John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

October 28, 2014

RE: US DOE-PORTS
GENERAL CORRESPONDENCE
REMEDIAL RESPONSE
PIKE COUNTY
I.D. # 466000865

Kristi Wiehle, Site Coordinator
Portsmouth/Paducah Project Office
US Department of Energy
Post Office Box 700
Piketon, Ohio 45661

Joel Bradburne, Site Lead
Portsmouth/Paducah Project Office
US Department of Energy
Post Office Box 700
Piketon, Ohio 45661

SUBJECT: Ohio EPA Concurrence/Approval as Applicable on the Revised Proposed Plan for the Site-Wide Waste Disposition Evaluation Project

Dear Ms. Wiehle and Mr. Bradburne:

Pursuant to the requirements of *the April 13th, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modifications for the Portsmouth Gaseous Diffusion Plant* (Decontamination and Decommissioning Project), (hereinafter DFF&O), DOE submitted the Revised Draft Proposed Plan for the Site-Wide Waste Disposition Project (Draft Proposed Plan) for Ohio EPA review and comment on October 28, 2014. The Draft Proposed Plan identifies DOE's proposed alternative of on-Site/off-Site disposal for waste anticipated to be produced from the decontamination and decommissioning for the Portsmouth Gaseous Diffusion Plant.

The Draft Proposed Plan also includes the Waste Acceptance Criteria (WAC) for Ohio EPA's approval as required by the DFF&O. As part of the preferred alternative and the WAC, Ohio EPA proposes to designate, pending public comment, the potential On-Site Disposal Cell (OSDC) as a treatment, storage, and disposal Corrective Action Management Unit (CAMU) and a waste staging area (known as the Impacted Material Transfer Area) as a treatment and storage CAMU under Ohio Administrative Code (OAC) 3745-57-72. This designation will also establish treatment standards for CAMU-eligible Waste and takes into account the protectiveness level of a potential OSDC.

Ohio EPA has reviewed the Draft Proposed Plan and is hereby providing DOE with concurrence in accordance with the requirements in Section XV, Review of Submissions of the DFF&O.

Ohio EPA further approves of the WAC in accordance with Section VII, Compliance Schedule, and Section XV of the DFF&O. Consistent with the terms of paragraph 79 of the DFF&O, Ohio EPA's concurrence and approval is for purposes of the DFF&O and does not impact DOE's obligations under any existing permits, authorizations, and orders, including but not limited to, the Ohio Consent Decree and the hazardous waste installation and operation permit. Finally, as indicated in the Draft Proposed Plan, whenever excavation and/or disposal of non-DFF&O and other remediation waste is discussed in the waste disposition documentation (e.g., Site-Wide Waste Disposition RI/FS Report, Supplement to the Site-Wide Waste Disposition RI/FS, this Proposed Plan, etc.), whether in terms of additional waste material or fill, it is understood that additional authorization/approval would be required to undertake this activity. While this letter does not constitute such authorization/approval, Ohio EPA looks forward to working through these issues with DOE at the appropriate time.

As set forth in paragraph 9c of the DFF&O, in the event that any portion of the Work requires a permit, license, or other authorization from Ohio EPA or any other state, federal or local government agency, Respondent shall submit applications in a timely manner and take all other actions necessary to obtain such permit, license, or other authorization. (See, DFF&O, ¶9c.)

DOE is required pursuant to Section VII, Compliance Schedule-Table 1C of the DFF&O to provide public notice of the proposed plan within 45 days after receipt of Ohio EPA's concurrence, thereby initiating the public comment period. Within 120 days after the close of the public comment period for the proposed plan, DOE shall submit the Draft ROD and Responsiveness Summary to Ohio EPA for review and concurrence and/or approval, as applicable, pursuant to the DFF&O.

If you have any questions, regarding this letter, please contact Maria Galanti of my staff at maria.galanti@epa.ohio.gov or 740-380-5289.

Sincerely,

Pete Whitehouse, Chief
Division of Environmental Response and Revitalization

cc: Dennis Carr, FBP, LLC
Vincent Adams, Site Director, PPPO-PORTS
William Murphie, Manager, Portsmouth/Paducah Project Office

ec: Ed Gortner, Manager, DERR-SEDO
John Rochotte, Supervisor, DERR-SEDO
Jim Sferra, Chief, SEDO
Maria Galanti, DERR-SEDO
Melody Stewart, DMWM-SEDO
Justin Burke, DERR-CO
Ann Fischbein, Legal
Colin Bennett, Legal
Todd Anderson, Legal

Proposed Plan for the Site-wide Waste Disposition Evaluation Project

This document has been approved for public release:

Henry Thomas (signature on file)	10-7-2014	*Sam Eldridge* (signature on file)	10-7-2014
Classification & Information Officer	Date	Export Controlled Information Officer	Date

U.S. Department of Energy, Piketon, Ohio

Portsmouth Gaseous Diffusion Plant, Piketon, Ohio — *October 2014*

Aerial photo of the Portsmouth Gaseous Diffusion Plant showing the three large process buildings (center of photo) and other support facilities, facing southwest

DOE has evaluated alternatives for managing waste that would be created by demolition of the buildings at PORTS and is requesting comments from the public before January 10, 2015 on the alternatives described in this Proposed Plan.

INTRODUCTION

The U.S. Department of Energy (DOE) invites public comments on this ***Proposed Plan***[1] for the disposal of waste to be produced from the ***decontamination and decommissioning (D&D)*** of the Portsmouth Gaseous Diffusion Plant (PORTS) located 20 miles north of Portsmouth, Ohio, and 4 miles south of the village of Piketon in Pike County.

DOE has completed its evaluation of waste disposal alternatives required by a legal agreement between DOE and the Ohio Environmental Protection Agency (Ohio EPA) called the ***Director's Final Findings and Orders (DFF&O)***.

Pursuant to Section I of the DFF&O, the DFF&O was issued to DOE pursuant to the authority vested in the Director of Ohio EPA under *Ohio Revised Code* Sections 3704.03, 3734.13, 3734.20, 6111.03, and 3745.01 and DOE entered into the DFF&O pursuant to Section 104 of the ***Comprehensive Environmental Response, Compensation, and***

[1] The first use of technical and administrative terms in this Proposed Plan is shown in ***bold italics*** in the text. Explanations of these terms are provided in the boxes.

PUBLIC COMMENT PERIOD

NOVEMBER 12, 2014 TO JANUARY 10, 2015

HOW YOU CAN PARTICIPATE

Read this Proposed Plan and review related documents in the Administrative Record.

Comment on this Proposed Plan by mail, email, or fax to:

Ms. Kristi Wiehle
Department of Energy
P.O. Box 370
Piketon, Ohio 45661
Email: WDcomments@fbports.com
Hotline: 888-603-7722
Fax: 740-897-2526

Attend the Public Meeting on November 17, 2014 at 6:00 p.m. at Waverly High School, 3 Tiger Dr., Waverly, Ohio.

See page 26 for more information about public involvement and contact information.

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Liability Act of 1980 (CERCLA), 42 *United States Code* §9604, Executive Order 12580, the Atomic Energy Act of 1954, as amended, and 42 *United States Code* §2011, *et seq.* DOE is proposing this action in accordance with the DFF&O and pursuant to DOE's CERCLA authority under Executive Order 12580.

DOE completed the investigation and evaluation of waste disposal alternatives through a comprehensive ***Remedial Investigation (RI)*** and ***Feasibility Study (FS)*** process. The Proposed Plan is a document that DOE is required to issue to fulfill the requirements of the DFF&O, CERCLA 117(a), and the ***National Contingency Plan (NCP)*** 300.430(f)(2). This Proposed Plan summarizes the evaluation and presents the preferred alternative that has been identified by DOE and concurred with by Ohio EPA with the ***waste acceptance criteria*** approved in accordance with the DFF&O.

The waste disposal evaluation considers waste anticipated to be produced by D&D of buildings and structures at PORTS, including the three major process buildings (the X-326, X-330, and X-333 Process Buildings) that enriched uranium. The uranium enrichment mission has ended, and some buildings and structures are contaminated with radiological and chemical constituents. The Waste Disposition RI/FS report, titled *Remedial Investigation and Feasibility Study Report for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, concludes that without disposal of the waste from the buildings and structures at PORTS there would be an unacceptable future risk to human health, safety, and the environment; therefore, an action is needed.

Proposed Plan – A document to summarize the preferred cleanup strategy, the rationale for the preference, and alternatives considered in the detailed analysis. The Proposed Plan solicits public review and comment on all alternatives under consideration.

Decontamination and Decommissioning (D&D) – The recognized steps to safely shut down, prepare, and dismantle a contaminated facility for subsequent disposal.

Director's Final Findings and Orders (DFF&O) – The agreement between Ohio EPA and DOE that was signed in 2010 and which covers the decisions for D&D of the gaseous diffusion plant buildings and disposal of the D&D wastes.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – The federal law that establishes, among other requirements, a program for parties (including federal agencies) for identifying, investigating, and, if determined necessary, remediating sites contaminated with a hazardous substance, pollutant, or contaminant. CERCLA required development of the National Contingency Plan.

Remedial Investigation (RI) – A CERCLA environmental study that identifies the nature and extent of contamination. Also provides an assessment of the potential risks associated with the contaminants.

Feasibility Study (FS) – A CERCLA engineering study that fully evaluates cleanup alternatives.

National Contingency Plan (NCP) – The National Oil and Hazardous Substances Pollution Contingency Plan is the federal government's blueprint for responding to spills and releases of oil and hazardous substances.

Waste Acceptance Criteria – Requirements that waste must meet before being placed in a disposal cell to ensure protection of human health, safety, and the environment. The criteria include limits on the amount of chemical and radiological contamination that can be present in the waste, requirements for size and shape of waste, and lists of wastes prohibited from disposal based on regulations or agreements. The waste acceptance criteria take into consideration the design of the disposal facility, the underlying geologic conditions, and the nature of the contamination.

Administrative Record File – Documents, including correspondence, public comments, and technical reports, that were considered during development, evaluation, and selection of a remedial action.

Agency Involvement in this Proposed Plan

OhioEPA

The Ohio Environmental Protection Agency is participating in the RI/FS and remedial action processes at PORTS. For additional information concerning the state's role in the cleanup process at PORTS or regarding the specifics of this Proposed Plan, please contact:

Ms. Maria Galanti
Ohio Environmental Protection Agency
Southeast District Office
2195 Front Street
Logan, OH 43138
Email: maria.galanti@epa.ohio.gov
Phone: 740-385-8501
Fax: 740-385-6490

Two government agencies are involved in the D&D project decisions at PORTS. DOE is responsible for carrying out the selected D&D project alternatives. DOE, with Ohio EPA's concurrence and approval of the waste acceptance criteria, presents the preferred alternative in this Proposed Plan.

This Proposed Plan identifies the preferred alternative for disposing of waste anticipated to be produced from the D&D of PORTS. The information considered in evaluating alternatives and developing the preferred alternative is contained in the ***Administrative Record File*** for the Waste Disposition Project. DOE invites anyone to review the Waste Disposition RI/FS report and other documents referenced in this Proposed Plan for more information. The Community Participation section at the end of this document provides instructions for accessing and viewing these documents. Questions about the project can be directed to the DOE or Ohio EPA contacts listed.

Overview of the PORTS Cleanup Decisions

The waste disposal decision described in this Proposed Plan is one of five major decisions, shown in Table 1, which will determine the future condition of PORTS. These five decisions are being made following two different legal agreements between DOE and Ohio EPA. The DFF&O is the legal agreement governing facility D&D and waste disposal. Decisions made under the DFF&O follow the decision-making process created by CERCLA.

The ***1989 Ohio Consent Decree***, along with the ***1997 Administrative Consent Order***, are the legal agreements governing soil and groundwater cleanup, among other things.

Decision	Final Decision Document	Anticipated Decision Date
1. D&D of 46 Support Buildings and Structures - DFF&O	Action Memorandum	Completed March 2012
2. Site-wide Waste Disposition Decision - DFF&O	Record of Decision	2015
3. Process Buildings & Complex Facilities D&D Decision - DFF&O	Record of Decision	2015
4. Ohio Consent Decree - Contaminated Soil Remedy Decision	Soil Remediation Decision Document	2016-2017
5. Ohio Consent Decree - Groundwater Remedy Decision	Groundwater Remediation Decision Document	To be determined

Note: The decision described in this Proposed Plan is highlighted in tan.

Table 1. Five Major Cleanup Decisions at PORTS

The 1997 Administrative Consent Order gave day-to-day oversight of contaminated soil and groundwater cleanup actions to Ohio EPA. Decisions made under the Ohio Consent Decree follow the decision-making process created by the ***Resource Conservation and Recovery Act of 1976 (RCRA), as amended***.

1989 Ohio Consent Decree (Ohio Consent Decree) – The legal agreement between Ohio EPA and DOE requiring contaminated soil, sediment, surface water, and groundwater cleanup at PORTS in accordance with RCRA. Signed by DOE and Ohio EPA in August 1989, the Ohio Consent Decree requires DOE to complete investigations and implement corrective actions as needed.

1997 Administrative Consent Order – The legal agreement between the United States Environmental Protection Agency (U.S. EPA), Ohio EPA, and DOE that requires investigation and remediation of solid and hazardous waste units in accordance with RCRA and CERCLA.

Resource Conservation and Recovery Act of 1976 (RCRA), as amended – A federal law that provides a comprehensive framework for hazardous waste management, waste unit closure, and environmental corrective action at operating industrial facilities. The cleanup of soil and groundwater continues at PORTS under RCRA via the 1989 Ohio Consent Decree and the 1989 U.S. EPA Consent Order (amended in 1994 and 1997).

On-Site Disposal Cell (OSDC) – An engineered disposal facility that employs multilayered lining and capping systems and other protective design features required by state and federal solid and hazardous waste management laws.

Contaminants – Substances that make another substance impure and potentially unusable due to contact or mixture. Radiological or chemical contaminants in some areas have made building materials and soil at PORTS unsafe for their normal uses or for disposal in a standard sanitary landfill.

Summary of the Preferred Alternative

Three remedial alternatives for management of anticipated PORTS D&D waste were developed for consideration. This Proposed Plan describes the required no-action alternative (Alternative 1) and two action alternatives, the first which considers a combination of on-Site and off-Site disposal (Alternative 2) and the second which considers complete off-Site disposal (Alternative 3). The preferred alternative is Alternative 2, a combination of both on-Site and off-Site disposal.

Alternative 2 is recommended because it protects human health, safety, and the environment; is reliable over the long term for anticipated D&D waste; uses proven waste containment technologies; and meets regulatory requirements. Alternative 2 is also less costly, provides the shortest time for waste disposal, and reduces transportation risks (injury and fatality) because less waste would be shipped off the Site.

Under the preferred Alternative 2, the majority of D&D wastes would remain at PORTS in a state-of-the-art ***On-Site Disposal Cell (OSDC)*** designed to safely isolate the ***contaminants*** present in the waste and to prevent them from being released to the environment. Out of the approximately 4,000 acres at PORTS, about 100 acres would be dedicated to the potential OSDC.

Along with design and physical siting requirements, waste acceptance criteria would be set for an OSDC. Waste acceptance criteria are requirements that waste must meet before being placed in a disposal cell to ensure protection of

human health, safety, and the environment. Waste not meeting these criteria would be safely treated to meet the waste acceptance criteria or shipped to an off-Site waste disposal facility.

To implement Alternative 2, DOE has worked with Ohio EPA to propose designation of both the OSDC and the Impacted Materials Transfer Area (IMTA), adjacent to the OSDC, as ***Corrective Action Management Units (CAMUs).*** A CAMU is an area located within a facility that is used only for managing cleanup waste (e.g., contaminated soil). The potential OSDC is proposed to be designated as a treatment, storage, and disposal CAMU, pending public comment consistent with *Ohio Administrative Code (OAC)* 3745-57-72(H). The IMTA is proposed to be designated as a treatment/storage CAMU, also pending public comment. DOE proposes the designation of CAMUs at PORTS due to the regulatory flexibility benefits offered when managing remediation waste. These benefits offer the ability to use desired remedies which are effective, protective, and more robust. It also offers the opportunity for a more efficient and thorough remedial effort.

Corrective Action Management Unit (CAMU) – An area within a facility that is used only for managing CAMU-eligible waste for implementing corrective action or cleanup at a facility. In addition to a disposal CAMU, one or more storage and/or treatment CAMUs may be designated at PORTS.

Record of Decision (ROD) – A public record documenting the final remedy selection. The ROD is a legally binding document.

Responsiveness Summary – A part of the ROD that summarizes and provides responses to public comments received on the Proposed Plan during the public comment period.

Environmental Risks – The threat, either from carcinogens (as measured by ***excess lifetime cancer risk [ELCR]*** to humans) or from other contaminants that are toxic to humans (as measured by ***hazard index [HI]***) or to ecological receptors (e.g., plants and animals) that affect their ability to live, thrive, and/or reproduce.

Excess Lifetime Cancer Risk (ELCR) – ELCR considers the cumulative probability of humans developing cancer as a result of a lifetime of exposure to a particular level of a contaminant, above the normal cancer rates from the natural environment. Cumulative means adding the carcinogenic risk from all contaminants and ways a person can be exposed.

Hazard Index (HI) – The ratio of the level of exposure to an acceptable level of exposure for contaminants that may cause adverse health effects to humans. A cumulative HI greater than 1 indicates that there may be a concern for adverse health effects. The HI is used to assess contaminants that may cause health effects other than cancer. For potentially cancer-causing (carcinogenic) contaminants, the ELCR is used. Some contaminants (e.g., uranium, arsenic) can have both carcinogenic and non-carcinogenic effects.

Remedial Action Objectives – A general description of what the cleanup will accomplish and how contaminant risks are addressed.

Community Participation

Community acceptance is one of the evaluation criteria that DOE and Ohio EPA are committed to evaluating during the process of selecting a waste disposal remedy for PORTS. This interaction with the community is important to the CERCLA decision-making process and to making sound environmental decisions.

The public is encouraged to read this Proposed Plan and comment on all alternatives presented, not just the preferred alternative, to provide input to the selection of the remedy. Public input can be through written comments by postal mail, fax, or email during the 60-day public comment period, or by verbal comment at a formal public meeting on this project.

The actual selection of the alternative to be implemented will only be made after comments received during the public comment period have been reviewed and analyzed. The DOE and Ohio EPA will consider all public comments on this Proposed Plan before DOE prepares the ***Record of Decision (ROD).*** Depending on comments received, the selected final remedy for waste disposal in the ROD could be different from the preferred alternative. All written and verbal comments received during the public comment period will be summarized and responded to in the ***Responsiveness Summary*** section of the ROD.

Proposed Plan Organization

This Proposed Plan provides information to assist public involvement in the remedy selection process including: (1) background information on the DOE reservation and the gaseous diffusion plant; (2) description of the characteristics of the area including the contaminants to be managed; (3) the scope of the waste disposal decision; (4) a summary of ***environmental risks*** that might exist at PORTS in the future if a waste disposal decision is not made; (5) identification of ***remedial action objectives*** for the waste disposal decision; (6) a summary of the alternative remedies considered; (7) an evaluation of the alternatives; and (8) the rationale for preferring Alternative 2. Because of the importance of an OSDC to Alternative 2, more information about such a facility is provided in Appendix A. The waste acceptance criteria approved by Ohio EPA for an OSDC is provided in Appendix B. Appendix C contains a detailed explanation of information which supports the designation of the OSDC as a CAMU. Appendix C is supported by the Waste Disposition RI/FS Supplement No. 1, titled *Supplement No. 1 to the Remedial Investigation and Feasibility Study Report for the Site-Wide Waste Disposition Evaluation Project Proposed Corrective Action Management Unit and Area of Contamination Designations for Alternative 2 at the Portsmouth Gaseous Diffusion*

Plant, Piketon, Ohio, which provides the technical basis for the proposed designation of a potential OSDC as a CAMU. The Waste Disposition RI/FS Supplement No. 1 can be found in the Waste Disposition Administrative Record File.

At the end of the Proposed Plan, points of contact and instructions for public comments are provided. A prepaid comment form is also included as the back cover of the plan.

