Department of Energy

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NOV 10 2010

PPPO-03-1060615-11

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

Dear Ms. Galanti:

ENGINEERING EVALUATION/COST ANALYSIS FOR THE X-626 AND X-630 RECIRCULATING COOLING WATER COMPLEXES AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO

Enclosed, please find the revised *Engineering Evaluation/Cost Analysis for the X-626 and X-630 Recirculating Cooling Water Complexes at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE/PPPO/03-0146&D2) that incorporated your comments on the previous version of the document (DOE/PPPO/03-0146&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 X-626 and X-630 Recirculating Cooling Water Complexes

cc w/ enclosure:
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Administrative Record (DFF&O)

DOE/PPPO/03-0146&D2

Engineering Evaluation/Cost Analysis for the X-626 and X-630 Recirculating Cooling Water Complexes 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/03-0146&D2

Engineering Evaluation/Cost Analysis for the X-626 and X-630 Recirculating Cooling Water Complexes at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Date Issued—November 2010

Prepared for the
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 requirements
AST	above-ground storage tank
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulations*
COPC	contaminant of potential concern
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 Design and Remedial Action for the Portsmouth Gaseous Diffusion Plant (Decontamination and Decommissioning Project)*
DOE	U.S. Department of Energy
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
GCEP	Gas Centrifuge Enrichment Plant
HPSB	high performance and sustainability building
LDR	land disposal restriction
LLW	low-level (radioactive) 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
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PORTS	Portsmouth Gaseous Diffusion Plant
PPPO	Portsmouth/Paducah Project Office
PPE	personal protective equipment
RAWP	Removal Action Work plan
RCRA	Resource Conservation and Recovery Act of 1976
RCW	recirculating cooling water
SAP	Sampling and Analysis Plan
S&M	surveillance and maintenance
SVOC	semivolatile organic compound
TBC	to be considered
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act of 1976
USEC	United States Enrichment Corporation
VOC	volatile organic compound
WAC	waste acceptance criteria

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EXECUTIVE SUMMARY

The 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 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)* (hereafter referred to as DFF&O) (Ohio EPA 2010). 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 PORTS will be conducted in accordance with requirements for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time-critical removal actions.

This EE/CA presents and evaluates relevant data to support a determination as to the need for a removal action with respect to the X-626 and X-630 Recirculating Cooling Water (RCW) Complexes, defines the specific objectives of any necessary removal action, evaluates removal action alternatives, identifies a recommended alternative, and presents the recommended alternative to the public for its review and comment prior to issuing an Action Memorandum selecting the removal action alternative to be implemented.

This EE/CA is being documented in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan, including Sect. 300.415(b)(4)(i), and Attachment D, *Generic Statement of Work for Conducting an Engineering Evaluation/Cost Analysis (EE/CA)*, in the DFF&O.

The facilities that comprise the X-626 and X-630 RCW Complexes are listed in the DFF&O, *List of Non-Time Critical Removal Action (EE/CA) Groups*, which identifies facilities where the objective is to conduct D&D activities at PORTS under the CERCLA removal action process.

The function of the Portsmouth RCW system was to supply cooling water to the process buildings. The heat of compression of the process gas was transferred to the water from the process equipment and then transferred to the atmosphere.

There were four subsystems in the Portsmouth RCW system: one for each of the process buildings (X-626 RCW system, X-630 RCW system, and X-633 RCW system) and the X-6000 for Gas Centrifuge Enrichment Plant (GCEP) cooling. Each subsystem consisted of a pump house, cooling tower system, and associated piping.

A non-time-critical removal action to demolish the X-633 cooling towers, pump house, and associated structures has already been documented and initiated. This removal action is described in the *Engineering Evaluation/Cost Analysis for the X-633 Recirculating Cooling Water Complex at Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2009a), the *Action Memorandum for the Removal of the X-633 Recirculating Cooling Water Complex at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2009b) and the *X-633 Recirculating Cooling Water Complex Removal Action Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2010a). The X-626 and X-630 RCW Complexes perform the same function as the X-633 RCW Complex, but differ in size, general arrangement, and capacity of equipment and storage.

The X-626 and X-630 RCW Complexes were constructed and began operation in 1955. The X-626 RCW Complex is located south of the X-326 Process Building and consists of the X-626-1 Pump House and the

X-626-2 Cooling Tower. The X-630 RCW Complex is located northwest of the X-330 Process Building and consists of the X-630-1 Pump House, X-630-2A Cooling Tower, X-630-2B Cooling Tower, and the X-630-3 Acid Handling Station.

The X-630 RCW Complex is currently inactive. The X-626 RCW Complex is anticipated to be transitioned to inactive status in late calendar year 2010.

Based on a streamlined risk assessment, DOE has determined that, if allowed to deteriorate in an uncontrolled manner, the X-626 and X-630 RCW Complexes present a threat to human health, safety, and the environment through the potential release and migration of contaminants to the air, surface water, and soil. The deteriorating structures also present safety hazards and physical risks with respect to workers performing routine surveillance and maintenance (S&M) activities associated with these facilities. The streamlined risk assessment supports the need for a non-time-critical removal action.

The following removal action objectives have been developed and form the basis for identifying and evaluating the appropriate response actions:

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

In identifying potential removal alternatives for the X-626 and X-630 RCW Complexes, DOE considered the potential reuse of the complex in addition to its removal. As discussed in Sect. 4.1.2 of this EE/CA, DOE has determined that the reuse of the facilities is not viable. Thus, reuse was not carried forward for the removal action alternatives analysis.

The following removal alternatives were developed and evaluated for effectiveness, implementability, and cost:

- Alternative 1 – No Action; and
- Alternative 2 – Remove Structures, Dispose/Recycle Equipment and Materials.

Alternative 1 is required to be evaluated and serves as a baseline to which the other alternative may be compared. In the no action alternative, basic fire protection and S&M activities would continue, although no major repairs or upgrades would be undertaken. The X-626 and X-630 RCW Complexes would continue to deteriorate and D&D would not be performed. Final disposition of contaminants generated by the structures' gradual degradation and ultimate failure would be deferred, and D&D of the complexes would occur at a future date. Alternative 1 is implementable but ineffective at achieving the removal action objectives or reducing actual or potential risks to workers and the environment. While there are no direct removal costs associated with Alternative 1, other costs, approximately $300,000 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 are additive because Alternative 1 does not avoid D&D of these facilities, but just postpones it. The current estimated cost for D&D of these above-grade structures in their current condition is approximately $11,000,000.

Alternative 2 consists of removing the cooling towers, pump houses, and associated above-ground structures and the disposal of generated non-salvageable or reusable materials in appropriate off-site disposal facilities. A separate decision would be made for the subsurface structures. Alternative 2 effectively achieves the removal action objectives and reduces risks to human health and the environment.

This alternative is technically and administratively implementable. The estimated cost for implementing Alternative 2 for the X-626 and X-630 RCW Complexes is approximately $11,000,000.

Alternative 2 is the recommended alternative for D&D of the X-626 and X-630 RCW Complexes. This alternative has been determined to be the most cost-effective approach that satisfies the objectives for the removal action, and will meet ARARs.

Removal of the X-626 and X-630 RCW Complexes structures would also facilitate the investigation and cleanup of any affected soils.

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1. INTRODUCTION TO THE DECONTAMINATION AND DECOMMISSIONING PROCESS

1.1 PURPOSE

The purpose of this Engineering Evaluation/Cost Analysis (EE/CA) is to present and evaluate relevant data to support a determination for the need of a removal action with respect to the X-626 Recirculating Cooling Water (RCW) Complex and the X-630 RCW Complex, define the specific objectives of any necessary removal action, evaluate removal action alternatives, identify a recommended alternative, and present the recommended alternative to the public for its review and comment prior to issuing an Action Memorandum (AM) selecting the removal action alternative to be implemented.

The Ohio Environmental Protection Agency (Ohio EPA) and the U.S. Department of Energy (DOE) have entered into a formal agreement regarding the performance of the decontamination and decommissioning (D&D) at the 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* f*or the Portsmouth Gaseous Diffusion Plant (Decontamination and Decommissioning Project)* (hereafter referred to as the DFF&O) (Ohio EPA 2010). 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 PORTS will be conducted in accordance with requirements for Comprehensive Environmental Response, Conservation, and Liability Act of 1980 (CERCLA) non-time-critical removal actions.

This EE/CA is being documented in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), including 40 *Code of Federal Regulations* (*CFR*) Sect. 300.415(b)(4)(i) and Attachment D in the DFF&O, *Generic Statement of Work for Conducting An Engineering Evaluation/Cost Analysis (EE/CA)*.

The facilities that comprise the X-626 and X-630 RCW Complexes are listed in the DFF&O Attachment G, *List of Non-Time Critical Removal Action (EE/CA) Groups*, which identifies facilities where the objective is to conduct D&D activities at PORTS under the CERCLA removal action process.

A Consent Decree, signed in 1989 by DOE and the Ohio EPA, and an Administrative Consent Order (amended 1997) with the U.S. Environmental Protection Agency (EPA) and DOE 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 any affected soils and groundwater will be addressed 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

Decommissioning is the final phase in the life cycle of a nuclear facility. It consists, generally, of decontamination, dismantlement of equipment and facilities, demolition of structures, and management of resulting materials. The D&D process includes activities described in Section III, Paragraph 5.e of 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.

If it is determined that a removal action is needed with respect to the X-626 and X-630 RCW Complexes, D&D activities will be conducted as a non-time-critical removal action pursuant to the DFF&O. A non-time-critical removal action process consists of the following elements:

- An EE/CA is performed to evaluate the need for a removal action and 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 Action Memorandum (AM) decision document that includes the following:

    - Authorizes the action,
    - Identifies the action and cleanup goals,
    - Explains the rationale for authorizing the removal 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.

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

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 acceptance of this action will be addressed by providing the EE/CA to the public, regulators, consulting parties, and the Site-Specific Advisory Board 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 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

The PORTS site is located in a rural area of Pike County, Ohio, east of the Scioto River on a 5.8-square-mile area (Fig. 1). The 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. Pike County has approximately 28,200 residents. The nearest population center to the PORTS site is Piketon, Ohio, which is located approximately 5 miles north on U.S. Route 23.

PORTS occupies an upland area of southern Ohio with an average land surface elevation of 670 ft above mean sea level. The PORTS site sits in a 1-mile-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 is located on fill that was removed from the higher elevations at PORTS and placed in existing drainage valleys and depressions.

PORTS 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 PORTS property before discharging into Big Beaver Creek. Big Run Creek is the smaller tributary of the Scioto River that drains the southern portion of PORTS 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 "bowl" around PORTS. 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 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 PORTS 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.

Bedrock consisting of clastic sedimentary rocks underlies the unconsolidated sediments beneath PORTS. 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.

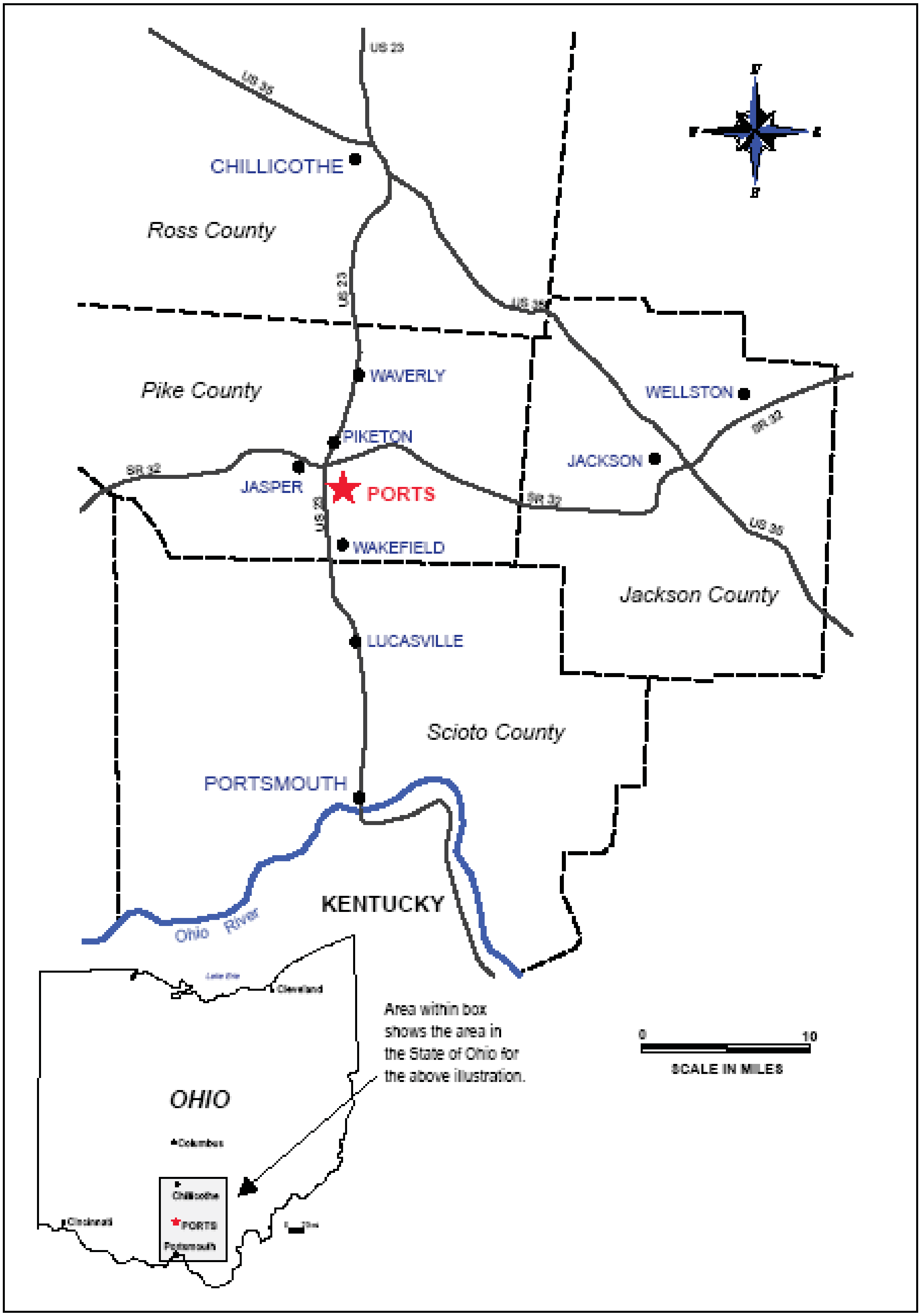

Fig. 1. PORTS site vicinity map.

