamination

This section includes a summary of any known or potential radiological and chemical contamination associated with the X-334 building.

Known or potential radiological contamination. Although earlier documents indicate that there is no radiological contamination associated with this building, items stored presently in the building have the potential for releasing radiological contamination to the environment if the building is allowed to deteriorate. The building contains storage tanks with labels indicating PCB/radioactive contamination and pipes/rubber hosing labeled as radioactive.

An earlier reference document (DOE 1993) states that thirty-two 132.5-kv electrical potential devices containing PCBs and uranium were reportedly on the premises at one time. However, recent interviews and visual assessments determined the material is no longer present in the facility. Because they were once located on the premises, the potential exists for radiological constituents to be present on the premises due to potential leakage.

A radiological survey of this facility was performed on September 25, 2001, and included the floor, hoses, drip trays, tops of pumps, fan top, fan motor, etc. The survey results indicated the total alpha was < 66 dpm/100 cm^2 and the total beta/gamma was < 633 dpm/100 cm^2 (critical detection level as defined in Fig. 8), which indicates, based on information listed on Fig. 8, that all of the survey results were below radiological background levels. The areas surveyed in the facility are not of radiological concern. Actual results of the survey are shown on Fig. 8.

Known or potential chemical contamination. Known or potential chemical contamination associated with this facility includes the following:

- Based on earlier documentation, residual PCB contamination is present on the floor of the building.
- Fluorescent light fixtures may contain PCBs in the ballasts (TPMC 2006b).
- Although an earlier document (DOE 1993) indicated there was no insulation in the facility, a walkdown conducted in June 2010 confirmed there is insulation on some of the piping, which could potentially contain asbestos.

Fig. 6. Building X-334 exterior with inserts of building interior (photo taken May 2010).

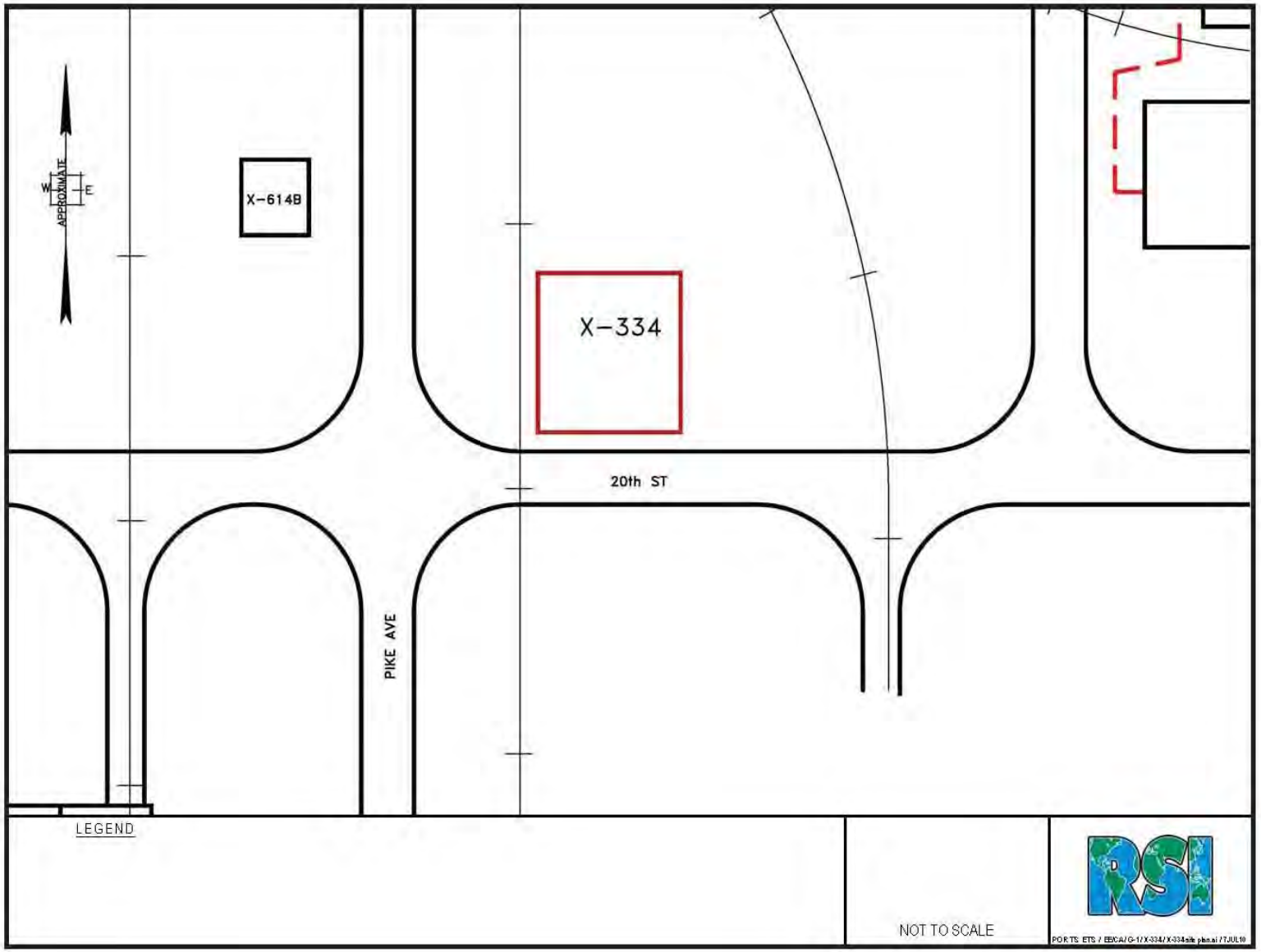


Fig. 7. Building X-334 transformer storage and cleaning building plan.

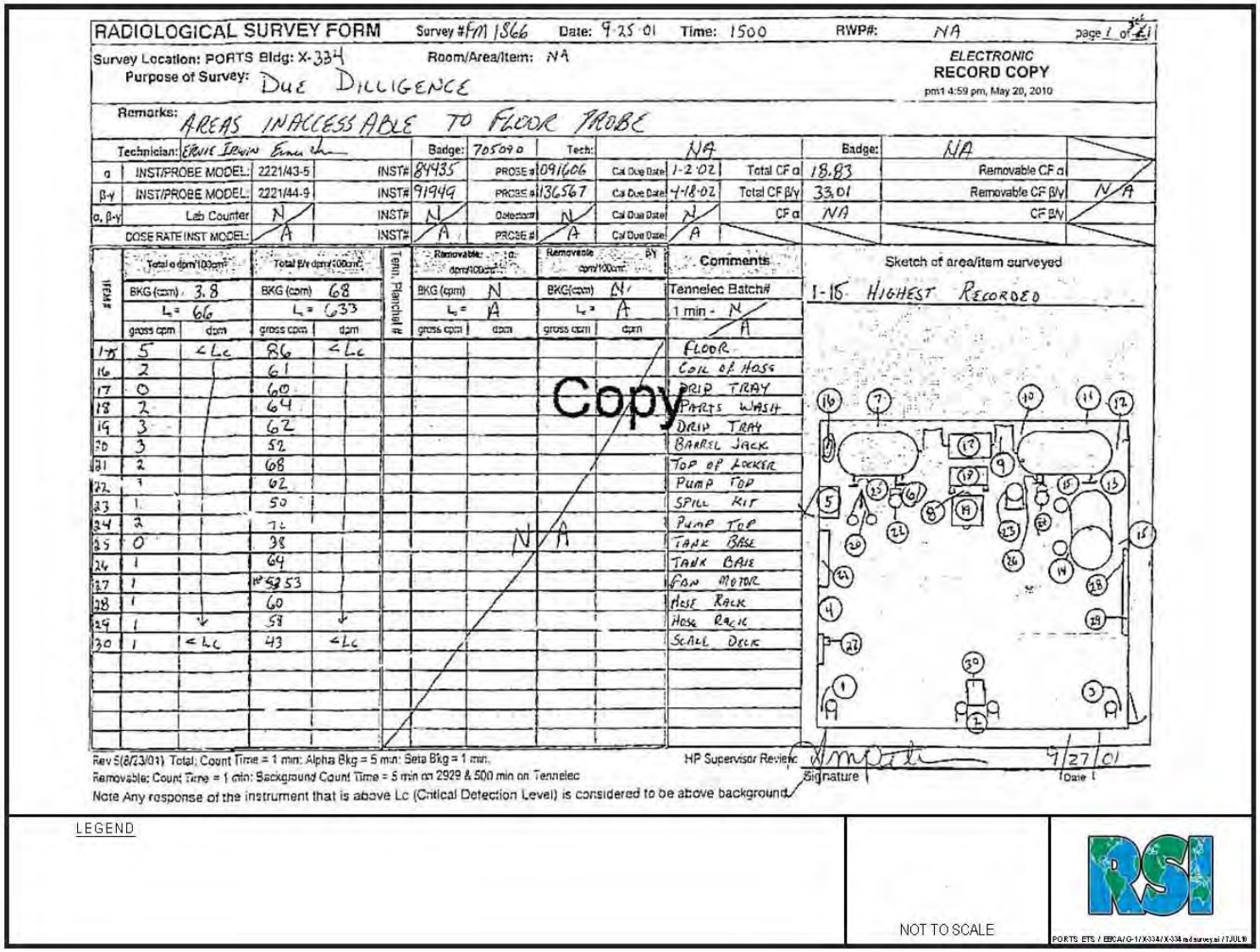


Fig. 8. Building X-334 facility radiological survey.

- Storage tanks (two 500-gallon tanks, one 500-gallon tank mounted on cart, and four 250-gallon stainless steel tanks) are labeled as PCB/radioactive contamination that were identified during a walkdown in June 2010.

- An oily coating on piping was identified during a walkdown in June 2010. The oily coating has the potential to contain PCBs based on past uses and spills in the building.

2.1.2.2.3 Building walkdown

A recent walkdown of this building was performed June 2 and 3, 2010, by Ohio EPA, LATA/Parallax Portsmouth, LLC (LPP), and Restoration Services, Inc (RSI) representatives to confirm historical information related to radiological and chemical contamination and to the building contents. The following items were confirmed:

- Paint is not chipping from the walls,
- There is pipe insulation,
- Stained areas exist on the floors,
- Area around equipment labeled as PCB spill area,
- Storage tanks with labels indicating PCB/radioactive contamination,
- Pipes/rubber hosing labeled as radioactive, and
- An oily coating on piping.

Additional sample collection is not required to evaluate removal action alternatives in this EE/CA. In the event the removal action selected for the building requires removal of the building, additional samples would be collected to support implementation of the selected removal action alternative.

2.1.2.3 Building X-344B Maintenance Storage Building

2.1.2.3.1 Building description

The X-344B Maintenance Storage Building, a prefabricated metal ~~"b~~utler building," is 120 ft long and 50 ft wide, encloses 6,000 sf on a 6-in. concrete pad, and has truck access doors in each end. The building interior is open and unobstructed for storage (DOE 1957).

This X-344B facility is located northeast of the X-344A facility, which is west of Pike Avenue and north of 20th Street. The building was constructed in 1958 and has always been used for storage and a repair shop. The north half of the building was most recently used for repair and modification of cooling tower equipment. The south half was used for roads and grounds equipment storage and materials storage. Initially, the building was used for interim storage of canisters of uranium oxides that resulted from operations in the X-344A UF_6 Sampling and Transfer Facility.

There is a restroom in the southeast corner of the building as verified by a walk down performed by USEC in July 2010. Water is supplied to the building via the X-611 Water Treatment Plant. Floor drains in the building are connected to the storm sewer. Photographs (taken June 2010) showing the external structure and some of the internal contents are shown in Fig. 9. Refer to Appendix A for additional photos (taken in June 2010) of Bldg. X-344B.

Fig. 9. Building X-344B exterior with insets of building interior.

2.1.2.3.2 Nature and extent of contamination

This section includes a summary of any known or potential radiological and chemical contamination associated with the building.

Known or potential radiological contamination. Known or potential radiological contamination located in this building includes the following:

- Fixed (sealed with epoxy paint) radiological contamination exists in various places on the concrete floor of the building.

- Tc-99 radiological contamination associated with the Tc-99 traps still located on a cart in the building.

Known or potential chemical contamination. Known or potential chemical contamination located in this building includes the following:

- ACM is present in the steam piping insulation.

- There is potential for residual chromium contamination from historic cooling tower equipment maintenance.

- There is a potential for residual pesticides, herbicides, and fungicides from historic roads and grounds maintenance (DOE 1993). Per the historical documentation (DOE 1993), the herbicides and pesticides were mixed outside the facility for application to site vegetation. Since the chemicals were handled outside the facility, herbicides and pesticides will not be carried forth as contaminants of potential concern for the interior of the building.

- Fluorescent light ballasts may contain PCBs based on the age of the building. Since there are not any documented reports of releases from the light ballasts, PCBs will not be carried forth as COPCs.

- Potential for residual contamination from the use and storage of oils, fuels, and solvents used in maintenance activities (DOE 1993). There is no evidence of residual contamination from these items; therefore, the solvents will not be carried forth as a COPC.

- While the possibility exists that waste oil may have dripped from spray nozzles of a portable tank (waste oils were removed from the X-750 Waste Oil Tank and pumped to a portable oil tank equipped with spray nozzles), there are no documented reports of spills from the tank. This portable tank was stored, temporarily, at the X-344B building until it was used to apply oil to various areas of the site for dust control. This practice was terminated in the mid-1980s (DOE 1993).

- Historical documentation (DOE 1993) indicates that interviews were performed with plant personnel who stated that the building was used as interim storage for canisters of uranium oxides (DOE 1993) that resulted from operations in the X-344A Sampling Facility. Recent walkdowns of the building indicate that these canisters are no longer present.

- Based on age of the building there is the potential for lead contamination from lead-based paint that is chipping from the walls and ceiling.

2.1.2.3.3 Building walkdown

A recent walkdown of this building was performed June 2 and 3, 2010, to confirm historical information. The following items were confirmed:

- Paint is chipping from the floor, walls, and ceiling;
- Floor has signs indicating fixed radioactive contamination;
- Tc-99 traps with signage indicating ―Caution, radiological material;"
- Floor drains exist;
- Possibility of asbestos in the pipe insulation and insulation; and
- Stained areas exist on the floors,

Additional sample collection is not required to evaluate removal action alternatives in this EE/CA. However, in the event the removal action selected for the building requires removal of the building, additional samples would be collected to support implementation of the selected removal action alternative.

2.1.3 Previous Removal Actions

None of the buildings addressed under this EE/CA have undergone any previous removal actions.

However, in August 2003, DOE performed closure activities for the 2,000-gallon kerosene tank associated with Building X-334. The closure activities are documented in *Underground Kerosene Storage Tank Closure Report 20th Street and Pike Avenue* (Easton Environmental Engineering 2003).

2.1.4 Preliminary Assessment of Releases

2.1.4.1 X-103 Auxiliary Office Building

There are no previous investigations regarding releases of contaminants from this building.

2.1.4.2 X-334 Transformer Cleaning and Storage Building

There are no previous investigations regarding releases of contaminants from this building.

2.1.4.3 X-344B Maintenance Storage Building

There are no previous investigations regarding releases of contaminants from this building.

2.1.5 Streamlined Risk Evaluation

As discussed in Sect. 2.1.2, the buildings and structures addressed in this Group 1 EE/CA are potentially contaminated with the various radioactive and nonradioactive contaminants. The following discussion includes a streamlined qualitative evaluation of the potential risks to human health and the environment from potential releases from the buildings and exposure to the contaminants.

2.1.5.1 Building X-103 Auxiliary Office Building

The primary contaminants of potential concern (COPCs) associated with the X-103 Auxiliary Office Building include lead, asbestos, and radionuclides (refer to Sect. 2.1.2.1.2). Since there is no reported or

documented evidence associated with PCB releases from the light ballast, PCBs will not be carried forth as a COPC.

Lead is a threat to human health because of its toxicity when ingested. It is also a Class B carcinogen, which means that it is a probable human carcinogen. It is toxic to the central nervous system and can cause decreased brain function; children are especially vulnerable to these toxic effects. Based on the age of the building and the multiple layers of paint, lead is anticipated to be found in lead-based paint on interior and exterior walls throughout the building. Continued deterioration of the building would likely result in flaking and peeling of paint, which has the potential for release to the environment. If released to the environment, the potential for human ingestion is increased.

Asbestos is a Class A carcinogen, which means that it is known to cause cancer based on epidemiological studies. The threat to human health is inhalation of asbestos fibers (which, if small enough and in a form that can be inhaled, are also known as friable asbestos). Asbestos is suspected to be present in the building based on visual inspections and would be confirmed during sampling conducted to support the RAWP. Asbestos-containing material is believed to be present in the thermal insulation and ceiling/floor tiles as well. If the building continues to deteriorate, the potential for the asbestos fibers to become airborne is increased and thus, the risk to human health via inhalation is increased.

Radionuclides are Class A carcinogens, which mean they are proven to cause cancer in humans via a variety of exposure pathways, depending on the specific radionuclide in question. The uranium isotopes (e.g., U-234, U-235, and U-238 in particular) cause kidney, liver, and lung cancers/tumors from direct exposure, inhalation, and ingestion. Based on the operational activities of this building, radioactivity would be possibly present in the area where the radioactive sources are located and where respirators were cleaned. If released to the environment, the potential for human exposure via inhalation, ingestion, and direct exposure is increased.

2.1.5.2 X-334 Transformer Cleaning and Storage Building

The primary COPCs associated with the X-334 Transformer Cleaning and Storage building include asbestos, radionuclides, and PCBs (refer to Sect. 2.1.2.2.2).

Asbestos is a Class A carcinogen, which means it is known to cause cancer based on epidemiological studies. The threat to human health is inhalation of asbestos fibers (which, if small enough and in a form that can be inhaled, are also known as friable asbestos). Asbestos is suspected to be present in the building based on visual inspections. Asbestos-containing material is believed to be present in the thermal insulation and ceiling/floor tiles as well. If the building continues to deteriorate, the potential for the asbestos fibers to become airborne is increased and thus, the risk to human health via inhalation is increased.

Radionuclides are Class A carcinogens, which mean they are proven to cause cancer in humans via a variety of exposure pathways, depending on the specific radionuclide in question. The uranium isotopes (e.g., U-234, U-235, and U-238 in particular) cause kidney, liver, and lung cancers/tumors from direct exposure, inhalation, and ingestion. Based on the operational activities of this building, radioactivity could be spread throughout. If released to the environment, the potential for human exposure via inhalation, ingestion, and direct exposure is increased.

The PCBs are Class B carcinogens, meaning they are probable human carcinogens. The PCBs are particularly harmful to the liver, via the ingestion exposure pathway. Based on the construction of the building, it is anticipated that PCBs are present throughout the building; they are in the fluorescent lights with PCB ballasts, and in oils containing PCBs (e.g., in transformers and storage tanks containing

PCB-oils). Continued deterioration of the building would likely result in the potential for release of PCBs to the environment. If released to the environment, the potential for human ingestion is increased.