PORTS BACKGROUND

PORTS functioned like a self-contained city for almost 50 years and served an important role in United States history. In 2005, the gaseous diffusion process was permanently shut down. Buildings, soil, and groundwater contaminated by uranium enrichment operations must be cleaned up, and the waste resulting from this cleanup must be safely managed.

PORTS, which began operations in 1954, is located on a federal reservation in south-central Ohio. It occupies 3,777 acres in a rural area of Pike County (shown with the red border on Figures 1 and 2). From 1954 until 2001, the PORTS gaseous diffusion process enriched uranium for DOE and its predecessor organization (Atomic Energy Commission), the Naval Nuclear Propulsion Program, and commercial customers.

The gaseous diffusion plant and federal reservation are owned by DOE. The plant consists of three main process buildings (X-333, X-330, and X-326) housing the gaseous diffusion process equipment, as well as hundreds of supporting facilities. The various support facilities include those needed for feed and transfer operations, maintenance, steam generation, chemical cleaning, decontamination, process heat removal, water supply, water storage, water distribution, electrical power distribution, and administration.

Most of the buildings are within an approximate 1,000-acre industrialized area that lies within the Perimeter Road. (Perimeter Road is shown on Figures 1 and 2.) The remaining property outside of Perimeter Road is used for a variety of purposes, including a water treatment plant, sediment ponds, closed landfills, cylinder storage yards, open fields, and forested buffer areas.

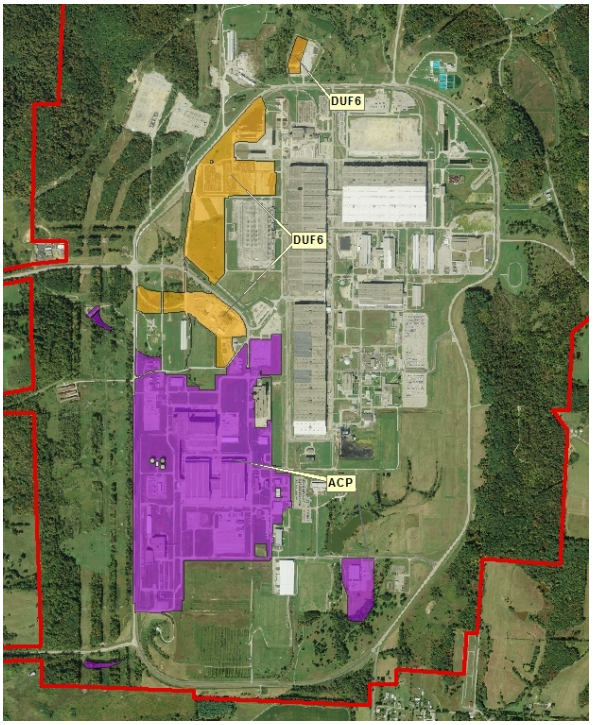


Figure 1. Operations at the DOE Portsmouth Site

In the early 1980s, DOE built a separate Gas Centrifuge Enrichment Plant on the DOE federal reservation. DOE leased that plant to the United States Enrichment Corporation for use by the advanced centrifuge technology program (American Centrifuge Plant [ACP]). This facility is currently not part of the gaseous diffusion plant D&D program and functions independently from the D&D project. The ACP operations area is shown in purple on Figure 1.

The DOE's Depleted Uranium Hexafluoride (DUF_6) Conversion Project, also located on the DOE federal reservation, converts DUF_6 into a more stable chemical form suitable for beneficial reuse or disposal. DUF_6 was generated during the operation of the gaseous diffusion process and is now stored in thousands of cylinders at the DOE site. This facility is currently not part of the gaseous diffusion plant D&D program and will continue to function independently from the D&D project. The DUF_6 operations area is shown in orange on Figure 1.

Groundwater. Investigations conducted in the early 1990s identified five areas, or plumes, of groundwater contaminated with trichloroethene (TCE), and to a lesser extent with uranium, technetium-99, polychlorinated biphenyls (PCBs), and heavy metals. TCE is a common cleaning solvent that was used to degrease equipment. The plumes are currently being managed through various technologies, including groundwater extraction and treatment and a slurry wall. The groundwater plumes are shown in purple on Figure 2.

Landfills. There are closed landfills at PORTS, as shown in yellow on Figure 2. These landfills cover about 101 acres and have been closed and capped under state and federal law. Fifty-six acres of landfills are located outside Perimeter Road, and 45 acres are located inside Perimeter Road. They contain about 1.7 million cubic yards of waste. Groundwater monitoring programs are in place at each landfill, and maintenance of the caps is ongoing.

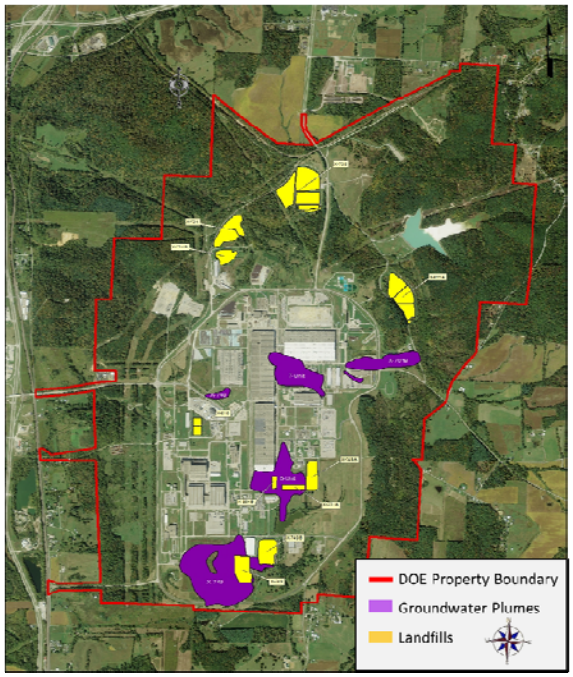


Figure 2. Landfill and Plume Locations at PORTS

PORTS CHARACTERISTICS

The area that became PORTS is located on an ancient river bed surrounded by hills. When the Cold War began, PORTS was created for the cause of national security. Enrichment of uranium at PORTS caused contamination of buildings, soil, and groundwater that is currently confined to the DOE property that must now be cleaned up.

PORTS straddles a broad, gently sloping, sediment-filled, ancient river valley (the pre-historic Portsmouth River channel) located about 130 feet above the Scioto River floodplain which lies to the west. The old river valley runs north to south through the industrialized area of PORTS and is bounded on the east and west by ridges and low-lying hills.

Geology and Hydrogeology. Understanding the geology of PORTS comes from analyzing soil and water samples collected at more than 1,600 soil borings and wells. The ground below the central industrial portion of PORTS consists of approximately 30 to 40 feet of sediments (silt, clay, sand, and gravel), which formed the Portsmouth River valley. ***Bedrock*** hills are under the east and west areas of the DOE reservation outside of the old valley. More detail on geology and hydrogeology of PORTS and its relationship with preferred Alternative 2 is contained in Appendix A.

Cultural Resources. In 1996 and 1997, a large-scale architectural survey of PORTS was performed. During this survey, 196 PORTS buildings and structures at 160 different locations were evaluated for potential historic significance. Archaeological surveys were conducted of PORTS beginning in 1996 and 1997 with additional surveys conducted in 2009 through 2012. The overall studies identified archaeological sites within the DOE property boundary. The sites include farmsteads, cemeteries, PORTS-related structural remnants, and historic-era and prehistoric artifact scatters or dumps. The archaeological surveys conducted in 2011 and 2012 found four historic properties, two of which are located near where a potential OSDC may be located, one of which would be directly impacted by the preferred alternative. The second site is located near the proposed project area and will be avoided. The two archaeological sites are eligible for listing on the National Register of Historic Places and contain prehistoric Native American artifacts such as flakes and tools.

Bedrock – A subsurface rock geologic unit that is generally impermeable to groundwater flow.

Residual Soil – Soils which adhere to equipment, structures, piping, building contents, or concrete foundations removed under the DFF&O or otherwise must be excavated as part of the D&D activities.

Threatened and Endangered Species. Some areas at PORTS may be suitable summer habitat for the Indiana bat (*Myotis sodalis*), a federal- and state-listed endangered species. Although PORTS provides good habitat for the bats, no Indiana bats have been found on the DOE property after extensive study. However, several northern long-eared bats, a proposed endangered species as of October 1, 2013, have been found.

Contamination. Demolition of the gaseous diffusion buildings, structures and systems would produce a large amount of waste, including hazardous materials, wood, steel, concrete, process gas equipment, and ***residual soils*** removed as part of building demolition. Some of the contamination results either from activities that occurred in the buildings (e.g., radioactive contamination) or from the materials historically used in constructing the buildings (e.g., asbestos, lead).

The main environmental risks at PORTS include those from degreasing solvents (TCE); heavy metals, specifically nickel, mercury, arsenic, and chromium; PCBs (including from electrical transformer oils); radioactive elements, particularly uranium and technetium-99; and asbestos in building materials.

Some operations and maintenance activities at PORTS caused releases of radioactive and chemical contaminants to the environment. Contamination has generally been restricted to the buildings, underlying soil, and groundwater plumes, which are generally confined to the DOE property.

DOE believes that the existing, closed landfills may contain waste such as industrial and office waste, asbestos, sludges, fly ash, construction debris/scrap, organic solvents, heavy metals, PCBs, uranium-contaminated soils, a nickel processing plant, and radioactively-contaminated equipment. Releases from some of these landfills contaminated the groundwater before they were closed. Capping and closing these landfills in compliance with state and federal regulations largely eliminated the ability of rainwater to move contaminants into the groundwater.

SCOPE AND ROLE OF THE RESPONSE ACTION

The waste disposal ***response action*** described in this Proposed Plan provides a long-term solution for waste produced by the D&D of PORTS. The waste disposal decision accomplishes the following:

- Provides long-term disposal of D&D wastes of PORTS.
- Ensures the capacity and protective disposal for potential non-DFF&O and other remediation wastes, that could be produced as a result of other decisions, to be disposed in a potential OSDC subject to applicable approvals and authorizations.
- Establishes ***institutional controls***, as necessary, to complement engineering measures taken for waste disposal.
- Ensures short-term and long-term protection of human health and environmental ***receptors***.
- Provides a cost-effective and implementable solution.
- Identifies mitigation measures for impacts to sensitive environmental and cultural resources consistent with regulatory requirements.

Response Action – An action to clean up a release of contamination or to prevent a future release. Response action is a broad term that can apply to either a CERCLA remedial or removal action.

Institutional Controls – Non-engineered procedures, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Institutional controls are important in remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior.

Receptors – Current or future human and ecological individuals or ecological populations that may be exposed to contamination released to the environment.

Waste Category 1 – DFF&O waste including building D&D waste and residual soil as defined in the DFF&O.
Waste Category 2 – Ohio Consent Decree waste.
Waste Category 3 – Non-DFF&O, non-Ohio Consent Decree waste composed of previously interred waste in closed waste management units.
Waste Category 4 – Other remediation waste for which DOE is a responsible party, including but not limited to CERCLA actions that are not addressed in the first three categories.

Note: Category 1 referred to as "D&D waste" herein. Categories 2 and 3 referred to as "non-DFF&O" waste herein. Category 4 referred to as "other remediation waste" herein.

Whenever excavation and/or disposal of non-DFF&O and other remediation waste is discussed in this document, whether in terms of additional waste material or fill, it is to be understood that additional authorization/approval outside of this Proposed Plan would be required to undertake such activity.

SUMMARY OF SITE ENVIRONMENTAL RISKS

An evaluation of current and/or future environmental risk if no action is taken shows that there would be unacceptable environmental risks to humans and ecological species from contaminant releases from waste from abandoned buildings.

DOE conducted a streamlined risk assessment and determined that action is necessary to protect human health or welfare or the environment. A risk assessment is a scientific process used to estimate the environmental risk that could exist if no response action is taken. Environmental risk for this effort was characterized considering exposure of humans and ecological receptors (e.g., plants and animals) to current and potential future contamination released from waste if no response action is taken.

Human Health Risk. The risk assessment evaluated the environmental risk from the required no-action alternative. Under the no-action alternative, the equipment, buildings, and structures would naturally decay over time, the waste would stay where it falls, and contaminants from the structures and equipment eventually would be released into the environment.

Contaminants released under the no-action alternative would pose an unacceptable environmental risk to humans such as future trespassers, future industrial workers, or future residents at PORTS by:

- Breathing in dust/soil/sediment,
- Skin contact with dust/soil/sediment,
- Accidentally swallowing small quantities of dust/soil/sediment,
- Drinking contaminated groundwater (residents or industrial workers), or
- Radiation exposure from contamination in dust/soil/sediment.

Ecological Risk. An evaluation of environmental risk to plants and animals shows unacceptable impacts may occur if no long-term waste disposal action is taken. Plant and animal exposure to contamination may increase over time as contaminants are released from buildings and associated waste, and as the ecological habitat within the boundaries of the process area naturally restores itself.

It is DOE's judgment that the preferred alternative or another active measure considered in this Proposed Plan is necessary to protect human health or welfare or the environment from actual or threatened releases of contamination into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives provide general descriptions of what the remedy (in this case, the waste disposal decision) must accomplish.

The objectives for the alternatives under consideration are as follows:

- **Objective 1:** Prevent uncontrolled storage or staging of waste piles. D&D wastes produced from the dismantlement of structures must be handled in compliance with ***applicable or relevant and appropriate requirements (ARARs)*** prior to disposal.

- **Objective 2:** Isolate the D&D wastes in a manner to protect human health, safety, and the environment.

- **Objective 3:** Prevent the migration of contaminants from the isolated D&D wastes at levels that could cause adverse groundwater and surface water impacts or impacts to humans, plants, and animals.

Applicable or Relevant and Appropriate Requirements (ARARs) – The substantive standards, criteria, or limitations established under federal or state laws that on-Site activities must meet during a CERCLA cleanup. ARARs are defined on a site-by-site basis to address and control the specific hazards of that site and based on the actions to be taken. Under certain circumstances specific ARARs can be waived.

SUMMARY OF THE REMEDIAL ALTERNATIVES

DOE reviewed several ways to disposition the almost one and a half million cubic yards of waste that are anticipated to be produced by demolition of the PORTS facilities. Two approaches met all the requirements for consideration and were evaluated in detail – disposal of all waste at off-Site locations, or a combination of on-Site and off-Site disposal where some waste is placed in a new, engineered disposal cell constructed at PORTS and some waste is shipped off the Site for disposal.

A range of remedial technologies and process options was initially considered for the disposal of waste from the demolition of buildings at PORTS. These technologies and process options were evaluated based on their effectiveness, implementability, and cost. This screening process resulted in the identification of two remedial alternatives that would be implementable and effective.

In order to adequately evaluate these two action alternatives, the DFF&O requires development of a no-action alternative to serve as a baseline by which to compare the action alternatives. Therefore, three alternatives, no action (Alternative 1) and two waste disposal alternatives (Alternatives 2 and 3), were developed to answer the question: "What is the best way to handle waste produced by D&D of PORTS, given all factors that must be considered?"

Factors Common to All Alternatives

The volume of waste produced by the demolition of PORTS facilities is estimated to be 1.47 million cubic yards. This 1.47 million cubic yards includes over 1.3 million cubic yards from the Process Buildings and Complex Facilities D&D Evaluation Project, as well as volumes of waste generated from earlier, smaller D&D decisions (approximately 170,000 cubic yards). Of this total 1.47 million cubic yards, DOE has identified up to 110,000 cubic yards of materials that are candidates to recycle and/or reuse, including copper, nickel, stainless steel, concrete, and aluminum. The amount of recycling and/or reuse is assumed to be the same for both Alternatives 2 and 3 and therefore does not affect their comparison. Throughout the D&D project, DOE would continually look for ways to treat waste and reduce the amount of waste to be disposed and/or increase the volume that can be recycled and/or reused.

Table 2 shows the estimated D&D waste volumes to be disposed or recycled (after segregation and size reduction activities are conducted as part of the D&D decisions) for all alternatives. The total estimated volume of anticipated D&D waste is reduced from 1.47 million cubic yards to 1.348 million cubic yards as a result of size reducing the process gas equipment as part of a decision for the Process Buildings and Support Facilities D&D Evaluation Project.

Waste Description	Estimated Volume to be Disposed (cubic yards)
Other Building Waste (including residual soil)	1,085,000
Process Gas Equipment	153,000*
Recyclables	110,000
D&D WASTE TOTAL	**1,348,000**

*Volume decreases significantly from size reduction efforts. Original volume is 272,000 cubic yards.

Table 2. Waste Disposal Volume Estimates

Both Alternatives 2 and 3 include disposal of D&D waste off the Site. Both alternatives use existing, permitted disposal facilities when evaluating the off-Site waste disposal component of the alternative. Other disposal facilities that are appropriately permitted and/or licensed and available during remedy design or implementation would also be considered for waste receipt.

Alternative 1 – No Action

Under this alternative, no action would be taken to demolish the buildings or dispose of the anticipated D&D waste. This alternative was kept for comparison in accordance with regulatory requirements. The no-action alternative represents a situation where no legal restrictions, access controls, or active remedial measures would be applied to the buildings and structures at PORTS. The buildings would not be demolished but instead would be left in their current state. No monitoring or maintenance would occur, and the buildings would eventually deteriorate. Items would not be recycled and/or reused, and no waste would be disposed. Also, no administrative or physical controls would be put in place to prevent access to radioactive or hazardous constituents.

In order to select the no-action alternative as the preferred alternative, the alternative must pose no unacceptable environmental risk to human health and the environment. As presented previously in the Summary of Site Environmental Risks section, the threat to human health and the environment caused by taking no action is unacceptable.

Alternative 2 – Combined On-Site and Off-Site Waste Disposal

Under this alternative, a new, engineered, long-term disposal facility would be constructed on the Site to manage the large volume of anticipated PORTS D&D waste. This engineered facility would be called an OSDC, which stands for On-Site Disposal Cell, and will only accept waste currently at or originating from PORTS. D&D waste that does not meet waste acceptance criteria for safe on-Site disposal would be safely treated to meet the waste acceptance criteria or shipped to licensed and/or permitted off-Site disposal facilities. In addition, this alternative proposes to designate the potential OSDC as a CAMU (as discussed more fully in Appendix C).

Key elements of this alternative include the location selected at PORTS for an OSDC, the design and operations of an OSDC, the long-term care of an OSDC, creating criteria for accepting waste into an OSDC (waste acceptance criteria), the use of centralized treatment systems, and the use of off-Site disposal locations. This summary of Alternative 2 also describes how the alternative meets remedial action objectives, key metrics associated with this alternative, and key ARARs that differ from those that must be attained by Alternative 3. Safety features of an OSDC are further highlighted in Appendix A to this Proposed Plan. Appendix B provides the Ohio EPA approved requirements (i.e., waste acceptance criteria) that must be met by waste placed in a potential OSDC.