According to the Soil Survey of Pike County, Ohio, 22 soil types occur within the PORTS property boundary. The predominant soil type at PORTS is Omulga Silt Loam (U.S. Department of Agriculture 1990). Most of the area within the active portion of the site 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, which make 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 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 cold, humid winters. Daily temperature averages are 22.2^{o}C (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 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. Portsmouth is situated on a 3,777-acre parcel of DOE-owned land. Twelve hundred acres of this area are located within the facility's Perimeter Road and comprise the centrally developed area. Five hundred acres of the land within Perimeter Road are fenced for controlled access. Approximately 190 buildings are located within PORTS 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 site improvements associated with the gaseous diffusion plant are located within the fenced area. Within this area are three large process buildings and auxiliary facilities currently leased to the United States Enrichment Corporation (USEC). A second, large developed area covering approximately 300 acres contains the facilities built for the Gas Centrifuge Enrichment Plant (GCEP), portions of which are leased to USEC. These areas are largely devoid of trees, with grass and paved areas dominating the open space. The remaining area within Perimeter Road has been cleared and is essentially level.

The uranium enrichment, production, and operations facilities at PORTS are leased by USEC. The lease between DOE and USEC is active through July 1, 2016, although some facilities may be returned to DOE on an earlier date. In addition to the leased facilities, USEC also leases common areas, including ditches, creeks, ponds, and other areas such as roads and rail spurs that are necessary for ingress, egress, and proper maintenance of facilities.

The economic region of influence for PORTS includes four counties in southern Ohio: Ross, Scioto, Jackson, and Pike. The largest city within 50 miles 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 PORTS in Ross County, Ohio.

Pike County, the county in which PORTS is located, had a population of 28,269 persons in 2006. 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 per the 2008 Census. The nearest population center to PORTS is Piketon, Ohio, with a population of 1,907 persons reported in the 2000 Census.

2.1.2 Description of the Removal Action Project Area at the Site

2.1.2.1 PORTS RCW system

The function of the RCW system was to supply cooling water to the process buildings. The heat of compression of the process gas was transferred to the water from the process equipment and then transferred to the atmosphere.

In the PORTS RCW system there were four subsystems, one for each of the process buildings (X-626 RCW system, X-630 RCW system, and X-633 RCW system) and the X-6000 for GCEP cooling. Each subsystem consisted of a pump house, cooling tower system, and associated piping.

A non-time-critical removal action to D&D the X-633-1 Pump House, X-633-2A, -2B, -2C and -2D cooling towers, and associated structures already has been documented and initiated. This removal action is described in the *Engineering Evaluation/Cost Analysis for the X-633 Recirculating Cooling Water Complex at Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2009a), the *Action Memorandum for the Removal of the X-633 Recirculating Cooling Water Complex at the Portsmouth Gaseous Diffusion Plant, Piketon Ohio* (DOE 2009b) and the *X-633 Recirculating Cooling Water Complex Removal Action Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2010a).

The X-626 and X-630 RCW Complexes perform the same functions as the X-633 RCW Complex (DOE 2009a, Sect. 2.2) but differ in size, general arrangement, and capacity of equipment and storage.

The RCW systems were supplied with water from the raw and makeup water system. The makeup water was fed into the systems at the pump houses where it was treated along with water that had been returned from the cooling towers (addition of sulfuric acid for pH adjustment, biocide for microbiological control, and phosphate for scale and corrosion control). The chemical treatment occurred in the pump house wet well. The treated water was pumped into the process buildings equipment cooling systems. The heated water from the process equipment cooling system was returned through risers to the top of the tower and into the tower distribution system. The water was evenly distributed in the top portion of the cells and was cooled as it fell through the tower cells. To enhance cooling, a fill material was placed in each cell. The fill was made of redwood or polyvinyl chloride and was constructed so that the water falling through it broke into small droplets. Small droplet size allowed for better air-to-water contact and, thus, better heat transfer. Louvers were located at the bottom of both sides of the towers. Their locations, in conjunction with the action of the fans, allowed the circulation of air through the tower cells. A portion of the returned RCW was lost through evaporation when passing through the cooling towers while the remainder accumulated in the cooling tower basins. The cooled water flowed from the tower basins through flumes back into the pump house wet well to again be circulated as cooling water.

The RCW pump houses acted as control centers for the three RCW systems. Chemical feeders, pumps, motors, valves, switchgear, and recorders are located in the pump houses.

There were eight cooling towers in the RCW system prior to implementing the X-633 RCW Complex removal action, one at X-626 (X-626-2), two at X-630 (X-630-2A and -2B), four at X-633 (X-633-2A, -2B, -2C, and -2D), and one at X-6000. The X-626-2 and X-6000 cooling towers are cross-flow towers designed to allow the air to flow across the falling water. The X-630-2A and -2B and the X-633-2A, -2B, -2C, and -2D cooling towers were counter-flow towers designed to allow the air and water to move in opposite direction. Each cooling tower is divided into a number of cells. Each cell is a complete unit, having a riser, distribution system, and fan system. The X-633-2A and -2B cooling towers were exceptions, each having two cells per riser.

The locations of the X-626 and X-630 RCW Complexes within the site are depicted on Fig. 2.

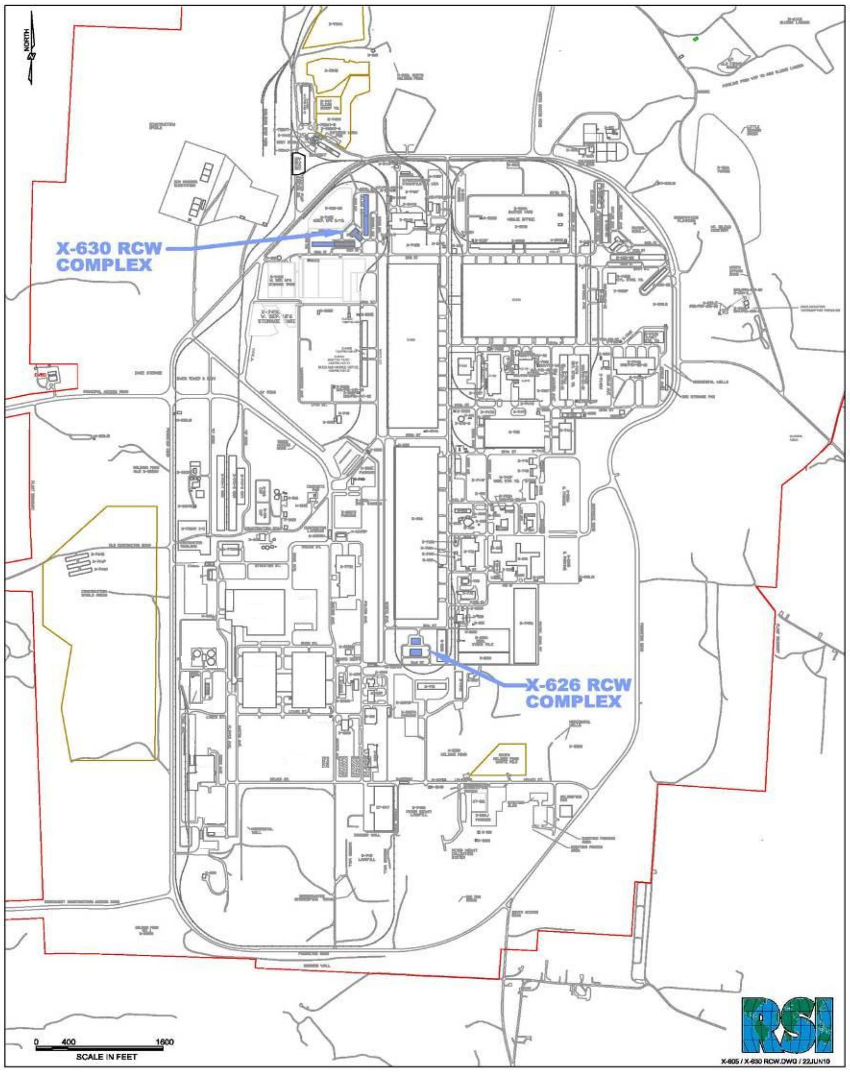

Fig. 2. Location of X-626 and X-630 RCW Complexes.

2.1.2.2 X-626 RCW Complex description

The X-626 RCW Complex consists of the X-626-1 Pump House and the X-626-2 Cooling Tower (see Fig. 3) and is located south of the X-326 Process Building.

Fig. 3. X-626 RCW Complex.

Both the pump house and cooling tower were constructed in 1954.

X-626-1 Pump House. The X-626-1 Pump House is a 7,000 ft^2, single-story building that consists of a steel-framed pump room that surmounts a reinforced concrete reservoir or wet well, and adjacent lower concrete wings on the north and south sides. The exterior walls of the pump room are enclosed with corrugated cement asbestos (transite) siding. The south wing was divided into separate rooms for water treatment, with each room being used for storage and housing equipment. The X-626-1 Pump House first floor plan and south elevation are shown in Figs. 4 and 5.

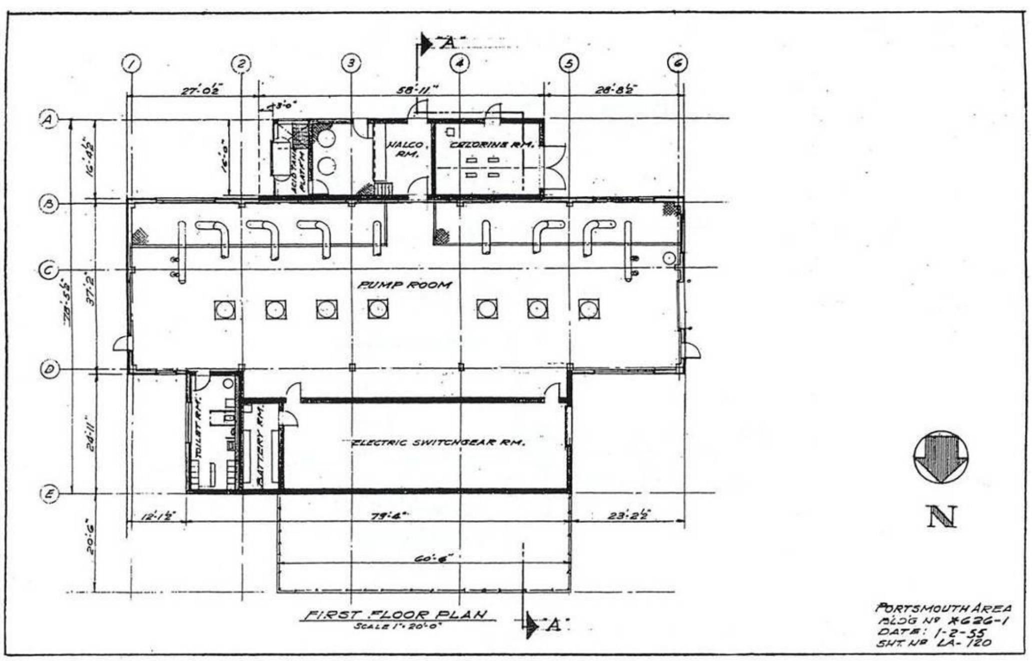

Fig. 4. X-626-1 Pump House first floor plan.

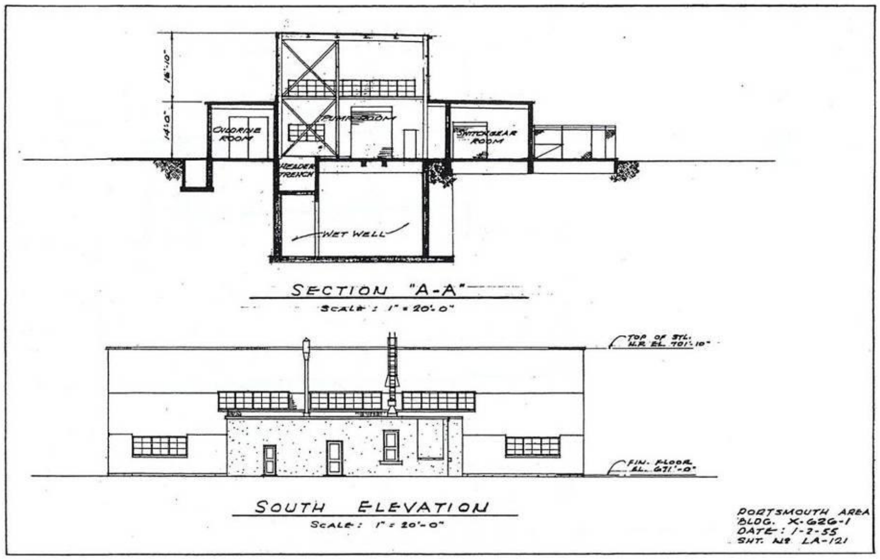

Fig. 5. X-626-1 Pump House south elevation.