2.1.5.3 X-344B Maintenance Storage Building

The primary COPCs associated with the X-344B Maintenance Storage building are asbestos, lead, and radionuclides (refer to Sect. 2.1.2.3.2), including Tc-99 and uranium isotopes. Whereas chromium is a COPC in water associated with the cooling towers, it will not be carried forth as a COPC for the X-344B building. Based on process knowledge, the only cooling tower equipment serviced were gear housings associated with the cooling tower fans. Due to its use within the recirculating cooling water system, only the exterior of the gear housings was exposed to the evaporative mist from the cooling towers; therefore, it is highly unlikely that the concentration of chromium on the exterior of the gear housings pose a risk to human health or environment.

Asbestos is a Class A carcinogen, which means that it is known to cause cancer based on epidemiological studies. The threat to human health is inhalation of asbestos fibers (which, if small enough and in a form that can be inhaled, are also known as friable asbestos). Asbestos is suspected to be present in the building based on visual inspections. Asbestos-containing material is believed to be present in the thermal insulation and ceiling/floor tiles as well. If the building continues to deteriorate, the potential for the asbestos fibers to become airborne is increased and thus, the risk to human health via inhalation is increased.

Lead is a threat to human health because of its toxicity when ingested. It is also a Class B carcinogen, which means it is a probable human carcinogen. Lead is toxic to the central nervous system and can cause decreased brain function; children are especially vulnerable to these toxic effects. Based on the age of the building and the multiple layers of paint, lead is anticipated to be found throughout the building in lead-based paint on the interior and exterior walls. Continued deterioration of the building would likely result in flaking and peeling of paint, which has the potential for release to the environment. If released to the environment, the potential for human ingestion is increased.

Radionuclides are Class A carcinogens, which mean they are proven to cause cancer in humans via a variety of exposure pathways, depending on the specific radionuclide in question. There is a question of whether uranium and Tc-99 are present in the building. Because Building X-344B was used to store items that could have been contaminated with Tc-99 and uranium, these two contaminants could be widely spread throughout Building X-344B. Tc-99 is a beta emitter which means it is particularly harmful to the lungs via the inhalation pathway. The uranium isotopes (e.g., U-234, U-235, and U-238 in particular) cause kidney, liver, and lung cancers/tumors from direct exposure, inhalation, and ingestion. If released to the environment, the potential for human exposure via inhalation, ingestion, and direct exposure is present.

2.1.5.4 COPCs, Toxicity Information, and Exposure Pathways of Concern

The primary COPCs (see Table 1) associated with these Group 1 buildings are anticipated to be present on the surfaces and/or embedded in the structural materials of the buildings (e.g., concrete flooring). As is typical with the demolition of industrial structures, hazardous substances, including asbestos insulation and siding, lead paint on surfaces, radiological contaminants in the concrete and siding, and PCBs associated with building materials, are potentially present in the buildings.

Table 1. Health data on the primary contaminants of potential concern for D&D of Group 1 buildings at PORTS

Contaminant of potential concern	Carcinogen class[a]	Human health exposure: primary pathway(s) of potential concern	Primary target organ(s) (for systemic and/or cancer effects)	Reference for carcinogen class and target organs
Asbestos	A	Inhalation	Lung, asbestosis	IARC 1994; NIH 2008
Lead	B1	Ingestion, inhalation	Central nervous system, bone, kidney, neuropsychological impairment	EPA 1989; ATSDR 1993; NIH 2008; IARC 1994
PCBs	B1	Ingestion, inhalation, dermal	Liver, hepatocellular tumors,	IARC 1994; NIH 2008
Technetium-99 (Tc-99)	A	Ingestion, inhalation, external exposure to radiation	Lung, thyroid, gastrointestinal	IARC 1994; NIH 2008
U-234	A	Inhalation, ingestion	Lung	NIOSH 2010
U-235	A	Ingestion, inhalation, external exposure to radiation	Kidney, lung, tumors, brain, liver, reproductive effects	NIOSH 2010
U-238	A	Ingestion, inhalation, external exposure to radiation	Kidney, lung, tumors (kidney, brain, liver), reproductive effects	NIOSH 2010

[a]Class A = human carcinogen; Class B1 = probable human carcinogen with limited human data, B2 = probable human carcinogen with sufficient evidence in animals; Class C = possible human carcinogen; Class D = not classified; and Class E = not a human carcinogen (EPA 1989).

ATSDR = Agency for Toxic Substances and Disease Registry
EPA = U.S. Environmental Protection Agency
IARC = International Agency for Research on Cancer
NIH = National Institutes of Health
NIOSH = National Institute for Occupational Safety and Health
PCB = polychlorinated biphenyl

Table 1 summarizes the potential carcinogenic effects (e.g., types of cancer) and systemic effects (e.g., other non-cancerous adverse effects to specific organs and systems) on human health, and the primary exposure pathways to be the most concerned with associated with exposure to these COPCs.

Security controls, including administrative and physical access controls, are currently in place to limit unauthorized entrance to these structures and ensure that only appropriately trained and authorized personnel should be allowed entrance. These institutional controls reduce the potential for direct contact with and exposure to the hazardous substances.

However, institutional controls will not prevent deterioration of the buildings or eliminate the threat of release of hazardous substances to the environment. As the buildings continue to age, the threat of release of radiological and hazardous substances increases with time, and it becomes more difficult to contain these materials and prevent a release to the environment. Radiological and hazardous substances could be released directly to the environment, for example, via a breach in a containment wall, roof, or other physical control as the buildings age and deteriorate. The exposure pathways of potential concern to human health (Table 1) include inhalation, ingestion, dermal/direct contact, and external exposure to radionuclides.

2.1.6 Federal, State, and Local Applicable or Relevant and Appropriate Requirements and To Be Considered

The applicable or relevant and appropriate requirements (ARARs) and to-be-considered (TBC) guidance anticipated to apply to activities to be evaluated under the removal alternatives are presented in Appendix B of this EE/CA.

Applicable requirements are ~~"t~~hose cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site" [53 *Federal Register* (*FR*) 51435, December 21, 1988; 40 *CFR* 300.5].

Relevant and appropriate requirements are ~~"t~~hose cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site" (53 *FR* 51436; 40 *CFR* 300.5).

In addition to ARARs, there are other advisories, criteria, or guidance to be considered for a particular release that were developed by the U.S. Environmental Protection Agency (EPA), other federal agencies, or states that may be useful in determining CERCLA remedies or cleanup levels that are protective of human health and the environment in the absence of ARARS. These are called TBC guidance. An example of TBC guidance is DOE Order 5400.5.

Requirements under federal or state law may be either applicable, or relevant and appropriate to CERCLA cleanup actions, but not both. However, requirements must be both relevant and appropriate for compliance to be necessary. In cases where both a federal and a state ARAR are available, or where two potential ARARs address the same issue, the more stringent regulation must be selected.

The CERCLA remedial and removal actions conducted entirely on-site, as defined in 40 *CFR* 300.5, must comply with the substantive provisions of laws and regulations that qualify as ARARs, but not procedural or administrative requirements. Consequently, under CERCLA Sect. 121(e), 42 United States Code (USC) 962(1)(e)(1), remedial actions are not required to obtain federal, state, or local permits in order to conduct on-site response actions. To ensure CERCLA response actions proceed as rapidly as possible, EPA has reaffirmed this position in the final NCP (55 *FR* 8756, March 8, 1990). Substantive requirements directly pertain to the actions or conditions at the site, while administrative requirements facilitate their implementation (e.g., applying for permits, recordkeeping, consultation, inspections, and reporting). It is the intent of DOE to meet the substantive requirements of appropriate federal and state regulations in accordance with ARARs.

The DFF&O for PORTS requires that, when DOE proposes a removal action regulated under CERCLA that, in the absence of CERCLA Sect. 121(e)(1) and the NCP, would require a permit, DOE must identify the Federal and State permits that would otherwise be required, identify the substantive requirements, standards, criteria, or limitations that would be required under that permit process, and explain how the proposed action will meet these standards. These permits have been identified in Sect. 5.2.1 of this EE/CA.

3. REMOVAL ACTION SCOPE, OBJECTIVES, AND SCHEDULE

This chapter summarizes DOE response authority and statutory limits under CERCLA for D&D actions, removal action justification, removal action scope and objectives, and planning schedule for D&D of the buildings addressed in this EE/CA.

Section 104 of CERCLA addresses the response to releases or threats of release of hazardous substances through removal actions. Executive Order 12580, ―Superfund Implementation," delegates to DOE the response authorities for DOE buildings. As lead agency, DOE is authorized to conduct response measures (e.g., removal actions) under CERCLA. A response under CERCLA is appropriate when (1) hazardous substances are released or there is a substantial threat of such release into the environment or (2) there is a release or substantial threat of release into the environment of any pollutant or contaminant, which may present an imminent and substantial danger to the public health or welfare. The DOE and U. S. Environmental Protection Agency (EPA) have issued a joint policy statement (DOE and EPA 1995) stating that building D&D activities should be conducted as CERCLA non-time-critical removal actions unless circumstances at the building make it inappropriate. The DFF&O also provides that D&D for certain identified buildings at the PORTS will be conducted as CERCLA non-time critical removal actions.

The National Environmental Policy Act of 1969 (NEPA) requires all federal agencies to consider the possible effects (both adverse and beneficial) of their proposed activities before taking action. DOE has issued a Secretarial Policy Statement on NEPA (DOE 1994) that states DOE will hereafter rely on the CERCLA process for review of actions to be taken under CERCLA and will address and incorporate NEPA values in CERCLA documents to the extent practicable. Such values may include socioeconomic, historical, cultural, ecological, aesthetic, and health effects, both short-term and cumulative, as well as environmental justice issues, land use issues, and the impacts of off-site transportation of wastes. Guidance states that NEPA values will be incorporated to the extent practicable, with more attention given to those aspects of the proposed action having the greater anticipated effects. In keeping with this policy, NEPA values have been incorporated into this EE/CA.

3.1 REMOVAL ACTION JUSTIFICATION

The buildings addressed in this EE/CA and their contents have the potential to present risks to human health and the environment due to building deterioration and release of building contents. DOE no longer has an operational need for the buildings and routine maintenance has ceased. The potential for health and safety threats to workers will increase over time as deterioration continues. For example, the potential for asbestos release and exposure will increase as the panels, tiles, and protective coverings of ACM in the buildings deteriorate. The release of building contents from the buildings also might impact ecological receptors via surface water migration if contaminants were released due to building deterioration.

Per the known or potential contamination described in Sect. 2.1.2, the following is possible:

- Building X-103 contains contaminants within the building structural components, paint, and insulation that would increase risk to human health and the environment if they are released into the environment. Contaminants that could be released from the X-103 building include the following:
    - Radiological contamination,
    - Asbestos from the insulation, and
    - Lead from painted surfaces.

- Building X-334 contains contaminants within tanks, hoses, or other components or structures that would increase risk to human health and the environment if they are released into the environment. Contaminants that could be released from the X-334 building include the following:

    - Radiological contamination from items labeled as radioactive and from storage tanks labeled as PCB/radioactive, if leakage has occurred;

    - PCB contamination from tanks labeled as PCB and PCB/radioactive, if leakage has occurred;

    - Pipe insulation containing asbestos; and

    - PCB contamination on the floor due to known PCB spills.

- Building X-344B contains contaminants within insulation, on the floors, or other components or structures that would increase risk to human health and the environment if they are released into the environment. Contaminants that could be released from the X-344B building include the following:

    - Asbestos from pipe insulation;
    - Lead from painted surfaces; and
    - Radiological contamination associated with the concrete floor, and Tc-99 traps.

Based on these potential risks, a non-time critical removal action is appropriate because it would prevent, minimize, or eliminate potential and actual risks posed by the potential release or threat of release of hazardous substances, pollutants or contaminants [40 *Code of Federal Regulation* (*CFR*) 300.415(b)(2)(i), (v), (viii)] should the buildings continue to deteriorate.

3.2 REMOVAL ACTION SCOPE AND OBJECTIVES

The scope of the recommended non-time-critical removal action alternative would include addressing the building contents, structures, and concrete slabs/foundations. Per the DFF&O, D&D activities include dismantlement, demolition, and removal of equipment, structures, piping, building contents, and concrete foundations. Only those soils incidental to the removal of the slab and foundation or which otherwise must be excavated as part of the D&D process would be removed as part of the recommended non-time critical removal action.

Based on the building descriptions and potential hazards identified in Section 2, the following removal action objectives (RAOs) have been identified in the DFF&O and developed for this removal action and form the basis for identifying and evaluating appropriate response actions:

- **Determine the viability of building reuse.** Does building reuse have a reasonable chance of succeeding taking into account factors that include the following:

    - Nature and extent of contamination,

    - Physical condition of the building(s)/structure(s),

    - Costs associated with bringing the building(e)/structure(s) into compliance with applicable standards and codes,

    - Past use/operations,

- Location, or

- Any identified future need or use

  Per the DFF&O, if reuse is determined to be viable, a removal action alternative for the building/structure reuse would be included in the EE/CA. If reuse is determined not to be viable, the EE/CA must specifically state that reuse is not viable, provide an explanation supporting that determination, and the EE/CA will not include a removal action alternative for building/structure reuse. The determination of whether reuse is a viable removal action alternative is provided in Section 4.1.2 of this EE/CA.

- **Meet ARARS to the extent practicable**. In accordance with Sect. 300.415(j) of the NCP, on-site removal actions conducted under CERCLA are required to attain ARARs to the extent practicable considering the exigencies of the situation.

- **Be protective of relevant receptors.** The removal action alternative must be protective of human health and safety and the environment and protect against the release or threat of release and migration of contaminants to the air, surface water, and soil.

- **Be cost effective**

3.3 REMOVAL ACTION PLANNING SCHEDULE

Separate RAWPs would be prepared for each of the buildings discussed in this EE/CA. For planning purposes, it is noted that if the AM for this EE/CA selects the removal action alternative requiring the removal of the building and the associated concrete slab, the field activities would be performed in two phases and a separate RAWP would be prepared for each phase. The initial RAWP for each building would include Phase I removal action activities (removal of the structures, equipment, materials, stabilizing slab (applying fixative/sealant, if needed), etc.) and a subsequent Phase II RAWP for each building would address removal of the slab and underground structures such as underground utilities in each building within the designated building footprint.

Per requirements of the DFF&O, DOE would submit the Phase I RAWPs to Ohio EPA for review and concurrence within 90 days of DOE receiving Ohio EPA concurrence on the AM unless otherwise mutually agreed to in writing by the parties. Subsequently, DOE would prepare the Phase II RAWP for each of the buildings within 90 days from the time DOE determines that DOE has funding to proceed with Phase II activities.

The removal action planning schedule for the buildings addressed in this EE/CA, which identifies proposed durations of activities leading to project completion, is provided for informational, non-enforceable purposes only and is presented in Table 2. Per the DFF&O, the planning schedule reflects a 30-day public comment period for the EE/CA. The remainder of the planning schedule identifies the field tasks and anticipated duration for project completion. The actual project schedules for the Group 1 buildings will be included in the Phase I RAWPs and will be subject to Ohio EPA review and approval.

Table 2. Generic Phase 1 planning schedule for Group 1 buildings

Activity	Projected start date	Projected Duration
Mobilization	Within 90 days of receipt of State of Ohio concurrence with RAWP	1 week
Building Preparation and Demolition of Superstructure	2 days after equipment removal completion	8 weeks
Site restoration	2 days after demolition completion	2 weeks
Phase I field work completion	160 days after receipt of State of Ohio concurrence with RAWP	
Submit Phase I Removal Action Completion Report	150 days after completion of Phase I field work and receipt of all validated data.	

The Phase I removal action schedule is based upon assumptions that organizations perform reviews within the requested review times and that comment resolution is reached in a timely manner. The schedule would be revised to reflect any deviations from the assumptions.

The Phase II removal action schedule would be provided in the Phase II RAWP.

4. DEVELOPMENT OF REMOVAL ACTION ALTERNATIVES

This chapter summarizes the identification and screening of technologies and the development of the removal action alternatives for D&D of the buildings addressed in this EE/CA.

4.1 REMOVAL ACTION ALTERNATIVES

4.1.1 Identification of Removal Technologies and Process Options

This section identifies technologies and disposal options available based on site-specific conditions, contaminants, affected media, and anticipated activities. Technologies for building dismantlement and size reduction were identified based on their ability to meet RAOs, provide safety to workers, feasibility of the technology under site-specific conditions, and ability to provide radiological control of the D&D activity. Disposal options for waste streams that would be generated from D&D activities are also presented.

4.1.1.1 Building dismantlement and size-reduction technologies, including pipe/utility separation/disconnection/sealing and lead-based paint/asbestos removal

Multiple dismantlement and size-reduction technologies exist that could be used in performing a removal action for the buildings. The dismantlement and size-reduction technologies that are considered for this removal action are identified in Table 3, which provides a description of the technologies and a discussion of their applicability and limitations. Dismantlement technologies include conventional disassembly using hand tools, circular cutters, hydraulic shears, oxyacetylene torches, and heavy machinery, including excavators with various processing heads (e.g., grappler, shear, cracker jaw, concrete breaker, etc). Size-reduction technologies include compaction and shredding (tearing into strips). Any or a combination of these technologies could be used for dismantlement/size-reduction depending upon the properties of material being removed.

The technologies considered for removal of lead-based paint, dust, and asbestos are dusting, scrubbing, vacuuming, and wiping. Any or a combination of these technologies could be used for the removal of paint, dust, and asbestos depending upon the properties of material from which they are being removed.

The technologies considered for sealing floor drains and open piping include check valves, expandable plugs, and pipe end caps. Any or a combination of these technologies could be used for sealing floor drains and open pipe.

The RAWP for each of the buildings discussed in this EE/CA would provide the details for determining which technology to use on the various types of materials within each specific building.