Location Selection for an OSDC. An initial area of approximately 320 acres would be needed to consolidate the demolition waste from the nearly 1,000-acre gaseous diffusion plant into a new, engineered OSDC and provide facilities needed to support the operation of such an OSDC. The final area required for long-term disposal of waste would be approximately 100 acres. Selecting a safe and suitable location for a disposal facility is referred to as "siting". Sixteen locations within the 3,777-acre DOE property were evaluated for siting an OSDC. These locations are shown in Figure 3. These 16 locations were narrowed to the best four (based on technical criteria) for more detailed evaluation. It was found that the bedrock below Study Area D provides a better level of protection for

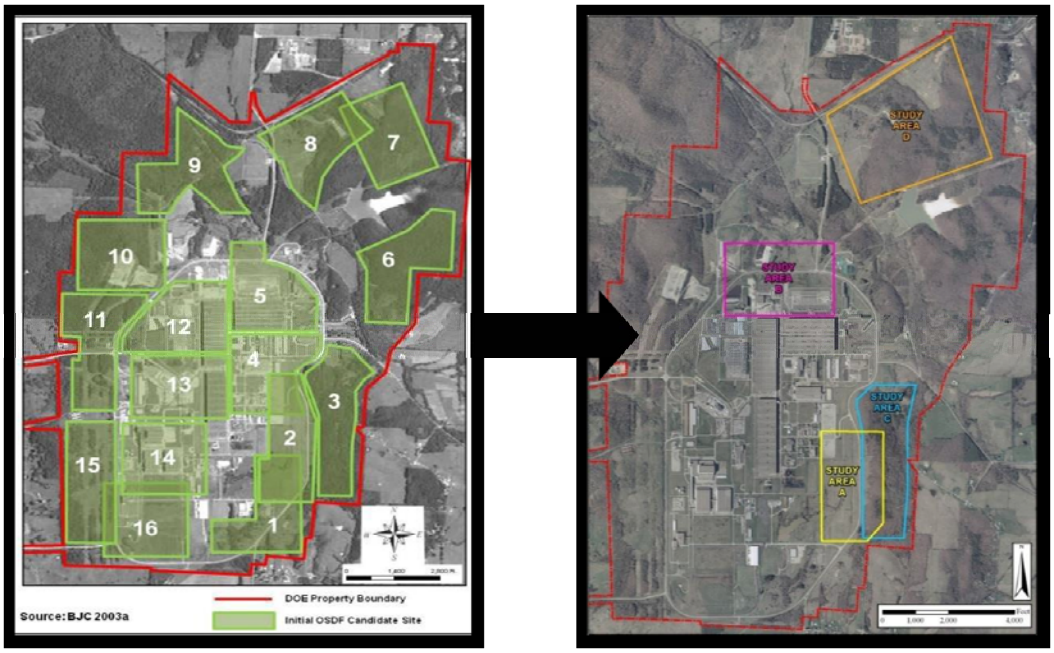


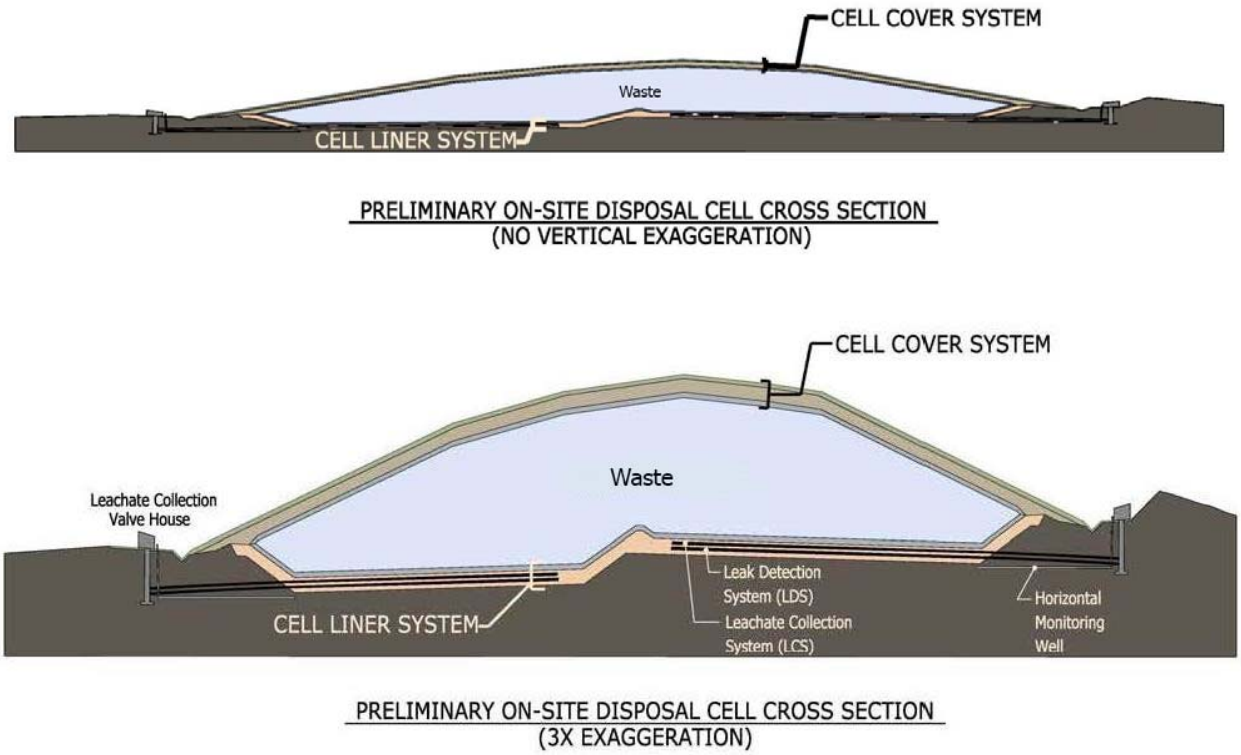
Figure 3. Locations Evaluated for Siting a New OSDC

human health and the environment than the other areas considered. Therefore, Study Area D in the northeastern corner of the property was ultimately selected as the location for the most extensive evaluation. Study Areas A and B were ruled out because of the shallow groundwater in the production area of PORTS. Study Area C has limited space for waste disposal.

Design and Operation of an OSDC. The potential OSDC would be designed based on requirements for landfills under the Toxic Substances Control Act of 1976 (TSCA), Subtitles C and D of RCRA, state requirements under *OAC* for solid and hazardous waste landfills, as well as certain DOE Order 435.1-1 and Ohio Department of Health, Radiation Control Program requirements for radioactive waste disposal facilities, and requirements for the disposal of asbestos and construction and demolition debris. These requirements are detailed in the ARAR table located in Appendix A. Figure 4 shows illustrative cross sections of a potential OSDC, one of which is exaggerated three times its height to allow key redundant safety features to be seen. To ensure containment of the waste, design of an OSDC would include the following:

- Multilayer cell liner system designed to keep contaminants from escaping the bottom of the cell and entering the soil and groundwater.
- ***Leachate*** collection and treatment system to manage liquid released as waste in the cell drains. The system includes monitoring to make sure all leachate is collected by the system.
- Plan for careful, safe, and effective placement of materials in an OSDC. This plan would minimize the chance for future waste settling that could damage the cap.
- Multilayered cover system to provide a barrier between the waste and the environment.

Leachate – The liquid that comes in contact with the waste and would be collected from inside an OSDC. Leachate typically comes from the moisture in material placed in an OSDC, water added to help compact the soil during construction, and rain or snow that falls during the time that the cell is still open to receive materials. The leachate is treated and cleaned through a treatment facility.



Note: First cross section is to scale. Second cross section is three times (3X) taller than planned so key features can be seen.

Figure 4. Cross Sections of a Potential OSDC

The operation of an OSDC would include a waste staging area known as the IMTA so the disposal operations could occur in the most efficient manner possible. The IMTA is proposed to be designated as a treatment/storage CAMU. A CAMU is an area located within a facility which manages only "CAMU-eligible" waste. CAMU-eligible waste is generally remediation waste (e.g., contaminated soil). At PORTS, the building demotion wastes are also considered to be CAMU eligible. The CAMUs were developed to promote more aggressive remediation by providing a more flexible approach to the management and disposition of hazardous waste-contaminated cleanup wastes. At PORTS, the OSDC CAMU will serve this purpose by providing the mechanism to potentially remove and consolidate facility-wide contamination from various areas (e.g., closed landfill units within Perimeter Road), into a new state-of-the-art OSDC. These regulations provide that CAMU-eligible wastes are placed in engineered storage or disposal facilities to assure the protection of human health and the environment. This concept is further discussed in Appendix C. Only waste that meets the waste acceptance criteria would be accepted.

The required volume of fill for an OSDC is expected to be between 2.1 and 2.6 million cubic yards. "Fill" is used to fill the empty spaces between pieces of disposed D&D waste to eliminate void spaces to ensure the long-term stability of the waste and the final capping system. This alternative proposes to use contaminated soil as fill. This contaminated fill would be obtained from areas overlying contaminated groundwater, areas with surface soil contaminated by plant operations, and closed landfills inside Perimeter Road. It is DOE's choice to use contaminated fill. DOE made that choice after an evaluation that concluded that the excavation and disposal of that fill represents a cost-effective approach to obtaining fill when considering the overall cleanup mission of the Portsmouth Site. As described in the Scope and Role of the Response Action section, additional authorization/approval outside of this Proposed Plan would be required to obtain and use contaminated fill.

The preferred alternative also includes DOE's option to use clean fill instead of contaminated fill if the use of contaminated fill is:

1) Not cost effective or the most efficient use of available funding when considering the cleanup mission of the Portsmouth Site; or

2) Cannot reasonably be achieved in a manner that:
   a. is safe for the workforce;
   b. is protective of human health and the environment; or
   c. will not exacerbate the contamination already present in the areas in which fill could be obtained.

Features to Ensure Long-term Care of the Waste. Long-term care of an OSDC after the waste has been placed includes the following to ensure that the waste is safely contained for the long term:

- Cover system designed to withstand weather and erosion.

- Long-term monitoring of leachate, groundwater, and surface water in the area by DOE or other federal entity with oversight by Ohio EPA.

- Signs and fencing along with other security features to prevent unauthorized access after an OSDC is closed to help protect the cap.

- Long-term maintenance of the cell to prevent unwanted plant growth on the cell; maintain the leachate treatment system; and ensure fences, signs, and drainage ditches remain in good physical condition and function properly.

- Covenants and deed restrictions to protect the integrity of an OSDC and its cap by preventing unauthorized future use of the cell property.

- A review every 5 years to ensure an OSDC is performing as designed and remains protective.

Waste Acceptance Criteria. Controlling what waste is placed in the disposal cell is another key feature to ensure long-term protectiveness of this alternative. Specific criteria that must be met before waste is accepted into an OSDC are called waste acceptance criteria. The DFF&O requires that Ohio EPA-approved waste acceptance criteria be presented in the Proposed Plan to allow public review and comment. The waste acceptance criteria and the step-by-step

manner in which they are satisfied are presented in Appendix B. The waste acceptance criteria for a potential OSDC are developed to provide long-term protection for the public and the environment, to protect the workers and the public during operations of the disposal cell and the placement of waste, and to protect the integrity of the final cap of the disposal cell so it functions as designed. The following are key components of the waste acceptance criteria:

- Prohibitions or limitations for disposing certain types of waste in an OSDC to provide long-term protection of human health, safety, and the environment and to protect workers and the public during placement of waste. Most of the prohibitions apply to all facilities in the United States that dispose of the same types of waste found at PORTS, irrespective of the site-specific conditions at the particular facility. DOE has elected to adopt additional prohibitions that restrict the acceptance of certain types of waste to enhance long-term protection, protect workers and the public, and improve the operations of a potential OSDC. Additionally, only waste currently at or originating from PORTS would be allowed to be disposed in a potential OSDC.

- Limits for specific radiological and chemical contaminants in the waste to provide long-term protection of human health, safety, and the environment. These restrictions are based on regulations and standards evaluated against conditions specific to the PORTS geology and OSDC design. The limits for chemical contaminants also include numerical standards imposed by hazardous waste regulations from both the federal government and the State of Ohio. Designation of a potential OSDC as a treatment, storage, and disposal CAMU allows for the development of alternate treatment standards for hazardous waste prior to disposal. These treatment standards have been developed and are part of the waste acceptance criteria for a potential OSDC.

- A series of additional engineering-based requirements driven primarily to protect workers and the public during operations and to protect the integrity of the final cap of a potential OSDC. The details of this last set of components will be developed by DOE and approved by Ohio EPA during later stages of the project if construction and operation of an OSDC is selected and as the design and operations plans for a potential OSDC are completed.

The site conditions at PORTS and the proposed engineering design are favorable to providing a protective on-Site disposal option. As discussed previously, the cell design utilizes multiple liners and a leachate collection system to contain and manage leachate. In addition, computer modeling supports that the underlying geology of the selected location will further inhibit the transportation potential if leachate does migrate within the 1,000-year design life of the OSDC. Based on computer modeling and knowledge of the anticipated contaminant levels in the waste at PORTS, the combination of geology and engineering design will protect future users of groundwater near the closed OSDC. The siting characteristics and cell design are discussed in detail in Appendix A. The waste acceptance criteria, as described above and as presented in Appendix B, provide additional controls to further bolster the site-specific protective features of the underlying geology and the planned design of a potential on-Site disposal facility at PORTS. Recycle and/or reuse of recyclable materials is included in this alternative along with storage of potential recyclable material.

Centralized Treatment. To prepare materials for recycle and/or reuse, a number of commonly applied techniques have been identified in the Process Buildings decision, including, but not limited to, crushing, size reduction, segmentation, segregation, and decontamination. Those limited activities conducted to prepare the material for recycling and/or reuse are generally part of the Process Buildings and Complex Facilities D&D Evaluation Project. However, recycling or reuse of materials at PORTS might require the use of a centralized treatment process (e.g., nickel decontamination and metal melting). Centralized treatment in this context refers to complex, non-commercial, ARAR-compliant treatment efforts that may require additional DFF&O documentation. While implementing Alternative 2, DOE might conduct treatability or pre-design studies to evaluate the benefits of building a centralized treatment facility. The ability to evaluate such a facility is included in this decision. Construction of any such facility that is outside the scope of this decision would require a modification to the Waste Disposition decision and would require DOE to seek additional public input and Ohio EPA concurrence and/or approval as applicable.

Off-Site Disposal. The following off-Site disposal facilities were considered in the Waste Disposition RI/FS report for waste that would not be placed into a potential OSDC at PORTS. Additional off-Site disposal locations could be used for disposal of PORTS waste if they are legally permitted to do so. Materials that have recycling or reuse potential may be recycled and/or reused, if deemed appropriate by DOE.

- Local municipal landfills such as the Pike Sanitation Landfill in Pike County may be used for disposal of non-radiologically-contaminated or non-hazardous waste.

- EnergySolutions, a commercial mixed low-level (radioactive) waste disposal facility located in Clive, Utah, may be used.

- DOE's Nevada National Security Site (NNSS) located near Las Vegas, Nevada, may be used, especially for classified waste.

Remedial Action Objectives. The remedial action objectives for Alternative 2 would be met as follows:

- **Objective 1:** Prevent uncontrolled storage or staging of waste piles. D&D wastes produced from the dismantlement of structures must be handled in compliance with ARARs prior to disposal.

  This objective is satisfied by complying with ARARs and the DFF&O and creating requirements for wastes that are temporarily staged/stored before disposal. Water running off waste held in approved, temporary piles would be controlled to prevent contaminated water from leaving the area. Air would be monitored, and any dust would be controlled.

- **Objective 2:** Isolate the D&D wastes to protect human health, safety, and the environment.

  The on-Site component of Alternative 2 satisfies this remedial action objective by safely containing waste inside an OSDC, controlling what waste is placed and how the waste is placed. Disposal and isolation in an OSDC is intended to be permanent, and an OSDC would be monitored in accordance with an Operation and Maintenance Plan, which is to be submitted for Ohio EPA review and approval or concurrence pursuant to the DFF&O.

  The off-Site component of Alternative 2 satisfies this remedial action objective by meeting the off-Site disposal facilities' approved waste acceptance criteria and permit requirements. Placement in these off-Site facilities is protective for the long term, and the facilities would be monitored in accordance with their respective permit requirements.

- **Objective 3:** Prevent the migration of contaminants from the isolated D&D wastes at levels that could cause adverse groundwater and surface water impacts or impacts to humans, plants, and animals.

  The on-Site component of Alternative 2 satisfies this remedial action objective through the design and operation of an OSDC, which isolates wastes and ensures environmental risk to humans is below a cumulative excess lifetime cancer risk of 1×10^{-5} (1 in 100,000) and a cumulative hazard index of 1. In addition, the design and operation of an OSDC also ensure surface water meets ***Ambient Water Quality Criteria*** in all surface water and groundwater meets drinking water standards, also called ***Maximum Contaminant Levels***, at the edge of the disposal cell.

  The off-Site component of this alternative satisfies this remedial action objective by meeting the off-Site disposal facilities' approved waste acceptance criteria and permit requirements.

Ambient Water Quality Criteria – The Clean Water Act requires U.S. EPA to develop criteria for water quality that accurately reflect the latest scientific knowledge. These criteria are based on data and scientific judgments on pollutant concentrations and environmental or human health effects. Criteria are developed for the protection of aquatic life as well as for human health.

Maximum Contaminant Levels – Concentration based thresholds for individual contaminants in drinking water established by federal and state regulations to ensure the protection of public health.

Key Metrics for Alternative 2. Calculations for transportation risk, cost, and other key metrics are based on the D&D waste volumes shown in Table 3. The estimates of waste remaining on the Site or being shipped off the Site are based on current information so total project cost and other important metrics can be calculated for the alternative. Actual quantities disposed on the Site or off the Site would depend upon when an OSDC is ready to receive waste, and on meeting the final waste acceptance criteria, attached as Appendix B. The amount of fill soil needed for an OSDC is estimated to range from 2.1 million to 2.6 million cubic yards, depending on the source of the fill and the final amount of waste generated. The potential sources of contaminated fill at PORTS are described in Appendix A.

Table 4 summarizes the key metrics for Alternative 2. The cost estimate includes costs to design, build, and operate an OSDC and support facilities for the disposal of 1,131,000 cubic yards of D&D waste that would be disposed on the Site, cap the disposal cells, and stabilize the support area when complete. An assumption that fill would be excavated from contaminated soil areas at PORTS was included in the cost estimate. Construction of an OSDC would require

trucks to bring gravel, piping, and other materials to PORTS from local sources in order to build the cap and liner systems. The projected number of trucks coming to PORTS to deliver these materials is shown in Table 4 as "Construction truck trips to PORTS". The other transportation numbers reflect shipping D&D waste to disposal facilities in the western United States.

D&D Waste Description	Estimated Volume (cubic yards)
WASTE DISPOSED OFF THE SITE	
Residual Soil Removed with Buildings	0
Building Waste (shipped by rail)	66,000
Process Gas Equipment (shipped by truck)*	41,000
Recyclable	110,000
TOTAL OFF-SITE DISPOSAL	**217,000**
WASTE DISPOSED ON THE SITE	
Residual Soil Removed with Buildings	53,000
Building Waste	966,000
Process Gas Equipment*	112,000
TOTAL ON-SITE DISPOSAL	**1,131,000**
WASTE TOTAL	**1,348,000**

*Process gas equipment includes converters, compressors, and coolers used in the uranium enrichment process

Table 3. Estimated On-Site and Off-Site D&D Waste Disposal Volumes for Alternative 2

Key Metric	Value
Cost (net present value)	$882 million
Schedule	12 years*
Transportation:	
- Construction truck trips to PORTS	116,000
- Truck trips to local landfill	2,500
- Truck trips to NNSS	5,000
- Rail cars to EnergySolutions	500
- Truck miles	25 million
- Rail miles	1.8 million
- Predicted transportation-related injuries	9
- Predicted transportation-related fatalities	0.6
Employment:	
- Duration	12 years*
- PORTS labor hours	5,700,000

*Durations based on the funding assumptions available to DOE in fiscal year 2012. Current funding projections may extend the durations as indicated in the Waste Disposition RI/FS Supplement No. 1; however, even at current funding levels, the extended durations would not impact the outcome of the analysis of alternatives.

Table 4. Summary of Key Numerical Metrics for Alternative 2

Key metrics are also summarized in Table 4 that present the relative likelihood of traffic-related injuries or fatalities that may result from transporting the quantities of materials associated with Alternative 2. The likelihood of an accident increases with the amount of time spent by transportation personnel on roads or railways during shipping operations. The total amount of time is a result of the miles travelled per trip and the total number of trips required to convey the materials to their destination for the alternative under consideration. The transportation industry has compiled long-term actuarial statistics for both commercial road and railway traffic to help predict the likelihood of accident-related injuries or fatalities when undertaking significant shipping operations. The actuarial statistics are used

by the industry primarily to conduct comparisons of the relative risks of transportation alternatives. They are also used by the insurance industry to establish policy terms and rates for commercial transportation coverage. The statistics are based on decades of transportation industry experiences and are representative of current national industry averages.

While used primarily to support the relative comparison of the transportation risks associated with Alternatives 2 and 3, the transportation-industry metrics provided in Table 4 also serve the vital secondary purpose of illustrating the need for significant safety programs to manage the risk and seek to ensure that operational performance exceeds the long-term industry averages experienced by the transportation industry – regardless of which alternative is selected. The number of predicted fatalities in Table 4 is reported as a decimal fraction (0.6) that is less than one, because trucks and trains from PORTS under Alternative 2 would be anticipated to travel about 60 percent of the total miles that the transportation-industry statistics predict could result in the full risk (1.0) of a potential fatality.