The north wing is used primarily to house the electrical switchgear for the pump motors and cooling tower fans (see Fig. 6) and is separated from the pump room by a concrete partition.

Fig. 6. X-626-1 Pump House switchgear room, battery room, and transformer platform.

The east end of the wing is divided into a battery room (see Fig. 6) and a combined shower, toilet, and locker room. Power transformers are located on an outside fenced concrete platform adjacent to the north wall (see Fig. 6).

The pump room constitutes the operating area and provides space for seven vertical-type pumps arranged in a row lengthwise near the axis of the building (see Fig. 7). The south portion of the pump room floor is depressed to form a header trench or trough for pump discharge piping and is covered at the floor level with a removable metal grating (see Fig. 7). Control panels are located adjacent to the switchgear room and a 7½-ton-capacity overhead electric crane serves all areas of the single-wide bay room.

Fig. 7. X-626-1 Pump House pump room, header trench, and control panels.

The concrete substructure of the pump room constitutes the wet well or reservoir from which the pumps drain water. An underground concrete flume connects the wet well with the cooling tower basins. Mechanical equipment and piping installations at the X-626-1 Pump House were designed to supply 45,000 gpm of cooled water to the RCW system under normal conditions or 27,000 gpm in the event a supply main was out of service.

The flow of water from the cooling tower basins is regulated at the basin end of the connecting flumes by sluice gates located in a concrete vault. Baffles in this vault aid in mixing chemicals with the water that flows by gravity to the lower part of the wet well.

The pump room contains seven 8,000 gpm vertical lift pumps that are each driven by 400-hp electric motors. The pumps discharge through horizontal connections and elbows to the 42-in.-diameter discharge header located below the floor level in the header trench. All pump discharges are equipped with gate valves and pneumatically operated rotary check valves. The two ends of the header pass through the building walls and connect with separate mains supplying the cooled water to the distribution system. Sectionalizing gate valves are provided in the header to permit partial use of the pumping facilities.

Three underground feeders from the X-530 Switch Yard provided 13.8 kilovolt (kv) power to step down transformers located on the transformer platform, which supplied power to the X-626 RCW Complex pumps and cooling tower fans at 2400V and 480V, respectively.

X-626-2 Cooling Tower. The X-626-2 Cooling Tower (see Fig. 8) is a rectangular flat-roofed redwood structure approximately 145 ft long, 88 ft wide, and 44 ft high erected over a concrete basin substructure.

Fig. 8. X-626-2 Cooling Tower.

The side walls of the cooling tower consist entirely of redwood louvers framed between the vertical members of the supporting frame. End walls of the towers and the roof are solidly covered. Eight wooden discharge collars extend above the roof, which is accessible by outside wooden stairways. Trap doors in the roof provide access to the top interior portion of the tower.

The interior of the cooling tower is divided longitudinally by a central partition and is cross partitioned into eight cells, each containing a large circular opening at the roof for individual induced-draft fans. Dispersion racks or fills, a sloping slat partition or drift eliminator, and other features are also included. A catwalk at the bottom of the tower extends lengthwise along either side of the center partitions. Doors are provided in the ends of the building and in the cross partitions for access to any of the cells.

The cooling tower basin is approximately 220 ft long, 90 ft wide, and 18 ft deep, with each end extending approximately 36 ft beyond the centrally located tower. The top of the basin under the tower is open and the balance is covered with concrete slabs just below ground level. The basin is divided transversely by a concrete partition wall to permit dewatering either half of the storage facility.

The bottom slab of the basin, which is constructed over a 6-in.-thick layer of crushed stone and pitched to drain toward the center, provides the foundation for the cooling tower walls and interior tower supports. Pre-cast concrete posts, bolted and grouted to the bottom slab, and the walls support pre-cast concrete girders and beams required for superstructure framing. Openings at the bottom of the north wall on either side of the center wall permit water flow into an adjoining discharge vault and flume. An overflow weir is located on the north side of the basin near the east end of the tower. It discharges excessive water via a storm drain to the X-230K South Holding Pond.

Six check valves are located in the bottom of the X-626-2 cooling tower basin and are evenly spaced in the middle along its length. These valves were installed during the original construction to prevent the basin from “floating” due to an increase in hydraulic pressure exerted on the basin as a result of an increase in groundwater elevation prior to filling. The valves would allow groundwater to enter the basins to equalize the hydraulic pressure. These basins are located within the 5-unit groundwater TCE contaminant area. The valves allow water flow in one direction only. Construction drawings show no French drains surrounding the bottom of the basin’s exterior walls.

The cooling tower is an induced-draft, cross-flow type with a high head distribution system designed to cool approximately 45,000 gallons of water per minute (gpm). Water to be cooled is conducted from the discharge headers of the RCW piping, which parallel the sides of the tower, through eight riser pipes (four on each side) to spreader troughs in the top of the tower. A manually operated gate valve, located on each riser just above the ground level, controls the flow. Water from the troughs is dispersed and drips through the baffled interior of the tower into the basin below. Cooling is accomplished by evaporation and contact of the dripping water with air circulating through the structure.


Fig.9. Fan propeller.

Eight propeller-type, 50-hp, motor-driven fans (see Fig. 9), one to each cell, are mounted horizontally in the 18-ft-diameter roof openings and provide induced draft or air circulation through the tower.

The temperature of the cooled water is controlled by running or shutting down individual fans or cells as required.

The cooling operation results in a maximum loss of 1,460 gpm in wind drift and evaporation; this quantity must be restored to the system. In addition, an estimated 730 gpm is used for blowdown to keep the chemical concentrations in the water within the limits desired to prevent pipe corrosion. The water required to replace the quantity lost is provided from the makeup water supply system.

Electrical power for the induced draft fans, tower lighting, controls, and instrumentation is supplied from the X-626-1 Pump House through underground conduit to the tower and exposed conduit above ground.

The draft fans are driven through a spiral gear mechanism by 50-hp, 460-v, 1750-rpm electric motors and are controlled from the pump house.

2.1.2.3 X-630 RCW Complex description

The X-630 RCW Complex, which consists of the X-630-1 RCW Pump House, X-630-2A Cooling Tower, X-630-2B Cooling Tower, and X-630-3 Acid Handling Station, is located northwest of the X-330 Process Building (see Fig. 10).

The X-630 RCW Complex supplied the cooling water requirements of the X-330 Process Building and the attendant X-530 Switchyard. The towers and basins of this group form a right angle, with the south and east towers parallel to the north and west sides, respectively of X-330. The X-630-1 Pump House, which includes both pumping and chemical treatment facilities, is oriented diagonally between the ends of the cooling towers. The X-630 RCW Complex was designed to supply 185,000,000 gallons of treated cooling water per day under normal operating conditions, 115,000,000 gallons per day in the event of failure of a distribution main, and a normal storage of approximately 3,800,000 gallons of water in each of the two basins as reserve supply in the event of a failure in the makeup water supply system. The X-630 RCW Complex was originally constructed in 1954.

Fig.10. X-630 RCW Complex.

X-630-1 RCW Pump House. The X-630-1 Pump House is a 10,200 ft^2, T-shaped structure consisting of a single-story, steel-framed pump room with transite siding, a northwest wing for switchgear, control and personnel use, and a southwest wing that housed water treatment facilities. The pump room sits over a reinforced concrete reservoir or wet well. The water treatment and electrical switchgear wings were one-story structures with reinforced concrete walls and roofs (see Figs. 11 and 12).

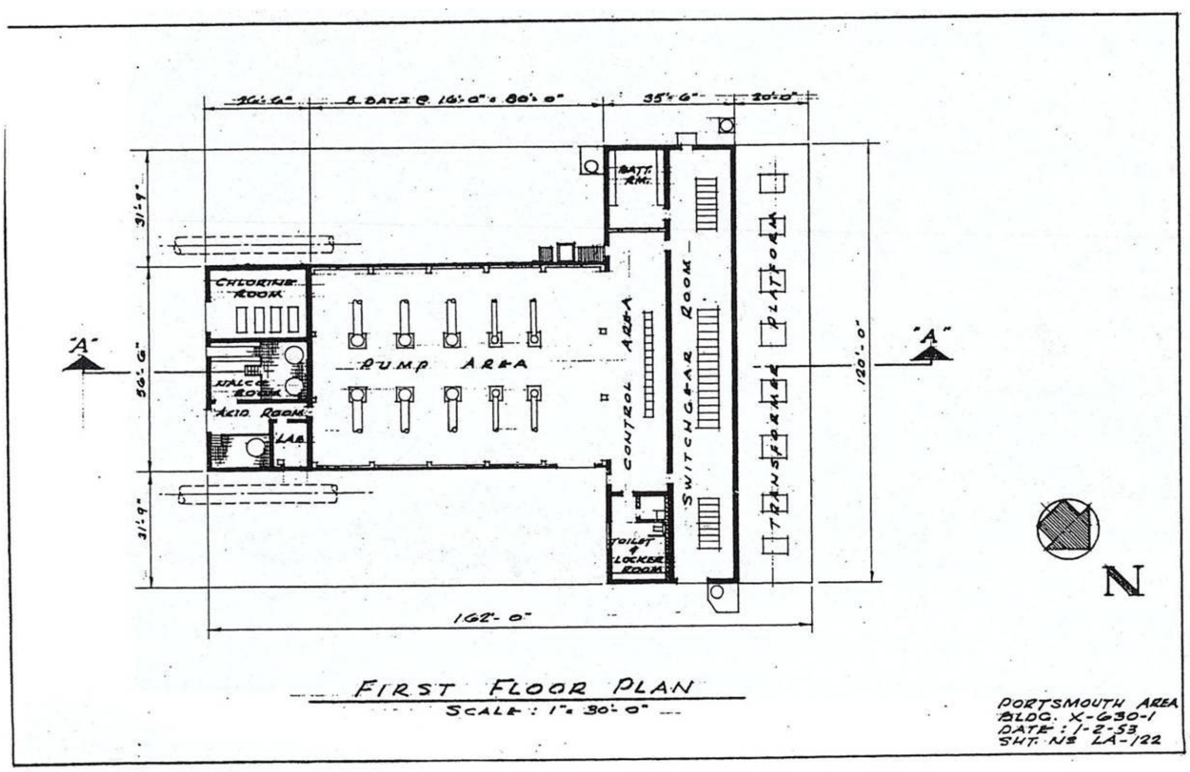

Fig.11. X-630-1 first floor plan.

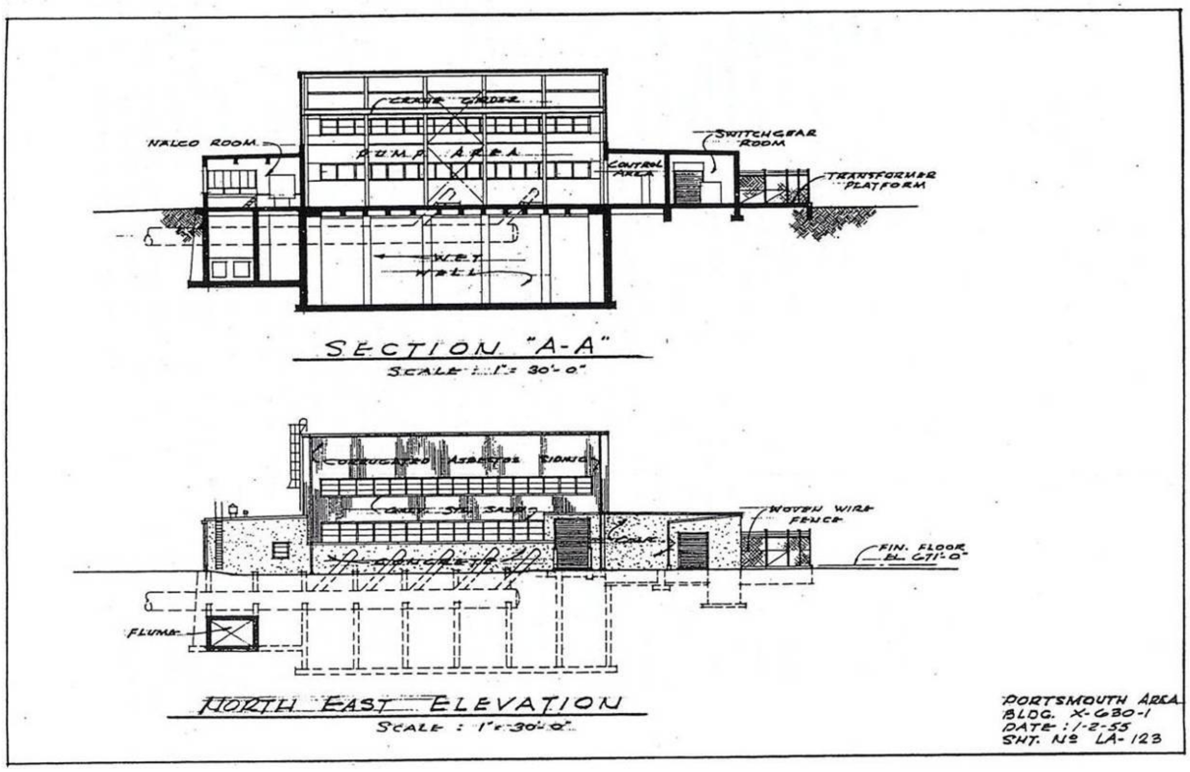

Fig.12. X-630-1 northeast elevation.