Table 3. Description and evaluation of structure dismantlement, size-reduction technologies, pipe/utility separation/disconnection, and lead-based paint/asbestos removal

Technology	Description	Applicability	Limitations	Comments
Conventional disassembly	Hand-held tools and saws; used for hand removal of nuts and bolts, disconnection of piping (including floor drains), and modifications of utility conduits to form an air gap	May be applied to any area, including utility piping and floor drains	Labor intensive and slow; recommended for limited application.	No additional worker training required; rotary saws, grinders and other high-speed mechanical tools would produce airborne particulates and fines that may need to be collected; if applicable, verify utilities have been tagged per lock-out/tag-out procedure before being disconnected.
Heavy machinery	Excavators with various processing heads such as grappler, shear, cracker jaw, concrete breaker, etc.	Cut 0.6-cm-(1/4-in.)-thick steel (large-diameter pipe, structural steel, tanks), shear wooden support structures or siding; reduce concrete to rubble	Depending on processing head used, pipe ends may be pinched, requiring further processing before decontamination, treatment, or disposal; eliminates airborne contamination associated with thermal cutting processes	If applicable, verify utilities have been tagged per lock-out/tag-out procedure before being disconnected
Oxyacetylene torch	Oxygen and fuel gas mixed ignited at the tip of a torch; metal heated to 816°C (1500°F) is burned away	Very effective in cutting carbon steel; depth of cut up to 10 to 15 cm (4 to 6 in.); cutting speed up to 76 cm/min (30 in./min); common technique for structural carbon steel member disassembly	Alloys uranium with the metal; however, generally does not affect cutting operation	Not recommended for aluminum or stainless steel due to formation of refractory oxides; additional worker protection may be required if torch is used to cut metals that have PCB coatings
Electric and pneumatic tools	Circular saws, porta-band saws, air impact wrenches, etc.	Cut metal pipes, wooden structural members	Clearance requirements have to be evaluated to determine most appropriate tool; thickness of target will determine effectiveness	Safety concerns: • Lacerations from blades, jagged metal, or splintering wood/siding • Flying particles from metal, wood, or transite shavings • Ergonomics/body postures from use of cutters • Noise exposures

Table 3. Description and evaluation of structure dismantlement, size-reduction technologies, pipe/utility separation/disconnection, and lead-based paint/asbestos removal (continued)

Technology	Description	Applicability	Limitations	Comments
Electric and pneumatic tools (continued)				• Metal fumes from dusts of metal cuts • If applicable, verify utilities have been tagged per lock out/tag out procedure before being disconnected
Compaction (crushing) and super compaction	Compresses wastes using hydraulic mechanical technology to achieve volume reduction	Scrap metal, concrete, glass, rubble, plastic material, rubber, paper, and cloth	Limited to compressible wastes; super compactors operating at 29,000 to 150,000 kilopascal (kPa) [4,000 to 22,000 pounds per square in. (psi)] required to compact most items	Greatly reduces the volume of reactors, tanks, etc.; volume reduction factors of 4 to 5 can be achieved for scrap metal resulting in densities as high as 150 lb/ft^3
Sealing piping and/or floor drains using check valves, expandable plugs, and pipe end caps	After disconnection of pipe by mechanical means, pipe end will be sealed	May be applied to any disconnection [i.e., floor drain, pipe conduit (air gaps)]	Labor intensive and slow; if pipe ends are pinched, will require additional processing to establish a seal	Verify utilities have been tagged per lock-out/tag-out procedure before being disconnected
Shredding	Shreds waste to provide waste volume reduction	Waste materials with large void spaces and thin metals	Waste size restrictions for most shredders [>3.175 cm (>1.25-in.) rebar, 3.75 cm (1.25-in.) steel cable, and 10 cm (4.0-in.) Schedule 40 pipe]; primarily for metal wastes	Not recommended due to limitations on size of material that can be shredded
Dusting/scrubbing/vacuuming/ wiping	Physical removal of dust, dirt, and loose surface contamination by common cleaning techniques	Removal of various types of contamination from a variety of surfaces, including lead-based paint chips and asbestos	Labor intensive, which causes high potential for worker exposure; wiping should not be used on porous or absorbent surfaces	Appropriate for most items where loose contamination could spread; vacuuming performed using HEPA filters

HEPA = high-efficiency particulate air
PCB = polychlorinated biphenyl

4.1.1.2 Concrete slab decontamination, stabilization, and removal technologies

Multiple decontamination and stabilization technologies exist for the concrete slabs if a removal action is chosen that requires the removal of the slab at some later time after the structures are removed. The technologies considered for the concrete slabs that would be removed after the structures are torn down are identified in Table 4, which provides a description of the technologies and a discussion of their applicability and limitations. Technologies for decontamination of the concrete include scabbling, sponge blasting, and abrasive blasting.

Table 4. Description and evaluation of concrete slab decontamination, stabilization, and removal technologies

Technology	Description	Applicability	Limitations	Comments
Encapsulation	Fixes wastes by encasement in low-solubility solid matrix	Used for wastes that are unstable	Increases volume and mass of waste	Reduces potential for leaching to groundwater
Applying fixative stabilizer coatings	Application of paints, films, and resins used as coatings to fix and stabilize contaminants in place	Stabilizes PCBs and radioactive contamination	No removal of contaminant is achieved; experiments to ensure effectiveness of stabilizer generally are required due to site-specific requirements	Also useful for containment of contaminants on transite siding or other building materials
Scabbling	Uses physical means (steel shot, steel rods, carbide cutters, etc.) to loosen and remove surface contamination	Effective on flat, shatterproof surfaces (concrete)	Effective for near surface contamination; creates additional waste	Highly effective for removal of surface layer of concrete, technology readily available, and dust can be suppressed
Sponge blasting	Uses a sponge grit suspended in an air spray to loosen and remove surface contamination	Effective on flat, shatterproof surfaces (concrete, aluminum, steel, and painted or coated surfaces) and on hard to reach areas such as ceilings	Effective for near-surface contamination; creates additional waste	Sponge grit can be recycled

Table 4. Description and evaluation of concrete slab decontamination, stabilization, and removal technologies (continued)

Technology	Description	Applicability	Limitations	Comments
Abrasive blasting	Uses an abrasive media (sand, glass beads, grit, or CO_2 pellets) suspended in an air spray to loosen and remove surface contamination	Effective on flat, shatterproof surfaces (concrete, aluminum, steel, and painted or coated surfaces) and on hard to reach areas such as ceilings	Effective for surface contaminants up to 0.64 cm (0.25 in.) deep depending on abrasive technique; creates additional waste; slow, labor-intensive technique that causes high potential for worker exposure	Can produce substantial amount of contaminated dust; appropriate for items that can be effectively decontaminated for reuse or ~~"c~~lean" disposal; CO_2 minimizes additional waste streams
Destruction and removal	Jackhammers that are hand held or mounted to a backhoe may be used to break up concrete; standard construction equipment may be used for removal	Applicable for reducing the size of large pieces of concrete	No removal of contaminant is achieved; slow, labor-intensive technique that increases potential for worker exposure (metal cutting methods may be required if rebar is present)	Technology and equipment are readily available, highly effective for removal; can produce substantial amount of contaminated dust, but dust can be suppressed

PCB = polychlorinated biphenyl

The technology for stabilization includes the application of fixative/stabilizer coatings (such as latex paints, gums, or resins) to keep in place any contamination found on the concrete slabs. Any or a combination of these technologies could be used to remove contamination initially and fix any remaining contamination to the concrete floor in any of the buildings addressed in this EE/CA. For example, scabbling could be used to remove contamination from the floor and then a fixative could be applied to the concrete floor to mitigate release of any remaining contaminants to the environment, if the concrete slabs were not removed at the time the building structures were removed. The RAWP for each of the buildings discussed in this EE/CA would provide the details for determining which technology to use on the various types of materials within each specific building.

4.1.1.3 Waste containerization options

It would be necessary to containerize the waste generated during D&D activities for transportation and/or disposal. A large variety of containers are available that would be appropriate for the different waste streams generated depending on which technology identified in Sects. 4.1.1.1 and 4.1.1.2 is applied. The types of containers most appropriate for this removal action include, but would not be limited to, gondolas, Sealand, intermodal, roll-off boxes, ST-boxes (B-25), steel drums, and polyethylene drums. Due to the potential variety of waste that would be generated from the D&D activities, it is possible that multiple container options would be used during implementation of the removal action. Depending upon the waste type, the containers would be used to contain the waste for transport to the disposal facility for direct placement into the disposal facility or the waste would be removed from the container and placed into the disposal facility or dumped directly from the transport container into the disposal facility. The

RAWP for each of the buildings discussed in this EE/CA would provide the details for determining which containerization technology to use for the various types of waste streams within each specific building.

4.1.1.4 Waste disposal options/waste streams

The DOE plans to ship all but one of the waste streams that would be generated from the D&D of the buildings addressed under this EE/CA to appropriate off-site facilities for disposal. The one exception is liquid decontamination wastewater that would be sampled and disposed of via an on-site treatment facility or National Pollutant Discharge Elimination System (NPDES) outfall in consultation with Ohio EPA. Sufficient off-site waste disposal capacity is available for the waste streams expected to be generated by the D&D activities. The RAWP would evaluate existing data and, where necessary, requires additional sampling and analysis to ensure sufficient characterization to confirm wastes meet applicable off-site disposal facility waste acceptance criteria (WAC) and to support project waste disposition determinations.

A listing of anticipated potential waste streams and estimated waste volumes is presented in Table 5. Volumes were taken from the Project Time and Cost CD-1 Scenario III estimate. Process knowledge and building specifications (e.g., building dimensions, materials of construction) for each building were used to estimate the volumes of the various materials (asbestos, concrete slab, below-grade materials, and building contents) that would be generated during the D&D activities. Sanitary waste volumes include volumes from the roof, concrete slab, exterior walls, interior walls/partitions, and soil. Actual square footage and appropriate building dimensions were used in calculating the volumes for roof, slab, exterior walls, and soil. Toxic Substances Control Act of 1976 (TSCA) volumes were generated using the number of transformers associated with the building and using the height, width, and length of the transformers to get the total TSCA volume. The asbestos volumes were calculated using information for pipe insulation and ceiling tile.

Table 5. Anticipated solid waste volumes for Group 1 EE/CA

Facility	Waste types (volume in cf)						Total volume (cf)
	LLW	MLLW	RCRA[a]	TSCA	Sanitary	Asbestos	
X-103				318	58,968	2,295	61,581
X-334				1,236	20,903		22,139
X-344B	1,024			388	36,510	812	38,734
Total	**1,024**	**0**	**nominal**	**1,942**	**116,381**	**3,107**	**122,454**

Source: "Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Estimate Scenario III, Off-Site Disposal without Size Reduction," as presented in the *Draft Final Cost and Schedule Summary Report Scenarios I – VI*, dated June 30, 2006, prepared by the U.S. Army Corps of Engineers – Huntington District and Project Time & Cost, Inc., TLG Services, Inc., and Project Enhancement Corporation.

[a]A small volume of universal waste will be generated.

EE/CA = Engineering Evaluation/Cost Analysis
LLW = low-level waste
MLLW = mixed (radioactive) low-level waste
RCRA = Resource Conservation and Recovery Act of 1976
TSCA = Toxic Substances Control Act of 1976

Although a variety of waste streams would be generated, the primary waste streams from D&D activities are expected to consist of construction/removal debris. As shown in Table 5, the greatest percentage of waste anticipated to be generated from each building is sanitary waste. Approximately 95% of the total waste volume generated is expected to be sanitary waste with the remaining 5% of the total volume consisting of asbestos and LLW.

As depicted in Table 5, DOE does not anticipate that wastes such as nonradioactive RCRA and/or mixed waste sludges or liquids (decontamination wastes, drained liquids from equipment or pipe, etc.) would be generated and does not anticipate any on-site treatment would be necessary for this non-time-critical removal action. However, in the unlikely event that such waste were to be encountered during D&D activities and/or on-site treatment becomes necessary, DOE would consult with the Ohio EPA and perform any such on-site treatment in accordance with ARARs to ensure any wastes requiring such treatment meet all WAC for the receiving disposal facility and LDRs prior to disposal.

Any liquid wastes generated during decontamination would be sampled prior to its release to an on-site groundwater treatment facility or NPDES outfall. Analytical data would be collected and reviewed with Ohio EPA prior to discharge through the NPDES permit to ensure compliance with the permit.

Any liquid wastes, other than decontamination liquids, generated as a result of draining pipe lines, equipment, etc. would be disposed at a permitted commercial disposal facility.

4.1.1.5 Off-site disposal

The types of off-site facilities used for disposal would depend on the nature of the waste generated. Process knowledge for the buildings addressed in this EE/CA indicates that the waste anticipated to be generated by the removal action requiring removal of the buildings would primarily consist of sanitary construction debris, which comprises approximately 95% of the anticipated waste volume, and low level or asbestos waste, which is estimated to be 5% of the anticipated total waste volume. The RAWP would provide details of the process the project would use in determining which off-site disposal facility [Nevada National Security Site (NNSS) and Energy*Solutions*] is most appropriate for a given waste stream.

The following section discusses the types of wastes anticipated to be generated during D&D activities and identifies which off-site disposal facilities could be used to dispose of those wastes that meet the applicable WAC.

4.1.1.6 Summary of disposal options

The various waste streams anticipated to be generated during performance of D&D activities at the buildings addressed in this EE/CA is listed in Table 6, if a removal action requiring removal of the buildings is selected.

The LLW waste stream would be disposed at NNSS, Energy*Solutions,* and/or another licensed, permitted commercial disposal facility eligible to receive such waste.

Mixed waste and RCRA waste would be treated, if necessary, to meet RCRA LDRs prior to disposal at NNSS, Energy*Solutions, Clive, Utah* or another permitted, commercial disposal facility eligible to receive such waste.

Radioactive ACM would be disposed at NNSS, Energy*Solutions,* and/or another permitted, commercial disposal facility eligible to receive such waste.

Any nonradioactive ACM or nonradioactive, nonhazardous solid wastes generated would be disposed at a permitted, commercial Subtitle D facility, or another permitted commercial disposal facility eligible to receive such waste.

Table 6. Summary of disposal options for D&D wastes

Facility	Non-rad ACM/ sanitary waste	LLW	MLLW	Rad ACM/ LLW	TSCA/ LLW waste	Liquid decontamination waste	Liquid waste
Energy*Solutions*		X	X	X	X		
DOE NNSS		X	X	X	X		
PORTS on-site groundwater treatment facility/existing outfall						X	
Other permitted commercial facilities	X	X	X	X	X		X

Note: All waste accepted at Nevada National Security Site and Energy*Solutions* must be radiological waste.

ACM = asbestos-containing materials
D&D = decontamination and decommissioning
DOE = U.S. Department of Energy
MLLW = mixed low-level waste (Resource Conservation and Recovery Act of 1976/LLW)
LLW = low-level waste
NNSS = Nevada National Security Site
TSCA = Toxic Substances Control Act of 1976

Any liquid decontamination waste generated would be sampled prior to its discharge via an on-site treatment facility or NPDES outfall in consultation with Ohio EPA. Any non-decontamination liquid waste generated would be disposed at a permitted, commercial disposal facility.

4.1.2 Development of Removal Action Alternatives

A reuse alternative was considered for the buildings addressed in this EE/CA. The buildings in their present condition contain materials or items (lead-based paint, radiological contamination, PCB contamination, asbestos) that pose a potential risk to human health and the environment. To remove the threat of release of potential contamination into the environment and be protective of human health, the reuse alternative would include removing the contents of the building, decontaminating the building structures to address contaminants of potential concern, disposing of any wastes generated, and renovating the building to meet present-day building codes to support potential reuse. Any renovations made to the buildings would have to meet or exceed goals set forth in *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*, Executive Order 13423 Sect. 2(f). Considering the ages of the buildings (two are more than 50 years old and the other is 25 years old), renovations to meet the criteria of the Executive Order would include, but not be limited to, installation of new wiring, incorporating energy efficient electrical components, energy efficient lighting, and energy efficient heating, ventilation, and air conditioning equipment.

Building X-103, Auxiliary Office Building, was used last as an office building. Therefore, reuse costs were based on renovating the building to be used as a future office building. Renovation costs to meet the standards set forth in Executive Order 13423 are estimated to be $3,200,000. These costs are based on installation of new wiring; energy efficient lighting; energy efficient heating, ventilation, and air conditioning (HVAC) equipment; engineering design input; roofing upgrades; and other miscellaneous items (e.g., decontamination of the building, repainting the interior of the building). All costs presented in this EE/CA are in unescalated 2009 dollars.

Building X-334, Transformer Cleaning and Storage Building, was used as a storage building, therefore reuse costs were based on renovating the building to be used as a future storage building (steel-framed metal frame). Renovation costs to meet the standards set forth in Executive Order 13423 are estimated to be $1,000,000. These costs are based on installation of new wiring, energy efficient lighting, energy efficient HVAC equipment, engineering design input, roofing upgrades, and other miscellaneous items (e.g., decontamination of the building, repainting the interior of the building).

Building X-344B, Maintenance Storage Building, was used as a storage/warehouse building, therefore, reuse costs were based on renovating the building to be used in the future as a storage building (Butler-type). Renovation costs to meet the standards set forth in Executive Order 13423 are estimated to be $3,200,000. These costs are based on installation of new wiring, energy efficient lighting, energy efficient HVAC equipment, engineering design input, roofing upgrades, and other miscellaneous items (e.g., decontamination of the building, repainting the interior of the building).

Total renovation costs for the three Group 1 EE/CA buildings are estimated to be $7,400,000.

Additionally, DOE used the excess building screening process for excess property to determine if other governmental organizations had an interest in using the buildings. A *Request Screening for Disposition of Real Property* was completed and forwarded to DOE Headquarters Office of Engineering and Construction Management for assessment of the government's interest in the buildings. DOE did not receive any request or interest from other governmental organizations to use the buildings, therefore, no reuse functions for these Group 1 buildings have been identified.

Based on the renovation costs and the fact that no interest was shown from other organizations or businesses to reuse the buildings, the reuse alternative of these buildings is not a viable alternative and will not be developed for evaluation as a removal action alternative. DOE, however, has identified two other alternatives that are being carried forward for evaluation to address the RAOs specified in Sect. 3.2. These removal alternatives are listed below and summarized in Sects. 4.1.2.1 and 4.1.2.2.

- Alternative 1 – No Action; and
- Alternative 2 – Remove and Dispose of Building Contents, Structures, and Concrete Slab.

4.1.2.1 Alternative 1 – No Action

CERCLA requires a no action alternative to be included as a baseline for comparison to the other removal action alternative. In the no action alternative, the buildings would be left in their current condition, existing controls that limit public and worker access to the on-site buildings would be maintained, no new controls would be implemented, support systems (e.g., fire protection) would be maintained in an operable condition, periodic S&M (e.g., grounds keeping, light bulb replacement) activities would continue, no major repairs or modifications to the facilities would be undertaken, limited deactivation activities likely would be performed as part of other programs to isolate the building from major utility feeds (e.g., water and electric), the buildings would deteriorate, and D&D would not be performed on the buildings.

4.1.2.2 Alternative 2 – Remove and Dispose of Building Contents, Structures, and Concrete Slab

In this alternative, D&D activities would be performed on the buildings, including, but not limited to, the removal of the building structures and all contents, the disposal of the structures/contents in appropriate off-site disposal facilities, and removal and disposal of the concrete slab and foundations. Removal of the contents and internal utilities would be sequenced to facilitate dismantling of the building structures. The specific order in which the systems would be removed from service and dismantled would be determined

during the design phase. In addition, engineering controls would be in place to help prevent fugitive dust emissions and stormwater runoff during demolition. DOE anticipates that under Alternative 2, D&D activities would be completed in two Phases. Phase I would address removal and disposal of the building structures and all contents, and Phase II would include removal and disposal of the concrete slab and underground structures beneath the slab within the designated footprint of each building.

Key components of this alternative include the following:

- Building contents would be removed.

- Potential waste streams would be identified and characterization data collected, if needed, to support selection of a disposal location.