Key Applicable or Relevant and Appropriate Requirements for Alternative 2. The D&D projects conducted on the DOE Portsmouth Site must comply with standards, called ARARs, which include requirements for siting, designing, constructing, operating, and closing an OSDC, as well as protecting sensitive resources.

Key ARARs that are specific to Alternative 2 include landfill design and operation requirements under TSCA and Subtitles C and D of RCRA; state requirements under *OAC* for solid, construction and demolition debris, and hazardous waste landfills; Ohio Department of Health, Radiation Control Program and DOE Orders for radiological waste landfills; requirements for CAMUs; and Clean Air Act of 1970 requirements for asbestos-containing materials disposal facilities. Also included are requirements for siting waste disposal facilities. Water treatment requirements address the potential new leachate treatment unit and associated discharges. The ***National Historic Preservation Act of 1966 (NHPA)*** provides requirements to address impacts to historic properties that may be impacted by construction of an OSDC. Off-Site activities for Alternative 2 must follow the laws and regulations that apply.

National Historic Preservation Act of 1966 (NHPA) – NHPA was enacted by Congress in 1966 and requires that federal decision makers (like DOE) consider impacts to historic properties during project planning.

The federal and state regulations directing the disposal of hazardous wastes were originally developed for operating industrial facilities and not for hazardous waste cleanup activities. To remove potential disincentives to excavating and consolidating cleanup waste, additional regulations were developed that allow the use of alternate treatment standards and considerations for storing, treating, and disposing of hazardous remediation wastes generated during cleanup. In this case, the treatment, storage, and disposal facilities associated with cleanup activities are designated as CAMUs which allows these alternate standards and considerations to be used. DOE has identified the CAMU regulations (*OAC* 3745-57-72) as ARARs for Alternative 2 and provided information to Ohio EPA justifying why a potential OSDC should be a CAMU. The potential OSDC has been proposed as a treatment, storage, and disposal CAMU, pending public comments. The basis behind the potential OSDC designation as a CAMU is summarized in Appendix C.

Almost 300 individual ARARs have been identified for Alternative 2. The NCP provides that waivers to specific requirements may be obtained if determined to be in the best overall interest to protect human health and the environment. DOE has provided justification to Ohio EPA for a waiver from Ohio EPA for *OAC* 3745-27-07(H)(4)(d), a state law which requires that solid waste be placed at least 200 feet from any stream. DOE has identified a need and justification for this waiver pending receipt of public comment. The justification for this waiver is provided in the Evaluation of the Alternatives section of this Proposed Plan.

U.S. EPA requires that any off-Site disposal facility have prior U.S. EPA approval for acceptance of waste generated under a CERCLA action.

Alternative 3 – Full Off-Site Waste Disposal

Under this alternative, all waste produced by D&D of the PORTS buildings and structures would be transported to, and disposed at, approved disposal facilities located off the PORTS property. Waste disposed under this alternative must meet the waste acceptance criteria of the selected off-Site disposal facility.

The same off-Site disposal facilities used for the off-Site portion of Alternative 2 make up the majority of this alternative. Most of the D&D waste is assumed to travel by rail to EnergySolutions in Utah. The process equipment is

assumed to travel by truck to NNSS. Trucks would also be used to ship waste locally to Pike Sanitation Landfill or an equivalent facility. It is likely that rail yard upgrades at PORTS would be needed to accommodate the increased rail traffic from the Site. Recycle and/or reuse of materials is also possible under this alternative. Storage of potentially recyclable materials is part of this alternative.

To prepare materials for recycle and/or reuse, a number of commonly applied techniques have been identified in the Process Buildings RI/FS, including, but not limited to, crushing, size reduction, segmentation, segregation, and decontamination. Those limited activities conducted to prepare the material for recycling and/or reuse are generally part of the Process Buildings and Complex Facilities D&D Evaluation Project. However, recycling or reuse of materials at PORTS might require the use of a complex centralized treatment process (e.g., nickel decontamination and metal melting). Centralized treatment in this context refers to complex, non-commercial, ARAR-compliant treatment efforts that may require additional DFF&O documentation. While implementing Alternative 3, DOE might conduct treatability or pre-design studies to evaluate the benefits of building a centralized treatment facility. The ability to evaluate such a facility is included in this decision. Construction of any such complex facility that is outside the scope of this decision would require a modification to the Waste Disposition decision and would require DOE to seek additional public input and Ohio EPA concurrence and/or approval as applicable.

Remedial Action Objectives. The remedial action objectives for Alternative 3 would be met as follows:

- **Objective 1:** Prevent uncontrolled storage or staging of waste piles. D&D wastes produced from the dismantlement of structures must be handled in compliance with ARARs prior to disposal.

  Alternative 3 satisfies this objective by complying with requirements for wastes that are temporarily stored/staged before disposal. Water running off the waste on the Site would be controlled to prevent contaminated water from leaving the area. Air would be monitored, and any dust would be controlled.

- **Objective 2:** Isolate the D&D wastes in a manner to protect human health, safety, and the environment.

  Alternative 3 satisfies this objective by meeting the off-Site disposal facilities' waste acceptance criteria and permit requirements. Placement in these off-Site facilities is protective in the long term, and the facilities would be monitored.

- **Objective 3:** Prevent the migration of contaminants from the isolated D&D wastes at levels that could cause adverse groundwater and surface water impacts or impacts to humans, plants, and animals.

  Alternative 3 satisfies this remedial action objective by meeting the off-Site disposal facilities' waste acceptance criteria and permit requirements.

Key Metrics for Alternative 3. Calculations for transportation risk, cost, and other key metrics were based on shipping the waste volumes shown in Table 2 off the Site. Table 5 summarizes the estimated volumes that would be disposed at each disposal location. Table 6 presents the key metrics calculated for Alternative 3, based on these volume estimates.

The number of transportation-related fatalities predicted for Alternative 3 is reported as a whole number with a decimal fraction (2.4) because trucks and trains from PORTS would travel nearly two and a half times the number of miles that transportation-industry statistics predict could result in the full risk (1.0) of a potential fatality.

D&D Waste Description	Estimated Volume (cubic yards)
WASTE DISPOSED OFF THE SITE	
Waste disposed at NNSS in Nevada (shipped by truck)	153,000
Waste disposed at EnergySolutions in Utah (shipped by rail)	845,000
Uncontaminated waste disposed at local landfill (shipped by truck)	240,000
Recycled	110,000
WASTE TOTAL	**1,348,000**

Table 5. Estimated Off-Site Disposal D&D Waste Volumes for Alternative 3

Key Metric	Value
Cost (net present value)	$1.1 billion
Schedule	18 years*
Transportation:	
- Truck trips to local landfill	16,000
- Truck trips to NNSS	9,700
- Rail cars to EnergySolutions	14,000
- Truck miles	43 million miles
- Rail miles	50 million miles
- Predicted transportation-related injuries	19
- Predicted transportation-related fatalities	2.4
Employment:	
- Duration	18 years*
- PORTS labor hours	1,600,000

*Durations based on the funding assumptions available to DOE in fiscal year 2012. Current funding projections may extend the durations as indicated in the Waste Disposition RI/FS Supplement No. 1; however, even at current funding levels, the extended durations would not impact the outcome of the analysis of alternatives.

Table 6. Summary of Key Numerical Metrics for Alternative 3

Key Applicable or Relevant and Appropriate Requirements for Alternative 3. Off-Site activities must meet all aspects of the applicable laws and regulations. Any wastes transferred away from the Site or transported along public rights-of-way must meet the state and federal requirements for packaging, labeling, marking, manifesting, and placarding hazardous materials. In addition, U.S. EPA requires that any off-Site disposal facility have prior U.S. EPA approval for acceptance of this kind of waste. Alternative 3 would meet all regulatory requirements along with DOE policies and procedures.

EVALUATION OF THE ALTERNATIVES

Both Alternatives 2 and 3 would protect human health, safety, and the environment and meet all laws and regulations. Alternative 2 has less transportation risk to complete, costs less, and would be finished sooner.

The alternatives were evaluated using the criteria defined within the DFF&O and the NCP. The Waste Disposition RI/FS report, found in the Waste Disposition Administrative Record File, contains the complete evaluation conducted by DOE.

Out of the nine cleanup evaluation criteria, the first two criteria, (1) ***overall protection of human health and the environment*** and (2) ***compliance with ARARs*** or satisfying requirements for a waiver, are considered ***threshold criteria*** that must be attained by the selected remedy. The next five criteria are: (3) ***long-term effectiveness and permanence***; (4) ***reduction of toxicity, mobility, or volume through treatment***; (5) ***short-term effectiveness,*** (6) ***implementability***; and (7) ***cost***. All five of these ***balancing criteria*** are weighed to achieve the best overall solution. The final two criteria to be considered, called ***modifying criteria,*** are (8) ***state acceptance*** and (9) ***community acceptance***. The state has

concurred with this Proposed Plan and agrees with the preferred remedy. Community acceptance will be evaluated on the basis of public comments received on the Proposed Plan. Those comments will be addressed in the Responsiveness Summary contained in the ROD.

Overall Protection of Human Health and the Environment

Alternatives 2 and 3 would provide long-term solutions and would protect human health and the environment. Under the no-action alternative (Alternative 1), waste from building decay would not be recycled or disposed, leading to the spread of waste and possible contamination. This condition could be a future environmental risk to humans, plants, and animals and would allow contaminants to be released into the environment. Therefore, the no-action alternative does not meet this criterion and is not discussed further in this evaluation.

Threshold Criteria – Criteria that must be satisfied.

Overall Protection of Human Health and the Environment – This criterion determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with ARARs – Compliance with ARARs evaluates whether the alternative meets substantive requirements of federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether the requirements for a waiver are met.

Alternatives 2 and 3 rely on engineering controls to protect human health and the environment, both at PORTS and at any off-Site disposal locations. Long-term monitoring, cap maintenance, and access controls would be necessary under both Alternatives 2 and 3 to supplement the engineering controls and protect the cap for disposal facilities located both at PORTS and off the Site.

Both Alternatives 2 and 3 are protective in the long term. The combined on-Site and off-Site disposal alternative (Alternative 2) is shown to be protective by the calculations and computer modeling performed to set waste acceptance criteria for an OSDC. The combination of the engineering design, quality construction, with the underlying natural bedrock formations in Study Area D are designed to provide levels of protection that readily meet state and federal standards for disposal of radioactive waste, hazardous waste under both RCRA and TSCA, solid waste, construction and demolition debris, and asbestos waste. Calculations and computer modeling demonstrate with reasonable certainty that groundwater and nearby creeks would be protected to the required levels for well over the required 1,000 years. Protectiveness is demonstrated in the calculations and computer models even with an assumption that the man-made components in cover and liner may fail in several hundred years. Similar processes were completed at the off-Site disposal facilities of Alternative 3 to determine the waste acceptance criteria there, assuring long-term protectiveness at all permitted off-Site disposal facilities.

Balancing Criteria – Criteria used to compare and contrast the alternatives.

Long-Term Effectiveness and Permanence – This criterion considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume through Treatment – This criterion evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness –This criterion considers the length of time needed to implement an alternative and the risks the alternative poses to workers, members of the public, and the environment during implementation.

Implementability – Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost – Costs include estimated capital and annual operations and maintenance costs, as well as present worth cost. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Both Alternatives 2 and 3 can be protective in the short term. However, Alternative 2, combined on-Site and off-Site waste disposal, would present the lowest overall short-term impacts to the public, primarily due to shipping less waste over long distances. Short-term impacts include mechanical hazards, transportation-related injury and fatality projections, and impacts due to potential releases, such as dust, during construction activities. Detailed comparison of short-term impacts for both alternatives is in the evaluation of "Short-term Effectiveness" below.

Both Alternatives 2 and 3 would protect the environment at their respective disposal locations over the long term. Design and operating requirements both on the Site and off the Site would protect human health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements

Alternative 3 and the off-Site portion of Alternative 2 would comply with the laws and regulations for transportation and disposal of waste. An OSDC would meet all disposal facility design ARARs, such as the use of multilayered capping and lining systems designed to be protective for a minimum of 1,000 years and development of waste

acceptance criteria to ensure waste is safe for placement in the cell. Required long-term monitoring would verify that the cell continues to contain wastes and protect human health, safety, and the environment.

Modifying Criteria – Criteria considered in evaluation.

State Acceptance – Considers whether the State agrees with the lead agency's analysis and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance – Considers whether the local community agrees with the lead agency's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

All potential locations available for an OSDC at PORTS would require a waiver of at least one of the state or federal disposal facility siting requirements. Study Area D, the area evaluated for an OSDC at PORTS, requires a waiver of *OAC* 3745-27-07(H)(4)(d) because the headwaters of four small drainage streams are located within 200 feet of the potential disposal area. The course of these small drainage streams, which only flow with water during heavy rainfall, would need to be changed. Ohio EPA has reviewed and concurred with the Waste Disposition RI/FS report, which presented data to support the selection of Study Area D. The overall protection resulting from the deep bedrock which is unique to Study Area D justifies waiving the *OAC* 3745-27-07(H)(4)(d) requirement. The Waste Disposition RI/FS presented the basis for DOE's request for this waiver. If Alternative 2 is selected and it is determined that the waiver is justified and appropriate, following public review and comment on this Proposed Plan, the formal waiver would be presented for Ohio EPA approval in the ROD.

Impacts to archaeological sites that are eligible for the National Register of Historic Places would occur by construction of an OSDC. One site is outside the area of construction and would be avoided. Indirect effects of noise and dust would occur but no direct impacts would occur. Access to the area where the site is located would be controlled. A cemetery is near the construction area and has been recommended as eligible for the National Register of Historic Places by the Ohio Historic Preservation Office (OHPO). Access to the cemetery would be controlled and there are no anticipated direct impacts. Access to the site for visitation by relatives would be allowed after arrangement with DOE. The other eligible site is within the footprint of the potential OSDC support area. Mitigation of adverse effects to the historic property is proposed by implementing a data recovery effort (Phase III). Coordination would occur with Tribal Nations on the data recovery effort before construction activities in a potential OSDC support area would begin. Recorded artifacts would be preserved at a recognized federal repository by a curation professional. A report documenting the results of the data recovery would be prepared.

DOE is also in the process of developing a Comprehensive Summary Report that summarizes all NHPA-related surveys conducted at PORTS (pre-historic, historic-era, and DOE-era). This report will serve as a mitigation measure for both the Waste Disposition decision and the Process Buildings decision.

Additionally, over the past several years, DOE has also developed other reports and conducted other cultural resource studies and surveys. These activities and reports are not mitigation measures but are an aspect of characterizing, understanding, and interpreting PORTS in a comprehensive manner. The documents were written as resource materials and have been made available to the public. Included among the reports is one on the earthwork and mound sites in the vicinity of PORTS (none were found on the DOE reservation), a comprehensive summary-level report on the many historic-era farmsteads that were found when the property was acquired in the 1950s, and an archival study on selected historic-era farmsteads showing the type of information that can be obtained with a minimum of effort.

To understand all the historic mitigation efforts occurring at PORTS, a summary of the mitigation elements that are part of the Process Buildings decision are also presented here. Some mitigation measures to support the Process Buildings decision are already in process, such as development of a Historic Context Report and development of the PORTS Virtual Museum. Other mitigation measures related to the Process Buildings decision are planned for the future, including the collection and evaluation of items from selected PORTS facilities, public outreach to local schools, development of a Geographic Information System, and others. For more information, please refer to the Process Buildings Proposed Plan.

Long-term Effectiveness and Permanence

Both Alternatives 2 and 3 offer long-term effectiveness and permanence. Long-term effectiveness is measured in two ways: the magnitude of the environmental risk remaining after the D&D project and the adequacy and reliability of any required engineering, monitoring, or access controls. Both Alternatives 2 and 3 are effective at protecting human health and the environment. Alternative 3, the full off-Site disposal alternative, may offer a higher level of overall

long-term effectiveness because the climate at the principal off-Site locations (Utah and Nevada) is drier and there is a deeper groundwater table. Contaminants do not move as readily in such an environment. While the climate in Ohio is wetter and could be considered less protective, this factor is considered both in determining what waste can be safely placed in a disposal cell to ensure long-term protection and in determining how a cell would be constructed.

Preventing exposure to contaminants placed in an engineered disposal facility over the long term – either on the Site or off the Site – depends to a large degree on the liners, caps, monitoring, and access controls. Research conducted by the government and universities drives requirements for design and maintenance of a disposal facility cover system to prevent damage to the cap and provides a high degree of confidence that an on-Site disposal system would remain effective for at least 1,000 years, resulting in an acceptable remaining environmental risk. The engineered facilities at EnergySolutions and NNSS are similar in nature and are reliable for long-term disposal of contaminated waste.

Long-term environmental impacts associated with an OSDC would include the long-term commitment and restricted public access to approximately 100 acres of land and change of partially wooded ecological habitat to grass habitat. No significant long-term impacts are expected for water quality and hydrology, or air quality with either Alternative 2 or 3.

Reduction of Toxicity, Mobility, or Volume through Treatment

Treatment of waste to meet disposal criteria is primarily part of the decisions that generate the waste and not part of this decision. However, minor reductions in waste volumes through centralized size reduction, decontamination activities, or treatment prior to off-Site disposal to meet the off-Site disposal facility waste acceptance criteria may occur for both Alternatives 2 and 3. Additionally, there may be some treatment of contaminated fill to meet the potential OSDC waste acceptance criteria prior to placement in the OSDC as fill. Landfill disposal for either Alternative 2 or 3 does not provide any reduction in toxicity, mobility, or volume through treatment.

Short-term Effectiveness

Short-term effectiveness evaluates the potential impacts to workers, the public, and the environment while carrying out the alternatives. This evaluation considers impacts that distinguish the two alternatives from each other. The evaluation does not include impacts that are common to both alternatives, such as the risk of work place accidents associated with cell construction or waste placement. This risk is the same whether the waste is disposed on the Site or off the Site. Considerations in this assessment include the projected number of years to accomplish a given alternative; impacts on the public, environment, or workers during construction activities; and the distances travelled to the respective disposal facilities.

Alternative 2 requires on-Site activities such as earthmoving; material transport; construction; and waste placement, which could pose some potential for impacts to the environment, workers, and the public. Potential excavation of non-DFF&O waste, including select existing landfills and other contaminated soil fill sources, also involves some construction hazards or potential for contaminant releases. These impacts can be controlled through engineering, construction, transportation management practices, and worker health and safety programs. Alternative 3, full off-Site disposal, presents the highest potential impact due to the injuries and fatalities that might occur in transporting such large quantities of material to disposal facilities located in Nevada and Utah. Alternative 2 presents lower potential for transportation-related injuries and fatalities because fewer overall miles are traveled on public roads for on-Site disposal, including miles necessary to transport clean construction materials to an OSDC from regional suppliers.

Figures 5 and 6 provide a summary level comparison of the key transportation metrics for Alternatives 2 and 3, based on published actuarial statistics from the transportation industry. Figure 5 shows that Alternative 2 requires fewer truck and rail trips be taken to disposal facilities in the western United States. It also shows that Alternative 2 has many local truck trips to bring construction materials to PORTS. Figure 6 shows that Alternative 2, the combined on-Site and off-Site alternative, presents less potential for transportation-related accidents and injuries compared to Alternative 3, the full off-Site disposal alternative. It is estimated that Alternative 3 would have twice the risk of transportation-related injuries and four times the risk of a transportation-related fatality as compared to Alternative 2.

Environmental impacts could result from a spill during off-Site transport and handling, but there is a relatively low risk of such an event, and only minor adverse short-term impacts would likely result. Vehicles along the transportation corridor would cause an inconsequential increase in pollution and noise levels, and the increase in carbon dioxide (CO_2)

emissions would be very small compared to PORTS CO_2 emissions during operations. Therefore, potential impacts to the environment from Alternative 3 are likely to be low.