The X-630-1 Pump House performs the same function as the smaller X-626-1 Pump House except for the following differences:

- The X-630-1 Pump Room contains two rows of vertical turbine-type pumps, with each row consisting of three 17,000 gpm units and two 8,500 gpm units (see Fig. 13). The pumps discharge to 54-in.-diameter common headers.

Fig.13. X-630-1 Pump Room and transformer platform.

- An overflow pit is located on the northwest corner of the X-630-1 Pump House. It discharges excessive water via a storm drain to the X-230-L North Holding Pond.

▪ Electric power is received at the building substation from four 13.8-kv feeders from the X-530 Switchyard. The power is then distributed to the recirculating water pump motors and cooling tower fan motors through eight transformers (see Fig. 13).

The pump house switchgear room, battery room, and control area are shown in Fig. 14.

Fig.14. X-630-1 switchgear room, battery room, and control area.

X-630-2A and X-630-2B Cooling Towers. The X-630-2A and -2B Cooling Towers are functionally the same as the smaller X-626-2 Cooling Tower with the following differences:

- The two X-630 cooling towers are each 260 ft long, 56 ft wide, and 47 ft high and covered with transite siding. The lower third of the longer side walls consists of a continuous redwood louvered air intake.

- The cooling towers are located over the ends of the basins or reservoirs nearest the X-630-1 Pump House.

- The basins are each approximately 540 ft long, 55 ft wide, and 19 ft deep. About 280 ft of each basin, which extends beyond the cooling towers, is covered with a concrete slab just below ground level (see Fig. 15).

Fig.15. Extended portion of cooling tower basin with concrete slab.

- Flumes that connect the basins with the X-630-1 Pump House extend from the ends of the basins directly to the adjacent ends of the building flume of the pump house.

- Each tower was designed to cool approximately 56,000 gpm and each tower consists of 10 cells. Each of the cells is equipped with a fan driven through a gear box by a 60-hp electric motor to induce a draft through the cells.

- Ten check valves are located in the bottom of each of the basins associated with the X-630-2A and -2B cooling towers and are evenly spaced in the middle along their length. These valves were installed during the original construction to prevent the basins from "floating" due to an increase in hydraulic pressure exerted on the basins as a result of an increase in groundwater elevation prior to filling. The valves would allow groundwater to enter the basins to equalize the hydraulic pressure. The valves allow water flow in one direction only. Construction drawings show no French drains surrounding the bottoms of the basins' exterior walls.

X-630-3 Acid Handling Station. The X-630-3 Acid Handling Station is currently listed in the DFF&O Attachment G, *List of Non-Time Critical Removal Action (EE/CA) Groups*, which identifies structures where the objective is to conduct D&D activities under the CERCLA removal action process. The X-630-3 Acid Handling Station is located southeast of the X-630-2A Cooling Tower and consists of a bermed 10,000-gallons storage tank that dispensed sulfuric acid used to adjust the cooling water pH. The X-630-3 Acid Handling Station is shown in Fig. 16.

Fig. 16. X-630-3 Acid Handling Station

2.1.3 Nature and Extent of Contamination

Based on previous reports and characterization data, Sect. 2.2.2 of the X-633 RCW Complex EE/CA (DOE 2009a) identified asbestos, lead, radionuclides, chromium, PCBs, and uranium as contaminants of potential concern (COPCs), which are substances detected that have the potential to adversely affect human health and the environment due to their concentrations, distribution, and toxicity. Since the X-626 and X-630 RCW Complexes performed the same function as the X-633 RCW Complex and were constructed during the same time frame, differing only in size, general arrangement, and capacity of equipment and storage, the COPCs are assumed to be the same.

2.1.3.1 Radiological results

Available documentation (DOE 1993, TPMC 2006) lists no known or potential radiological hazards associated with the X-626 RCW Complex.

A radiological survey conducted in 1998 identified an area of fixed contamination in the X-630-1 Pump House "NALCO" Room (see Fig. 11). A recent walk down of the facility confirmed that the "NALCO" Room was posted as a "Fixed Contamination Area" and a "Radioactive Materials Area".

Based on the fixed contamination associated with the X-630-1 "NALCO" Room, uranium is expected to be a COPC with respect to the X-630 RCW Complex.

2.1.3.2 Asbestos results

Based on observations, historical knowledge, and sampling within the X-633 RCW Complex, asbestos-containing material (ACM) is anticipated to be present in the X-626 and X-630 RCW Complexes structures. The forms of ACM present within the X-633 RCW Complex, and thought to be present within the X-626 and X-630 RCW Complexes, include transite siding, pipe insulation, electrical sheathing/wrapping, caulking/sealant where the RCW piping penetrated the concrete walls and window caulking. Transite is a term for hard, composite material, fiber cement boards typically used in construction materials. The use of asbestos in transite was phased out in the mid-1980s. However, transite used at the time of construction of the RCW facilities contained 12-50% asbestos. The X-633 RCW Complex asbestos sampling results are summarized in Table 1. Asbestos samples were obtained from the X-633 RCW Complex pump house and cooling towers and, although not sampled, the window glazing and caulking were determined to likely contain asbestos. Since the X-626 and X-630 RCW Complexes performed the same function as the X-633 RCW Complex and were constructed during the same time periods differing only in size, general arrangement, and capacity of equipment and storage, asbestos is expected to be a COPC at the X-626 and X-630 RCW Complexes.

Table 1. X-633 RCW Complex asbestos sampling summary

Type	No. of samples	Results[a]	
		Minimum	Maximum
Wrap for piping	3	ND	ND
Orange pump gasket in pump house	3	ND	ND
Domestic cold water layered paper insulation	3	30–40% Chrysotile	30–40% Chrysotile
Domestic cold water fitting, elbow, lagging	3	Trace	1-3% Chrysotile
Circulating hot water jacket and insulation	6	Trace	1-3% Chrysotile
Sludge	100	ND	< 1%

[a]Percent of building material containing asbestos.

ND = not detectable
RCW = recirculating cooling water

If a removal action alternative that includes demolition is selected, this material would be handled as ACM. Any off-site disposal of asbestos waste would be in accordance with the off-site disposal facility's license (see Sect. 4.1.1.4).

2.1.3.3 Beryllium results

The extent of beryllium contamination was evaluated in the X-633 RCW Complex in June 2009 by collecting wipe samples from representative areas in the pump house, cooling towers, and cooling tower basins. Beryllium was not detected during this investigation (DOE 2009). Based on the similarity of construction, equipment, and operations with respect to the X-633 RCW Complex, beryllium is not expected to be a COPC at the X-626 or X-630 RCW Complex.

2.1.3.4 Lead results

Due to the age of the X-633-1 Pump House, paint swab tests were performed to determine if lead-based paint was present. Swab tests were conducted on painted pumps, door jambs, and other painted equipment. Each observed color was swabbed. Three of the seven paint swab tests had positive results, which indicated the presence of lead in the gray-painted pumps. In addition, three bulk paint chip samples were collected from areas where peeling paint was observed. These samples included gray paint from a pump, red paint from a door jamb, and paint from a transformer. The analyses indicate that lead concentrations ranged from 5,300 mg/kg to 45,000 mg/kg. DOE determined that the lead paint in the building would pose a human health hazard if it were released in the form of dust (DOE 2009).

Since the X-626 and X-630 RCW Complexes performed the same function as the X-633 RCW Complex and were constructed during the same time periods differing only in size, general arrangement, and capacity of equipment and storage, lead in lead-based paint is also a COPC with respect to the X-626 and X-630 RCW Complexes.

2.1.3.5 Chromium results

Prior to 1989, RCW was treated with a chromium-based corrosion inhibitor. In early 2009, 100 sludge samples were collected from the X-633 RCW Complex cooling tower basins. These samples contained no constituent above RCRA Toxicity Characteristic Leaching Procedure (TCLP) regulatory limits (DOE 2009). The TCLP is an analytical procedure used to determine if a waste is hazardous.

In June 2009, wipe samples were collected from the X-633 RCW Complex and analyzed for chromium to provide information to ensure that appropriate health and safety procedures were implemented to protect workers during the D&D. The additional wipe samples were collected from the pump house, cooling tower wood, and concrete basins that underlie the towers. Six wipe samples were collected from the pump house, four wipe samples were obtained from the concrete basins beneath the cooling towers, and the remaining 12 cooling tower wipe samples were collected from the cooling tower wood. Results from the 22 chromium wipe samples obtained from the X-633 RCW Complex are shown in Table 2. The lowest concentrations of chromium were present in the pump house and cooling tower concrete basins. Wood in the cooling towers exhibited the highest concentrations of chromium based on the wipe sample results, which is likely due to past use of a chromium-based corrosion inhibitor in the RCW (DOE 2009).

Table 2. X-633 RCW Complex chromium wipe sampling summary

		Results (µg/wipe)		
Location	**No. of samples**	**Minimum**	**Maximum**	**Average**
X-633-1 (pump house)	6 walls and floor	48	100	73
X-633-2A (cooling tower)	3 wood/1 concrete	56	1,500	862
X-633-2B (cooling tower)	3 wood/1 concrete	36	3,300	1,759
X-633-2C (cooling tower)	2 wood/2 concrete	45	4,200	2,086
X-633-2D (cooling tower)	4 wood	890	3,500	1,923

RCW = recirculating cooling water

Since the X-626 and X-630 RCW Complexes performed the same function as the X-633 RCW Complex, differing only in size, general arrangement, and capacity of equipment and storage, chromium is also expected to be a COPC with respect to the X-626 and X-630 RCW Complexes.

2.1.3.6 Wood core results

Pentachlorophenol and cupric arsenate, which are fungicides, were used in the X-633 RCW Complex cooling towers for wood treatment. Before 1989, the wood was treated using chromium-based preservatives. The wood treatment was usually applied to the plenum and deck areas by temporarily removing a tower cell from service and manually spraying the treatment solution onto the wood structure. In June 2009, three wood core samples were collected from the X-633-2A and X-633-2B Cooling

Towers, six wood core samples were collected from the X-633-2C Cooling Tower, and seven wood core samples were collected from the X-633-2D Cooling Tower. These samples were analyzed to determine if the wood contained metals and if those metals would leach from the wood. The wood core TCLP analytical results for chromium and arsenic are summarized in Table 3. One chromium TCLP result (X-633-2C Cooling Tower) exceeded the TCLP regulatory limit, which indicates the uncontrolled release of the wood could potentially allow chromium to leach into the environment. However, the average analytical result for the samples was < 5.0 mg/L regulatory limit (DOE 2009a).

Table 3. X-633 RCW Complex June 2009 wood core sampling summary

Tower	Analyte	RCRA TCLP limit (mg/L)	Results (mg/L)		
			Minimum	Maximum	Average
X-633-2A	Arsenic	5.0	ND	ND	ND
X-633-2B	Arsenic	5.0	ND	ND	ND
X-633-2C	Arsenic	5.0	0.027	0.55	0.21
X-633-2D	Arsenic	5.0	0.01	0.097	0.042
X-633-2A	Chromium	5.0	0.35	0.9	0.58
X-633-2B	Chromium	5.0	0.35	1.4	0.74
X-633-2C	Chromium	5.0	0.7	6.4[a]	2.83
X-633-2D	Chromium	5.0	0.61	3.8	1.76

[a]Concentration exceeds the TCLP 5 mg/L limit established for chromium.

ND = not detected
RCRA = Resource Conservation and Recovery Act of 1976
RCW = recirculating cooling water
TCLP = Toxicity Characteristic Leaching Procedure

In December 2009 and January 2010, additional wood core samples were collected and analyzed using EPA SW-846 Method 6010B to determine the concentrations of leachable chromium in the cooling tower wood. Samples were obtained from each layer of the cooling towers (DOE 2010a).

As shown in Table 4, the concentration in the wood core samples did not exceed the RCRA TCLP regulatory limit of < 5.0 mg/L.

Table 4. X-633 Complex December 2009/January 2010 wood core sampling summary

Tower	Number of samples analyzed	Locations			Highest chromium result (mg/L)
		Top layer	Middle layer	Bottom layer	
X-633-2A	23	8 interior	7 interior	7 exterior	2.2
X-633-2B	23	7 interior	3 interior; 4 exterior	2 interior; 6 exterior	2.2
X-633-2C	23	7 interior	7 interior	2 interior; 6 exterior	0.99
X-633-2D	23	6 interior; 5 exterior	4 interior; 1 exterior	1 interior; 5 exterior	1.6

Since the X-626 and X-630 RCW Complexes performed the same function as the X-633 RCW Complex and were constructed during the same time periods, differing only in size, general arrangement, and capacity of equipment and storage, chromium is expected to also be a COPC with respect to the X-626 and X-630 RCW Complexes cooling tower wood.