- In Phase I, building structures would be removed and disposed. Appropriate measures (e.g., spraying water (mist) directly onto the structure) would be taken to mitigate the release of any contaminants of concern, fugitive dust, or other contaminants during this operation. If not performed as a pre-D&D activity, a fixative/sealant would be applied, if necessary, to the slab of each building following the removal of the building. The fixative/sealant would serve to fix contaminants in place and mitigate the potential for runoff pending final slab removal. The wastes generated by disassembly/removal of the structures would be segregated, if necessary, based on pre-D&D waste characterization sampling. Based on existing data, it is assumed that no decontamination or treatment would be required beyond any treatment that might be necessary to meet land disposal restrictions. In the unlikely event any such treatment is required, it would be conducted in accordance with ARARs and would be performed pursuant to plans reviewed and concurred with by Ohio EPA.

- If hazardous deposits exist or open contaminant migration pathways are created after Phase I activities, the material would be removed or the pathway capped to control releases between phases.

- In Phase II, the building concrete slabs and foundations would be removed and disposed as part of this CERCLA non-time critical removal action. After removal of the slab and any necessary RCRA cleanup activities conducted pursuant to the RCRA Consent Decree, clean soil would be brought in to prepare the area for final grading and seeding, and best management practices (e.g., straw bales, silt fencing, etc.) would be used to control erosion until vegetation is re-established.

- Hazardous waste determinations would be made based on process knowledge and/or representative sampling in accordance with EPA procedure SW846. The RAWP would provide details for managing waste streams for off-site transportation and disposal.

- All wastes would be shipped off site, with the exception of decontamination water that would be sampled prior to its release to an on-site treatment facility or NPDES outfall in consultation with Ohio EPA. The waste equipment and materials would be placed in appropriate transport containers [e.g., gondolas, Sealand, intermodal, roll-off boxes, ST-boxes (B-25), steel drums, and polyethylene drums] for transport to an appropriate off-site disposal facility. The RAWP for each of the buildings discussed in this EE/CA would provide the details for determining which containerization technology to use for the various types of waste streams present within the specific building being addressed.

- DOE does not anticipate discovering any unexpected or unknown waste items during the D&D process. However, if any such items are discovered, DOE would consult with Ohio EPA and perform any necessary characterization and on-site treatment in accordance with ARARs to ensure wastes requiring such treatment meet all WAC for the disposal facility and LDRs prior to disposal. The

unknown items/wastes may be placed in a proper storage facility until such time as an appropriate disposition path could be identified.

- Materials meeting reuse criteria and requirements (e.g., ARARs, DOE Order requirements, etc.) may be recycled or reused. Material that would be recycled or reused must have an outlet when generated. Such material would be prepared to meet the transportation requirements and conditions set forth by the recycler.

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5. ANALYSIS OF REMOVAL ACTION ALTERNATIVES

In accordance with NCP and EPA guidance (EPA 1993), the alternatives developed in Sec. 4.1.2 have been evaluated against the short- and long-term aspects of three broad criteria: effectiveness, implementability, and cost (see Table 7). The effectiveness of each alternative is based on the alternative's ability to meet the RAOs presented in Sect. 3.2. The implementability of each alternative is based on the technical and administrative feasibility of the alternative. In addition, availability of services and materials is evaluated for each alternative. The cost of each alternative is presented for comparison purposes. These evaluations were used to draw sufficient distinctions among the alternatives to allow identification of a recommended alternative.

Table 7. Criteria to be used for evaluation of removal action alternative

Effectiveness
1. Protectiveness • Protective of public and community (short- and long-term) • Protective of workers during implementation (short-term) • Protective of the environment (short- and long-term) • Complies with ARARs
2. Ability to Achieve RAOs • Level of treatment/containment expected • No residual effect concerns • Will maintain control until long-term solution implemented
Implementability
1. Technical Feasibility • Construction and operational considerations • Demonstrated performance/useful life • Adaptable to environmental conditions • Contributes to remedial performance
2. Availability • Equipment • Personnel and services • Outside laboratory testing capacity • Off-site treatment and disposal capacity • Post-removal site control
3. Administrative Feasibility • Permits required • Easements or rights-of-way required • Impact on adjoining property • Ability to impose institutional controls • Likelihood of obtaining exemption from statutory limits (if needed)
Costs
1. Capital cost 2. Post-removal site control cost

ARAR = applicable or relevant and appropriate requirement
RAO = remedial action objective

NEPA values have been incorporated into the alternatives analysis below.

5.1 ALTERNATIVE 1 – NO ACTION

For this alternative, the buildings addressed in this EE/CA would be left in their current condition, existing controls that limit public and worker access to the on-site facility would be maintained, no new controls would be implemented, support systems (e.g., fire protection) would be maintained in an operable condition, periodic S&M (e.g., grounds keeping, light bulb replacement) activities would continue, no major repairs or modifications to the facility would be undertaken, limited deactivation activities likely would be performed as part of other programs to isolate the building from major utility feeds (e.g., water and electric), the buildings would deteriorate and D&D would not be performed on the buildings.

5.1.1 Effectiveness

Alternative 1 does not meet the RAOs.

Protectiveness and ability to achieve RAOs - The short-term risks to the public, the workers, and the environment would remain unchanged because this alternative consists of no action. Existing hazards to workers and the public would continue to be controlled with controls that restrict access to the facility.

In the long term, a gradual reduction in protection of human health and the environment would result from the deterioration of the structures, with potential risks to on-site worker health and safety resulting from the eventual failure of the structures. The inevitable deterioration of the structures eventually would result in the release of contamination to the environment.

For the X-103 building, contaminants that could be released include ACM from the building ceiling tiles and thermal insulation of water lines; radiological contamination from the Ra-226 and Cs-137 sources that are stored in a concrete vault room of the building; and lead from interior and exterior paint.

For the X-334 building, contaminants that could be released include radiological and PCB contamination from containers/tanks stored in the building. As identified during a recent walkdown (June 2010), the X-334 building contains several storage tanks (two 2000 gallon tanks, one 500 gallon tank mounted on cart, and four 250-gallon stainless steel tanks) that are labeled as PCB/radioactive contamination. Radiological contamination is associated also with the pipes/rubber hosing labeled as "radioactive" that are stored in the building.

For building X-344B, COPCs that could be released include radiological contamination on the concrete floor and Tc-99 traps; ACM associated with the piping insulation and boxes of insulation stored in the building; lead from the painted surfaces; and PCB contamination from light ballasts.

With regard to NEPA values, leaving the structures in place would inhibit future land use and the presence of the structures would prevent use of the space for other purposes. The gradual deterioration of the structures would present limited impacts to air, soil, and other affected environments, unless a catastrophic release of the contaminants occurred. No floodplains or wetlands are present at or near the vicinity of the buildings. Thus, no impacts to either floodplains or wetlands would result from not taking any action. No federal or state-listed threatened or endangered plant or animal species have been identified at the X-103, X-334, and X-344B buildings.

Executive Order 12898, *"Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,"* requires agencies to identify and address disproportionately high and adverse human health or environmental effects that the agencies' activities have on minority and low-income populations. No census tracts near PORTS include a higher proportion of minorities than the national

average. Some nearby tracts meet the definition of low-income populations, but there would be no disproportionately high and adverse environmental impacts to any minority or low-income populations because there is limited opportunity for offsite migration of contamination from no action. Site perimeter air monitoring is used to identify any potential releases and determine if mitigative measures are needed during S&M activities.

5.1.2 Implementability

Technical and administrative feasibility - The no action alternative is readily implementable. No specialized services or equipment are required and minimal quantities of waste would be generated for off-site or on-site waste disposal due to basic fire protection and S&M activities.

Availability of services and materials - Existing site services can maintain current controls.

5.1.3 Cost

The total estimated annual cost, as described with S&M activities, for Alternative 1 is $28,717. Maintenance cost likely would be required to address regulatory requirements and limit impacts on other buildings. At some future date, the buildings eventually would have to be removed at an estimated cost of $2,550,000.

5.2 ALTERNATIVE 2 – REMOVE AND DISPOSE OF BUILDING CONTENTS, STRUCTURES, AND CONCRETE SLAB

In this alternative, the contents in the buildings would be removed, the building structures would be removed and disposed, and the slab would be removed and disposed.

5.2.1 Effectiveness

Alternative 2 would meet the RAOs.

Protectiveness and ability to achieve removal action objectives - Implementing Alternative 2 would avoid the deterioration of the buildings and the significant increase for the potential of contaminant release. Risks to on-site workers (through demolition and waste packaging) and the public (through waste transportation) would increase slightly during implementation, however, these risks are manageable by adherence to site health and safety requirements and PORTS procedures. Chemical, radiological, and physical risks to workers would be controlled by engineering controls and/or PPE.

In the long-term, based on the streamlined risk evaluation, D&D of the buildings would prevent, minimize, or eliminate potential and actual risks to workers and ecological receptors posed by the release or threat of release of the contaminants of potential concern. Alternative 2 would permanently remove contaminants in the above-grade building structures from an uncontrolled environment and the wastes would be disposed at an appropriate site that would provide long-term containment for any contaminants.

If wastes are shipped to off-site disposal facilities, there would be increased cargo and vehicle-related transportation risks to transportation workers (i.e., crew) and members of the public during implementation. A radioactive material release resulting from a transportation accident could occur, however, the risks could be minimized by using established cleanup methods.

The ARARs for this alternative are presented in Appendix B. All on-site CERCLA actions under this non-time-critical removal action would comply with ARARs. Transportation of the waste to any off-site

disposal facility (and any treatment that may be required to satisfy LDRs) would be performed in accordance with the ARARs. Shipments may be performed by truck or rail. All off-site disposal activities would be conducted in accordance with disposal site permit requirements.

The Phase I Archaeological Survey determined that there are no archaeological resources within Perimeter Road. Therefore, implementation of this alternative would have no effect on any archaeological resources. DOE intends to approach this alternative as though Buildings X-103 and X-344B, which are support buildings associated with the initial development of PORTS, are historic properties eligible for inclusion in the National Register of Historic Places. Consistent with this approach, DOE would perform certain mitigation measures (refer to Appendix B) to address the adverse effects to properties that, for purposes of this analysis, are being considered historic to meet any of the substantive requirements of the National Historic Preservation Act of 1966 that would apply if the buildings were eligible for inclusion in the National Register of Historic Places.

With regard to NEPA values, impacts to federal- or state-listed threatened and endangered plant or animal species were considered. No federal or state-listed threatened or endangered plant or animal species have been identified at these buildings.

Executive Order 12898 requires agencies to identify and address disproportionately high and adverse human health or environmental effects their activities may have on minority and low-income populations. No census tracts near PORTS include a higher proportion of minorities than the national average. Some nearby tracts meet the definition of low-income populations, but there would not be disproportionate or adverse environmental impacts to any minority or low-income populations because there is limited opportunity for offsite migration of contamination. Dust suppression and storm water control would prevent releases from implementing this alternative. Additionally, this action would benefit populations in the vicinity of the site because the presence and mobility of hazardous constituents would be reduced as a result of performing the removal actions.

Permit Requirements - Pursuant to requirements in the DFF&O, the following permits or administrative notification activities would normally be triggered if this removal action were not being conducted as an on-site CERCLA action. The substantive requirements of these permit activities are listed as ARARs in Appendix B.

- A notice of intent for coverage under Ohio's NPDES general permit (NPDES OHC00003) for stormwater discharges associated with construction/demolition activities would normally need to be filed if the activities were not being performed under CERCLA. The LPP and USEC activities at PORTS already have coverage under the State's NPDES stormwater general permit and are authorized to discharge stormwater to surface water of Ohio under the permit. The stormwater runoff controls detailed in the general permit, as listed in Appendix B, are substantive requirements of this permit and would be met through the implementation of best management practices to control pollutants in runoff. Such practices would include soil stabilization practices (e.g., seeding), perimeter structural practices (e.g., gabions, silt fences, sediment traps), and storm water management devices.

- Planned asbestos removal activities would require a formal notification to the state pursuant to 40 *CFR* 61.145(c) and OAC3745-20-04 if the activities were not being performed under CERCLA. The discussion and approval by the State of planned asbestos removal activities in the CERCLA documents for this action constitute notification to the State of this permit activity. Substantive requirements that are identified as ARARs and would be met include those for asbestos removal, handling, and disposal activities as detailed in 40 *CFR* 61.145(a)(1) [*OAC* 3745-20-04(A)(1)]; 40 *CFR* 61.145(c)(1)(i) through (iv) [*OAC* 3745-20-04(A)(1) (a) through (d)]; 40 *CFR* 61.150(b)(1) -

(2) [*OAC* 3745-20-05(A)]; 40 *CFR* 61.150(a)(3) [*OAC* 3745-20-05(B)(2)]; 40 *CFR* 61.150(b)(3) [*OAC* 3745-20(B)(5)]; 40 *CFR* 61.150(b)(1) and (2) [*OAC* 3745-20-05(A)]; and 40 *CFR* 61.150(a)(4) [*OAC* 3745-20-05(B)(4)].

- If DOE were to establish new RCRA or TSCA storage or treatment area(s) as part of this removal activity, DOE would have to meet applicable RCRA permit modification or TSCA approval requirements, respectively, if the activities were not being performed as an onsite CERCLA action. The ARARs for siting and operating new storage and treatment units for RCRA hazardous wastes and TSCA PCB wastes, as detailed in Appendix B, constitute the substantive requirements under such permit modification or approval requirements. Storage and treatment units would be sited, designed, and operated to meet the ARARs listed in Appendix B.

Subsequent project documents to be prepared and submitted for Ohio EPA review pursuant to the terms of the DFF&O (e.g., RAWPs) for this removal action would describe in more detail the activities planned to meet these ARARs and TBC.

5.2.2 Implementability

Technical and administrative feasibility - This alternative is implementable and technically feasible. Conventional construction/removal techniques would be used to remove the equipment, building infrastructure, and concrete slab. Techniques for decontaminating and sealing the concrete slab with a fixative are readily implementable. Off-site disposal of waste materials would occur at existing facilities that have sufficient existing capacities.

Availability of services and materials - Sufficient on-site equipment and personnel are available for this alternative. On-site waste storage is available, if necessary, for wastes generated during D&D and being prepared for and waiting for off-site disposal. DOE does not anticipate on discovering any unexpected or unknown waste items during the D&D process. However, if any such waste items are discovered, DOE would consult with Ohio EPA and perform any characterization and on-site treatment in accordance with ARARs to ensure wastes requiring such treatment meet WAC for the disposal facility and LDRs prior to disposal. On-site waste storage is available, if necessary, for such wastes. The wastes may be placed in a proper storage facility in accordance with ARARs until time of disposition. Sufficient off-site disposal capacity and services are available for all anticipated project wastes.

5.2.3 Cost

The total estimated cost for Alternative 2 is $2,550,000. The actual cost would be dependent on the actual waste type and volumes generated during the implementation of the removal action and could vary from the cost estimate.

The total estimated costs for Alternative 2 include costs for the removal and disposal of the contents/equipment, structures, and concrete slab from each building. The costs presented are direct costs and do not include costs associated with contractor oversight or project management.

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6. COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

This section compares the removal action Alternatives 1 and 2 on the basis of effectiveness, implementability, and cost. The comparative analysis is presented in Table 8.

6.1 EFFECTIVENESS COMPARISON

Alternative 1 (No Action alternative) does not meet RAOs, remove hazardous substances, pollutants, and contaminants from the environment, provide a long-term, or permanent, solution, or contribute to progress toward overall site cleanup goals. The X-103, X-334, and X-344B buildings would remain in place and, as time passed, would be subject to deterioration, thereby presenting the potential for the release of hazardous substances, pollutants, and contaminants to the environment and a substantial safety hazard with respect to workers providing S&M of the facilities.

Alternative 2, Remove and Dispose of Building Contents, Structures, and Concrete Slab, would be the most effective alternative with respect to the mitigation or prevention of releases of hazardous substances, pollutants and contaminants to the environment and would provide a long-term solution by removing the facilities (e.g., structures, slabs, equipment) that pose potential risks to human health and the environment. This alternative also meets RAOs, complies with ARARs and contributes to progress toward overall site cleanup goals.

Due to increased short-term risks (e.g., potential of contaminant release) created by the implementation of the removal action, Alternative 2 results in greater short-term risks than Alternative 1. However, with appropriate planning and the application of engineering (e.g., dust suppression) and administrative (e.g., procedures) controls these risks can be controlled at an acceptable level. Engineering controls that minimize release of contaminants would be implemented during the removal of equipment, asbestos material, and structures.

6.2 IMPLEMENTABILITY COMPARISON

Alternative 1 would be easier to implement because no additional activities would be required; however, both alternatives are implementable using existing technologies and services. For Alternative 1, some S&M activities, including fire protection and grounds keeping activities, would continue to be necessary. Alternative 2 could be implemented using readily available construction equipment and common industry practices. There is available disposal capacity at appropriate permitted disposal facilities.

6.3 COST COMPARISON

Comparative analysis of the removal action alternatives is provided in Table 8. The cost for Alternative 1 is less, in the near-term than the cost for Alternative 2. While there are no direct removal costs associated with the Alternative 1, other costs, approximately $28,700 annually associated with the continued support systems (e.g., fire protection) and maintenance (e.g., grounds keeping) would continue to be incurred. However, these costs actually are additive in that Alternative 1 only postpones and does not avoid eventual removal of these facilities. The current estimated cost for D&D of these facilities in their current condition (Alternative 2) is approximately $2,550,000. Continued deterioration of the facilities could increase the cost of eventual removal due to increased removal action worker health and safety requirements (e.g., personnel protective equipment, access restrictions resulting from falling objects or unstable structures), changes in the method or sequence of D&D activities (e.g., early removal of hazardous materials, waste segregation) and the increased cost of environmental media cleanup in the event of an uncontrolled release of hazardous substances, pollutants or contaminants. Thus the total life-cycle cost for Alternative 1 actually would be higher than the cost for Alternative 2.

Table 8. Comparative analysis of removal action alternatives

	Alternative	Effectiveness	Implementability	Estimated cost
1.	No Action	• Will not achieve RAOs • Will not remove hazardous or radiological constituents • Least protective of human health and the environment • Highest potential for environmental release • Does not provide a long-term solution or permanent solution • Results in no progress towards site cleanup goals	• Readily implementable technically • Generates minimal quantities of waste • Basic fire protection and S&M activities would continue	~$28,700 annually in S&M cost (plus estimated future removal costs of approximately $2,550,000)
2.	Remove and Dispose of Building Contents, Structures, and Concrete Slab	• Will achieve RAOs • Protective of human health and the environment • Could be implemented in compliance with ARARs • Could be implemented in a manner protective of workers and public • Provides a long-term solution • Effective at isolating contaminants from the environment • Results in progress towards site cleanup goals	• Readily implementable utilizing conventional, readily available construction techniques • Services and materials are readily available • Appropriate permitted disposal facilities with sufficient capacity are available to disposition wastes generated from facilities removal	~$2,550,000

ARAR = applicable or relevant and appropriate requirement
RAO = removal action objective
S&M = surveillance and maintenance

7. RECOMMENDED REMOVAL ACTION ALTERNATIVE

The recommended removal action alternative for D&D of the X-103 Auxiliary Office Building, X-334 Transformer Cleaning and Storage Building, and X-344B Maintenance Storage Building is Alternative 2, Remove and Dispose of Building Contents, Structures, and Concrete Slab.