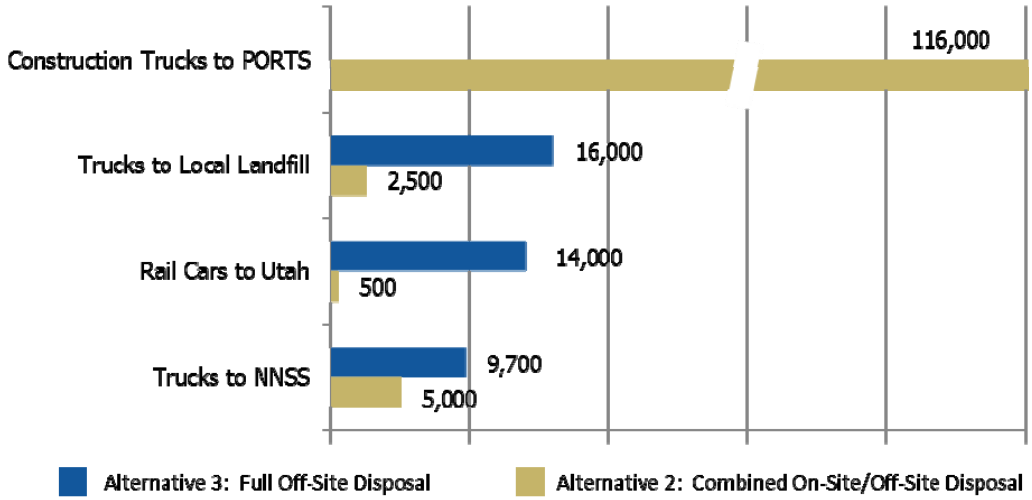
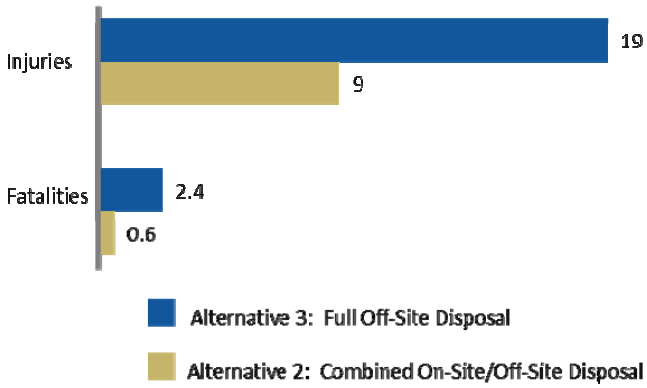


Figure 5. Approximate Number of Trucks and Rail Cars used in Alternatives 2 and 3



	Alternative 2: Combined On-Site/Off-Site Disposal	Alternative 3: Full Off-Site Disposal
Truck Miles	25 Million	43 Million
Rail Miles	1.8 Million	50 Million

Figure 6. Transportation Miles, Injuries, and Fatalities for Alternatives 2 and 3

For Alternative 2, construction and operation of an OSDC would cause local, short-term impacts to the environment of a nature typically associated with a large construction project. The course and flow of four nearby drainage streams would be changed by construction of an OSDC in Study Area D. To avoid harming the overall environment of the area, any length of stream destroyed by constructing an OSDC would be mitigated or replaced by restoring, creating, or enhancing other streams or similar surface water bodies elsewhere. Potential impacts to streams or wetlands are presented in the Waste Disposition RI/FS. Ohio EPA and DOE have agreed that mitigation efforts would be focused on the PORTS property. The amount of mitigation will be determined based on Ohio EPA rules and regulations and specified in the ROD. Short-term disturbance of land would be expected, resulting in temporary losses of habitat for plants and animals. However, to ensure potential bat habitats are not disturbed during summer roosting season, clearing of an OSDC area would be planned between September and March. During construction, there might also be releases of clean sediment into the location's drainage ways and streams during heavy rain events. Ways to limit impacts to the nearby environment would be identified and implemented during design and construction of an OSDC.

For Alternative 2, the short-term impacts to humans, if any, from construction, operation, or final capping of a potential OSDC would be mitigated to the extent practicable. Increased truck traffic bringing equipment and construction materials to PORTS would be expected on local roadways near an OSDC. Noise from heavy equipment could be heard some distance from a construction site, and dust might be produced by the transport of construction materials to PORTS. Efforts would be undertaken to minimize noise during nonworking hours, to control dust through wetting roads and, if needed, covering truck loads, and to limit night-time operation that would require lighting. If night-time construction would be needed, noise and lighting surveys would be conducted to assess any impact on nearby residents and determine if mitigation efforts are needed.

The duration of disposal activities for Alternatives 2 and 3 would be based on many factors, including available funding. For the purposes of the evaluation in the Waste Disposition RI/FS, Alternative 2 was anticipated to take up to 12 years to complete, following the issuance of the ROD. Alternative 3 would take upwards of 18 years, resulting in a projected time difference of about 6 years between the two alternatives to implement the actions. These durations are based on the funding assumptions available to DOE in early 2012. Recent funding information suggests the time for D&D of the gaseous diffusion plant and to dispose of the waste could be quite a bit longer. If the schedule were to increase, the costs of each alternative would also increase because there are certain fixed costs that exist on a project whether much activity occurs or not. There are more of these fixed costs with Alternative 2 because a potential OSDC, once operational, would require ongoing activities to ensure it remains in a safe condition, regardless of how much waste is received. Since Alternative 3 would not require such activities, costs increase more with an extended schedule for Alternative 2 than for Alternative 3. However, Alternative 2 would still be less expensive than Alternative 3, even if the schedule durations tripled. Current funding projections may extend the durations; however, even at current funding levels, the extended durations would not impact the outcome of the analysis of the alternatives.

Implementability

Both Alternatives 2 and 3 are considered implementable through the use of existing technologies, available construction materials, and current construction methods. The availability of off-Site disposal capacity over the duration of the PORTS D&D project presents uncertainty because of the 18-year duration of waste shipment under Alternative 3. For these reasons, Alternative 3's implementability is more uncertain than that of Alternative 2, and there could be delays if the project needed to find alternate disposal locations if a key off-Site landfill closed. This same challenge exists for the off-Site component of Alternative 2, but to a smaller degree and with less overall impact because less material is shipped away from the Site under Alternative 2. Although additional authorizations would be necessary if certain types of contaminated fill are used in Alternative 2, there are no administrative issues that would make Alternative 2 or 3 difficult to implement.

Cost

Cost estimates in the RI/FS provide a basis for comparison among alternatives. Estimates are provided to an accuracy range of +50 percent (real cost could be 50 percent higher than the estimate) to -30 percent (real cost could be 30 percent lower than the estimate) because of inherent uncertainties in the available information used to develop them. To provide a fair basis of comparison for the alternatives, cost estimates are presented as ***net present value (NPV)*** costs. Table 7 summarizes the NPV costs for Alternatives 2 and 3. Long-term operations and maintenance costs were estimated for 1,000 years. Costs for operation and maintenance of off-Site facilities are incorporated into the fee paid at the time of disposal.

Net Present Value (NPV) – NPV costs reflect the quantity of money that would need to be placed in a bank today at a set interest rate, termed the discount rate, to pay for the remedial action over the life of the project. The NPV approach for cleanup decision making and comparison of alternatives is recommended by U.S. EPA in its cost estimating guidance for Superfund sites (EPA 540-R-00-002, *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*, July 2000).

Cost Category	Alternative 2 Combined On-Site and Off-Site Disposal Costs (NPV)	Alternative 3 Full Off-Site Disposal Costs (NPV)
Cost through waste disposal	$868 Million	$1.1 Billion
Long-term operations and maintenance	$14 Million	*
COST TOTAL	**$882 Million**	**$1.1 Billion**

*Long-term operations and maintenance costs for off-Site disposal facilities are assumed to be covered by disposal fees. Costs are based on the funding assumptions available to DOE in fiscal year 2012. Current funding projections may extend the durations as indicated in the Waste Disposition RI/FS Supplement No. 1, thereby increasing the costs; however, even at current funding levels, the extended durations would not impact the outcome of the analysis of alternatives.

Table 7. Cost Comparison of the Alternatives

Costs for Alternative 2 include excavation of contaminated soil from groundwater areas, select existing landfills, and other areas to be used as fill. It also includes estimated costs to treat soil or dispose any of the excavated material off the Site if it does not meet the criteria for safe placement in an OSDC. While it would cost less in the near term to build an OSDC with clean soil as fill, DOE has determined that, should DOE's evaluation as discussed on page 12 be correct, using contaminated fill represents a cost-effective approach when considering the overall cleanup mission of PORTS.

The ability to use soil from surface areas contaminated by plant operations, generated as fill for an OSDC, also provides a possibility to dispose of soil on the Site that could otherwise require off-Site transport and disposal. Disposing this soil in an OSDC would avoid risk of additional transportation injuries, fatalities, and increased costs associated with potential disposal of this soil off the Site. If an OSDC were not available and contaminated soil were required to be disposed off the Site, there would be an estimated $600 million to dispose of such soils in addition to the $1.1 billion cost associated with off-Site disposal for all DFF&O cleanup wastes of PORTS.

Other Factors Considered

In addition to the nine DFF&O evaluation criteria, DOE analyzed the two alternatives to: (1) consider what types of resources would be permanently used in implementing the remedy, and (2) assure incorporation of ***National Environmental Policy Act of 1969 (NEPA)*** values in the alternative analysis and selection process.

National Environmental Policy Act of 1969 (NEPA) – A federal law that requires federal agencies to consider the societal and environmental impacts associated with significant federally-funded activities. DOE has issued a Secretarial Policy Statement on NEPA that states DOE hereafter will 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.

Irreversible and Irretrievable Commitment of Resources. A commitment of resources is irreversible if its use in the response action limits future opportunities to use it again, even if it continues to exist. The resource is committed for the long term to the project. The gravel in the bottom of a potential OSDC or the land on which a potential OSDC is built are examples. An irretrievable commitment refers to the use of resources that keeps them from ever being used by future generations because the resource is destroyed and cannot be replaced. An example of the latter is the use of fuel in the heavy equipment or trucks associated with the response action.

Both Alternatives 2 and 3 permanently commit or use some resources. Alternative 2 would require over 5 million gallons of fuel for trucks bringing construction materials onto PORTS and removing some of the D&D waste to off-Site disposal locations. Alternative 2 requires nearly 2,500,000 cubic yards of gravel and rock for construction of an OSDC. Alternative 3 would require over 8 million gallons of fuel to transport the same waste off the Site.

An OSDC also would require a permanent commitment of approximately 100 acres of land at PORTS, and as much as 320 acres may be initially cleared for both an OSDC and support areas. This would result in the loss of forested areas until an OSDC is closed and support areas returned to natural conditions. How an OSDC was built and restrictions on the types of waste received would prevent impacts to other natural resources such as air, creeks, streams, fish and wildlife, underlying groundwater, or nearby drinking water.

National Environmental Policy Act Values. For cleanup decisions it is a DOE policy to integrate NEPA values into the decision-making process. Impacts to sensitive resources such as wetlands, floodplains, cultural resources, and threatened and endangered species are NEPA values that are directly addressed as ARARs by both Alternatives 2 and 3. For both alternatives, impacts to sensitive resources have been avoided or minimized as much as possible. With respect to impacts to historic properties that were not able to be avoided or minimized by the preferred alternative, DOE would take actions to diminish the impacts as described in the Compliance with ARARs evaluation section.

Other NEPA values considered include impacts on the human environment such as socioeconomics and land use. Regarding socioeconomic impacts, Pike County typically has one of the highest unemployment rates and highest rates of people living below the poverty level in the state of Ohio. Alternative 2, combined on-Site and off-Site disposal, provides more local work and buys more local goods and services, which would have a larger positive impact on the local economy than Alternative 3. The majority of the costs associated with Alternative 3 would go to rail companies and off-Site disposal facilities, likely having little impact on local jobs or the local economy.

Since construction and operation began in the 1950s, PORTS has been a major employer in Pike, Scioto, Jackson, and Ross Counties (Figure 7). The closure of the plant raises concerns among residents of this region, which has long been one of the most economically challenged parts of Ohio. According to the Ohio Department of Job and Family Services, in July 2013 the unemployment rate in Pike County was 12.1 percent, Scioto County unemployment was 11.1 percent, Jackson County was 9.1 percent, and Ross County was 8.1 percent, compared to the state average of 7.3 percent.

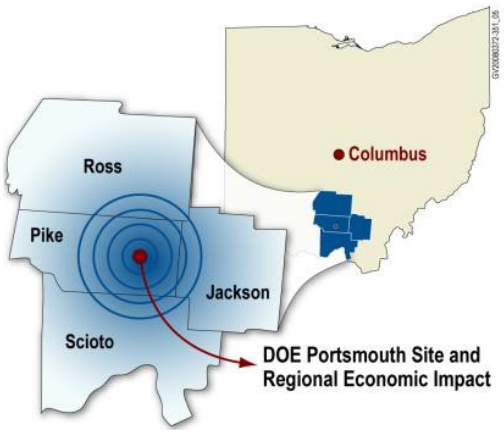


Figure 7. The Four Counties Surrounding PORTS

In 2010, DOE provided a grant to Ohio University to engage the community on the future of PORTS. A full report on this effort, called thePORTSfuture Project, can be found at www.portsfuture.com. This study confirmed that jobs and economic issues are the biggest concerns to people in the region, summarized by the following:

- 83 Percent of a 998-person survey listed jobs/economy/business development as the most important issue to this community.
- Considering the role of jobs and the economy, more than 75 percent of 747 survey respondents indicated that PORTS is very important to the future of the community.
- After extensive work to create community-driven future use scenarios for PORTS, 95 percent of the votes were cast for some type of job-creating future use of the DOE property.

The presence of a potential OSDC outside of the main industrialized area of PORTS would have minimal impact on future industrial development of the area. The potential to use existing landfills within Perimeter Road as sources of potential fill would make the main area of PORTS more attractive for future development, even with a potential OSDC located in the northeast corner of the reservation. Alternative 3 (all Off-Site disposal) does not include an OSDC as a component and therefore no fill is needed. This potentially limits future development opportunities.

As part of a socioeconomic evaluation, DOE considered a U.S. EPA study evaluating the potential impact of a waste disposal decision on local property values (see U.S. EPA, Superfund "What Does the Evidence Say About Property Value Studies to Assess the Benefits of the Superfund Program" http://www.epa.gov/superfund/programs/recycle/effects/property.html). U.S. EPA review of property value studies found there is no established correlation between property value and the location of a contaminated site. U.S. EPA found that most studies are ill-fitted to the task of identifying causal linkages between the price effects they evaluate and the impact of cleanup actions. Considering this information, it is not possible to quantitatively predict whether the presence of an OSDC would have any appreciable impact on property values compared to removing waste away from the Site.

PREFERRED ALTERNATIVE

DOE proposes construction of a new, engineered OSDC at PORTS to safely manage the large volume of equipment and building waste, while also shipping away materials that are not suitable for disposal at PORTS. DOE has determined that the combined on-Site and off-Site alternative (Alternative 2) is cost-effective and provides a safe, balanced solution for all communities affected by this action.

Based on all considerations and the information currently available, Alternative 2, combined on-Site and off-Site disposal, is the preferred alternative to manage waste anticipated to be produced by D&D of PORTS. The preferred alternative meets the required threshold criteria and it provides the best balance of all other criteria. DOE has determined that the preferred alternative satisfies the legal requirements of CERCLA §121(b): (1) be protective of human health and the environment, (2) to appropriately comply with ARARs, (3) be cost-effective, and (4) use permanent solutions and resource recovery technologies to the maximum extent practicable. The fifth CERCLA §121(b) criterion, to satisfy the preference for treatment as a principal element of the remedy will be addressed if the potential OSDC is designated as a CAMU. Treatment of waste to meet disposal criteria is also part of

the decisions that generate the waste (the Process Buildings remedial action decision and the Support Buildings removal action decision). The preferred alternative can change in response to public comments on this Proposed Plan or if new information is provided to the agencies. The combined on-Site and off-Site alternative accomplishes the following:

- Provides reliability over the long term for all D&D waste and materials,
- Has a lower overall cost,
- Has the shortest time,
- Has a lower chance of transportation-related injuries and fatalities, and
- Complies with all remedial action objectives and ARARs and satisfies the requirement to qualify for a waiver of the state solid waste disposal facility siting requirements to be 200 feet from a stream.

Geological studies indicate that Study Area D provides the best location for construction of an OSDC at PORTS and protection of human health and the environment. This location is also isolated from the main area of PORTS, preserving the central portion of PORTS for a variety of other future uses. Thus, an OSDC would be located in Study Area D if Alternative 2 is selected in the ROD.

Because an OSDC is an important part of the preferred alternative, Appendix A to this Proposed Plan is dedicated to explaining this element in greater detail. In Appendix A, readers can find more answers to questions about a potential OSDC design, operations, physical appearance, and compliance with environmental laws and regulations.

There are elements of the preferred alternative that provide additional benefits to the long-term future of PORTS. DOE would pursue use of non-DFF&O waste, specifically soil and soil-like material from areas overlying contaminated groundwater, areas with surface soil contaminated by plant operations, and closed landfills inside Perimeter Road. Use of this non-DFF&O waste as fill could allow more of the 1,000-acre industrial portion of the PORTS property to be more readily reused and may eliminate the need for long-term operation and maintenance of the current remedies. If DOE determines any of the bases upon which it chose to select the use of contaminated fill prove to be incorrect, DOE may utilize clean, uncontaminated fill. DOE also decided to not dispose of the converters, compressors, and coolers from the X-326 Process Building in a potential OSDC. This decision results in one of the most contaminated waste streams at PORTS being disposed off the Site, increasing the safety factor for a potential OSDC.

Options for managing historic properties that would be impacted by the preferred alternative were also developed with input from Tribal Nations and the OHPO. More information on the recommendations of these groups can be found in Appendix A. This input is in addition to, and does not replace, the formal public comment process. Input is sought at this time from the Advisory Council on Historic Preservation and individuals interested in historic preservation.

COMMUNITY PARTICIPATION

Public input is a key element in the decision-making process. The public is encouraged to provide comments on any of the alternatives or information presented, including the preferred alternative.

The ***Portsmouth Site-Specific Advisory Board (SSAB)***, which is comprised of local residents, community leaders, labor leaders, and PORTS employees from Pike, Scioto, Ross and Jackson counties, is chartered by DOE to foster community input into the decision process. The SSAB has made recommendations to DOE on preferred cleanup levels, waste disposal strategies, and future land uses for PORTS. Site leadership also talks frequently with elected county commissioners to understand their positions on the same topics. DOE also works closely with Tribal Nations, the OHPO, the Advisory Council on Historic Preservation, and individuals interested in historic preservation to seek and consider their input on matters pertaining to historic properties. Development of the Waste Disposition RI/FS and this Proposed Plan considered the evolving deliberations of these groups.

Portsmouth Site Specific Advisory Board (SSAB) – A stakeholder board made up of community members selected to represent a diversity of viewpoints and provide DOE with advice, information, and recommendations on issues affecting the DOE Environmental Management Program. Among those issues are cleanup standards and environmental restoration, waste management and disposal, and cleanup science and technology activities. The SSAB's website can be viewed at www.ports-ssab.org.

Surveys, reports, and special studies regarding cultural resources can be found on the DOE Portsmouth/Paducah Project Office (PPPO) website www.pppo.energy.gov/nhpa. Information provided to the SSAB and recommendations of the SSAB can be found on the SSAB's website www.ports-ssab.org. Information provided to Tribal Nations and members of the public interested in historic preservation can be found on the Fluor-B&W Portsmouth LLC (FBP) website www.fbportsmouth.com.

Additional details on the remedial alternatives can be found in the RI/FS report for waste disposal. This report and other documents on the PORTS cleanup and background are available in the Waste Disposition Administrative Record File in the DOE Environmental Information Center (EIC), 1862 Shyville Road, Room 207, Piketon, Ohio 45661. You may contact the EIC at 740-289-8898 or by email: portseic@wems-llc.com. You may also find the Site-wide Waste Disposition RI/FS report at the PPPO website www.pppo.energy.gov and the FBP website www.fbportsmouth.com.