2.1.3.7 Wet well and valve vault water results

Volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), TCLP metals, and radiological parameters (total uranium, gross alpha, gross beta, technetium, and U-235 assay) were analyzed from water taken from the X-633 RCW Complex wet well and floor drain in the pump house and water in the valve vaults. Results of the detected constituents are summarized in Table 5. VOCs, SVOCs, metals, and radiological constituents were detected. Eleven polyaromatic hydrocarbons (PAHs) commonly found in wood preservatives were detected.

Table 5. X-633 RCW Complex wet well and valve vault water sampling summary

Detected analytes	Number of samples (number of non-detects)	Results	
		Maximum detect	Minimum detect
VOCs (45 constituents analyzed) (µg/L)			
Chloroform	13 (9)	0.45 J	0.37 J
Methylene Chloride	13 (12)	0.45 J	NA
SVOCs (i.e., PAHs) (59 constituents analyzed) (µg/L)			
Benz(a)anthracene	12 (10)	14	3.1 J
Benzo(a)pyrene	12 (11)	21	NA
Benzo(b)fluoranthene	12 (10)	25	2.7 J
Benzo(g,h,i)perylene	12 (11)	9.8 J	NA
Benzo(k)fluoranthene	12 (11)	15	NA
Chrysene	12 (10)	14	3 J
Dibenz(a,h)anthracene	12 (11)	2.8 J	NA
Fluoranthene	12 (10)	16	7.6 J
Indeno(1,2,3-cd)pyrene	12 (11)	8.3 J	NA
Phenanthrene	12 (10)	4.1 J	3.1 J
Pyrene	12 (10)	15	5.7 J
Metals (8 constituents analyzed) (mg/L)			
Arsenic	12 (10)	0.041	0.012
Barium	12 (0)	0.46	0.011
Cadmium	12 (11)	0.024	NA
Chromium	12 (5)	1.6	0.016
Lead	12 (6)	0.054	0.0043
Radiological (9 constituents analyzed)			
Gross Alpha (pCi/L)	12 (7)	55.3	13.8
Gross Beta (pCi/L)	12 (0)	49.6	4.33
Uranium 233/234 (pCi/L)	12 (0)	20.4	0.2196
Uranium 235 (% wt.)	12 (6)	1.524	0.6454
Uranium 235 (pCi/L)	12 (6)	1.037	0.03602
Uranium 238 (pCi/L)	12 (1)	14.09	0.1635
Uranium-Metal (mg/L)	12 (1)	42.21	0.4903

J = estimated value
NA = only one sample detected analyte; minimum detection value not applicable.
PAH = polycyclic aromatic hydrocarbon
RCW = recirculating cooling water
SVOC = semivolatile organic compounds
VOC = volatile organic compounds

Since the X-626 and X-630 RCW Complexes performed the same function as the X-633 RCW Complex differing only in size, general arrangement, and capacity of equipment and storage, similar contaminants are also expected to be found in the X-626 and X-630 RCW Complexes wet wells and cooling tower basins.

2.1.3.8 Other potential contaminants

Other COPCs identified during previous investigations associated with the X-633 RCW Complex include oils and chemicals stored in ASTs, such as sulfuric acid, chlorine, and PCBs associated with fluorescent light ballasts.

2.1.4 Previous Removal Actions and Investigations

According to the *Report for Environmental Audit Supporting Transition of the Gaseous Diffusion Plants to the United States Enrichment Corporation* (DOE 1993), the following investigations have taken place at the X-626 and X-630 RCW Complexes:

- A plant-wide asbestos survey was performed beginning in July 1988 and ending in 1993. Two forms of ACM were reported in the facilities: (1) transite siding, and (2) thermal system insulation in pipelines. Breaks and abrasions of the ACMs in the X-626-1 Pump House were repaired and encapsulated when practical and replaced with materials containing no asbestos where applicable.

- A PCB investigation has been conducted with respect to the facility electrical equipment. The four pad-mounted electrical transformers in the X-626 RCW Complex were considered to be non-PCB (e.g., < 50 ppm). The eight pad-mounted transformers in the X-630 RCW Complex were considered non-PCBs. The fluorescent (ballast) transformers in the indoor lighting at the facility were considered to be potential PCB-containing electrical equipment.

There have been no previous removal actions at the X-626 and X-630 RCW Complexes.

2.1.5 Preliminary Assessment of Releases

According to the *Report for Environmental Audit Supporting Transition of the Gaseous Diffusion Plants to the United States Enrichment Corporation* (DOE 1993), the following releases have taken place at the X-626 and X-630 RCW Complexes:

- A sulfuric acid spill occurred on July 24, 1988, at the X-630-3 Acid Handling Station when a corroded transfer pipe leaked approximately 10 gallons of 93% sulfuric acid. The spill was contained by diking the ditch adjacent to the facility. In August 1992, a sulfuric acid spill occurred at the X-630-3 Sulfuric Acid Station when a vendor overfilled the tank into the containment dike. The dike area drain valve was partially open and, an unknown quantity, at least 20 gallons and possibly as much as 200 gallons, was released to the storm sewer. The release eventually made its way into a drainage ditch leading to the X-230L North Holding Pond and into Little Beaver Creek. Steps were taken to contain and neutralize the spill. The contaminated area was excavated and the generated waste appropriately dispositioned. The remaining soils potentially impacted by this leak will be addressed under the RCRA Corrective Action Program in accordance with the 1989 Consent Decree signed with Ohio EPA and are not included in the scope of this EE/CA.

- There was a reported release of approximately 36,000 gallons of RCW containing hexavalent chromium from the X-626-1 Pump House in 1985. It was discharged to the South Holding Pond and chromium was detected in Big Run Creek immediately following the release. Any soils potentially impacted by this leak will be addressed under the RCRA Corrective Action Program in accordance with the 1989 Consent Decree signed with Ohio EPA and are not included in the scope of this EE/CA.

Releases from these facilities have contaminated nearby soils (DOE 1998, DOE 2000). Cleanup of the contaminated environmental media will be addressed under the RCRA Corrective Action Program in accordance with the 1989 Consent Decree signed with Ohio EPA and are not included in the scope of this EE/CA.

2.1.6 Streamlined Risk Evaluation

Based on the preceding analyses in Sect. 2.1.3 and knowledge of the plant operations, asbestos, lead, arsenic, radionuclides, chromium, PCBs, and uranium are the expected primary COPCs for the X-626 and X-630 RCW Complexes.

Asbestos is a Class A carcinogen, which means that it is known to cause cancer based on epidemiological studies. The ACM found in structures in the X-626 and X-630 RCW Complexes are expected to be similar to those found in the X-633 RCW Complex structures. If appropriate controls are not in place, ACM has the potential to affect human health and the environment during removal activities. Chrysotile, the most commonly found form of asbestos, is present in the transite siding at a volume of 12 to 50 percent. Chrysolite was also found in potable cold water layered paper insulation at a volume of 30 to 40 percent and in the potable cold water fittings, elbow and lagging, and circulating hot water jacket and insulation at a volume of 1 to 3 percent in the X-633 RCW Complex. The asbestos will continue to become more brittle and friable if not removed. Uncontrolled releases of ACM would present a risk to human health and the environment if not removed. The exposure pathway for asbestos would most likely be through the air and the primary pathway of concern would be inhalation with the primary target organ being the lungs. The cancer effect would be asbestosis. Asbestos abatement would be accomplished using a licensed ACM abatement contractor. Dust control measures, including misting and mechanical measures, would be employed during removal activities to minimize potential exposure and risk to human health and the environment. Air monitoring would be performed throughout D&D activities to ensure appropriate actions are taken, if required, to minimize potential exposure and risk to human health and the environment.

Lead is a Class B carcinogen, meaning that it is a probable human carcinogen. Lead-based paint is also expected to be present in the X-626-1 and X-630-1 pump houses at concentrations similar to those found in the X-633-1 Pump House, where concentrations ranged from 5,300 ppm to 45,000 ppm with a percent by weight range of 0.53 to 4.5 percent. The lead paint in the pump houses would pose a threat to human health if it were to become airborne (i.e., mobile dust) or if it were subjected to heat. The primary pathways of exposure would be ingestion and inhalation with the primary target organs being the central nervous system, bones, and kidneys. Neuropsychological impairment would be a systemic effect from exposure; children are particularly susceptible to exposures to lead. If the structures are removed, appropriate controls such as personal protective equipment would be used to protect workers. Throughout the removal action, air samples would be collected to ensure appropriate actions are taken, if required, to minimize potential exposure and risk to human health and the environment.

Arsenic is a Class A carcinogen, meaning it is a known human carcinogen. The primary exposure pathways are ingestion and inhalation. Arsenic can be toxic and is harmful to the lungs, liver, and gastrointestinal tract (refer to Table 6). Arsenic was detected twice out of 12 samples in the X-633 RCW Complex wet well. Arsenic is also expected to be present at the X-626 and X-630 RCW Complexes. Continued deterioration of the X-626 and X-630 RCW Complexes could result in release of this COPC to the environment and, if released, the potential for exposure to humans via ingestion and inhalation increases.

PCBs are Class B carcinogens, meaning they are probable human carcinogens. PCBs are particularly harmful to the liver, via the ingestion exposure pathway. PCBs found in structures in the X-626 and X-630 RCW Complexes are expected to be similar to those found in the X-633 RCW Complex structures, e.g., fluorescent lights with PCB ballasts and oils containing PCBs. Continued deterioration of the facilities could result in the potential release of PCBs to the environment. If released to the environment, the potential for human ingestion is increased.

Radionuclides are Class A carcinogens. This means that 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) can 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 increased.

As shown on Table 5, VOCs (i.e., chloroform), metals, and radiological constituents were detected in the water in the X-633 RCW Complex pump house wet well, valve vaults, and pump house floor drain. Similar conditions are expected to be found at the X-626 and X-630 RCW Complexes.

PAHs are commonly found in wood preservatives and are also ubiquitous to the PORTS facility. However, in samples collected from the X-633 RCW Complex, PAHs were below detection limits in 83% of the samples analyzed. Additionally, the maximum detected value of any of the PAHs analyzed was 25 ug/L. Based on the infrequency of detection and the low detected value PAHs are not considered as primary human health COPCs.

Chromium is a Class A known human carcinogen. The primary target organ is the lungs, via the inhalation pathway of exposure. Chromium was present in the wood and on the surface of the X-633 RCW Complex cooling tower basins, and at low concentrations in the pump house. Chromium is also expected to be present at the X-626 and X-630 RCW Complexes. Exposure to chromium poses a potential inhalation and dermal (i.e., skin absorption) risk to human receptors. If the X-626 and X-633 RCW Complex structures are allowed to deteriorate and the wood is released to the environment in an uncontrolled manner, the chromium-containing wood could pose an inhalation (of dust) and dermal risks to human receptors such as workers. If the structure is removed, personal protective equipment would be used to prevent exposures to human health during the removal action. Note: only "total" chromium was analyzed for and detected (refer to Tables 2 and 5), and speciation between chromium VI and chromium III was not performed. Therefore, to be protective of human health and the environment, the more hazardous chemical (i.e., chromium VI) is discussed above and chromium VI data are presented in Table 6.

If the X-626 and X-630 RCW Complexes structures are allowed to remain in place, weather elements such as wind and rain could eventually result in infrastructure failure (e.g., asbestos transite siding blowing off the cooling towers), which in turn may result in an increased threat of exposure to human health and the environment. Risks to human health from exposure to the COPCs (ACM, PCBs, arsenic, chloroform, lead, chromium, or uranium) are minimal under current conditions; however, future uncontrolled releases could cause increased risk to human health and the environment. In addition, releases of COPCs from the X-626 and X-630 RCW Complexes could impact ecological receptors by surface water migration.

The primary pathways of exposure, target organs, and systemic and cancer effects that could be a risk/hazard to human health with respect to the X-626 RCW Complex and X-630 RCW Complex COPCs are presented in Table 6.

Table 6. Health data on the primary contaminants of potential concern for D&D of Group 2 facilities at the Portsmouth site

Contaminant of primary 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
Arsenic	A	Ingestion, inhalation	Liver, skin, gastrointestinal tract, bladder, lungs, kidney, nasal passages, liver, respiratory tract, prostate	IARC 1994; NIH 2008
Asbestos	A	Inhalation	Lung, asbestosis	IARC 1994; NIH 2008
Chromium VI	A	Inhalation, dermal	Lung, developmental effects, skin, gastrointestinal	IARC 1994; NIH 2008
Chloroform	B2	Inhalation, ingestion, dermal	Liver, kidney, central nervous system	ATSDR 1989
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
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

Security controls, including administrative and physical access controls, are currently in place to limit unauthorized access to these facilities, and only appropriately trained and authorized personnel would be allowed entrance. These institutional controls reduce the potential for direct contact with, and exposure to, the COPCs.

However, institutional controls would not prevent deterioration of the facilities or eliminate the threat of release of COPCs to the environment. As these facilities continue to age, the threat of release of radiological and chemical substances increases with time, and it becomes more difficult to contain these materials and prevent a release to the environment. Radiological and chemical substances could be released directly to the environment via, for example, a breach in a containment wall, roof, or other physical control as the facilities age and deteriorate.