Alternative 2 is effective in the short-term and long-term, implementable, and is the most cost-effective approach that satisfies the RAOs for D&D of the buildings.

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APPENDIX A: BUILDINGS X-103, X-334, AND X-344B PHOTOGRAPHS

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Figure A.1. Building X-103 - representative cubicle office layout.

Figure A.2. Building X-103 - representative area showing floor tiles.

Figure A.3. Building X-103 - exterior (side view) of building.

Figure A.4. Building X-334 - containers labeled PCB.

Figure A.5. Building X-334 - area roped off as PCB spill area.

Figure A.6. Building X-344B - items stored inside building.

Figure A.7. Building X-344B - additional items stored inside building.

Figure A.8. Building X-344B - equipment/pipe with asbestos insulation.

APPENDIX B: APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO-BE-CONSIDERED GUIDANCE FOR GROUP 1 BUILDINGS X-103, X-334, AND X-344B ENGINEERING EVALUATION/COST ANALYSIS

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TABLES

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ACRONYMS

ACM	asbestos-containing material
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CFR	*Code of Federal Regulation*
CMBST	combustion
CWA	Clean Water Act
D&D	decontamination and decommissioning
DEACT	deactivation
DOE	U.S. Department of Energy
DOE M	U.S. Department of Energy Radioactive Waste Management Manual
DOE O	U.S. Department of Energy Order
DOT	U.S. Department of Transportation
EDE	effective dose equivalent
EE/CA	engineering evaluation/cost assessment
EPA	U.S. Environmental Protection Agency
FR	*Federal Register*
GCEP	Gaseous Centrifuge Enrichment Plant
HMR	Hazardous Materials Regulations
HMTA	Hazardous Materials Transportation Act of 1975 (Amendments of 1976)
ID	identification number
LDRs	(RCRA) land disposal restrictions
LLW	low-level (radioactive) waste
LPP	LATA/Parallax Portsmouth, LLC
NCP	National Oil and Hazardous Substances Contingency Plan
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCE	National Register Criteria for Evaluation
NRHP	National Register of Historic Places
OAC	*Ohio Administrative Code*
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Officer
ORC	*Ohio Revised Code*
OSWER	U.S. Office of Solid Waste and Emergency Response
PCB	polychlorinated biphenyl
POLYM	polymerization
Portsmouth	Portsmouth Gaseous Diffusion Plant
RACM	regulated asbestos-containing material
RCRA	Resource Conservation and Recovery Act of 1976, as amended
RCW	Recirculating Cooling Water
RORGS	recovery of organics
TBC	to be considered [guidance]
T&E	threatened and endangered
TSCA	Toxic Substances Control Act of 1976
USC	*United States Code*
USEC	U.S. Enrichment Corporation
UTS	universal treatment standards

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B.1. INTRODUCTION

In accordance with 40 *Code of Federal Regulations (CFR)* Sect. 300.415(j) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and U.S. Department of Energy (DOE) Headquarters guidance, DOE on-site removal actions conducted under Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, are required to attain applicable or relevant and appropriate requirements (ARARs) to the extent practicable, considering the exigencies of the situation. The ARARs include only federal and state environmental or facility siting laws/regulations; they do not include occupational safety or worker radiation protection requirements. Additionally, per 40 *CFR* 300.400(g)(3), other advisories, criteria, or guidance may be considered in determining remedies [to-be-considered (TBC) category]. The decontamination and decommissioning (D&D) removal action alternatives include removal of stored materials, equipment, infrastructure, and any waste materials generated during the removal action; demolition of the building structures; and characterization and disposal of the generated wastes. The removal action alternatives (i.e., other than no action) would comply with all identified ARARs/TBCs.

CERCLA 121(e)(1) provides that no federal, state, or local permit shall be required for the portion of any removal or remedial action conducted entirely as an on-site response action. In addition to "permits", the U.S. Environmental Protection Agency (EPA) has interpreted CERCLA Section 121(e)(1) broadly to cover: "all administrative provisions from other laws, such as recordkeeping, consultation, and reporting requirements. In other words, administrative requirements do not apply to on-site response actions." [Office of Solid Waste and Emergency Response (OSWER) 9205.5-10A]. Those portions of the removal action that are taken off site are subject to both the substantive and administrative requirements of applicable laws.

ARARs are typically divided into three groups: (1) chemical-specific, (2) location-specific, and (3) action-specific. Tables B.1 and B.2 group the location- and action-specific ARARs/TBCs, respectively, for the D&D removal action. There were no chemical-specific ARARs identified. In some cases, the conditions associated with the prerequisite requirements have not been confirmed to be present; if the subject condition is encountered during implementation of the action, then the specified ARAR would apply. A brief description of key ARAR/TBC topics follows.

B.2. CHEMICAL-SPECIFIC ARARs/TBCs

Chemical-specific ARARs provide health or risk-based concentration limits or discharge limitations in various environmental media (i.e., surface water, groundwater, soil, and air) for specific hazardous substances, pollutants, or contaminants The scope of this action is decontamination and decommissioning of building and does not include remediation of environmental media, therefore, there are no chemical-specific ARARs triggered.

B.3. LOCATION-SPECIFIC ARARs/TBCs

Location-specific requirements establish restrictions on permissible concentrations of hazardous substances or establish requirements for how activities will be conducted because they are in special locations (e.g., wetlands, floodplains, critical habitats, streams). The federal location-specific ARARs for the protection of historic properties are listed in Table B.1.

B.3.1 FLOODPLAINS AND WETLANDS

None of the activities associated with the removal action alternatives would be conducted within any floodplain. In addition, no wetlands are present at or near the vicinity of the buildings. Thus, no impacts to either floodplains or wetlands would result from any of the alternatives considered for this proposed removal action.

B.3.2 THREATENED AND ENDANGERED SPECIES

None of the removal action alternatives would adversely impact any federally or state-listed threatened or endangered (T&E) species located or seen at the Portsmouth Gaseous Diffusion Plant (Portsmouth). Consequently, none of the requirements for protection of T&E species or critical habitat are included as ARARs.

B.3.3 CULTURAL RESOURCES

Cultural resources include prehistoric or historic districts, sites, buildings, structures, or objects considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. When these resources meet any one of the National Register Criteria for Evaluation (36 *CFR* Part 60.4), they may be termed historic properties and thereby are eligible for inclusion on the National Register of Historic Places (NRHP).

A Phase I Archaeological Survey for Portsmouth in Scioto and Seal Townships, Pike County, Ohio and a Phase II Archaeological Testing at Site 33PK210, Scioto Township, Pike County, Ohio, have been prepared and accepted by the Ohio Historic Preservation Office (OHPO). A survey of the architectural properties at Portsmouth was completed in 1997 with updates to the information gathered in 2006. The purpose of these surveys is to provide baseline inventory information regarding properties on the Portsmouth site. As a part of the 1996-1997 architectural survey, Ohio Historic Inventory (OHI) forms were completed for the buildings and structures at the facility, including X-103, X-334 and X-344B. Buildings X-103 and X-344B were among the earliest support buildings at Portsmouth associated with Portsmouth's Cold War mission. The OHI forms are on file at the OHPO.

The proposed activities are described in Sect. 4.1.2 of the Engineering Evaluation/Cost Analysis.

The X-334 building is currently inactive and the X-103 and X-344B facilities are being phased out and will be inactive in early fiscal year (FY) 2011 and are no longer needed at the site. Federal agencies must take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion on the National Register. Federal agencies must initiate measures to assure that where, as a result of Federal action, a historic property is to be substantially altered or demolished, timely steps are taken to make or have made appropriate records.

The impacted area (area of potential effect) of this project includes the X-103, X-334, and X-344B facilities and the area in close proximity to their structures. Based on the results of the Phase I Archaeological Survey of the Portsmouth site, it was determined that all of the area within perimeter road was disturbed during plant construction, including the X-103, X-334, and X-344B areas. Therefore, no archaeological resources would be impacted during the removal action.

For purposes of this review, the X-103 and X-344B facilities are being treated as if they are historic properties eligible for inclusion in the NRHP. DOE is taking the following steps to ensure appropriate records are made of the buildings to be demolished under this action. The materials developed for

items a-e will become part of an overall mitigation strategy to document the history of the Portsmouth Cold War mission, which is presently in development by the Portsmouth/Paducah Project Office (PPPO).

a. Copies of the original Ohio Historic Inventory Forms that are on file with the Ohio Historic Preservation Office numbered PIK-83-12 (X-103) and PIK-159-12 (344-B), and a map showing the locations of the facilities proposed for demolition, will be placed in the X-103, X-334 and X-344B Removal Action Administrative Record.

b. Full sets of color or black and white photographs in a minimum 5-in. × 7-in. format, appropriately labeled, documenting the design, current conditions, and surrounding landscape around the X-103 and X-344B facilities will be placed in the X-103, X-334, and X-344B Removal Action Administrative Record. DOE will provide the photographic documentation in digital format and will compile photographic documentation using additional photographic formats such as I-PIX 360 degree photographs and videography.

c. Historic structural and architectural drawings documenting the details and layout of the X-103 and X-344B facilities will be placed in the X-103, X-334, and X-344B Removal Action Administrative Record. If drawings are not available, DOE will prepare basic plan view drawings to scale of the X-103 and X-344B facilities that emphasize the spatial organization of interior components and the functional relationship of its structures to the overall processes.

d. DOE will prepare a brief written narrative explaining the functional relationship of the X-103 and X-644B facilities to the overall processes at Portsmouth. The narrative will be placed in the X-103, X-334, and X-344B Removal Action Administrative Record.

e. Prior to demolition, salvage of selected uncontaminated items from buildings for future preservation considerations will occur.

B.4. ACTION-SPECIFIC ARARs/TBCs

Action-specific ARARs include operation, performance, and design requirements or limitations based on the waste types, media, and removal/remedial activities. The ARARs for the D&D alternatives include requirements related to waste characterization, scrap metal removal, decontamination, waste storage, treatment and disposal, and transportation of hazardous materials.

B.4.1 BUILDING REMOVAL

The D&D alternatives include removal of scrap metal, equipment, infrastructure, any waste materials and debris, and, where necessary, stabilization of foundation concrete surfaces, etc. Requirements under the Clean Air Act of 1970, as amended, for control of asbestos and/or radionuclide emissions included in Table B.2 would have to be met. Requirements for the closure of tanks containing hazardous (i.e., acids used for cooling water treatment) materials would have to be met.

B.4.2 WASTE MANAGEMENT

Building removal activities may result in the generation of Resource Conservation and Recovery Act of 1976 (RCRA), as amended, solid or hazardous waste and asbestos-containing waste materials. Although some characterization has been performed, additional waste streams may be identified during implementation of the removal action.

All primary wastes (e.g., D&D debris) and secondary wastes (e.g., contaminated personal protective equipment, decontamination wastes) generated during building remediation activities must be appropriately characterized and managed in accordance with appropriate RCRA, Toxic Substances Control Act of 1976 (TSCA), or DOE Order requirements as specified in the ARARs tables. Long-term storage of waste would not be anticipated. Hazardous waste determinations will be made based on available process knowledge and sampling/analysis results. Assuming no listed wastes are present and the sample does not exhibit a hazardous characteristic, the debris will be categorized as nonhazardous. Requirements associated with the characterization, storage, treatment, and disposal of the aforementioned waste types are listed in Table B.2. Hazardous and other waste may be accumulated and stored in appropriate storage areas at Portsmouth.

B.4.3 TRANSPORTATION

Substantive requirements (i.e., ARARs) apply by law only to on-site CERCLA response actions. The NCP at 40 *CFR* 300.400(e)(1) defines "on-site" as meaning "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action." Off-site disposal, by definition, is not an on-site response action and is subject to all substantive, procedural, and administrative requirements of all legally applicable laws but not to any requirements that might normally be labeled relevant and appropriate under the ARARs process.

Any wastes transferred off site or transported in commerce along public right-of-ways must meet the requirements summarized on Table B.2, depending on the type of waste (e.g., RCRA, low-level waste, or mixed). These requirements include packaging, labeling, marking, manifesting, and placarding for hazardous materials in accordance with 49 *CFR* 170-180 *et seq.* Transport of D&D wastes along roads within the Portsmouth site must meet the requirements of the *Transportation Safety Document for the On-Site Transfer of Hazardous Material at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (LPP-0021/R2, LATA/Parallax Portsmouth, LLC).

In addition, CERCLA Sect. 121(d)(3) provides that the off-site transfer of any hazardous substance, pollutant, or contaminant generated during CERCLA response actions be sent to a treatment, storage, or disposal facility that complies with applicable federal and state laws and has been approved by EPA for acceptance of CERCLA waste (see also the "Off-Site Rule" at 40 *CFR* 300.440 *et seq.*). Accordingly, DOE will verify with the appropriate EPA regional contact that any needed off-site facility is acceptable for receipt of CERCLA wastes before transfer.

Table B.1. Location-specific ARARs for X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio

Location	Requirements[a]	Prerequisite	Citation
	Cultural resources		
Presence of historical resources	Federal agencies must take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.	Federal agency undertaking that may impact historical properties listed or eligible for inclusion on the National Register of Historic Places – **applicable**	16 USC 470f 36 *CFR* 800.1(a)
	Federal agencies must initiate measures to assure that where, as a result of Federal action, a historic property is to be substantially altered or demolished, timely steps are taken to make or have made appropriate records.	Substantial alterations or demolition of a historic property—**applicable**	16 USC 470h-2(b)

[a]The Requirements portion of the ARARs table is intended to provide a summary of the cited ARAR. The omission of any particular requirement does not limit the scope of the cited ARARs.

ARAR = applicable or relevant and appropriate requirement
CFR = *Code of Federal Regulations*
USC = *United States Code*

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Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio

Action	Requirements[a]	Prerequisite	Citation
	Site preparation, construction, and excavation activities		
Activities causing release of air pollutants	Shall not cause the emission or escape into the open air from any source or sources whatsoever of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, or any other substances or combinations of substances in such manner or in such amounts as to endanger the health, safety, or welfare of the public, or cause unreasonable injury or damage to property.	Activities causing the release of air pollution nuisances as defined in *OAC* 3745-15-07(A) — **applicable**	*OAC* 3745-15-07
	The operation of a hazardous waste facility shall not cause, permit, or allow the emission there from of any particulate matter, dust, fumes, gas, mist, smoke, vapor, or odorous substance that unreasonably interferes with the comfortable enjoyment of life or property by persons living or working in the vicinity of the facility or that is injurious to public health.	Site where hazardous waste will be managed such that air emissions may occur — **applicable**	*ORC* 3734.02(I)
Activities causing fugitive dust (particulate) emissions	Shall take reasonable achievable control measures to prevent particulate matter from becoming airborne. Reasonable achievable control measures shall include, but are not limited to, the following:	Fugitive emissions from transportation, land-disturbing, or building alteration activities, except as exempted under *OAC* 3745-17-08(A)(3) — **applicable**	*OAC* 3745-17-08(B)
	• Use, where possible, of water or chemicals for control of dust and in demolition of existing buildings or structures, construction operations, grading of roads, or the clearing of land;		*OAC* 3745-17-08(B)(1)
	• Periodic application of asphalt, oil (excluding used oil), water, or other suitable chemicals on dirt or gravel roads and parking lots, materials stock piles, and other surfaces that can create airborne dusts, or the use of canvas or other suitable coverings for all materials stockpiles and stockpiling operations except temporary stockpiles;		*OAC* 3745-17-08(B)(2) and (6)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Activities causing fugitive dust (particulate) emissions (continued)	• Install and use hoods, fans, and other equipment to adequately enclose, contain, capture, vent, and control the fugitive dust at the point(s) of capture to the extent possible with good engineering design. Equipment must meet the efficiency requirements of *OAC* 3745-17-08(B)(3)(a) and (b);		*OAC* 3745-17-08(B)(3)
	• Use of adequate containment methods during sandblasting or similar operations;		*OAC* 3745-17-08(B)(5)
	• Cover, at all times, open-bodied vehicles when transporting materials likely to become airborne;		*OAC* 3745-17-08(B)(7)
	• Pave and maintain roadways in a clean condition; and		*OAC* 3745-17-08(B)(8)
	• Promptly remove, in such a manner as to minimize or prevent resuspension, earth or other material from paved streets onto which this material has been deposited by trucking or earth moving equipment or erosion by water or other means.		*OAC* 3745-17-08(B)(9)
Airborne radionuclide emissions	Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive an EDE of 10 mrem per year.	Radionuclide air emissions to the ambient air from DOE facilities – **applicable**	40 *CFR* 61.92
Radiation protection of the public and the environment	Except as provided in 5400.1(II)(1)(a)(4), exposure to individual members of the public from radiation shall not exceed a total EDE of 0.1 rem/year (100 mrem/year), exclusive of the dose contributions from background radiation, any medical administration the individual has received, or voluntary participation in medical/research programs.	Radionuclide emissions from all exposure modes from all DOE activities (including remedial actions) at a DOE facility – **TBC**	DOE O 5400.5(II)(1)(a)
	Shall use, to the extent practicable, procedures and engineering controls based on sound radiation protection principles to achieve doses to members of the public that are ALARA.		DOE O 5400.5(II)(2)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Activities causing storm water runoff (e.g., demolition)	Dischargers must utilize best management practices to control pollutants in storm water discharges during and after construction, which may include, as appropriate, soil stabilization practices (e.g., seeding), perimeter structural practices (e.g., gabions, silt fences, sediment traps), and storm water management devices as detailed in Part III.G.2 (–Controls") of NPDES OHC000003.	Storm water runoff discharges from land disturbed by construction activity—disturbance of ≥ 1 acre total, except where otherwise exempt as specified in 40 *CFR* 122.26(b)(15) – **TBC**	Authorization for Storm Water Discharges Associated with Construction Activity under NPDES OHC000003 Part III.G.2
	Waste generation, characterization, and segregation		
Characterization of solid waste	Must determine if solid waste is hazardous or is excluded under 40 *CFR* 261.4 [*OAC* 3745 51-04]; and	Generation of solid waste as defined in 40 *CFR* 261.2 – **applicable**	40 *CFR* 262.11(a) *OAC* 3745-52-11(A)
	Must determine if waste is listed as a hazardous waste in 40 *CFR* Part 261 [*OAC* 3745-51-30 to -35]; or	Generation of solid waste that is not excluded under 40 *CFR* 261.4 – **applicable**	40 *CFR* 262.11(b) *OAC* 3745-52-11(B)
	Must determine whether the waste is identified in subpart C of 40 *CFR* 261 [*OAC* 3745-270], characterizing the waste by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used.	Generation of solid waste that is not listed in subpart D of 40 *CFR* 261 and not excluded under 40 *CFR* 261.4 – **applicable**	40 *CFR* 262.11(c) *OAC* 3745-52-11(C)
	Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 of Chapter 40 [*OAC* 3745-51, -54 to -57, -65 to -69, -205, -256, -266, -270, and -273] for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of solid waste that is determined to be hazardous – **applicable**	40 *CFR* 262.11(d) *OAC* 3745-52-11(D)
Characterization of hazardous waste	Must obtain a detailed chemical and physical analysis of a representative sample of the waste(s) that, at a minimum, contains all the information that must be known to treat, store, or dispose of waste in accordance with 40 *CFR* 264 and 268 [*OAC* 3745-54 to -57, -205, and -270].	Generation of RCRA hazardous waste for storage, treatment or disposal – **applicable**	40 *CFR* 264.13(a)(1) and (2) *OAC* 3745-54-13(A)(1) and (2)
Determinations for land disposal of hazardous waste	Must determine if the waste meets the treatment standards in 40 *CFR* 268.40, 268.45, or 268.49 [*OAC* 3745-270-40, -45, and -49] by testing in accordance with prescribed methods or use of generator knowledge of waste.	Generation of RCRA hazardous waste for storage, treatment or disposal – **applicable**	40 *CFR* 268.7(a) *OAC* 3745-270-07(A)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Determinations for land disposal of hazardous waste (continued)	Must determine each EPA Hazardous Waste Number (Waste Code) to determine the applicable treatment standards under 40 *CFR* 268.40 et seq. [*OAC* 3745-270-40 et seq.]	Generation of RCRA hazardous waste for storage, treatment or disposal – **applicable**	40 *CFR* 268.9(a) *OAC* 3745-270-09(A)
	Must determine the underlying hazardous constituents [as defined in 40 *CFR* 268.2(i) and *OAC* 3745-270-02] in the waste.	Generation of RCRA characteristically hazardous waste (and is not D001 non-wastewaters treated by CMBST, RORGS, or POLYM of Sect. 268.42 Table 1) for storage, treatment or disposal – a**pplicable**	40 *CFR* 268.9(a) *OAC* 3745-270-09(A)
	Must determine whether the waste meets other applicable treatment standards under 40 *CFR* 268.9 [*OAC* 3745-270-09] for characteristic wastes.	Generation of RCRA characteristically hazardous waste– a**pplicable**	40 *CFR* 268.9(b) to (d) *OAC* 3745-270-09(B) to (D)
Characterization and management of wastewater (e.g., decon water)	On-site wastewater treatment units (including tank systems, conveyance systems, and ancillary equipment used to treat, store or convey wastewater to the wastewater treatment facility) are exempt from the requirements of RCRA Subtitle C standards.	On-site wastewater treatment units subject to regulation under § 402 or § 307(b) of the CWA – **applicable**	40 *CFR* 264.1(g)(6) *OAC* 3745-54-01(G)(6)
Characterization and management of industrial wastewater	Industrial wastewater discharges that are point source discharges under Sect. 402 of the CWA, as amended, are not solid wastes for purpose of hazardous waste management.	Generation of industrial wastewater for discharge – **applicable**	40 *CFR* 261.4(a)(2) *OAC* 3745-51-04(A)(2)
Characterization of LLW	Shall be characterized using direct or indirect methods and the characterization documented in sufficient detail to ensure safe management and compliance with the WAC of the receiving facility.	Generation of LLW for storage or disposal at a DOE facility – **TBC**	DOE M 435.1-1 IV.I
	Characterization data shall, at a minimum, include the following information relevant to the management of the waste:		DOE M 435.1-1 IV.I(2)
	• Physical and chemical characteristics;		DOE M 435.1-1 IV (2)(a)
	• Volume, including the waste and any stabilization or absorbent media;		DOE M 435.1-1 IV.I (2)(b)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Characterization of LLW (continued)	• Weight of the container and contents;		DOE M 435.1-1 IV.I (2)(c)
	• Identities, activities, and concentrations of major radionuclides;		DOE M 435.1-1 IV.I (2)(d)
	• Characterization date;		DOE M 435.1-1 IV.I (2)(e)
	• Generating source; and		DOE M 435.1-1 IV.I (2)(f)
	• Any other information that may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with performance objectives.		DOE M 435.1-1 IV.I (2)(g)
Packaging of solid LLW for storage (e.g., radioactively contaminated debris)	Shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	Storage of LLW in containers at a DOE facility – **TBC**	DOE M 435.1-1(IV)(L)(1)(a)
	Vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container. Containers shall be marked such that their contents can be identified.		DOE M 435.1-1(IV)(L)(1)(b) and (c)
Segregation of scrap metal for recycle	Material is not subject to RCRA requirements for generators, transporters, and storage facilities under 40 *CFR* Parts 262 through 266, 268, 270, or 124 [*OAC* 3745-50-40 to 3745-50-235 or 3745-52, -53, -54 to -57, -65 to -69, -205, -256, -266, and -270].	Scrap metal, as defined in 40 *CFR* 261.1(c)(6) intended for recycle – **applicable**	40 *CFR* 261.6(a)(3)(ii) *OAC* 3745-51-06(A)(3)(b)
Decontamination of radioactively contaminated equipment and building structures	Must meet surface contamination guidelines for residual activity provided in Figure IV-1 of the Order for specified radionuclides.	Residual radioactive material on equipment and building structures for unrestricted use – **TBC**	DOE O 5400.5(IV) (4)(d) and Figure IV-1
Release of radiological materials or scrap metal for reuse	Before being released, property shall be surveyed to determine whether both removable and total surface contamination (including contamination present on or under any coating) is greater than the levels given in Figure IV-1 of the Order and that the contamination has been subjected to the ALARA process.	Radionuclide-contaminated materials and equipment intended for unrestricted reuse – **TBC**	DOE O 5400.5(II)(5)(c)(1)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	Where potentially contaminated surfaces are not accessible for measurement (as in some pipes, drains, and ductwork), such property may be released after case-by-case evaluation and documentation based on both the history of its use and available measurements demonstrate that the unsurveyable surfaces are likely to be within the limits given in Figure IV-1.		DOE O 5400.5(II)(5)(c)(4)
Torch-cutting of metal coated with paint that may contain PCBs	No person may open burn PCBs. Combustion of PCBs by incineration as approved under Sect. 761.60 (a) or (e), or otherwise allowed under Part 761, is not open burning.	Management of PCB waste for storage or disposal – **applicable**	40 *CFR* 761.50(a)(1)
Management of PCB items	Any person removing from use a PCB Item containing an intact and non-leaking PCB Article must dispose of it in accordance with Sect. 761.60(b), or decontaminate it in accordance with Sect. 761.79. PCB Items where the PCB Articles are no longer intact and non-leaking are regulated for disposal as PCB bulk product waste under Sect. 761.62(a) or (c).	Management of PCB waste for storage or disposal – **applicable**	40 *CFR* 761.50(b)(2)
Demolition of a facility containing RACM	Remove all RACM from the facility before demotion and follow the procedures for asbestos emission control and RACM handling as appropriate and detailed in 40 *CFR* 61.145(c)(1) through (7) [*OAC* 3745-20-04(A)(1) through (7)].	Demolition of a facility that contains RACM exceeding the volume requirements of 40 *CFR* 61.145(a)(3) [*OAC* 3745-20-02(B)] – **applicable**	40 *CFR* 61.145(a)(1) *OAC* 3745-20-04(A)(1)
	RACM need not be removed before demolition if:		40 *CFR* 61.145(c)(1)(i) *OAC* 3745-20-04(A)(1)(a)
	• It is Category I nonfriable ACM that is not in poor condition and is not friable;		
	• It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition;		40 *CFR* 61.145(c)(1)(ii) *OAC* 3745-20-04(A)(1)(b)
	• It is not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, the material cannot be safely removed (exposed RACM and asbestos-contaminated debris must be adequately wet at all times); or		40 *CFR* 61.145(c)(1)(iii) *OAC* 3745-20-04(A)(1)(c)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Demolition of a facility containing RACM (continued)	o It is Category II nonfriable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition.		40 *CFR* 61.145(c)(1)(iv) *OAC* 3745-20-04(A)(1)(d)
Management of ACM prior to disposal	Discharge no visible emissions to the outside air or use one of the emission control and waste treatment methods specified in paragraphs (a)(1) through (a)(4) of 40 *CFR* 61.150 [paragraphs (B)(1) through (B)(4) of *OAC* 3745-20-05].	Generation, collection, processing, packaging, and transportation of any asbestos-containing waste material that is not Category I or II nonfriable ACM waste that did not become crumbled, pulverized, or reduced to powder [40 *CFR* 61.150(a)(5)]– **applicable**	40 *CFR* 61.150(a) *OAC* 3745-20-05(B)
	For facilities demolished where the RACM is not removed prior to demolition according to §§61.145(c)(i) – (iv) [*OAC* 3745-20-04(A)(1) or (D)], adequately wet ACM at all times after demolition and keep wet during handling and loading for transport. Such ACM does not have to be sealed in leak-tight containers or wrapping but may be transported and disposed of in bulk in leak-tight transport vehicles that are securely covered or enclosed and cause no visible emissions.		40 *CFR* 61.150(a)(3) *OAC* 3745-20-05(B)(2)
	All asbestos-containing waste material shall be deposited as soon as practicable at waste disposal site operated in accordance with the provisions of 40 *CFR* 61.154 [*OAC* 3745-20-06] or an EPA-approved site that coverts RACM and asbestos-containing waste materials into nonasbestos (asbestos-free) materials according to the provisions of 40 *CFR* 61.155 [*OAC* 3745-20-13].		40 *CFR* 61.150(b)(1) - (2) *OAC* 3745-20-05(A)
	The requirements of 40 *CFR* 61.150(b)(1) and (2) [*OAC* 3745-20-05(B) and (C)] do not apply to Category I nonfriable ACM that is not RACM.		40 *CFR* 61.150(b)(3) *OAC* 3745-20-05(B)(5)
Characterization and management of universal waste	A large quantity handler of universal waste is prohibited from disposing, diluting, or treating universal waste except in accordance with 40 *CFR* 273 [*OAC* 3745-273-33 or 3745-273-37].	Generation of universal waste [as defined in 40 *CFR* 273 and *OAC* 3745-273] for disposal – **applicable**	40 *CFR* 273.31 *OAC* 3745-273-31
	A large quantity handler of universal waste must manage universal waste in accordance with 40 *CFR* 273 [*OAC* 3745-273-33] in a way that prevents releases of any universal waste or component of a universal waste to the environment.		40 *CFR* 273.33 *OAC* 3745-273-33(A)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	Must label or mark the universal waste to identify the type of universal waste.		40 *CFR* 273.34 *OAC* 3745-273-34
	May accumulate waste for no longer than one year from the date the waste is generated or received from another handler unless the requirements of 40 *CFR* 273.35(b) [*OAC* 3745-372-35(B)] are met		40 *CFR* 273.35(a) *OAC* 3745-273-35(A)
	May accumulate universal waste for longer than one year from the date the universal waste is generated,or received from another handler if such activity is solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment, or disposal. However, the handler bears the burden of proving that such activity was solely for this purpose.		40 *CFR* 273.35(b) *OAC* 3745-273-35(B)
	A large quantity handler of universal waste must immediately contain all releases of universal wastes and other residues from universal wastes, and must determine whether any material resulting from the release is hazardous waste, and if so, must manage the hazardous waste in compliance with all applicable requirements.		40 *CFR* 273.37 *OAC* 3745- 273.37
Management of universal waste lamps (fluorescent, mercury vapor)	A large quantity handler of universal waste must contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. Such containers and packages must remain closed and must lack evidence of leakage, spillage, or damage that could cause leakage of hazardous constituents under reasonably foreseeable conditions.	Generation of universal waste lamps [as defined in 40 *CFR* 273.9 and *OAC* 3745-273-05] – **applicable**	40 *CFR* 273.33(d)(1) *OAC* 3745-273-33(D)(1)
	A large quantity handler of universal waste lamp must immediately clean up and place in a container any lamp that is broken and must place in a container any lamp that shows evidence of breakage, leakage, or damage that could cause the release of mercury or other hazardous constituents to the environment.		40 *CFR* 273.33(d)(2) *OAC* 3745-273-33 (D)(2)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	Each lamp or container or package in which such lamps are contained must be labeled or marked clearly with one of the following phrases: "Universal Waste-Lamp(s)," or "Waste Lamps," or "Used Lamps."		40 *CFR* 273.34(e) *OAC* 3745-273-34(E)
	Mark or label the individual item with the date the lamp(s) became a waste, or mark or label the container or package with the date the wastes were received.		40 *CFR* 273.35(c) *OAC* 3745-273-35(C)
Management of used oil	Used oil shall not be stored in a unit other than a tank, container, or a RCRA-regulated unit.	Generation and storage of used oil, as defined in 40 *CFR* 279.1 [*OAC* 3745-279-01(A)(12)], that meets the requirements of 40 *CFR* 279.10 – **applicable**	40 *CFR* 279.22(a) *OAC* 3745-279-22(A)
	Containers and aboveground tanks used to store used oil must be in good condition (no severe rusting, apparent structural defects, or deterioration) and not leaking (no visible leaks).		40 *CFR* 279.22(b)(1) and (2) *OAC* 3745-279-22(B) (1) and (2)
	Containers and aboveground tanks used to store used oil and fill pipes used to transfer used oil into USTs must be labeled or marked clearly with the words "Used Oil."		40 *CFR* 279.22(c)(1) and (2) *OAC* 3745-279-22 (C)(1)
	Upon detection of a release of used oil to the environment, a generator must stop the release; contain, clean up, and properly manage the released used oil; and, if necessary, repair or replace any leaking used oil storage containers or tanks prior to returning to service.	Release of used oil to the environment – **applicable**	40 *CFR* 279.22(d) *OAC* 3745-279-22(D)
Management of PCB waste	Any person storing or disposing of PCB waste must do so in accordance with 40 *CFR* 761, Subpart D.	Storage or disposal of waste containing PCBs at concentrations ≥ 50 ppm – **applicable**	40 *CFR* 761.50(a)
	Any person cleaning up and disposing of PCBs shall do so based on the concentration at which the PCBs are found.	Cleanup or disposal of PCB remediation waste as defined in 40 *CFR* 761.3 – **applicable**	40 *CFR* 761.61

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Decontamination of PCB contaminated materials prior to use, re-use, distribution, in commerce or disposal as a non-TSCA waste	Chopping (including wire chopping), distilling, filtering, oil/water separation, spraying, soaking, wiping, stripping of insulation, scraping, scarification or the use of abrasives or solvents may be used to remove or separate PCBs to the decontamination standards for liquids, concrete, or non-porous surfaces, as listed in 40 *CFR* 761.79(b).	Generation of PCB wastes, including water, organic liquids, non-porous surfaces (scrap metal from disassembled electrical equipment), concrete, and non-porous surfaces covered with porous surfaces, such as paint or coating on metal – **applicable**	40 *CFR* 761.79(b)
Decontamination of water containing PCBs to levels acceptable for discharge	For water discharged to a treatment works or to navigable waters, decontaminate to <3 µ/L (approximately <3 ppb)or a PCB discharge limit included in a permit issued under Sect. 304(b) or 402 of the CWA; or	Discharge of water containing PCBs to a treatment works or navigable waters – **applicable**	40 *CFR* 761.79(b)(1)(ii)
Decontamination of water containing PCBs to levels acceptable for unrestricted use	Decontaminate to ≤ 0.5 µg/L (approximately ≤ 0.5 ppb) for unrestricted use.	Release of water containing PCBs for unrestricted use – **applicable**	40 *CFR* 761.79(b)(1)(iii)
Decontamination of organic liquids or non-aqueous inorganic liquids containing PCBs	For organic liquids or non-aqueous inorganic liquids containing PCBs, decontamination standard is < 2 mg/kg (i.e., < 2 ppm) PCBs.	Release of organic liquids or non-aqueous liquid containing PCBs – **applicable**	40 *CFR* 761.79(b)(2)
Decontamination of non-porous surfaces in contact with liquid PCBs to levels acceptable for unrestricted use	For non-porous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, ≤ 10 µg PCBs per 100 square centimeters (≤ 10 µg/ 100 $cm^{2)}$ as measured by a standard wipe test (40 *CFR* 761.123) at locations selected in accordance with Subpart P of 40 *CFR* 761.	Release of non-porous surfaces in contact with liquid PCBs at any concentration for unrestricted use – **applicable**	40 *CFR* 761.79(b)(3)(i)(A)
Decontamination of non-porous surfaces in contact with non-liquid PCBs to levels acceptable for unrestricted use	For non-porous surfaces in contact with non-liquid PCBs (including non-porous surfaces covered with a porous surface, such as paint or coating on metal), clean to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish of the NACE. A person shall verify compliance with standard No. 2 by visually inspecting all cleaned areas.	Release of non-porous surfaces in contact with non-liquid PCBs for unrestricted use – **applicable**	40 *CFR* 761.79(b)(3)(i)(B)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Decontamination of non-porous surfaces in contact with liquid PCBs to levels acceptable for disposal in a TSCA smelter	For non-porous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, decontaminate to < 100 µg/100 cm^2 as measured by a standard wipe test (Sect. 761.123) at locations selected in accordance with Subpart P of 40 *CFR* 761,	Disposal of non-porous surfaces previously in contact with liquid PCBs at any concentration into a smelter operating in accordance with Sect. 761.72(b) – **applicable**	40 *CFR* 761.79(b)(3)(ii)(A)
Decontamination of non-porous surfaces in contact with non-liquid PCBs to levels acceptable for disposal in a TSCA smelter	For non-porous surfaces in contact with non-liquid PCBs (including non-porous surfaces covered with a porous surface, such as paint or coating on metal) clean to Visual Standard No. 3, Commercial Blast Cleaned Surface Finish, of the NACE. A person shall verify compliance with Standard No. 3 by visually inspecting all cleaned areas.	Disposal of non-porous surfaces in contact with non-liquid PCBs into a smelter operating in accordance with Sect. 761.72(b) – **applicable**	40 *CFR* 761.79(b)(3)(ii)(B)
Decontamination of concrete recently contaminated with PCBs	Decontamination standard for concrete is < 10 µg/100 cm^2 as measured by a standard wipe test (Sect. 761.123) if the decontamination procedure is commenced within 72 hours of the initial spill of PCBs to the concrete or portion thereof being decontaminated.	Decontamination of concrete within 72 hours of the initial spill of PCBs to the concrete – **applicable**	40 *CFR* 761.79(b)(4)
Disposal of materials previously contaminated with PCBs as non-TSCA waste	Materials from which PCBs have been removed by decontamination in accordance with 40 *CFR* 761.79, not including decontamination wastes and residuals under 40 *CFR* 761.79(g), are considered unregulated for disposal under Subpart D of TSCA (40 *CFR* 761).	Disposal of materials from which PCBs have been removed – **applicable**	40 *CFR* 761.79(a)(4)
Risk-based decontamination of PCB-containing materials	May decontaminate to an alternate risk-based decontamination standard under 40 *CFR* 761.79(h) if the standard does not pose an unreasonable risk of injury to health or the environment.	Decontamination of materials contaminated with PCBs – **applicable**	40 *CFR* 761.79(h)
Management of PCB/radioactive waste	Any person storing such waste ≥ 50 ppm PCBs must do so taking into account both its PCB concentration and radioactive properties, except as provided in 40 *CFR* 761.65(a)(1), (b)(1)(ii) and (c)(6)(i).	Generation of PCB/radioactive waste for disposal – **applicable**	40 *CFR* 761.50(b)(7)(i)
	Any person disposing of such waste must do so taking into account both its PCB concentration and its radioactive properties.		40 *CFR* 761.50(b)(7) (ii)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	If, after taking into account only the PCB properties in the waste, the waste meets the requirements for disposal in a facility permitted, licensed, or registered by a state as a municipal or non-municipal non-hazardous waste landfill, then the person may dispose of such waste without regard to the PCBs, based on its radioactive properties alone.		40 *CFR* 761.50(b)(7) (ii)
	Storage		
Storage of hazardous wastes restricted from land disposal	Prohibits storage of hazardous waste restricted from land disposal unless the generator stores such waste in tanks, containers, or containment buildings on site solely for the purpose of accumulating such quantities as necessary to facilitate proper recovery, treatment, or disposal.	Accumulation of hazardous wastes restricted from land disposal solely for purpose of accumulation of quantities as necessary to facilitate proper recovery, treatment, or disposal – **applicable**	40 *CFR* 268.50 *OAC* 3745-270-50
Temporary storage of hazardous waste in containers on site	A generator may accumulate hazardous waste at the facility provided that: • The waste is placed in containers that comply with 40 *CFR* 265.171-173 (Subpart I) [*OAC* 3745-66-70 to -77],	Accumulation of RCRA hazardous waste on-site as defined in 40 *CFR* 260.10— **applicable**	40 *CFR* 262.34(a)(1)(i) *OAC* 3745-52-34(A)(1)(a)
	• Container is marked with the date upon which each period of accumulation begins,		40 *CFR* 262.34(a)(2) *OAC* 3745-52-34(A)(2)
	• Container is marked with the words "hazardous waste", or		40 *CFR* 262.34(a)(3) *OAC* 3745-52-34(A)(3)
	• Container may be marked with other words that identify contents.	Accumulation of 55 gal or less of RCRA hazardous waste at or near any point of generation – **applicable**	40 *CFR* 262.34(c) (1)(ii) *OAC* 3745-52-34(C) (1)(b)
Management of hazardous waste stored in containers	If container is not in good condition (e.g., severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers – **applicable**	40 *CFR* 264.171 *OAC* 3745-55-71