The public comment period for this Proposed Plan extends from November 12, 2014 to January 10, 2015. Comments on the preferred alternative, other alternatives, or any element of this Proposed Plan will be accepted through January 10, 2015. (To ensure your comments are properly received and addressed, please include the words "Waste Disposition" in your submittal.) The contact information for DOE and Ohio EPA persons who will receive comments on this Proposed Plan, and who can supply additional information is as follows:

Ms. Kristi Wiehle Department of Energy P.O. Box 370 Piketon, OH 45661 Hotline: 888-603-7722 Email: WDComments@fbports.com Fax: 740-897-2526	-OR-	Ms. Maria Galanti Ohio Environmental Protection Agency Southeast District Office 2195 Front Street Logan, OH 43138 Phone: 740-385-8501 Email: maria.galanti@epa.ohio.gov Fax: 740-385-6490

A prepaid comment form is also provided with this Proposed Plan as the back page of the document.

A public meeting will be held on November 17, 2014, at 6:00 p.m., at Waverly High School, 3 Tiger Drive, Waverly, Ohio, to present the Proposed Plan. Verbal or written comments will be accepted at the meeting.

The actual selection of the alternative to be implemented will be made after all comments received during the public comment period have been reviewed and addressed. DOE will consider all public comments on this Proposed Plan in preparing the ROD. Based on comments received, the selected final remedy for waste disposal presented in the ROD could be different from the preferred alternative. All written and verbal comments received during the public comment period will be summarized and responded to in the Responsiveness Summary section of the ROD.

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APPENDIX A: OVERVIEW OF AN ON-SITE DISPOSAL CELL

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OVERVIEW OF AN ON-SITE DISPOSAL CELL

(Note: If the Record of Decision [ROD] identifies Alternative 2 as the selected remedy, the U.S. Department of Energy [DOE] will submit the detailed design components of the On-Site Disposal Cell [OSDC] in the Remedial Design Document. The ROD will be subject to the Ohio Environmental Protection Agency [Ohio EPA] review and approval/concurrence, as applicable, pursuant to *The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto* [DFF&O].)

Use of an OSDC is a major element of the preferred alternative, and humans and the environment are protected through its many facets. This appendix provides more details on the five elements of an OSDC that provide a long-lasting, safe, and secure final location for the waste anticipated to be produced by dismantling the gaseous diffusion plant. These five elements are: location, compliance with applicable or relevant and appropriate requirements (ARARs), design, operations, and the use of fill. The appendix ends with additional considerations associated with an OSDC – a summary of the community input received to date and the visual impacts of an OSDC.

SITING OF AN OSDC

Four final candidate study areas (identified as Study Areas A, B, C, and D) were identified as candidate locations in the Waste Disposition Remedial Investigation/Feasibility Study (RI/FS). Several technical factors such as depth to groundwater, material properties of soil and rock, aquifer (a permeable geologic formation capable of producing water for a well) characteristics, and topography were considered to determine the best, safest location for an OSDC. A total area of 320 acres to support the 100-acre OSDC, as well as associated support facilities, is needed.

At Study Area D, the proposed location for an OSDC, geologic and hydrogeologic conditions offer another degree of protection for waste in the cell in addition to the design of the liner and cover systems. The earth there consists of thick layers of bedrock that restrict the movement of water and contaminants. The bedrock beneath the Portsmouth Gaseous Diffusion Plant (PORTS) has several layers: the Bedford shale, Berea sandstone, Sunbury shale, and Cuyahoga shale (Figure A.1). An OSDC would be located northeast of the main plant, over the Cuyahoga shale. No known geologic faults are located in the immediate area. Geological studies conclude that Study Area D, the location selected for an OSDC, provides the best geology for construction of an OSDC at PORTS. The location also best satisfies the criteria recommended by the Portsmouth Site Specific Advisory Board (SSAB).

The Cuyahoga shale, the uppermost bedrock layer in the geographic area, forms the hills surrounding the more flat industrialized area of PORTS. It is moderately hard, thinly layered shale, with numerous sandstone layers, that reaches a thickness of approximately 160 feet. It also is an aquitard (a low-permeability geologic formation that acts as a barrier to groundwater flow) and therefore does not contain groundwater or allow water to pass through easily. The Cuyahoga shale located at the proposed location of an OSDC has been tested and found to be fractured near the surface down to a depth of approximately 20 feet. Below this depth, the bedrock is intact and does not contain cracks, making it difficult for water to seep through it.

The Sunbury shale, seen as the gray layer below the Cuyahoga shale in Figure A.1, averages about 15 to 20 feet in thickness. The Sunbury shale is also considered to be an aquitard and does not contain groundwater.

Groundwater at PORTS is primarily located in the Berea sandstone and the Gallia sand and gravel (both are local aquifers). The Gallia sand layer is located beneath the former production area of PORTS. The Berea sandstone layer is located below approximately 175 feet of bedrock. The depth and quality of the bedrock at Study Area D provides exceptional conditions for safe containment of waste materials produced by decontamination and decommissioning (D&D) of PORTS.

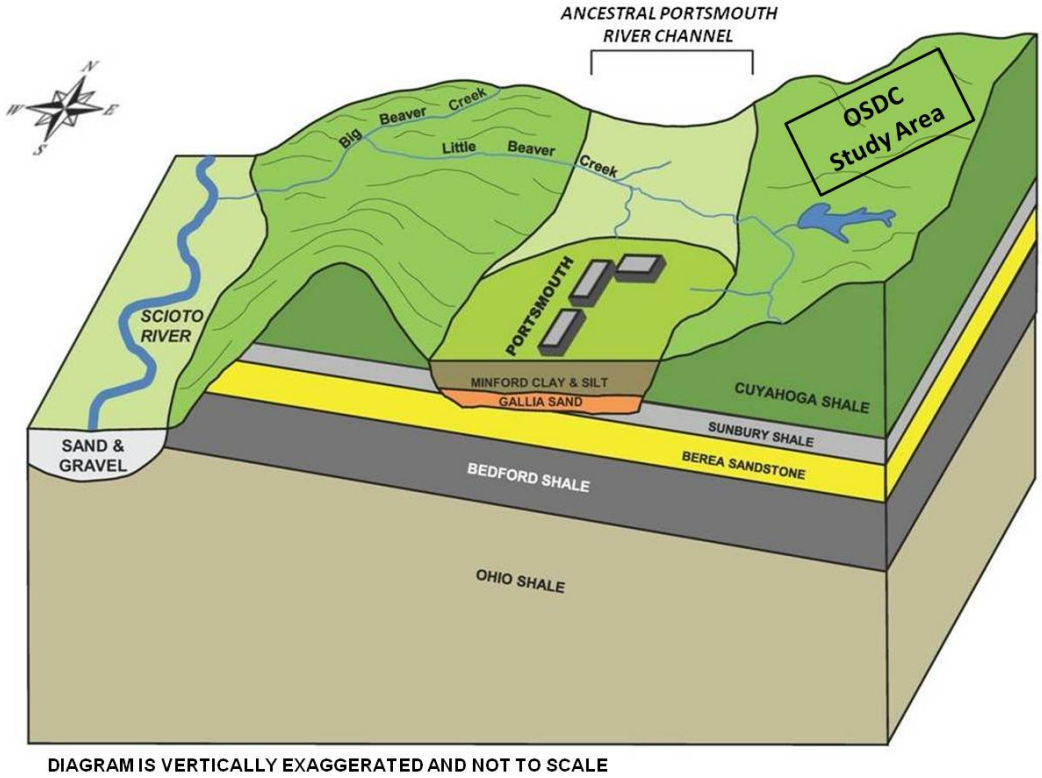

Figure A.1. PORTS Geologic Features

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Disposal of waste from the D&D at PORTS must be conducted in compliance with requirements, called ARARs, which include requirements for siting, designing, constructing, operating, and closing an OSDC. As described in the Evaluation of Alternatives, Alternative 2 would meet all ARARs with the exception of the Ohio solid waste requirement to not locate waste within 200 feet of a stream. Based on its review of the data presented by DOE in the RI/FS, Ohio EPA has concurred that Study Area D is the best location of an OSDC at PORTS to protect human health and the environment. The overall protection resulting from the deep bedrock in Study Area D justifies waiving the *Ohio Administrative Code (OAC)* 3745-27-07(H)(4)(d) requirement. In accordance with the National Contingency Plan, issuance of the formal waiver would occur as part of the ROD, after receipt of public comments on the Proposed Plan and selection of the final remedial action, if the final remedial action includes construction and operation of an OSDC at Study Area D.

DOE has identified the Corrective Action Management Unit (CAMU) regulations (*OAC* 3745-57-72) as ARARs for Alternative 2 and provided information to Ohio EPA justifying why a potential OSDC should be a CAMU. In this Proposed Plan, the potential OSDC has been identified as a potential treatment, storage, and disposal CAMU pending public comments.

Off-Site activities would meet all applicable laws and regulations. Compliance with the ARARs was evaluated during the conceptualization of an OSDC. Table A.1 at the end of this appendix shows the key ARARs associated with each of the three remedial action objectives and how the on-Site disposal portion of the preferred alternative meets these requirements. This list is not a complete listing of the requirements for the on-Site and off-Site disposal activities, but focuses on ARARs that ensure the preferred alternative meets the remedial action objectives. There are approximately 300 ARARs in total for the preferred alternative. DOE expects Ohio EPA's continued oversight to ensure all the ARARs are appropriately satisfied.

DESIGN OF AN OSDC

Part of the effectiveness of an OSDC is provided through its design and construction. The waste facility uses redundant layers of natural and man-made materials to isolate the waste from the surrounding environment. An OSDC's design, with its multilayer cover and liner systems, minimizes infiltration of water into the underlying waste and uses a collection system to capture and remove contaminated water, called leachate, that either was in the waste at the time it was placed in an OSDC or that was introduced as a result of rain during operations.

Cell Cover System. In accordance with hazardous waste landfill closure requirements, the final cover has multiple design elements to provide a long-term barrier between cell contents and the environment. These elements include a topsoil and vegetative soil layer, granular filter layer, biointrusion barrier layer, cover drainage layer, synthetic cap materials layer, compacted clay cap layer, and contouring layer. Figure A.2 provides a detailed cross section and explanation of the many layers of the cell cover system, which is about 9 feet 10 inches thick in total.

Cell Liner System. The cell liner system also has multiple design elements to ensure the waste remains in an OSDC. The base liner system includes a compacted clay liner with a double geocomposite liner system, along with two low-permeability liners, a leachate collection and removal system, and a leak detection system. Figure A.2 provides a detailed cross section of an OSDC liner system and explains the various layers that form a portion of the waste containment system. The cell liner system is a minimum of 5 feet 2 inches in total.

Figure A.3 illustrates how all the levels come together in a cross section of an OSDC. The first figure shows a representation of a potential OSDC to illustrate the relationship between the width of the cell as compared to the height. The second figure exaggerates the height by a factor of three so redundant safety features can be better seen. When closed, the total height of an OSDC is estimated to be between 60 to 80 feet above the nearby ground surface.

Leachate Collection, Leak Detection, and Leachate Treatment System. A leachate collection system and leak detection system would be constructed. The system would be located in the cell liner system and would collect leachate and gravity drain it to a sump/vault system located just outside each waste cell. The leak detection system serves as a second layer of protection to confirm leachate does not pass through the primary barrier layer.

Through the life of an OSDC, the leachate flow is expected to slowly decrease and ultimately stabilize to a very small flow. At this point, the initial leachate treatment system would be replaced by a passive leachate treatment system that uses in-place treatment media.

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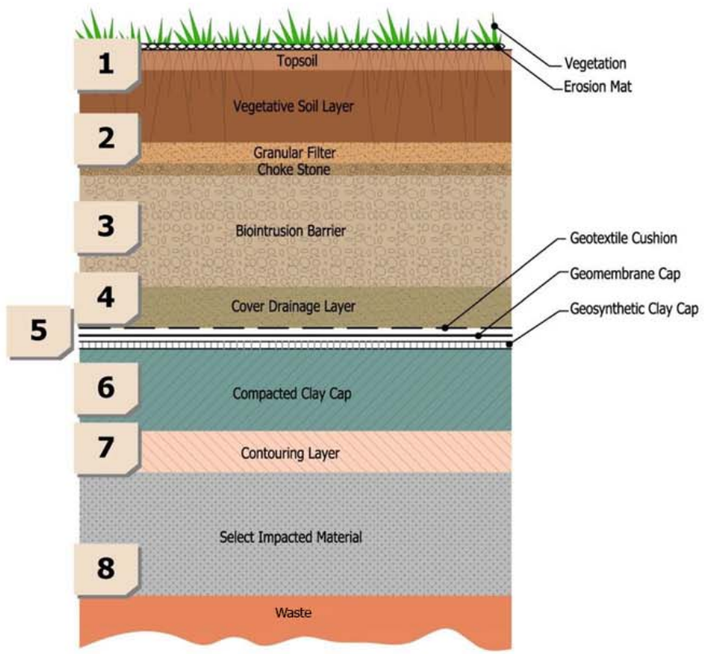

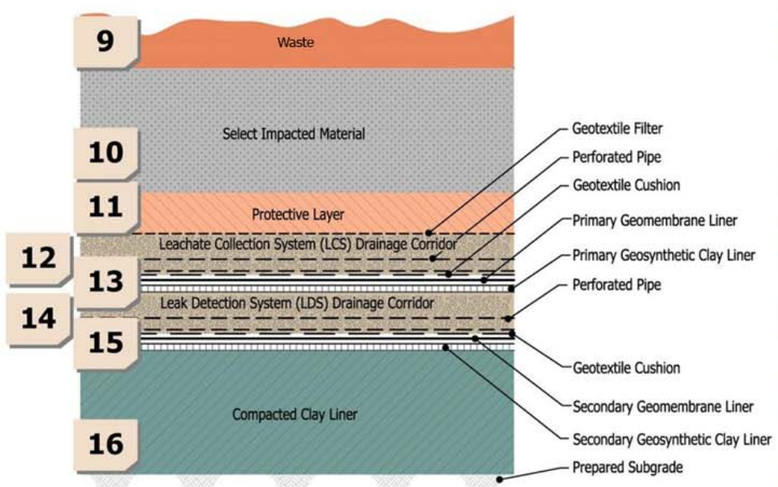

OSDC FINAL COVER SYSTEM

1 **Topsoil and Vegetative Soil Layer** (approximately 27 inches thick) – Constructed of suitable grasses (Vegetation), Erosion Mat, Topsoil, and Vegetative Soil Layer (General Soil). Provides rooting zone for Vegetation, water storage for plant growth, and frost protection. Grasses reduce water infiltration and help prevent soil erosion.

2 **Granular Filter** (approximately 6 inches thick) – Constructed of sand.
Prevents movement of Vegetative Soil into the Biointrusion Barrier, allows water to drain from the Vegetative Soil Layer, and provides additional frost protection.

3 **Biointrusion Barrier** (approximately 36 inches thick) – Constructed of rock (approximately 6 inches - 10 inches in diameter) and a top layer of Choke Stone (gravel).
Prevents deep root growth as well as human and animal intrusion. Serves as back-up erosion and frost protection until construction of upper layers or upper layers are eroded.

4 **Cover Drainage Layer** (approximately 12 inches thick) – Constructed of gravel.
Drains water from the cap system and protects synthetic cap materials from large rocks in the Bioinstrusion Barrier.

5 **Synthetic Cap Materials** (approximately 1 inch thick) – Constructed of Geotextile Cushion, Geomembrane Cap, and Geosynthetic Clay Cap.
(Manmade) materials create a barrier against infiltration of water.

6 **Compacted Clay Cap** (minimum 24 inches thick) – Constructed of "clean" compacted, low permeability clay.
(Natural) material barrier against infiltration of water into the waste (Impacted Material).

7 **Contouring Layer** (approximately 12 inches thick) – Constructed of "clean" soil.
Creates the proper subgrade on which to build the Compacted Clay Cap.

WASTE

8 **Select Impacted Material** (approximately 36 inches thick) – Constructed of impacted soil or soil-like material.
Compacted impacted soil or soil-like material provides a buffer between the Final Cover System above and the Impacted Material below.

9 **Impacted Material** (up to approximately 82 feet thick) – Primarily consists of low-level radioactive waste.
All the waste in the OSDC must have met stringent radiological, chemical, and physical waste acceptance criteria approved by Ohio EPA.

10 **Select Impacted Material** (approximately 36 inches thick) – Constructed of impacted soil or soil-like material.
Compacted impacted soil or soil-like material provides a buffer between the Impacted Material above and the Liner System below.

11 **Protective Layer** (approximately 12 inches thick) – Constructed of compacted impacted or "clean" soil or soil-like material.
Prevents debris in the Impacted Material Layers from damaging the Liner System. Provides protection of the Liner System from the construction equipment.

OSDC LINER SYSTEM

12 **Leachate Collection System (LCS)** (approximately 12 inches thick) – Constructed of Geotextile Filter, gravel, and Perforated Pipe.
Collects water that comes into contact with impacted materials (leachate) during waste placement. Collects leachate that drains from the waste. Collected leachate drains laterally to one of 12 valve houses, where it is discharged to the Leachate Transmission System.

13 **Primary Synthetic Liner System** (approximately 1 inch thick) – Constructed of Geotextile Cushion, Geomembrane Liner, and Geosynthetic Clay Liner.
Geotextile Cushion protects the Geomembrane Liner from damage from overlying gravel materials. The Geomembrane Liner and the Geosynthetic Clay Liner create a composite liner system that prevents leachate from passing through, both during and after construction.

14 **Leak Detection System (LDS)** (approximately 12 inches thick) – Constructed of gravel and Perforated Pipe.
Provides an additional safeguard in the unlikely event that leachate would pass through the Primary Synthetic Liner System by collecting leachate and draining it laterally to one of 12 valve houses, where it is monitored and discharged to the Leachate Transmission System.

15 **Secondary Synthetic Liner** (approximately 1 inch thick) – Constructed of Geotextile Cushion, Geomembrane Liner, and Geosynthetic Clay Liner.
Provides final synthetic barrier to stop downward movement of leachate from the waste. The Geotextile Cushion protects the Geomembrane Liner from damage from overlying gravel. The Geomembrane Liner and the Geosynthetic Clay Liner prevent leachate which may have passed through the Primary Synthetic Liner System from passing through, both during and after construction.

16 **Compacted Clay Liner** (minimum 36 inches thick) – Constructed of "clean", compacted, low permeability clay.
The Compacted Clay Liner minimizes the seepage flow and provides additional redundancy to the synthetic liners.

Figure A.2. Details of an OSDC Cover and Liner Systems

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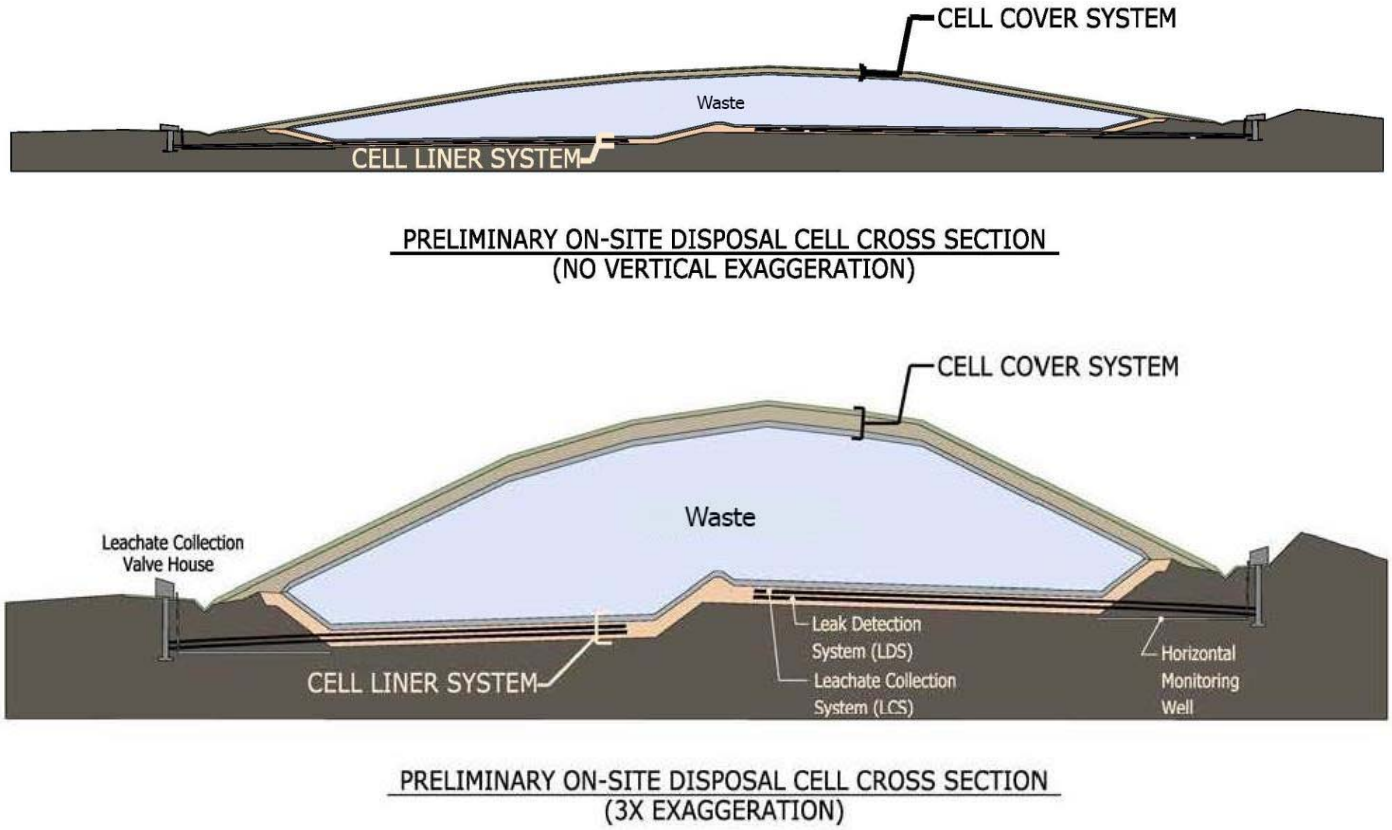

Figure A.3. Illustration of an OSDC

OPERATIONS AND MAINTENANCE

Construction techniques, support facilities, and monitoring and access controls provide protection while an OSDC is operated and maintained.