2.1.7 Federal, State, and Local ARARs and To Be Considered Guidance

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 A of this EE/CA.

Applicable requirements are "those 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 "those 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 the 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.

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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 following expected primary COPCs have been identified for the X-626 and X-630 RCW Complexes:

- Asbestos from transite siding, piping insulation, etc.;
- PCBs from light ballasts, oils, etc.;
- Lead from lead-based paint and wet well and valve vault water;
- Arsenic, chromium, and radionuclides from cooling tower wood and concrete and wet well and valve vault water; and
- Radionuclides from fixed contamination in the X-630-1 Pump House "NALCO" Room.

Based on a streamlined risk assessment, DOE has determined that, if allowed to deteriorate in an uncontrolled manner, the X-626 and X-630 RCW Complexes present a threat to human health, safety, and the environment through the potential release and migration of the COPCs to the air, surface water, and soil. For example, the potential for airborne asbestos release and exposure would increase over time as the transite panels, piping insulation, etc. associated with the buildings deteriorate. Building deterioration may also result in the release of lead, chromium, arsenic, and radionuclides via surface water that could impact ecological receptors.

The deteriorating structures also present safety hazards and physical risks with respect to workers performing routine surveillance and maintenance (S&M) activities associated with these facilities.

3.2 REMOVAL ACTION SCOPE AND OBJECTIVES

This non-time critical removal action will address the X-626 and X-630 RCW Complexes cooling tower structures above ground, including associated buildings and infrastructure. Per the DFF&O, D&D includes dismantlement, demolition, and removal of equipment, structures, piping, building contents. The concrete slabs and foundations as well as underground structures will be assessed and addressed under a separate decision. The only soils that would be removed and disposed pursuant to this non-time-critical removal action are those adhering to structures or that otherwise must be excavated as an integral part of the removal action. Soils, piping, and underground structures outside of the footprint of the X-626 and X-630 RCW Complexes are not included in a CERCLA removal action decision.

The following removal action objectives have been developed for this action and form the basis for identifying and evaluating appropriate response actions:

- **Determine the viability of facility 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(s)/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 will 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 facility/structure reuse. The determination of reuse viability is addressed in Sect. 4.1.2.

- **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

If an alternative is selected that requires D&D, separate RAWPs would be prepared for both the X-626 RCW Complex and the X-630 RCW Complex. The RAWPs would cover Phase I of the removal action (D&D of the structures, equipment, materials, etc., excluding immediate field actions for the basins and other subsurface structures) for each of the facilities that is addressed in this EE/CA. The X-630 RCW Complex is currently inactive. The X-626 RCW Complex is anticipated to be transitioned to inactive status in late calendar year 2010. Per the requirements of the DFF&O, the Phase I X-626 RCW Complex and X-630 RCW Complex RAWPs would be submitted for Ohio EPA review within 90 days of DOE receiving concurrence on the AM unless otherwise mutually agreed to in writing by the parties. The removal action would be initiated for each RCW Complex by the date established in the approved schedules in the applicable RAWPs.

The removal action planning schedule, which identifies proposed durations of activities leading to the completion of Phase I X-630 RCW Complex removal action activities, is presented in Table 7 for informational, non-enforceable purposes only. The actual project schedule for the X-630 RCW Complex will be included in the X-630 RCW Complex RAWP and will be subject to Ohio EPA review and approval. No removal action planning schedule is presented for the X-626 RCW Complex because no specific transition date to inactive status has been established. DOE anticipates that the removal action planning schedule for the X-626 RCW Complex would be similar to the planning schedule for the X-630 RCW Complex. The actual project schedule for the X-626 RCW Complex will be included in the X-626 RCW Complex RAWP and will be subject to Ohio EPA review and approval.

Table 7. X-630 RCW Complex Phase I schedule

Activity	Projected start date	Projected duration
Remove equipment (such as tanks, motors, cranes)	Within 30 days of receipt of Ohio EPA concurrence with the RAWP	150 days
Demolish wood cooling tower structures	Within 120 days of receipt of Ohio EPA concurrence with the RAWP	60 days
Demolish above-grade portion of pump house	Immediately after cooling tower demolition is complete	30 days
Complete Phase I field work	Within 210 days of receipt of Ohio EPA concurrence with the RAWP	
Submit Phase I Remedial Action Completion Report	Within 150 days after completion of Phase I field work and receipt of all validated data	

Ohio EPA = Ohio Environmental Protection Agency
RAWP = Remedial Action Work Plan
RCW = recirculating cooling water

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4. DEVELOPMENT OF REMOVAL ACTION ALTERNATIVES

This section identifies the removal technologies and options and the removal action alternatives to be evaluated in this EE/CA.

4.1 REMOVAL ACTION ALTERNATIVES

4.1.1 Identification of Removal Technologies and Process Options

This section identifies the technologies and disposal options 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 the ability to provide radiological control of the D&D activity. Disposal options for waste streams that would be generated from the D&D activities are also presented.

4.1.1.1 Structure dismantlement and size reduction

Multiple dismantlement and size-reduction technologies exist and could be used in performing a removal action for the X-626 and X-630 RCW Complexes structures. The dismantlement and size-reduction technologies that are considered for this removal action are identified in Table 8. A description of the technologies and a discussion of their applicability and limitations is provided in Table 8. Dismantlement and size-reduction technologies include conventional disassembly using mechanical hand tools, various electric and pneumatic hand tools (e.g., circular saws, porta-band saws, air impact wrench, etc.) and heavy machinery, including excavators with various processing heads (e.g., grappler, shear, cracker-jaw, concrete breaker, etc.). The technique selected would be based on the properties of material being removed. The technologies considered for sealing floor drains and open piping include check valves, expandable plugs, and pipe end caps. Compaction has been used as a representative process option because this technique can be easily applied to a variety of materials and results in substantial volume reduction of the structural debris.

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.

4.1.1.2 Concrete decontamination, stabilization, and removal technologies

Multiple decontamination, stabilization, and removal technologies exist to address the concrete. The technologies available for concrete decontamination, stabilization, and removal techniques are identified in Table 9. A description of the technologies and a discussion of their applicability and limitations is provided in Table 9. These technologies are the most appropriate for evaluation with respect to this removal action.

Table 8. 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 that require 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
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 would determine effectiveness	Safety concerns include the following: • 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 • Metal fumes from dusts of metal cuts • If applicable, verify utilities have been tagged per lock-out/tag-out procedure before being disconnected

Table 8. Description and evaluation of structure dismantlement, size-reduction technologies, pipe/utility separation/disconnection, and lead-based paint/asbestos removal

Technology	Description	Applicability	Limitations	Comments
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 kPa (4,000 to 22,000 pounds psi) required to compact most items	• Greatly reduces 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 of piping and/or floor drains using check valves, expandable plugs, and pipe end caps	After disconnection of pipe by mechanical means, pipe end would be sealed	May be applied to any disconnection [e.g., floor drain, pipe conduit (air gaps)]	• Labor intensive and slow; • If pipe ends are pinched, would 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

Table 9. Description and evaluation of concrete 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 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 is readily available • 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
Abrasive blasting	Uses an abrasive medium (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 “clean” disposal • CO2 minimizes additional waste streams

Table 9. Description and evaluation of concrete decontamination, stabilization, and removal technologies (continued)

Technology	Description	Applicability	Limitations	Comments
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

4.1.1.3 Waste containerization options

It would be necessary to containerize the waste generated during D&D activities for transportation and disposal. A large variety of containers are available that would be appropriate for the different waste streams anticipated to be generated, depending on which technologies identified in Sects. 4.1.1.1 and 4.1.1.2 are applied. The types of containers most appropriate for this removal action would include but not be limited to gondolas, Sealand containers, intermodal containers, roll-off boxes, strong-tight boxes (B-25), steel drums, and polyethylene drums. Due to the potential variety of wastes that are anticipated to be generated from D&D activities, it is possible that multiple container options would be used during implementation of the removal action.

4.1.1.4 Waste streams

The anticipated waste volumes associated with Phase I removal of the X-626 and X-630 RCW Complexes are summarized in Table 10. Approximately 98% of the wastes generated are expected to be sanitary waste.

Table 10. Anticipated removal action wastes

Waste type	Estimated volume (cf)
Sanitary	484,005
LLW	7,537
Total	**491,542**

Source: *Removal Action Work Plan for the X-630 Recirculating Cooling Water Complex at the Portsmouth Gaseous Diffusion Plant* (DOE 2010b). The X-626 RCW Complex waste volumes were scaled from the anticipated X-630 RCW Complex waste volumes by square footage.

LLW = low-level radioactive waste

Although RCRA and Toxic Substances Control Act of 1976 (TSCA) wastes are expected to be dispositioned during pre-removal action activities and are not listed in Table 10, some residuals may be encountered during any selected removal action. Due to this possibility, RCRA, TSCA and mixed wastes are carried forward as potential waste streams in the following waste disposition analyses.

All wastes generated from the removal of structures in the X-626 and X-630 RCW Complexes would be shipped by DOE to appropriate off-site facilities for disposal. Sufficient off-site waste disposal capacity is available for all solid waste streams anticipated to be generated if a removal action requiring D&D is selected. RCRA wastes would be containerized for disposal in accordance with regulatory requirements. A 90-day storage area would be established to temporarily store RCRA wastes, if needed, pending transportation and disposal. No waste piles would be established at these removal action sites by DOE. Existing data have been sufficient to allow the determination of anticipated waste streams, identification of contaminants of concern, evaluation of potential risks, and development of approaches that would ensure worker safety. It is recognized that current data may not be sufficient to meet off-site disposal facilities' waste acceptance criteria (WAC); in such cases, any necessary additional sampling and analysis would be performed during performance of any selected removal action. It is anticipated that the waste material would require disposal as solid waste, RCRA waste, LLW, and/or mixed low-level waste.

Hazardous waste determinations to date are based on available process knowledge and sampling/analysis results. Additional samples, which contain representative portions of all wastes, would be collected prior to removal of the cooling towers. Assuming no listed wastes are present and the sample does not exhibit a hazardous characteristic, the debris would be categorized as nonhazardous. Accordingly, sorting and segregation would be instituted as a best management practice to determine the presence of RCRA hazardous waste.

Disposal options that could be considered for the disposal of certain wastes generated during D&D activities may be limited if radionuclide contamination is present at levels that exceed the industrial or sanitary landfill limits of the receiving disposal facility.

Although a variety of waste streams would be generated if a D&D removal action alternative is selected, the primary X-626 and X-630 RCW Complexes removal waste streams are expected to be construction/removal debris.

During performance of this non-time-critical removal action, wastes such as nonradioactive RCRA solid waste and/or liquid waste (e.g., decontamination wastes, liquids, etc.) and secondary waste streams also could be generated. It is anticipated that no on-site treatment of this waste would be necessary; however, if on-site treatment becomes necessary, DOE would consult with the Ohio EPA. Although not anticipated, the RCRA waste would be treated, if necessary, to meet RCRA land disposal restrictions (LDRs) prior to disposal.

If wet decontamination techniques are employed, a bermed, lined decontamination area would be established. The collected decontamination water would be sampled and disposed of via an on-site treatment facility or a National Pollutant Discharge Elimination System (NPDES) outfall.

If necessary to support the removal action, water that has accumulated in the cooling tower basins, valve vaults, and wet well would be sampled prior to removal and discharged through an on-site treatment system or NPDES outfall in consultation with Ohio EPA.

Results of the characterization efforts, including additional disposal data obtained as necessary, would be used to separate debris, using reasonable efforts, into waste streams that conform to the proposed disposal facility WAC. A discussion of the primary waste disposal facilities being considered for waste from the D&D activities and a summary of their respective WAC are presented in the following sections. In addition, if wastes were generated that could not meet the WAC for the facilities discussed in this EE/CA, other commercial disposal facilities would be utilized for these wastes.

4.1.1.5 Off-site disposal

Off-site facilities used for disposal would depend on the nature of the waste generated. Sampling data would be collected at the X-626 and X-630 RCW Complexes to determine appropriate off-site disposal options. It is expected that the majority of generated waste would be disposed at an off-site facility that accepts construction waste. Off-site disposal facilities and facility-specific WAC, if applicable, would be evaluated to determine the appropriate off-site disposal path for the anticipated and potential waste streams listed in Table 11.

Table 11. Anticipated and potential waste streams

Waste stream	Description
LLW	LLW is defined as radioactively contaminated, non-consolidated, solid material and is managed separately from non-LLW because of differing characterization requirements. The waste streams within this category can include scrap metal, concrete, decontamination materials, including decontamination waste waters, and secondary waste streams such as PPE generated during performance of a non-time-critical removal action. This waste category consists of ACM that can be demonstrated to meet the appropriate radiological release criteria and secondary waste streams such as PPE generated during performance of a non-time-critical removal action.
Mixed wastes (RCRA)	This waste category includes waste streams that have both a RCRA hazardous component and a radioactive component based on their origin within a radioactive materials management area, surface contamination exceeding release limits, or available characterization data. Among the wastes included in this category are inherently hazardous non-recyclable metal items and secondary waste streams such as PPE generated during performance of a non-time-critical removal action.
Hazardous wastes	This waste category encompasses RCRA-hazardous waste streams (that are not mixed wastes and do not exceed radiological release criteria) and secondary waste streams such as PPE generated during performance of a non-time-critical removal action.
Nonradioactive, nonhazardous, solid waste	This waste category includes wastes that are nonradioactive and RCRA nonhazardous. Among the items included in this category is miscellaneous trash (paper, cloth, wood, plastic, etc.) generated outside the work boundary area during performance of the non-time-critical removal action.