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	Use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired.		40 *CFR* 264.172 *OAC* 3745-55-72
	Keep containers closed during storage, except to add/remove waste.		40 *CFR* 264.173(a) *OAC* 3745-55-73(A)
	Open, handle, and store containers in a manner that will not cause containers to rupture or leak.		40 *CFR* 264.173(b) *OAC* 3745-55-73(B)
	At least weekly, the must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors.		40 *CFR* 264.174 *OAC* 3745-55-74
Operation of a RCRA container storage area	Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage in containers of RCRA hazardous wastes that do not contain free liquids – **applicable**	40 *CFR* 264.175(c) *OAC* 3745-55-75(C)
Storage of RCRA hazardous waste with free liquids in containers	Area must have a containment system designed and operated in accordance with 40 *CFR* 264.175(b) [*OAC* 3745-55-75(B)] as follows:	Storage of RCRA hazardous waste with free liquids or F020, F021, F022, F023, F026 and F027 in containers – **applicable**	40 *CFR* 264.175(a) and (d) *OAC* 3745-55-75(A) and (D)
	• A base must underlie the containers that is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed;		40 *CFR* 264.175(b)(1) *OAC* 3745-55-75(B)(1)
	• Base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;		40 *CFR* 264.175(b)(2) *OAC* 3745-55-75(B)(2)
	• Must have sufficient capacity to contain 10 percent of the volume of containers or volume of largest container, whichever is greater;		40 *CFR* 264.175(b)(3) *OAC* 3745-55-75(B)(3)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	• Runon into the system must be prevented unless the collection system has sufficient capacity to contain along with volume required for containers; and		40 *CFR* 264.175(b)(4) *OAC* 3745-55-75(B)(4)
	• Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in a timely manner as or necessary to prevent overflow.		40 *CFR* 264.175(b)(5) *OAC* 3745-55-75(B)(5)
Storage of ignitable or reactive waste in containers	Containers holding ignitable or reactive waste must be located at least fifteen meters (fifty feet) from the facility's property line.	Storage of ignitable or reactive RCRA hazardous waste in containers—**applicable**	40 *CFR* 264.176 OAC 3745-55-76
Storage of incompatible waste in containers	Must not place incompatible wastes in same container unless comply with 40 *CFR* 264.17(b) [*OAC* 3745-54-17(B)].	Storage of ~~in~~compatible" RCRA hazardous wastes in containers – **applicable**	40 *CFR* 264.177(a) *OAC* 3745-55-77(A)
	Waste shall not be placed in an unwashed container that previously held an incompatible waste or material.		40 *CFR* 264.177(b) *OAC* 3745-55-77(B)
	A container holding incompatible wastes must be separated from any waste or nearby materials or must protect them from one another by using a dike, berm, wall, or other device.		40 *CFR* 264.(c) *OAC* 3745-55-77(C)
Temporary storage of RCRA remediation waste in a staging pile	May be temporarily stored (including mixing, sizing, blending, or other similar physical operations intended to prepare the wastes for subsequent management or treatment) at a facility provided that the staging pile will be designed to:	Accumulation of non-flowing hazardous remediation waste (or remediation waste otherwise subject to land disposal restrictions) as defined in 40 *CFR* 260.10 – **applicable**	40 *CFR* 264.554(d)(1) *OAC* 3745-57-74
	• Facilitate a reliable, effective and protective remedy;		40 *CFR* 264.554(d) (1)(i) *OAC* 3745-57-74(D) (1)(a)
	• Prevent or minimize releases of hazardous wastes and constituents into the environment, and minimize or adequately control cross-media transfer, as necessary, to protect human health and the environment (e.g., through the use of liners, covers, runon/runoff controls, as appropriate).		40 *CFR* 264.554(d) (1)(ii) *OAC* 3745-57-74(D) (1)(b)
	Must not place incompatible wastes in same pile unless comply with 40 *CFR* 264.17(b) [*OAC* 3745-54-17(B)].	Storage of ~~in~~compatible" remediation waste in staging pile – **applicable**	40 *CFR* 264.554(f)(1) *OAC* 3745-57-74(F)(1)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	Incompatible wastes must be separated from any waste or nearby materials or must protect them from one another by using a dike, berm, wall, or other device.		40 *CFR* 264.554(f)(2) *OAC* 3745-57-74(F)(2)
	Must not pile remediation waste on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to comply with 40 *CFR* 274.17(b) [*OAC* 3745-54-17(B)].		40 *CFR* 264.554(f)(3) *OAC* 3745-57-74(F)(3)
Storage of RCRA hazardous waste	Must comply with the substantive requirements of a site-specific RCRA storage permit.	Storage of RCRA hazardous waste – **TBC**	PORTS RCRA Part B Storage Permit No. 04-66-0680
Temporary storage of PCB waste in a non-RCRA area	Except as provided in 40 *CFR* 761.65 (b)(2), (c)(1), (c)(7), (c)(9), and (c)(10), after July 1, 1978, facilities used for the storage of PCBs and PCB Items designated for disposal shall comply with the storage unit requirements in 40 *CFR* 761.65(b)(1).	Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal – **applicable**	40 *CFR* 761.65(b)
	The facilities shall meet the following criteria:		40 *CFR* 761.65(b)(1)
	• Adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB Items;		40 *CFR* 761.65(b)(1)(i)
	• Adequate floor that has continuous curbing with a minimum 6-inch high curb. Floor and curb must provide a containment volume equal to at least two times the internal volume of the largest PCB article or container or 25% of the internal volume of all articles or containers stored there, whichever is greater. *Note*: 6 inch minimum curbing not required for area storing PCB/radioactive waste;		40 *CFR* 761.65(b)(1)(ii)
	• No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area.		40 *CFR* 761.65(b)(1)(iii)
	• Floors and curbing constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface as defined at Sect. 761.3, which prevents or minimizes penetration of PCBs; and		40 *CFR* 761.65(b)(1)(iv)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	• Not located at a site that is below the 100-year flood water elevation.		40 *CFR* 761.65(b)(1)(v)
Temporary storage of PCB waste in a RCRA-regulated area	Does not have to meet storage unit requirements in 40 *CFR* 761.65(b)(1) provided unit is stored in compliance with RCRA and PCB spills are cleaned up in accordance with Subpart G of 40 *CFR* 761.	Storage of PCB waste in a RCRA regulated area – **applicable**	40 *CFR* 761.65(b)(2)(i) thru (iv)
Temporary storage of PCB waste in containers	Container(s) shall be marked as illustrated in 40 *CFR* 761.45(a).	Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal – **applicable**	40 *CFR* 761.40(a)(1)
	Storage area must be properly marked as required by 40 *CFR* 761.40(a)(10).		40 *CFR* 761.65(c)(3)
	Any leaking PCB items and their contents shall be transferred immediately to a properly marked non-leaking container(s).		40 *CFR* 761.65(c)(5)
	Except as provided in 40 *CFR* 761.65(c)(6)(i) and (ii), container(s) shall be in accordance with requirements set forth in DOT HMR at 49 *CFR* 171-180.		40 *CFR* 761.65(c)(6)
	Items shall be dated when they are removed from service and the storage shall be managed so that PCB items can be located by this date. [Note: Date should be marked on the container.]	PCB items (includes PCB wastes) removed from service for disposal – **applicable**	40 *CFR* 761.65(c)(8)
Risk-based storage of PCB remediation waste or bulk product waste prior to disposal	May store in a manner other than prescribed in 40 *CFR* 761.65 if method will not pose an unreasonable risk of injury to health or the environment.	Storage of PCB remediation waste or bulk product waste prior to disposal – **applicable**	40 *CFR* 761.61(c) 40 *CFR* 761.62(c)
Temporary storage of PCB remediation waste or PCB bulk product waste in a TSCA waste pile	Waste must be placed and managed in accordance with the design and operation standards, including liner and cover requirements and run-off control systems, in 40*CFR* 761.65(c)(9).	Storage of PCB-remediation waste or PCB bulk product waste at cleanup site or site of generation – **applicable**	40 *CFR* 761.65(c)(9)(i)
	Requirements of 40 *CFR* 761.65(c)(9) of this part may be modified under the risk-based disposal option of Sect. 761.61(c).		40 *CFR* 761.65(c) (9)(iv)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Storage of PCB/radioactive waste in containers	For liquid wastes, containers must be nonleaking.	Storage of PCB/radioactive waste in containers other than those meeting DOT HMR performance standards – **applicable**	40 *CFR* 761.65(c)(6)(i)(A)
	For nonliquid wastes, containers must be designed to prevent buildup of liquids if such containers are stored in an area meeting the containment requirements of 40 *CFR* 761.65(b)(1)(ii); and		40 *CFR* 761.65(c)(6)(i)(B)
	For both liquid and nonliquid wastes, containers must meet all substantive requirements pertaining to nuclear criticality safety.		40 CFR 761.65(c)(6)(i)(C)
Temporary staging and storage of LLW	Ensure that radioactive waste is stored in a manner that protects the public, workers, and the environment and that the integrity of waste storage is maintained for the expected time of storage.	Management and storage of LLW at a DOE facility – **TBC**	DOE M 435.1-1 I.F(13)
	Shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water.		DOE M 435.1-1 IV.N(1)
	Shall be stored in a location and manner that protects the integrity of waste for the expected time of storage.		DOE M 435.1-1 IV.N(3)
	Shall be managed to identify and segregate LLW from mixed waste.		DOE M 435.1-1 IV.N(6)
	Staging of LLW shall be for the purpose of accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal.		DOE M 435.1-1 IV.N(7)
	Treatment/disposal		
Disposal of RCRA-prohibited hazardous waste in a land-based unit	May be land disposed only if it meets the requirements in the table "Treatment Standards for Hazardous Waste" at 40 *CFR* 268.40 (*OAC* 3745-270-40) before land disposal. The table lists either "total waste" standards, "waste-extract" standards, or "technology-specific" standards [as detailed further in 40 *CFR* 268.42 (*OAC* 3745-270-42)].	Land disposal, as defined in 40 *CFR* 268.2, of RCRA prohibited waste [as listed in 40 *CFR* 268.20 to .39 (*OAC* 3745-270-20 to -39)] – **applicable**	40 *CFR* 268.40(a) *OAC* 3745-270-40(A) 40 *CFR* 268.20 to .40 *OAC* 3745-270-20 to -40 40 *CFR* 268.42 *OAC* 3745-270-42

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	For characteristic wastes (D001 – D043) that are subject to the treatment standards, all underlying hazardous constituents must meet the UTSs specified in 40 *CFR* 268.48 (*OAC* 3745-270-48).	Land disposal of restricted RCRA characteristic wastes (D001-D043) that are not managed in a wastewater treatment unit that is regulated under the CWA, that is CWA equivalent, or that is injected into a Class I nonhazardous injection well – **applicable**	40 *CFR* 268.40(e) *OAC* 3745-270-40(E) 40 *CFR* 268.48 *OAC* 3745-270-48
	May be land disposed if the wastes no longer exhibit a characteristic at the point of land disposal, unless the wastes are subject to a specified method of treatment other than DEACT in 40 *CFR* 628.40 (*OAC* 3745-270-48), or are D003 reactive cyanide.	Land disposal of RCRA-restricted characteristic wastes – **applicable**	40 *CFR* 268.1(c)(4)(iv) *OAC* 3745-270-01 (C)(4)
Debris	May be land disposed if treated prior to disposal as provided under the ―Alternative Treatment Standards for Hazardous Debris" in 40 *CFR* 268.45(a)(1)-(5) [*OAC* 3745-270-45(A)(1)-(5)] unless it is determined under 40 *CFR* 261.3(f)(2) [*OAC* 3745-51-03(F)(2)] that the debris is no longer contaminated with hazardous waste or the debris is treated to the waste specific treatment standard provided in 40 *CFR* 268.40 (*OAC* 3745-270-40) for the waste contaminating the debris.	Land disposal, as defined in 40 *CFR* 268.2 (*OAC* 3745-270-02), of RCRA-restricted hazardous debris – **applicable**	40 *CFR* 268.45(a) *OAC* 3745-270-45(A)
	The hazardous debris must be treated for each ―contaminant subject to treatment," which must be determined in accordance with 40 *CFR* 268.45(b) [*OAC* 3745-270-45(B)].		40 *CFR* 268.45(b) *OAC* 3745-270-45(B)
Soils	May be land disposed if treated prior to disposal according to the alternative treatment standards of 40 *CFR* 268.49(c) [*OAC* 3745-270-49(C)] or according to the UTSs specified in 40 *CFR* 268.48 (*OAC* 3745-270-48) applicable to the listed hazardous waste and/or applicable characteristic of hazardous waste if the soil is characteristic.	Land disposal, as defined in 40 *CFR* 268.2 (*OAC* 3745-270-02), of RCRA-restricted hazardous soils – **applicable**	40 *CFR* 268.49(b) and (c) *OAC* 3745-270-49(B) and (C)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Disposal of treated hazardous debris	Debris treated by one of the specified extraction or destruction technologies on Table 1 of this section and which no longer exhibits a characteristic is not a hazardous waste and need not be managed in RCRA subtitle C facility.	Treated debris contaminated with RCRA-listed or characteristic waste – **applicable**	40 *CFR* 268.45(c) *OAC* 3745-270-45(C)
	Hazardous debris contaminated with listed waste that is treated by an immobilization technology must be managed in a RCRA subtitle C facility.		
Disposal of hazardous debris treatment residues	Except as provided in 268.45(d)(2) and (d)(4) [*OAC* 3745-270-45(D)(2) and (D)(4)], treatment residues must be separated from the treated debris using simple physical or mechanical means, and such residues are subject to the waste-specific treatment standards for the waste contaminating the debris.	Residues from the treatment of hazardous debris – **applicable**	40 CFR 268.45(d)(1) *OAC* 3745-270-45 (D)(1)
Prohibition of dilution to meet LDRs	Except as provided under 40 *CFR* 268.3(b) [*OAC* 3745-270-03(B)], must not in any way dilute a restricted waste or the residual from treatment of a restricted waste as a substitute for adequate treatment to achieve compliance with land disposal restriction levels.	Land disposal, as defined in 40 *CFR* 268.2 (*OAC* 3745-270-02), of RCRA-restricted hazardous soils – **applicable**	40 *CFR* 268.3(a) *OAC* 3745-270-03(A)
Disposal of wastewaters containing RCRA hazardous constituents in a CWA wastewater treatment unit	Disposal is not prohibited if the wastes are managed in a treatment system which subsequently discharges to waters of the US under the CWA unless the wastes are subject to a specified method of treatment other than DEACT in 40 *CFR* 268.40 (*OAC* 3745-270-40) or are D003 reactive cyanide.	Disposal of RCRA restricted hazardous wastes that are hazardous only because they exhibit a hazardous characteristic and are not otherwise prohibited under 40 *CFR* Part 268 – **applicable**	40 *CFR* 268.1(c)(4)(i) *OAC* 3745-270-01 (C)(4)
Disposal of wastewaters in a CWA wastewater treatment unit	No entity shall cause pollution or place or cause to be placed any sewage, sludge, sludge materials, industrial waste, or other wastes in a location where they cause pollution of any waters of the state.	Discharge of contaminants to waters of the state – **applicable**	*ORC* 6111.04
	No person shall violate or fail to perform any duty imposed by sections 6111.01 to 6111.08 of the Revised Code or violate any order, rule, or term or condition of a permit issued or adopted by the director of environmental protection pursuant to those sections.		*ORC* 6111.07