Construction Sequence. An OSDC would be constructed in phases to match the rate at which waste is generated. This is done to protect the cell cap and liners from unnecessary exposure to weather. Figure A.4 shows the plan for an OSDC with multiple cells. In general, it is assumed that only two cells would be constructed at a time. Once the first two cells are receiving waste, construction would begin on the next two cells. When the initial cells are filled and the side slopes are sufficiently stable, a portion of the final cap would be installed with a geosynthetic cover material extending enough to allow it to be attached to the adjacent cell cover material.

A defined quality control process would be developed and used during construction of an OSDC. Certification of the appropriate quality of construction would be provided to Ohio EPA before the first waste is placed. Also, once construction and operations begin, an annual report would be submitted to Ohio EPA that discusses the construction progress, the amount of waste placed, the estimated remaining capacity, and quantities of leachate managed, along with other relevant information. Details of the quality assurance program and the annual report requirements would be presented in the remedial design reports.

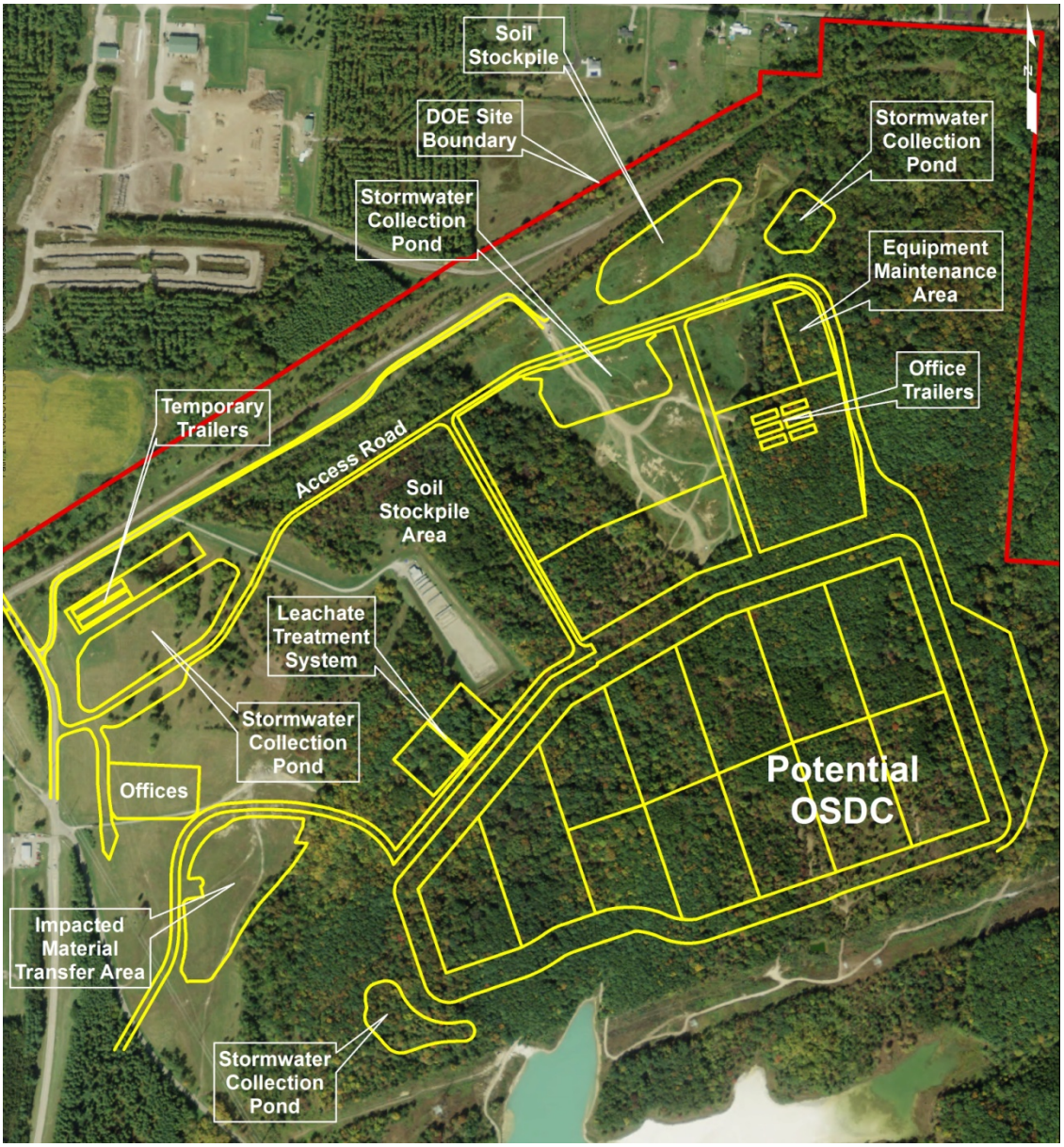

Figure A.4. OSDC Plan View Showing Individual Cells and Support Facilities

Much of the waste would be placed in bulk, not containerized. Bulk waste would be placed in layers and compacted using dozers and/or wheeled landfill compactors. Waste and containers would be placed to minimize possible damage to the geotextile layer and minimize void spaces after backfilling.

Support Areas and Infrastructure. Figure A.4 also shows the various areas and facilities that would support operations at an OSDC. The total area involved in an OSDC operation would be 320 acres, of which roughly 100 acres would be associated with the disposal facility itself. An OSDC support area would include temporary offices and trailers, equipment maintenance areas, storm water collection ponds, and soil stockpile areas. The leachate treatment system would be located next to an OSDC. A waste staging area, called the interim materials transfer area, would serve as a temporary storage area for incoming D&D waste. This area would be used if the rate of incoming D&D waste deliveries exceeds the rate of placement in the disposal facility, as might be the case during bad weather. It would also be used to temporarily and safely stockpile D&D waste to allow the most economical placement. The support areas and infrastructure would only exist while waste is being placed in an OSDC.

The support areas would be removed and restored to allow natural vegetation to grow once OSDC construction was completed.

Monitoring and Access Controls. A network of groundwater monitoring wells surrounding an OSDC would be used to monitor the quality of the underlying groundwater. Air monitoring equipment would be installed at the facility boundary for use during construction and operations. The area would be secured, fenced, and, as appropriate, patrolled. DOE or other federal entity would maintain ownership of the land that contains an OSDC. DOE or other federal entity would be responsible for maintaining the cap, monitoring the underlying groundwater and nearby surface water, and providing long-term security.

POTENTIAL TO USE NON-DFF&O CONTAMINATED SOIL AS FILL

To ensure long-term stability and protection of an OSDC and to achieve required compaction of the waste mass, fill that consists of soil or material with a consistency of soil must be placed with D&D waste to fill any empty/void spaces and eliminate air pockets inside the disposal cell. It is estimated that at least two times as much fill as D&D waste would be required. That means that for every 1 cubic yard of D&D waste placed, approximately 2 cubic yards or more of fill is estimated to be placed.

DOE would pursue the use of non-DFF&O waste, specifically contaminated soil and soil-like materials from PORTS, as fill for an OSDC. This contaminated fill would come from areas overlying contaminated groundwater, areas with surface soil contaminated by plant operations, and closed landfills inside Perimeter Road. Whenever excavation and/or disposal of non-DFF&O and other remediation waste is discussed in this document, whether in terms of additional waste material or fill, it is to be understood that additional authorization/approval outside of this Proposed Plan would be required to undertake this activity.

Under DOE's proposed method, these non-DFF&O contaminated soil areas would be prioritized and excavated one at a time to obtain fill for an OSDC. In landfill areas, a landfill would be excavated to its documented or delineated perimeter and depth. When a landfill overlies a groundwater contamination plume, excavation would then continue deeper into the contaminated soil associated with the groundwater plume.

DOE's analysis has determined that placement of this waste in the potential OSDC would be protective of human health and safety and the environment, assuming such waste meets the waste acceptance criteria. Waste found in excavated landfills would be removed and, if it meets the waste acceptance criteria, transferred to the new OSDC for permanent disposal. Any waste removed from landfills that does not meet the criteria for disposal in an OSDC would be safely treated or shipped to an appropriate off-Site disposal facility.

Table A.2 describes the potential sources of fill to be targeted in building and operating an OSDC. Figure A.5 shows the locations of the landfill and plume source areas at PORTS. Areas of surface soil contaminated by plant operations areas are located throughout the plant. If the bases upon which contaminated fill was selected prove to be incorrect, DOE may utilize clean, uncontaminated fill.

Potential Targeted Fill Source Areas
X-701B Area
X-740 Area
X-749/120 Area
7-Unit Area
5-Unit Area
X-749 Landfill
X-749A Landfill
X-749B (Peter Kiewit) Landfill
X-231 A & B Oil Biodegradation Plots
Surface soil contaminated by plant operations

Table A.2. Targeted Fill Source Areas

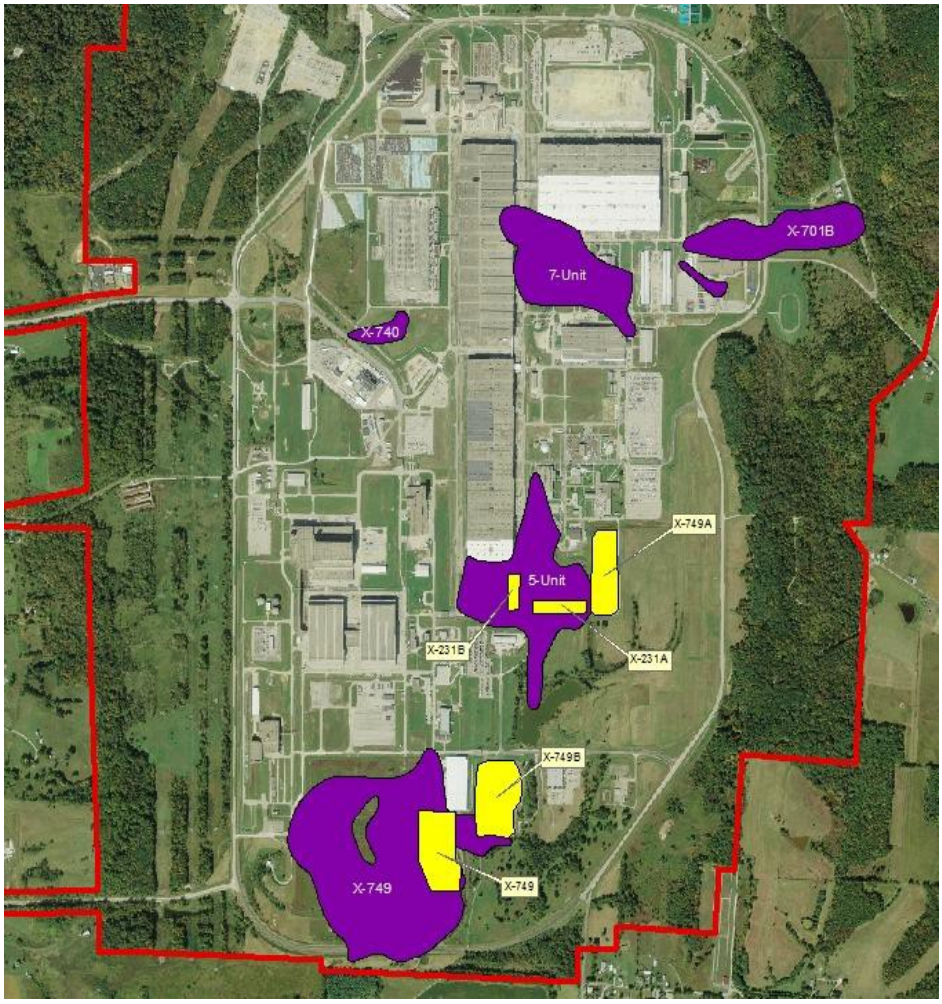

Figure A.5. Landfill and Plume Source Areas

The excavation of non-DFF&O waste in select landfills has the potential to generate additional waste that cannot be used as fill. Table A.3 presents the volumes of D&D waste plus the volumes for other potential waste streams, namely non-DFF&O waste (including soil and soil-like materials, as well as non-soil waste). Even though Ohio EPA is not authorizing/approving the decision to excavate and/or dispose of non-DFF&O waste in this process, DOE has evaluated the environmental impact, if any, of such excavation and disposal decision and DOE's analysis has determined that placement of this waste in the potential OSDC would be protective of human health and safety and the environment assuming such waste meets the waste acceptance criteria. The table shows that the total estimated capacity that may be needed for an OSDC is 3.9 million cubic yards. All of these volumes are estimates and may change as more information becomes available in the future.

Waste Description	Estimated Volume (cubic yards)
Alternative 2 Off-Site Disposal	
Residual Soil Removed with Buildings	0
Building Waste (shipped by rail)	66,000
Process Gas Equipment (shipped by truck)	41,000
Recyclable	110,000
Potential Non-DFF&O waste, specifically Landfill Waste that does not meet OSDC Waste Acceptance Criteria or is not authorized/approved for disposal.	4,000
TOTAL OFF THE SITE	221,000
Alternative 2 On-Site Disposal	
Residual Soil Removed with Buildings	53,000
Building Waste	966,000
Process Gas Equipment	112,000
Potential Non-DFF&O Landfill Waste not suitable for use as fill	223,000
TOTAL ON THE SITE	1,354,000
WASTE TOTAL	**1,575,000**
Projected OSDC Contents	
D&D Waste (building waste and process gas equipment)	1,078,000
Contaminated Fill Sources (includes residual soil removed with buildings and potentially non-DFF&O soil waste)	2,602,000
Potential Non-DFF&O Landfill Waste not suitable for use as fill	223,000
VOLUME OF OSDC	**3,903,000**

Table A.3. Total Estimated Waste and Fill Volumes and OSDC Capacity

ADDITIONAL CONSIDERATIONS AND INFORMATION

DOE has engaged with the SSAB and County Commissioners from Pike, Scioto, Ross and Jackson counties. DOE also worked closely with Tribal Nations, the Ohio Historic Preservation Office, the Advisory Council on Historic Preservation, and individuals interested in historic preservation to identify mitigation measures for any impacted historic properties. The input already received regarding impact to historic properties does not in any way replace the formal public comment process.

The SSAB supports on-Site disposal at PORTS under certain conditions. The SSAB outlined these conditions in Recommendation 13-02 issued in May 2013 which can be found on their website www.ports-ssab.org.

The conditions are as follows: (1) no waste generated from off-Site locations is placed in an OSDC; (2) contaminated groundwater plumes are exhumed and remediated to allow future reindustrialization of the area without unnecessary restrictions; (3) existing landfills within Perimeter Road are consolidated in an OSDC or shipped off the Site if they do not meet waste acceptance criteria; (4) nickel barrier material from process gas equipment in the X-333 and X-330 Process Buildings is segregated for potential recovery of the nickel and never disposed on the Site; (5) waste from the depleted uranium hexafluoride conversion process is disposed off the Site; and (6) DOE funds an implementable land use plan resulting in a usable end state for whatever reuse opportunities become available.

In July 2013, commissioners from Pike, Scioto, Ross and Jackson counties sent a letter to DOE Secretary Moniz providing their support for a future vision for PORTS that is cost effective, environmentally safe, and economically beneficial for the community. This future vision is the commissioners' desired approach to optimize the amount of the plant available for reuse by leaving viable infrastructure in place and consolidating landfills and plumes from the former production areas into a new OSDC.

Tribal Nations visited PORTS in May 2013, and the siting of an OSDC and impact on historic properties was specifically discussed. DOE is developing mitigation measures to address the adverse impacts to the historic properties.

Visual studies have been completed to show what an OSDC might look like to local residents or potential future users of PORTS. For purposes of the studies, it was assumed an OSDC would be located at Study Area D. Figure A.6 is a bird's eye view of an OSDC location and an artist's rendering of what it would look like when complete. Figure A.7 provides the results of computer modeling to show where a person standing at ground level from on-Site and off-Site viewpoints could see an OSDC. The red areas on the image mean that a portion of an OSDC can be seen by a person standing at ground level in that location. Individuals standing in areas that are not red on the figure cannot see any part of an OSDC. The blue circles are locations of houses or businesses.

Additional computer modeling was performed to determine what portion of an OSDC could be seen from locations north, south, east, and west of an OSDC. The results of this modeling were rendered into actual photographs taken from the locations. As examples, Figures A.8 and A.9 show the current and future images from one of the more visible off-Site locations (Figure A.8) and the most visible on-Site location (Figure A.9).