ACM = asbestos containing material
LLW = low-level (radioactive) waste
PPE = personal protective equipment
RCRA = Resource Conservation and Recovery Act of 1976

4.1.1.6 Summary of disposal options

The waste streams that DOE anticipates would be generated during a D&D removal action are identified in Table 11. The primary waste stream is anticipated to be nonradioactive, nonhazardous solid waste from structure and foundation debris. Any RCRA waste would be treated, if necessary, to meet RCRA LDRs prior to disposal at a permitted commercial facility. If RCRA wastes with a radioactive component were encountered, they would also be treated, if necessary, to meet RCRA LDRs before being disposed at Energy*Solutions* in Utah. Radioactive wastes would also be disposed at the DOE NNSS and/or at Energy*Solutions*. Nonradioactive ACM would be disposed at a permitted, commercial Subtitle D facility. No radioactive asbestos-containing wastes are anticipated; however, if found, such wastes would be disposed at the NNSS or Energy*Solutions*. Any liquid decontamination waste generated would be sent to an onsite treatment system and/or discharged through an NPDES outfall. Water that has accumulated in the cooling tower basins, valve vaults, and wet well that is removed to support the removal action would be sampled and discharged through an NPDES outfall. A summary of the waste disposal options for the various anticipated waste streams is presented in Table 12.

Table 12. Summary of disposal options for D&D waste

Facility	Nonradioactive, nonhazardous, solid waste and non-radioactive ACM	LLW	Mixed waste	Hazardous (RCRA) waste	Radioactive ACM	Liquid cooling tower basin waste	Liquid decon waste
Energy*Solutions*		X	X	X	X		
NNSS		X	X		X		
Other permitted facilities	X			X			
Portsmouth on-site treatment facility(s) or existing NPDES outfalls						X	X

ACM = asbestos-containing material
LLW = low-level (radioactive) waste
NNSS = Nevada National Security Site
NPDES = National Pollutant Discharge Elimination System
RCRA = Resource Conservation and Recovery Act of 1976

4.1.2 Development of Removal Action Alternatives

In accordance with the NCP and EPA guidance, DOE screened several alternatives for the X-626 and X-630 RCW Complexes removal action. However, not all the alternatives, including a renovation and reuse alternative, were carried forward for detailed evaluation in this EE/CA. The primary reasons a renovation/reuse alternative was not further considered included the nature of the X-626 and X-630 RCW Complexes, their current state of deterioration, the lack of current or future DOE mission for the cooling towers, lack of any other reasonably foreseeable use, and renovation cost.

The DOE considered a renovation/reuse alternative that included removing outdated equipment, decontaminating portions of the structures to remove the threat of release of contaminants of potential concern, renovating the structures for potential reuse, and disposing the wastes generated during the decontamination and renovation activities.

To the greatest extent practical, any renovations made to the RCW complexes would have to meet or exceed the statutory goals addressed in *Guiding Principles for Federal Leadership in High Performance and Sustainability Buildings (HPSB)*, Executive Order 13423 Sect. 2(f). Examples of HPSB improvements include installing new electrical wiring, incorporating energy-efficient electrical components, supervisory data software, energy efficient lighting, and Energy Star heating equipment. In addition, all 28 cooling tower cells would require renovation, including replacement of much of the wood structure. The cooling towers are deteriorating (interior wood slats have fallen into the basins and stairs and decking are barricaded because they are unsafe).

The estimated cost to renovate the X-633 RCW Complex (e.g., upgrade equipment to make it operational and correct unsafe conditions to allow access for maintenance) was approximately $23,000,000 (DOE 2009a). Costs presented in this EE/CA are in unescalated 2009 dollars unless otherwise noted. The X-633 RCW Complex occupied approximately 143,500 ft^2. The combined area of both the X-626 and X-630 RCW Complexes is approximately 84,300 ft^2 (see Table 13). Since the X-626 and X-630 RCW Complexes are similar with respect to construction, equipment, and operation (size being the only major difference), an estimated renovation cost for these facilities, based on the ratio of square footage, would be approximately $13,500,000.

Table 13. Facility occupied area

Facility	Area (ft^2)
X-633 RCW Complex	
X-633-1 Pump House	11,268
X-633-2A Cooling Tower	53,600
X-633-2B Cooling Tower	53,600
X-633-2C Cooling Tower	5,000
X-633-2D Cooling Tower	20,000
Total	**143,468**
X-626 and X-630 RCW Complexes	
X-626-1 Pump House	7,010
X-626-2 Cooling Tower	12,000
X-630-1 Pump House	10,249
X-630-2A Cooling Tower	27,500
X-630-2B Cooling Tower	27,500
Total	**84,259**

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 U.S. Army Corps of Engineers - Huntington District and Project Time & Cost, Inc., TLG Services, Inc., and Project Enhancement Corporation, prepared for the United States Department of Energy, Portsmouth Gaseous Diffusion Plant, Piketon, Ohio.

In addition to the renovation costs (which include decontamination costs), at some future date following renovation, the X-626 and X-630 RCW Complexes would eventually have to undergo the D&D process at a total estimated cost of $11,000,000 for removal of the above-grade structures.

The current annual S&M cost associated with the X-626 and X-630 RCW Complexes is $300,000.

DOE has no current or anticipated future mission that would include the need to reuse the X-626 and/or X-630 RCW Complexes. 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 government agencies or non-governmental entities to use these complexes. Therefore, the renovation/reuse alternative has not been carried forward for further consideration in this evaluation of potential removal action alternatives.

DOE has identified two alternatives that address the removal action objectives that were specified in Sect. 3:

- Alternative 1 - No action, and
- Alternative 2 - Remove Structures, Dispose/Recycle Equipment and Materials.

These removal alternatives are summarized in Sects. 4.1.2.1 and 4.1.2.2.

4.1.2.1 Alternative 1 - No Action

A no action alternative is included to serve as a baseline for comparison to the other alternatives. In the no action alternative, basic fire protection and S&M activities would continue, although no major repairs or upgrades would be undertaken. The X-626 and X-630 RCW Complexes would continue to deteriorate and D&D would not be performed. Final disposition of contaminants generated by the structures' gradual degradation and ultimate failure would be deferred, and D&D of the complexes would occur at a future date.

4.1.2.2 Alternative 2 – Remove Structures, Dispose/Recycle Equipment and Materials

The following are key components of this removal action alternative.

Demolition activities would be performed in compliance with X-626 and X-630 RCW Complexes ARARs. Engineering controls, e.g. spraying or misting water, would be employed to minimize the release of fugitive dust or other contaminants during D&D activities.

Waste generated by the removal action would be segregated, size-reduced if necessary, containerized and shipped to an appropriately-licensed off-site disposal facility. No decontamination or treatment would be required unless treatment were necessary to meet LDRs. Waters generated by the project (e.g., decontamination waters) would be sent to an existing onsite treatment facility or a NPDES outfall.

D&D of the X-626 and X-630 RCW Complexes structures would be conducted in two phases. This EE/CA addresses Phase I of the D&D, which consists of D&D of above-grade structures. A subsequent decision would address Phase II and would address the subsurface structures (e.g., cooling tower basins, wet wells, valve pits, etc.).

Phase I D&D. The following activities would be key components of Phase I D&D:

- **Removal of salvageable/reusable equipment**

  Equipment identified as salvageable/reusable includes, but would not be limited to, transformers, empty tanks, switchgear, wet well pumps, motors, and overhead trolley cranes. Some early equipment removal may have occurred as a pre-D&D activity, however, the remaining equipment removal would occur as part of this CERCLA alternative. Equipment removal would be initiated prior to demolition and would continue as demolition of the structures progressed. Cranes and/or heavy equipment would be used to remove the equipment. Equipment identified as salvageable/reusable would be loaded onto the recyclers' or end-users' vehicles for transport. Equipment not identified as salvageable/reusable would be size reduced as necessary, and containerized for disposal.

- **Demolition of wooden above-grade portions of cooling tower structures**

  This activity would consist of demolition of the wood framing and honey-comb fill that sits above each cooling tower basin.

  Core samples would be collected from the X-626-2 Cooling Tower to verify that the average concentration of chromium in the cooling tower wood does not exceed the RCRA TCLP limit (< 5.0 mg/L) and the wood is nonhazardous.

  The above-grade portion of the cooling towers would be demolished using excavators equipped with bucket, shear, or grapple attachments. The structural debris would fall directly into the concrete basins beneath the cooling towers, which would contain the debris in a central location and lessen the impact on soils surrounding the towers. Debris would then be grabbed or scooped from the basins using excavators equipped with bucket and grapple attachments. Engineered solutions would be used, if necessary, to prevent material in the basins from contaminating the demolition debris.

- **Demolition of above-grade concrete structures**

  The above-grade portion of the X-626-1 Pump House and the X-630-1 Pump House and other support structures would be removed using excavators equipped with concrete breaker, bucket, shear, and grapple attachments. These structures would be removed to the slab.

- **Asbestos removal**

  Despite pre-D&D asbestos abatement efforts, ACM may be found during D&D activities. Engineering controls, including wetting methods, negative air units, or containment structures, would be used to control air emissions. Air monitoring would be conducted to assure adequacy of engineering controls and personnel protective equipment.

- **Concrete characterization results**

  Characterization of the concrete would be conducted as part of this CERCLA non-time critical removal action. If cost effective, decontamination would occur if characterization data indicated the concrete walls would not qualify as clean hard fill [as defined in OAC 3745-400-01(E)]. If it is not cost effective to decontaminate the concrete, or if the decontaminated concrete does not meet the requirements, the concrete would be disposed off site. If characterization data indicated the concrete met the requirements per ARARs, the concrete would be removed and may be rubblized for use as fill elsewhere.

- **Recycling/reuse**

  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.

- **Site restoration and demobilization**

  Upon completion of Phase I activities, the equipment and materials used would be demobilized from the site and the site would be put in a safe configuration. Depending on the time needed before Phase II can be implemented, activities may include roping off any open and exposed subsurface structures to restrict entry, removing temporary access roads and laydown areas, or even temporarily seeding disturbed areas. Pathways for contaminant migration would be controlled (such as by the sealing of slabs, capping of pipelines, or removal of sources of remaining contamination now open to the environment).

5. ANALYSIS OF REMOVAL ACTION ALTERNATIVES

In accordance with NCP and EPA guidance (EPA 1993), the alternatives developed in Sect. 4.1.2 have been evaluated against the short- and long-term aspects of three broad criteria: effectiveness, implementability, and cost. Those main criteria are summarized in Table 14. The evaluations were used to draw sufficient distinctions among the alternatives to allow identification of a recommended alternative.

Table 14. Criteria used to evaluate the removal action alternatives

EFFECTIVENESS

• Protectiveness
  ○ Protective of public health and community (short and long term)
  ○ Protective of workers during implementation (short term)
  ○ Protective of the environment (short and long term)
  ○ Complies with ARARs
 	
• Ability to achieve RAOs
  ○ Level of treatment/containment expected
  ○ No residual effect concerns
  ○ Will maintain control until long-term solution implemented

IMPLEMENTABILITY

• Technical Feasibility
  ○ Construction and operational considerations
  ○ Demonstrated performance/useful life
  ○ Adaptable to environmental conditions
  ○ Contributes to remedial performance
 	
• Availability
  ○ Equipment
  ○ Personnel and services
  ○ Outside laboratory testing capacity
  ○ Off-site treatment and disposal capacity
  ○ Post-removal site control
 	
• 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)

COST
• Capital cost • Post-removal site control cost

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

In accordance with DOE's 1994 *Secretarial Policy Statement on the National Environmental Policy Act of 1976 (NEPA)*, NEPA values have been incorporated into the alternative analysis.

5.1 ALTERNATIVE 1 – NO ACTION

A no action alternative is included to serve as a baseline for comparison to the other alternatives. In the no action alternative, basic fire protection and S&M activities would continue, although no major repairs or upgrades would be undertaken. The X-626 and X-630 RCW Complexes would continue to deteriorate and D&D would not be performed. Final disposition of contaminants generated by the structures' gradual degradation and ultimate failure would be deferred, and D&D of the complexes would occur at a future date.

5.1.1 Effectiveness

Alternative 1 does not meet the RAOs.

Protectiveness and ability to achieve RAOs. Because this alternative consists of no action, the short-term risks to the public, the workers, and the environment would remain unchanged. Existing hazards to workers and the public would continue to be controlled with institutional controls that restrict access to the X-626 and X-630 RCW complexes.

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 could result in the release of contamination to the environment. Upon structural failure, release of contaminants to the atmosphere and surface water pathways could potentially occur (e.g., ACM and lead-based paint could become airborne due to structural failure). This could also present a hazard to on-site workers due to physical dangers associated with roof and building structure failure.

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. Wetlands and floodplains would be impacted if asbestos, lead-based paint, or other potential contaminants migrated after being released due to aging and degradation of the structures. No federal or state-listed threatened or endangered plant or animal species have been identified at the X-626 and X-630 complexes. Habitat for the federally endangered Indiana bat (*Myotis sodalis*) potentially exists in the vicinity, but these complexes do not provide suitable habitat. Indiana bats require exfoliating trees, which are not present at either facility. This alternative would not have any direct or indirect adverse impacts on local socioeconomic resources.