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Treatment of LLW	Waste treatment to provide more stable waste forms and to improve the long-term performance of a LLW disposal facility shall be implemented as necessary to meet performance objectives of the disposal facility.	Generation of LLW for disposal at a DOE LLW disposal facility – **TBC**	DOE M 435.1-1 IV.O
Disposal of solid LLW at DOE facilities	Shall meet waste acceptance requirements before it is transferred to the receiving facility.	Generation of LLW for disposal at a DOE facility – **TBC**	DOE M 435.1-1 IV.J(2)
Disposal of refrigeration equipment	With the exception of the substitutes in the end uses listed in 40 *CFR* 82.154(a)(1)(i) – (vi), no person maintaining, servicing, repairing, or disposing of appliances may knowingly vent or otherwise release into the environment any refrigerant or substitute from such appliances.	Appliances that contain Class I or II substances used as a refrigerant – **applicable**	40 *CFR* 82.154(a)(1)
	De minimis releases associated with good faith attempts to recycle or recover refrigerants are not subject to this prohibition.		40 *CFR* 82.154(a)(2)
	No person may dispose of such appliances, except for small appliances, MVACs, and MVAC-like appliances, without: • Observing the required practices set forth in 40 *CFR* 82.156, and • Using equipment that is certified for that type of appliance pursuant to 40 *CFR* 82.158.		40 *CFR* 82.154(b)
Disposal of asbestos-containing waste material (e.g., transite siding, pipe lagging, insulation, ceiling tiles)	All asbestos-containing waste material must be deposited as soon as practicable at a waste disposal site operated in accordance with Section 61.154 [*OAC* 3745-20-06] or a site that converts RACM and asbestos-containing waste material into nonasbestos (asbestos free) material according to the provisions of 40 *CFR* 61.155 [*OAC* 3745-20-13].	Removal and disposal of RACM except Category I nonfriable asbestos containing material **– applicable**	40 *CFR* 61.150(b)(1) and (2) *OAC* 3745-20-05(A)
	May use an alternative emission control and waste treatment method that will control asbestos emissions equivalent to currently required methods, the alternative method is suitable for the intended application, and the alternative method will not violate other regulations and will not result in increased water or land pollution or occupational hazards.		40 *CFR* 61.150(a)(4) *OAC* 3745-20-05(B)(4)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Exclusions for disposal or reuse of construction and demolition debris, or ~~"~~clean hard fill" [as defined in OAC 3745-400-01(E)]	Construction and demolition debris facility requirements do not apply to construction and demolition debris or clean hard fill used in one or more of the following ways: • Any construction site where construction debris and trees and brush removed in clearing the construction site are used as fill material on the site where the materials are generated or removed; • Any site where clean hard fill is used, either alone or in conjunction with clean soil, sand, gravel, or other clean aggregates, in legitimate fill operations; • Any site where debris is not disposed, such as where debris is reused or recycled in a beneficial manner, or stored for a temporary period remaining unchanged and retrievable.	Use of construction and demolition debris or clean hard fill at a site – **applicable**	*OAC* 3745-400-03
Disposal of construction and demolition debris as ~~"~~clean hard fill"	Clean hard fill (does not include materials contaminated with hazardous, solid, or infectious waste) consisting of reinforced or nonreinforced concrete, asphalt concrete, brick (includes but is not limited to refractory brick and mortar), block, tile, or stone shall be managed in one or more of the following ways: • Recycled into usable construction material; • Disposed in construction and demolition debris or other waste facilities; • Used in legitimate fill operations for construction purposes or to bring the site up to consistent grade, on the site of generation, or on a site other than the site of generation, pursuant to paragraph (C) of OAC 3745-400-05.	Use of clean hard fill to bring a construction site up to consistent grade – **applicable**	*OAC* 3745-400-05(A)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Performance-based disposal of PCB remediation waste	Shall be disposed according to 40 *CFR* 761.60(a) or (e), or decontaminated in accordance with 40 *CFR* 761.79.	Disposal of liquid PCB remediation waste – **applicable**	40 *CFR* 761.61(b)(1)
	May dispose by one of the following methods:	Disposal of nonliquid PCB remediation waste (as defined in 40 *CFR* 761.3) – **applicable**	40 *CFR* 761.61(b)(2)
	• In a high-temperature incinerator under 40 *CFR* 761.70(b);		40 *CFR* 761.61(b)(2)(i)
	• By an alternate disposal method under 40 *CFR* 761.60(e);		
	• In a chemical waste landfill under 40 *CFR* 761.75;		
	• In a facility under 40 *CFR* 761.77; or		
	• Through decontamination in accordance with 40 *CFR* 761.79.		40 *CFR* 761.61(b) (2)(ii)
Risk-based disposal of PCB remediation waste	May dispose of in a manner other than prescribed in 40 *CFR* 761.61(a) or (b) if the method will not pose an unreasonable risk of injury to health or the environment.	Disposal of PCB remediation waste – **applicable**	40 *CFR* 761.61(c)
Disposal of PCB decontamination waste and residues	Shall be disposed of at their existing PCB concentration unless otherwise specified in 40 *CFR* 761.79(g).	PCB decontamination waste and residues for disposal – **applicable**	40 *CFR* 761.79(g)
Disposal of PCB liquids (e.g., from drained electrical equipment)	Must be disposed of in an incinerator that complies with 40 *CFR* 761.70, except:	PCB liquids at concentrations ≥ 50 ppm – **applicable**	40 *CFR* 761.60(a)
	For mineral oil dielectric fluid, may be disposed in a high efficiency boiler according to 40 *CFR* 761.71(a).	PCB liquids at concentrations ≥ 50 ppm and < 500 ppm – **applicable**	40 *CFR* 761.60(a)(1)
	For liquids other than mineral oil dielectric fluid, may be disposed in a high efficiency boiler according to 40 *CFR* 761.71(b).		40 *CFR* 761.60(a)(2)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Disposal of PCB-contaminated precipitation, condensation, or leachate	May be disposed in a chemical waste landfill that complies with 40 *CFR* 761.75 if:	PCB liquids at concentrations ≥ 50 ppm from incidental sources and associated with PCB articles or non-liquid PCB wastes – **applicable**	40 *CFR* 761.60(a)(3)
	• Disposal does not violate 40 *CFR* 268.32(a) or 268.42(a)(1), and		40 *CFR* 761.60(a)(3)(i)
	• Liquids do not exceed 500 ppm and are not ignitable waste as described in 761.75(b)(8)(iii).		40 *CFR* 761.60(a) (3)(ii)
Disposal of PCB transformers	Shall be disposed of in either:	PCB-contaminated electrical equipment (including transformers that contain PCBs at concentrations of ≥ 50 ppm and < 500 ppm in the contaminating fluid) as defined in 40 *CFR* 761.3 – **applicable**	40 *CFR* 761.60(b)(1)
	• An incinerator that complies with 40 *CFR* 761.70, or		40 *CFR* 761.60(b)(1)(i)(A)
	▪ A chemical waste landfill that is compliant with 40 *CFR* 761.75, provided all free flowing liquid is removed from the transformer, the transformer is filled with a solvent, the transformer is allowed to stand for at least 18 continuous hours, and then the solvent is thoroughly removed.		40 *CFR* 761.60(b)(1)(i)(B)
Performance-based disposal of PCB bulk product waste	May dispose of by one of the following:	Disposal of PCB bulk product waste as defined in 40 *CFR* 761.3 – **applicable**	40 *CFR* 761.62(a)
	• In an incinerator under Sect. 761.70,		40 *CFR* 761.62(a)(1)
	• In a chemical waste landfill under Sect. 761.75,		40 *CFR* 761.62(a)(2)
	• In a hazardous waste landfill under Sects. 3004 or Sect. 3006 of RCRA,		40 *CFR* 761.62(a)(3)
	• Under alternate disposal under Sect. 761.60(e),		40 *CFR* 761.62(a)(4)
	• In accordance with decontamination provisions of Sect. 761.79;		40 *CFR* 761.62(a)(5)
	• In accordance with the thermal decontamination provisions of Sect. 761.79(e)(6) for metal surfaces in contact with PCBs.		40 *CFR* 761.62(a)(6)
Risk-based disposal of PCB bulk product waste	May dispose of in a manner other than that prescribed in 40 *CFR* 761.62(a) if the method will not pose an unreasonable risk of injury to health or the environment.	Disposal of PCB bulk product waste as defined in 40 *CFR* 761.3 – **applicable**	40 *CFR* 761.62(c)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Disposal of PCB bulk product waste in solid waste landfill	May dispose of the following in a municipal or non-municipal non-hazardous waste landfill.	Disposal of non-liquid PCB bulk product waste listed in 40 *CFR* 761.62(b)(1) – **applicable**	40 *CFR* 761.62(b)(1)(i) and (ii)
	▪ Plastics (such as plastic insulation from wire or cable; radio, television and computer casings; vehicle parts; or furniture laminates); preformed or molded rubber parts and components; applied dried paints, varnishes, waxes or other similar coatings or sealants; caulking; Galbestos; non-liquid building demolition debris; or non-liquid PCB bulk product waste from the shredding of automobiles or household appliances from which PCB small capacitors have been removed (shredder fluff)		40 *CFR* 761.62(b)(1)(i)
	▪ Other PCB bulk product waste, sampled in accordance with the protocols set out in subpart R of 40 *CFR* Part 761, that leaches PCBs at < 10 µg/L of water measured using a procedure used to simulate leachate generation		40 *CFR* 761.62(b)(1)(ii)
	May dispose of in a municipal or non-municipal nonhazardous waste landfill if:	PCB bulk product waste not meeting conditions of 40 *CFR* 761.62(b)(1) (e.g., paper/felt gaskets contaminated by liquid PCBs) – **applicable**	40 *CFR* 761.62(b)(2)
	• The PCB bulk product waste is segregated from organic liquids disposed of in the landfill, and		40 *CFR* 761.62(b)(2)(i)
	• Leachate is collected from the landfill and monitored for PCBs.		40 *CFR* 761.62(b) (2)(ii)
Disposal of fluorescent light ballasts	Must be disposed of in a TSCA disposal facility as bulk product waste under 40 *CFR* 761.62 or in accordance with the decontamination provisions of 40 *CFR* 761.79.	Generation for disposal of fluorescent light ballasts containing PCBs in the potting material – **applicable**	40 *CFR* 761.60(b) (6)(iii)
Disposal of PCB-contaminated electrical equipment (except capacitors)	Must remove all free-flowing liquid from the electrical equipment and dispose of the removed liquid in accordance with 40 *CFR* 761.60(a) and	Generation of PCB-contaminated electrical equipment (as defined in 40 *CFR* 761.3) for disposal - **applicable**	40 *CFR* 761.60(b)(4)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Disposal of PCB-contaminated electrical equipment (except capacitors) (continued)	Dispose of by one of the following methods: • In a facility managed as a municipal solid waste or non-municipal non-hazardous waste; • In an industrial furnace operating in compliance with 40 *CFR* 761.72; or • In a disposal facility under 40 *CFR* 761.60.	Drained PCB-contaminated electrical equipment, including any residual liquids – **applicable**	40 *CFR* 761.60(b)(4)(i)
Disposal of PCB-contaminated articles	Must remove all free-flowing liquid from the article, disposing of the liquid in compliance with the requirements of 40 *CFR* 761.60(a)(2) or (a)(3), and	Generation of PCB-contaminated articles (as defined in 40 *CFR* 761.3) for disposal – **applicable**	40 *CFR* 761.60(b)(6)(ii)
	Dispose by one of the following methods: • In accordance with the decontamination provisions at 40 *CFR* 761.79; • In a facility managed as a municipal solid waste or non-municipal nonhazardous waste; • In an industrial furnace operating in compliance with 40 *CFR* 761.72; or • In a disposal facility approved under 40 *CFR* 761.60.	Disposal of PCB-contaminated articles with no free-flowing liquid – **applicable**	40 *CFR* 761.60(b)(6)(ii)(A) thru (D)
	Closure		
Closure performance standard for RCRA hazardous waste management units	Must close the facility in a manner that: • Minimizes the need for further maintenance; and • Controls, minimizes or eliminates, to the extent necessary to protect human health and environment, post-closure escape of hazardous waste, hazardous constituents, contaminated run off or hazardous waste decomposition products to ground or surface waters or to the atmosphere.	Closure of a RCRA hazardous waste management unit – **applicable**	40 *CFR* 264.111(a) *OAC* 3745-55-11(A) 40 *CFR* 264.111(b) *OAC* 3745-55-11(B)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	• Complies with the substantive closure requirements of 40 *CFR* 264 [*OAC* 3745-54 to -57 and -205] for the particular type of facility, including but not limited to the requirements of Sects. 264.178 (container storage area) [*OAC* 3745-55-78], 264.197 (tanks) [*OAC* 3745-55-97], 264.310 (landfills) [*OAC* 3745-57-10], and 264.554 (remediation waste piles) [*OAC* 3745-56-58].		40 *CFR* 264.111(c) *OAC* 3745-55-11(C)
	During closure periods, all contaminated equipment, structures, and soils must be properly disposed or decontaminated.		40 *CFR* 264.114 *OAC* 3745-55-14
Closure of a RCRA container storage unit	Must remove all hazardous waste and residues from containment system. Remaining containers, liners, bases and soil containing or contaminated with hazardous waste or residues must be decontaminated or removed.	Closure of a RCRA hazardous waste container storage area – **applicable**	40 *CFR* 264.178 *OAC* 3745-55-78
Closure of a RCRA remediation waste staging pile	Must be closed by removing or decontaminating all remediation waste, contaminated containment system components, and structures and equipment contaminated with waste and leachate.	Closure of a remediation waste staging pile located in a previously contaminated area – **applicable**	40 *CFR* 264.554(j)(1) *OAC* 3745-57-74(J)(1)
	Must decontaminate contaminated subsoils in a manner that will protect human health and the environment.		40 *CFR* 264.554(j)(2) *OAC* 3745-57-74(J)(2)
	Must be closed according to substantive requirements in 40 *CFR* 264.258(a) and 264.111 or 265.258(a) and 265.111 [*OAC* 3745-56-58(A) and 3745-55-11 or 3745-67-58 and 3745-66-11].	Closure of a remediation waste staging pile located in an uncontaminated area – **applicable**	40 *CFR* 264.554(k) *OAC* 3745-57-74(K)
Closure of TSCA storage facility (i.e., storage areas established under this action)	Must close in a manner that eliminates the potential for post-closure releases of PCBs that may present an unreasonable risk to human health or the environment.	Closure of a TSCA storage facility – **applicable**	40 *CFR* 761.65(e)(1)
	Must remove or decontaminate PCB waste residues and contaminated containment system components, equipment, structures, and soils during closure in accordance with the levels specified in the PCB Spills Cleanup Policy in subpart G of 40 *CFR* 761.		40 *CFR* 761.65(e) (1)(iv)
	A TSCA/RCRA storage facility closed under RCRA is exempt from the TSCA closure requirements of 40 *CFR* 761.65(e).	Closure of TSCA/RCRA storage facility – **applicable**	40 *CFR* 761.65(e)(3)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	Transportation[b]		
Transportation of hazardous waste on site	The generator manifesting requirements of 40 *CFR* 262.20 to 262.32(b) [*OAC* 3745-52-20 to -23 and 3745-52-32(B)] do not apply. Generator or transporter must comply with the requirements set forth in 40 *CFR* 263.30 and 263.31 [*OAC* 3745-53-30 and 3745-53-31] in the event of a discharge of hazardous waste on a private or public right-of-way.	Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by a public or private right-of-way – **applicable**	40 *CFR* 262.20(f) *OAC* 3745-52-20(F)
Transportation of radioactive waste	Shall be packed and transported in accordance with he substantive requirements of DOE O 460.1C (*Packaging and Transportation Safety*) and DOE O 460.2A (*Departmental Materials Transportation and Packaging Management*). To the extent practicable, the volume of waste and number of shipments shall be minimized.	Preparation of shipment of radioactive waste – **TBC**	DOE M 435.1-1 I.1 (E)(11) DOE M 435.1-1 III.L(2) DOE M 435.1-1 IV.L(2)
Transportation of PCB wastes off site	Must comply with the manifesting provisions at 40 *CFR* 761.207 through 218.	Relinquishment of control over PCB wastes by transporting or offering for transport – **applicable**	40 *CFR* 761.207(a)
Transportation of hazardous waste off site	Must comply with the generator requirements of 40 *CFR* 262.20 to 262.23 [*OAC* 3745-52-20 to -23] for manifesting, Sect. 262.30 [*OAC* 3745-52-30] for packaging, Sect. 262.31 [*OAC* 3745-52-31] for labeling, Sect. 262.32 [*OAC* 3745-52.-32] for marking, Sect. 262.33 [*OAC* 3745-52-33] for placarding, Sect. 262.40, 262.41(a) for record keeping requirements, and Sect. 262.12 to obtain EPA ID number.	Preparation of RCRA hazardous waste for transport off site – **applicable**	40 *CFR* 262.10(h) *OAC* 3745-52-10(H) 40 *CFR* 262.20 to .23 *OAC* 3745-52-20 to -23 40 *CFR* 262.30 to .33 *OAC* 3745-52-30 to -33
Transportation of universal waste off site	Off-site shipments of universal waste by a large quantity handler of universal waste shall be made in accordance with 40 *CFR* 273.38 [*OAC* 3745-273-38].	Preparation of universal waste for transport off site – **applicable**	40 *CFR* 273.38(c) *OAC* 3745-273-38(C)

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Transportation of used oil off site	Except as provided in paragraphs (a) to (c) of 40 *CFR* 279.24 [*OAC* 3745-279-24(A) to (C)], generators must ensure that their used oil is transported by transporters who have obtained U.S. EPA ID numbers.	Preparation of used oil for transport off site – **applicable**	40 *CFR* 279.24 *OAC* 3745-279-24
Transportation of asbestos-containing waste materials off site	For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and location at which the waste was generated.	Preparation for transport of asbestos-containing waste materials off site – **applicable**	40 *CFR* 61.150(a)(1)(v) *OAC* 3745-20-05(C)(1)
	Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that the signs are visible. The markings must conform to the requirements of 61.149(d)(1)(i), (ii), and (iii).		40 *CFR* 61.150(c) *OAC* 3745-20-05(E)
Transportation of hazardous materials on site	Must meet the substantive requirements of 49 *CFR* Parts 171 – 174, 177, and 178 or the site or facility specific Transportation Safety Document [i.e., *Transportation Safety Document for the On-Site Transfer of Hazardous Material at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio,* LPP-0021/R2].	Transport of hazardous materials on the Portsmouth site – **TBC**	DOE O 460.1C(4)(b)
Transportation of hazardous materials off site	Shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 *CFR* 171–180 related to marking, labeling, placarding, etc.	Any person who, under contract with an department or agency of the federal government, transports ~~in~~ commerce", or causes to be transported or shipped, a hazardous material – **applicable**	49 *CFR* 171.1(c)

[a]The Requirements portion of the ARARs table is intended to provide a summary of the cited ARAR. The omission of any particular requirement does not limit the scope of the cited ARARs.

[b]Off-site transportation, by definition, is not an on-site response action and is subject to all substantive, procedural, and administrative requirements of all legally applicable laws but not to any requirements that might be relevant and appropriate under the ARARs process.

Table B.2. Action-specific ARARs for the X-103, X-334, and X-344B (Group I) facilities at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation

ACM = asbestos-containing materials
ALARA = as low as reasonably achievable
ARAR = applicable or relevant and appropriate requirement
CFR = Code of Federal Regulations
CMBST = combustion
CWA = Clean Water Act
DEACT = deactivation
DOE = U.S. Department of Energy
DOE M = Radioactive Waste Management Manual
DOE O = U.S. Department of Energy Order
DOT = U.S. Department of Transportation
EDE = effective dose equivalent
EPA = U.S. Environmental Protection Agency
HMR = Hazardous Materials Regulations
HMTA = Hazardous Materials Transportation Act of 1975 (Amendments of 1976)
ID = identification number
LDR = land disposal
LLW = low-level (radioactive) waste
LPP = LATA/Parallax Portsmouth, LLC
MVAC = motor vehicle air conditioning
NACE = National Association of Corrosion Engineers
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
ORC = Ohio Revised Code
PCB = polychlorinated biphenyl
POLYM = polymerization
RACM = regulated asbestos-containing material
RCRA = Resource Conservation and Recovery Act of 1976
RORGS = recovery of organics
TBC = to be considered
TSCA = Toxic Substances Control Act of 1976
UST = underground storage tank
UTS = universal treatment standard
WAC = waste acceptance criteria

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