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 Portsmouth 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 off-site or on-site waste disposal is required due to basic fire protection and S&M activities.

Availability of services and materials. Existing site services can maintain current institutional controls and continue to provide S&M activities that routinely occur.

5.1.3 Cost

While there are no direct removal costs associated with Alternative 1, other costs, approximately $300,000 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 does not avoid D&D of these facilities; it just postpones it. The current estimated cost for D&D of these facilities in their current condition is approximately $11,000,000. Continued deterioration of the facilities could increase the cost of eventual D&D 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.

5.2 ALTERNATIVE 2 – REMOVE STRUCTURES, DISPOSE/RECYCLE EQUIPMENT AND MATERIALS

Under this alternative, the aboveground structures associated with the X-626 and X-630 RCW Complexes would be removed and material and equipment reused as appropriate. The removal action is described in detail in Sect. 4.1.2.2.

5.2.1 Effectiveness

Alternative 2 would meet the removal action objectives.

Protectiveness and ability to achieve removal action objectives. Based on the streamlined risk assessment, D&D of the X-626 and the X-630 RCW Complexes would prevent, minimize, or eliminate potential and actual risks to workers and ecological receptors posed by the uncontrolled release or threat of release of the contaminants of potential concern. The D&D of these structures, equipment, and materials would prevent or minimize any migration of hazardous constituents to the environment.

The ARARs for this alternative are presented in Appendix A. All on-site CERCLA actions under this non-time-critical removal action would comply with ARARs. The transportation of waste to any off-site disposal facility (and any treatment that may be required to satisfy land disposal restrictions or the WAC) would be performed in accordance with ARARs. Shipments would be accomplished via truck or rail. All off-site disposal activities would be conducted in accordance with disposal site permit requirements.

The Phase I Archaeological Survey (Schweikart 1997) determined that there are no archaeological resources within Perimeter Road, therefore, implementation of this alternative would not affect any archaeological resources. DOE intends to approach this alternative as though the X-626 and X-630 RCW Complexes, 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 will perform certain mitigation measures 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 (see Appendix A for further discussion).

This alternative would permanently remove contaminants in the building structures from an uncontrolled environment. Waste would be disposed at an appropriately licensed off-site disposal facility that would provide long-term containment for any hazardous and/or radioactive constituents. The off-site disposal of solid waste, along with the maintenance of existing institutional controls, would prevent any residual effects on the environment, worker health and safety, and public health and safety.

With regard to NEPA values, future land use would not be inhibited if the structures were removed. No contaminants currently found in the structures would remain; therefore, they would present no impact to air, soil, and or the surrounding environments. Wetlands and floodplains would not be affected by the removal action because engineering controls would be implemented during removal activities. No federal or state-listed threatened or endangered plant or animal species have been identified at the X-626 or X-630 RCW Complexes. This alternative would not have any direct or indirect adverse impacts on local socioeconomic resources.

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 impacts that agencies activities have on minority and low-income populations. No census tracts near Portsmouth 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. Dust suppression and storm water control would prevent releases from implementation of 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 after the action is completed.

If Alternative 2 is implemented, building deterioration that would otherwise result in any significant increase in contaminant release would not occur. Risks to on-site workers and the public would increase slightly during implementation; however, these risks would be managed by adhering to health and safety requirements and PORTS procedures. Chemical, radiological, and physical risks to workers would be controlled by engineering controls and/or personal protective equipment.

Alternative 2 would include shipment of wastes to off-site disposal facilities. Those shipments would increase cargo and vehicle-related transportation risks to workers (e.g., crew) and members of the public. If characterization of the concrete and surrounding soils indicates the concrete can be left in place (see Sect. 4.1.1.2), the number of shipments would be reduced significantly. Reducing the number of shipments would reduce the associated transportation risks.

Permit requirements. Pursuant to requirements of 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 A.

- 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 waters of Ohio under the permit. The stormwater runoff controls detailed in the general permit, as listed in Appendix A, 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 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 will 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 Toxic Substances Control Act of 1976 (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 on-site 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 A, 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 A.

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 will describe in more detail the activities planned to meet the ARARs and TBC guidance.

5.2.2 Implementability

Technical and administrative feasibility. This alternative is technically and administratively feasible. Conventional construction/removal techniques would be used to remove the equipment, structures, cooling tower basins, valve vaults, and pump house wet well. Off-site disposal of waste materials would occur at existing facilities that have sufficient existing capacities. After D&D is completed, the sites would be regraded to final design grade.

Availability of services and materials. Sufficient equipment and personnel are available for this alternative. On-site waste storage is available, if necessary, for unexpected or unknown wastes generated during the D&D process and waste being prepared for and waiting off-site disposal. Off-site disposal services are available.

5.2.3 Cost

The total estimated cost for removal of the above-grade structures associated with the X-626 and the X-630 RCW Complexes is approximately $11,000,000. This cost represents removal of the above-grade structures and disposal of all debris, including concrete and other materials. Any materials that could be reused or recycled, including concrete, would reduce the cost for Alternative 2. The costs presented are direct costs and do not include costs associated with contractor oversight and project management.

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6. COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

This section compares the alternatives on the basis of effectiveness, implementability, and cost. The comparative analysis is presented in Table 16.

6.1 EFFECTIVENESS COMPARISON

The No Action alternative (Alternative 1) 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-626 and X-630 RCW Complexes 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, D&D of the structures and disposal/recycling of equipment and materials, 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, 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. Additionally, appropriate permitted disposal facilities, with sufficient capacity, are available to disposition wastes anticipated to be generated from the removal of the X-626 and X-630 RCW Complexes buildings and structures.

6.3 COST COMPARISON

Comparative analysis of the removal action alternatives is provided in Table 15. 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 Alternative 1, other costs, approximately $300,000 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 because Alternative 1 does not avoid D&D of these facilities, but only postpones it. The current estimated cost for removal of the above-grade structures in their current condition (Alternative 2) is approximately $11,000,000. Continued deterioration of the facilities could increase the cost of eventual D&D 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 15. 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 or permanent solution • Does not result in progress toward site cleanup goals	• Readily implementable technically • Generates minimal quantities of waste • Basic fire protection and S&M activities would continue	$300,000 annually in S&M cost (plus estimated future removal costs of $11,000,000)
2. Remove Structures, Dispose/Recycle Equipment and Materials	• 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 • Results in progress toward site cleanup goals • Effective at isolating contaminants from the environment	• 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	$11,000,000

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

7. RECOMMENDED REMOVAL ACTION ALTERNATIVE

Alternative 2, demolition of above-grade structures, is the recommended alternative for D&D of the X-626 and X-630 RCW Complexes. This alternative has been determined to be the most cost-effective approach that satisfies the objectives for the removal action and would meet ARARs to the extent practicable.

Removal of the X-626 and X-630 RCW Complexes structures would also facilitate the investigation and cleanup of any affected soils.

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APPENDIX A: APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TO-BE-CONSIDERED GUIDANCE FOR X-626 AND X-630 RECIRCULATING COOLING WATER COMPLEX ENGINEERING EVALUATION/COST ANALYSIS

CONTENTS

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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
CAA	Clean Air Act of 1970, as amended
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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A.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 A.1 and A.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.

A.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.

A.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 A.1.

A.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.

A.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.

A.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 PORTS 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-626 and X-630 Recirculating Cooling Water (RCW) Complexes. These RCW Complexes were among the original facilities at Portsmouth built in support of the Portsmouth Cold War mission. The OHI forms are on file at the OHPO.

The proposed activities are described in Sect. 4.1 of the Engineering Evaluation/Cost Analysis.

The RCW Complexes are currently inactive or are being phased out at the end of Fiscal Year (FY) 2010 or early FY 2011 and 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-626 and X-630 RCW Complexes and the area in close proximity to their structures. Based on the results of the Phase I Archaeological Survey at Portsmouth, it was determined that all of the area within Perimeter Road was disturbed during plant construction, including the X-626 and X-630 areas. Therefore, no archaeological resources would be impacted during a removal action.

The X-626-1 Recirculating Water Pump House, X-626-2 Cooling Tower, X-630-1 Recirculating Water Pump House, and X-630-2A and X-630-2B Cooling Towers are associated with Portsmouth original construction. The following steps would be taken to implement the ARAR as necessary:

a. Copies of the original OHI forms that are on file with the OHPO numbered PIK-101-12 (X-626-1); PIK-102-12 (X-626-2) Recirculating Water Pump House and Cooling Tower); PIK-151-12 (X-630-1 Recirculating Water Pump House); PIK-152-12, PIK-152-12, and PIK-153-12 (X-630-2A and X-630-2B Cooling Towers), and a map showing the locations of the facilities proposed for demolition will be placed in the X-626/X-630 RCW Complex 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 and current conditions and surrounding landscape around X-626 and X-630 RCW Complexes will be placed in the X-626/X-630 RCW Complex 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 X-626 and X-630 will be placed in the X-626/X-630 RCW Complex Removal Action Administrative Record. If drawings are not available, DOE will prepare basic plan view drawings to scale of X-626 and X-630 RCW Complexes 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 X-626 and X630 RCW Complexes to the overall processes at Portsmouth. The narrative will be placed in the X-626/X-630 RCW Complex Removal Action Administrative Record.

e. Prior to demolition, salvage of selected uncontaminated items from the buildings will be identified for future preservation opportunities that may occur.

A.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.

A.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 (CAA) of 1970, as amended, for control of asbestos and/or radionuclide emissions included in Table A.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.

A.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 A.2. Hazardous and other waste may be accumulated and stored in appropriate storage areas at Portsmouth.

A.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 A.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 A.1. Location-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio

Location	Requirements[a]	Prerequisite	Citation
	Cultural resources		
Presence of historic properties	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 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 A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes 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)
	• 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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Activities causing fugitive dust (particulate) emissions (continued)	• 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)
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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
Characterization of solid waste (continued)	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 the 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)
	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 – **applicable**	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 Sect. 402 or Sect. 307(b) of the CWA – **applicable**	40 *CFR* 264.1(g)(6) *OAC* 3745-54-01(G)(6)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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)
	• 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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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 use – **TBC**	DOE O 5400.5(II)(5) (c)(1)
	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)(1) [*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: ▪ It is Category I nonfriable ACM that is not in poor condition and is not friable;		40 *CFR* 61.145(c)(1)(i) *OAC* 3745-20-04(A)(1)(a)
	▪ 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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	▪ 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)
	▪ 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 a 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

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	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)
	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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	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)
	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 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 applicability 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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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
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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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)
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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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)
	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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	• 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
	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, 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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	• 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)
	• Run-on 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 "incompatible" 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, run on/run off 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 "incompatible" remediation waste in staging pile – **applicable**	40 *CFR* 264.554(f)(1) *OAC* 3745-57-74(F)(1)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes 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 regulated 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)
	▪ Not located at a site that is below the 100-year flood water elevation.		40 *CFR* 761.65(b)(1)(v)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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.		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 the 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 bulk 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 bulk 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)
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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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
Disposal of RCRA-prohibited hazardous waste in a land-based unit (continued)	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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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 – **applicabl**e	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 – **applicabl**e	40 *CFR* 268.49(b) and (c) *OAC* 3745-270-49(B) and (C)
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 – **applicabl**e	40 *CFR* 268.3(a) *OAC* 3745-270-03(A)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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 U.S. 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
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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	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)
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

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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)
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); • 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		40 *CFR* 761.61(b)(2)(i)
	• 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).		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 A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes 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 Sect. 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 A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes 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) – **applicabl**e	40 *CFR* 761.62(b)(1)
	▪ 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 A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	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 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	Closure of a RCRA hazardous waste management unit – **applicable**	40 *CFR* 264.111(a) *OAC* 3745-55-11(A)
	• 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.		40 *CFR* 264.111(b) *OAC* 3745-55-11(B)
	• 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)

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
	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 in a 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 RCRA hazardous waste tanks	At closure, remove all hazardous waste and hazardous waste residues from tanks, discharge control equipment, and discharge confinement structures.	Management of RCRA hazardous waste in tanks**—applicable**	40 *CFR* 264.197(a) *OAC* 3745-55-97(A)
	If all contaminated contents cannot be removed, must consider the tank system a landfill and close the facility and perform postclosure care in accordance with the landfill closure requirements of 40 *CFR* 264.310.		40 *CFR* 264.197(b) *OAC* 3745-55-97(B)
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 A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes 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 the substantive requirements of DOE O 460.1C (*Packaging and Transportation Safety*) and DOE O 460.2A (*Departmental Materials Transportation and Packaging Management*) .	Preparation of shipment of radioactive waste – **TBC**	DOE M 435.1-1 I.1 (E)(11)
	To the extent practicable, the volume of waste and number of shipments shall be minimized.		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 for labeling [*OAC* 3745-52-31], Sect. 262.32 [*OAC* 3745-52-32] for marking, Sect. 262.33 [*OAC* 3745-52-33] for placarding, Sect. 262.40 and 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)
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

Table A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio (continued)

Action	Requirements[a]	Prerequisite	Citation
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 A.2. Action-specific ARARs for the X-626 and X-630 RCW Complexes 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 restriction
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