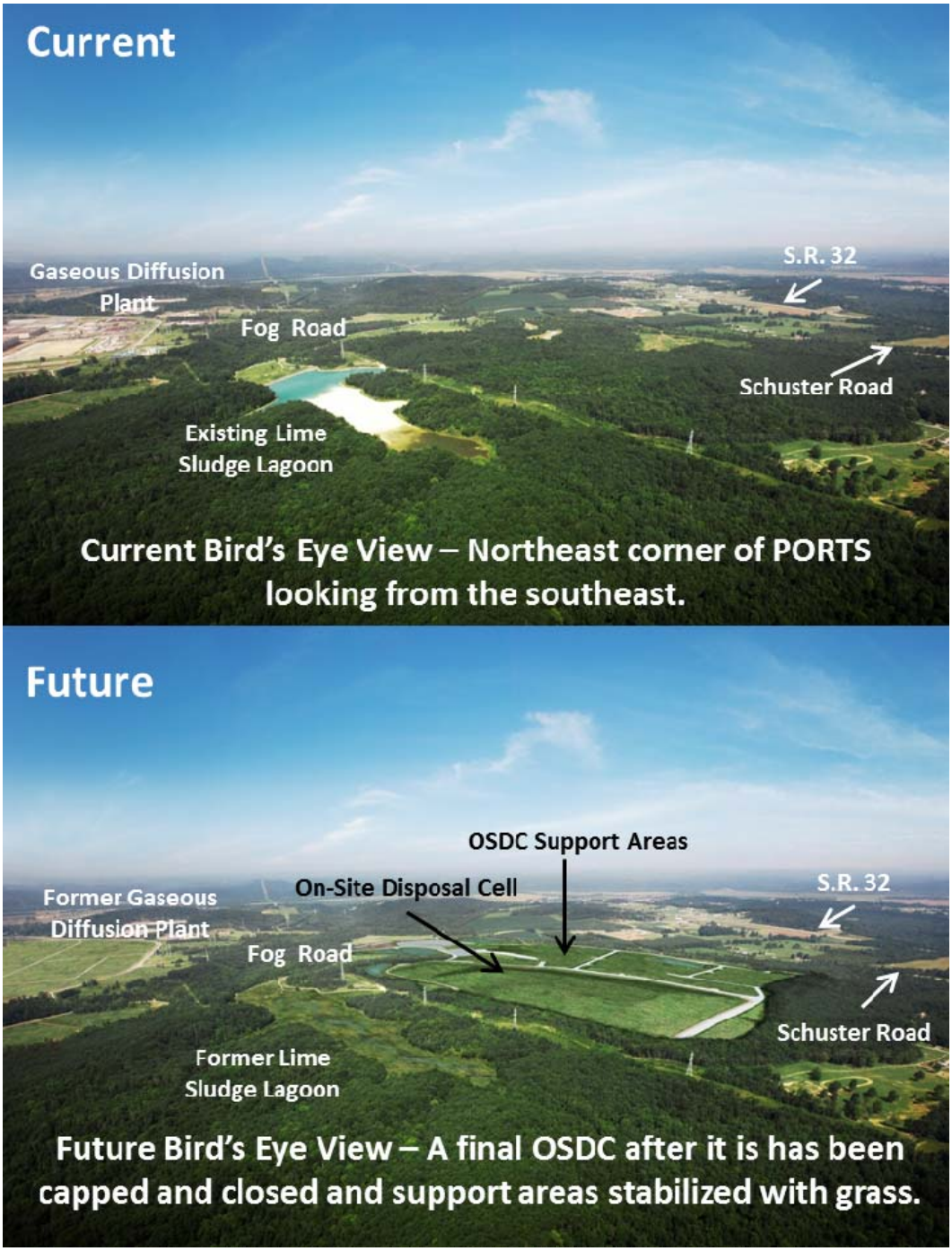

Figure A.6. Current and Future Images from Bird's Eye View - Looking from the Southeast

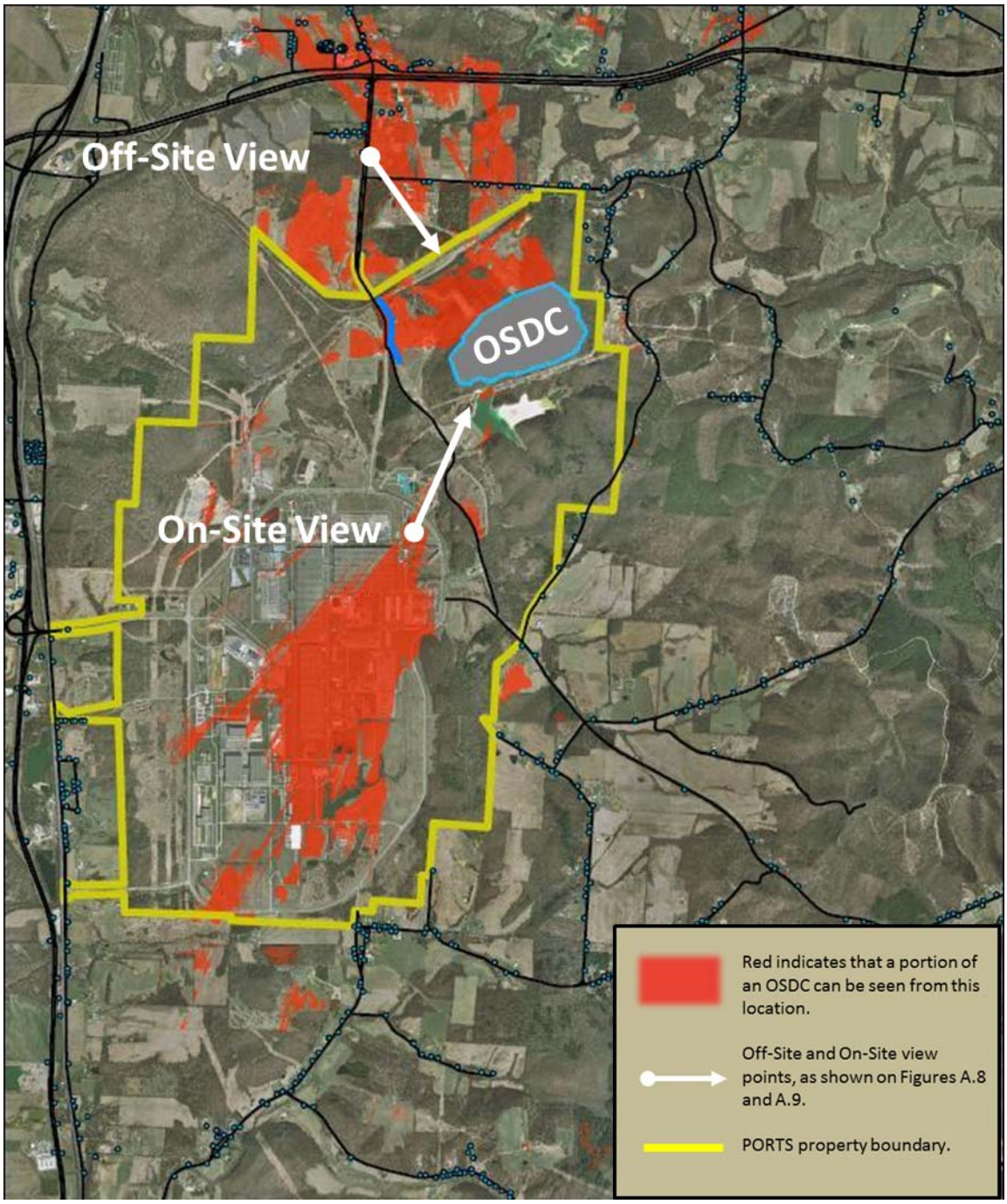

Figure A.7. Locations Where a Portion of an OSDC Would be Visible

Figure A.8. Current and Future Images from Off-Site View – Looking Southeast from Shyville Road

Figure A.9. Current and Future Images from On-Site View – Looking from PORTS Production Area

Remedial Action Objective	Key ARARs	Compliance Approaches
Remedial Action Objective 1: Prevent uncontrolled storage or staging of waste piles. Wastes produced from dismantlement of structures must be handled in compliance with ARARs prior to disposal.	• Solid Waste and Infectious Waste Regulations, *OAC* 3745-27 • Standards Applicable to Generators of Hazardous Waste, 40 Code of Federal Regulations (*CFR*) 262 [*OAC* 3745-52] • Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal [TSD] Facilities, 40 *CFR* 264 [*OAC* 3745-50 and -54 to -57] • Toxic Substances Control Act – Polychlorinated Biphenyls: Storage for Disposal, 40 *CFR* 761.65 • Asbestos Emission Control: Standards for Active Waste Disposal Sites, *OAC* 3745-20-06	• Store wastes only in designated waste storage areas • Waste storage containers – labeled and dated, covers on at all times, secondary containment • Waste staging – covered, run-on/runoff controls • Asbestos handling – wet down all surfaces, wrap or bag all wastes • Track waste arriving at and leaving any staging areas
Remedial Action Objective 2: Permanently isolate D&D wastes in a manner that protects human health, safety, and the environment.	• Standards for Owners and Operators of Hazardous Waste TSD Facilities, 40 *CFR* 264 [*OAC* 3745-50 and -54 to -57] • Solid Waste and Infectious Waste Regulations, *OAC* 3745-27 • Chemical Waste Landfills, 40 *CFR* 761.75 • Land Disposal of Radioactive Waste – Facility Design and Siting Requirements, *OAC* 3701:1-54-08 and 09 • National Emission Standard for Asbestos – Standards for Waste Disposal, 40 *CFR* 61.151 [*OAC* 745-20-06 and -07] • CAMU, *OAC* 3745-57-72	• Site selection – consider sensitive resources (e.g., wetlands, floodplains, endangered and rare species, distance to residences, schools, streams, and drinking wells) • Site selection – consider hydrogeological factors (e.g., avoid fault zones, limestone quarry, sand and gravel pit, water table, groundwater aquifers) • Design landfill to meet design standards set forth in the regulations • Install engineered cover and storm water and surface water run-on/runoff controls during closure • Conduct continuous operational and closure/post-closure monitoring and inspections to maintain systems and post-closure controls • Set treatment standards for waste and means of operating treatment, storage, and disposal facilities

Table A.1. ARARs Compliance Crosswalk for Remedial Action Objectives

Remedial Action Objective	Key ARARs	Compliance Approaches
Remedial Action Objective 3: Prevent migration of contaminants from permanently isolated D&D wastes at levels that could cause adverse groundwater and surface water impacts or impacts to humans, plants, and animals.	• Standards for Owners and Operators of Hazardous Waste TSD Facilities: Landfills, 40 *CFR* 264, Subpart N [*OAC* 3745-57] • Standards for Owners and Operators of Hazardous Waste TSD Facilities: Releases From Solid Waste Management Units, 40 *CFR* 264, Subpart F and Closure and Post-closure, 40 *CFR* 264, Subpart G [*OAC* 3745-54 and -55] • Chemical Waste Landfills, 40 *CFR* 761.75 • Construction and Demolition Debris Landfills, *OAC* 3745-400 • National Emission Standard for Asbestos – Standard for Waste Disposal, 40 *CFR* 61.150 • "Radiation Protection of the Public and the Environment," DOE Order 458.1 • Radiation Control: Dose Limits for Individual Members of the Public, *OAC* 3701:1-38-13 • Land disposal of radioactive waste, design and waste characteristics, *OAC* 701:1-54-08 and 10	• Install double liners and leak detection system • Install leachate monitoring and collection system • Install engineered cover during closure • Install and maintain background and detection groundwater monitoring wells • Install and maintain surface water monitoring stations • Install and maintain radionuclide air monitoring stations • Conduct continuous operational and closure/post-closure monitoring and inspections to maintain systems and post-closure controls • Initiate multilayered response plans for any indication of potential migration of contaminants • Develop waste acceptance criteria to not allow waste placement that would cause adverse groundwater impacts or impacts to humans, plants, and animals

Table A.1. ARARs Compliance Crosswalk for Remedial Action Objectives (Continued)

APPENDIX B: ON-SITE DISPOSAL CELL WASTE ACCEPTANCE CRITERIA

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ON-SITE DISPOSAL CELL WASTE ACCEPTANCE CRITERIA

The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto (DFF&O) requires that the Ohio Environmental Protection Agency (Ohio EPA)-approved waste acceptance criteria (WAC) be included in the Proposed Plan to allow public review and comment. The WAC are developed to protect the public and the environment over the long term after a potential On-Site Disposal Cell (OSDC) is closed, as well as to protect the workers, the public, and the environment during operation of a potential OSDC and placement of the waste. The WAC address both the inherent health or environmental risk of the waste stream (the type and level of contamination) and the size or shape of the individual waste items. The WAC are developed to ensure there is no unacceptable release through the engineered features of a potential OSDC and also to protect the integrity of the final cap of a potential OSDC so it can function as designed for the long term. The WAC also serve to protect workers, the public, and the environment during the transportation of waste materials to a potential OSDC from the points of waste generation.

The WAC consist of seven components, which are outlined in the DFF&O: (1) prohibited items resulting from applicable or relevant and appropriate requirements (ARARs) or U.S. Department of Energy (DOE) decisions or agreements; (2) activity criteria and chemical concentration criteria (radiological levels and other contaminant levels); (3) waste evaluation and characterization standards (methods used in the field to verify waste can go into a potential OSDC); (4) waste physical characteristics standards (size and shape of items); (5) waste packaging standards; (6) waste safe handling standards; and (7) waste transportation standards. Several of the components (3 through 7) of the final WAC will require refinements after the final design is completed. Such refinements for these WAC components will be reviewed and approved by Ohio EPA in future OSDC-related regulatory documents as required by the DFF&O. The future OSDC regulatory documents would establish Ohio EPA-approved operational controls and field oversight for a potential OSDC, including measures to control dust emissions and leachate collection, treatment, and monitoring.

Waste must satisfy every component of the WAC before it is allowed to be disposed in a potential OSDC. Figure B.1 summarizes the seven individual WAC components and illustrates that the WAC are satisfied by evaluating each waste stream through a progressive step-wise process that considers all seven WAC components. If a waste stream cannot meet one or more of the WAC components, it either must be treated or further processed to satisfy the on-Site requirement, or it must be disposed off the Site. Each of the seven WAC components shown in the figure is described in greater detail after Figure B.1.

WAC Component 1. The first component of the WAC is a series of prohibitions that forbid waste from being disposed in an OSDC unless associated requirements are met. WAC Component 1 is divided into two parts:

- WAC Component 1A: Formal regulatory prohibitions that result from ARARs
- WAC Component 1B: DOE-elected prohibitions that result from DOE operational decisions to make the disposal facility even more protective or easier to operate.

Early public input was considered by DOE when developing the WAC Component 1B operational prohibitions. Included in the operational prohibitions is the requirement that only waste generated at the Portsmouth Gaseous Diffusion Plant (PORTS) be considered for disposal at a potential OSDC.

The list of draft operational prohibitions is presented in Table B.1, under WAC Component 1B. These operational prohibitions will be finalized once public comments on this Proposed Plan and the preferred alternative are considered.

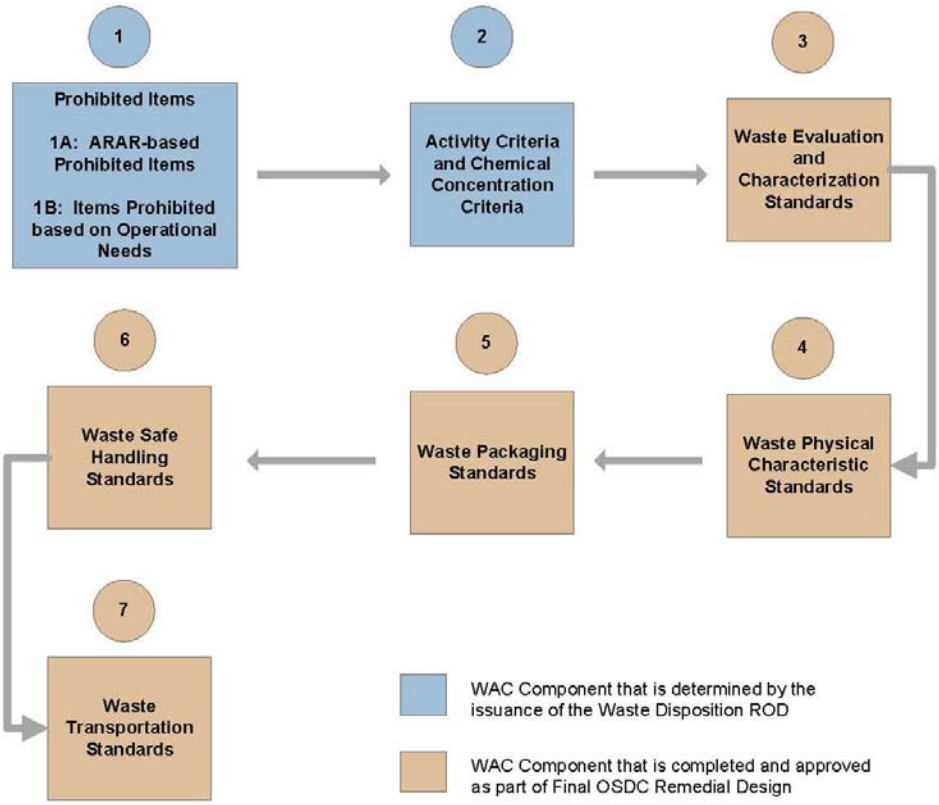

Figure B.1. The seven components of the waste acceptance criteria for a potential OSDC

WAC Component 2. WAC Component 2 requires that the waste be evaluated against activity and chemical concentration criteria as required by DFF&O. Wastes that do not meet these criteria are not allowed to be disposed in a potential OSDC unless further treatment following prescribed requirements is performed.

Fate and transport modeling was conducted to determine the potential migration of constituents of concern from the OSDC. The results of this modeling are presented in detail in Appendix I of the Waste Disposition Remedial Investigation/Feasibility Study. This modeling creates a tool to forecast the movement of the contaminant in the waste into the environment and to potential future human and ecological receptors. This model mathematically mimics the influences that both the site geology and the engineering properties of the disposal facility would have on the movement of these contaminants for 1,000 years into the future. The results of this modeling provide upper bound numerical limits for the maximum activity and chemical concentrations that may be present in hypothetical wastes to ensure the long-term protection of the public and the environment. The results indicate that the activity and chemical concentrations actually present in PORTS waste are at least five orders of magnitude lower

Examples of How a Potential Waste Stream is Evaluated Against All Seven WAC Components

Acid Batteries - *a potential waste stream that may be encountered when dismantling a building*.

- To evaluate whether or not acid batteries can be disposed in an OSDC, the list of prohibitions provided in WAC Component 1A are first evaluated.
- The WAC, under *OAC* 3745-273-31, prohibits placement of acid batteries in an OSDC.
- Therefore, acid batteries are not further evaluated under the remaining WAC Components for on-Site disposal, and acid batteries would be disposed of away from the Site.

Oversized Piece of Demolition Rubble - *a potential waste stream that may be encountered when dismantling a building*.

- Ineligible for on-Site disposal, irrespective of its ability to meet the requirements of the other six WAC components, until it is size reduced to meet the WAC Component 4 constraints

than what the model demonstrates could be placed into the disposal facility and remain protective. This conclusion is the result of the favorable geology found at the proposed location of a potential OSDC along with the robust engineering design features of the disposal facility.

Any waste stream that is designated as a Resource Conservation and Recovery Act of 1976 (RCRA), as amended, hazardous waste must meet the treatment standards associated with the ARARs summarized in Table B.1, WAC Component 2. As part of the preferred alternative, DOE is proposing designation of a potential OSDC as a treatment, storage, and disposal Corrective Action Management Unit (CAMU) under *Ohio Administrative Code (OAC)* 3745-57-72(E)(4) in the Site-wide Waste Disposition Project Record of Decision (ROD). This designation allows the establishment of treatment standards for CAMU-eligible wastes associated with implementing cleanup at PORTS. The standards take into consideration the protectiveness level of a potential OSDC. These treatment standards replace those treatment standards designated in *OAC* 3745-270-40, -45, and -49 for CAMU-eligible wastes. The designated treatment standards in *OAC* 3745-270-40, -45, and -49 will continue to apply to all non-CAMU-eligible RCRA hazardous wastes that are generated during Site cleanup. Based on the evaluation conducted at PORTS, the only Principal Hazardous Constituent (PHC) identified at this time is trichloroethene (TCE). An adjusted treatment standard of 5,000 ppm will be set. DOE is seeking public input to the selection of both the PHC and the treatment standard. Additional PHCs may be identified in the future pending any further required characterization (e.g., of landfills).

WAC Components 3 through 7. The other five components of the WAC deal specifically with the engineering features of a potential OSDC and will be modified as further design and operations plans of a potential OSDC are developed. Table B.1 includes the two design and operations documents that will be developed after the ROD is signed and, upon Ohio EPA review and approval, would become enforceable should an on-Site alternative be selected. These documents will detail out the remaining WAC components defined in the DFF&O and will be reviewed and, as appropriate, approved by Ohio EPA before implementation of the preferred alternative.

Prohibitions (Component 1A)	
Prohibition/Exclusions	**Rationale**
A prohibition on the acceptance of RCRA hazardous waste that does not meet LDR treatment standards.	40 *CFR* 268.40(a) *OAC* 3745-270-40(A)
A prohibition on the acceptance of RCRA hazardous debris and/or soil that does not meet Alternate Treatment Standards.	40 *CFR* 268.45(a) (for hazardous debris) 40 *CFR* 268.49(a) (for hazardous soil) *OAC* 3745-270-45(A) (for hazardous debris) *OAC* 3745-270-49(A) (for hazardous soil)
When a CAMU designation is obtained, a prohibition on CAMU-eligible waste that does not meet the established minimum treatment standards for the PHCs. The ROD will designate a potential OSDC as a treatment, storage, and disposal CAMU and TCE as a PHC with a treatment standard of 5,000 ppm.	40 *CFR* 264.552(e)(4) *OAC* 3745-57-72(E)(4)
A prohibition on the acceptance of ignitable and reactive waste per RCRA.	40 *CFR* 264.312(b) *OAC* 3745-57-12(B)
A prohibition on the acceptance of TRU waste or HLW.	DOE Order 435.1 design constraints
A prohibition on the acceptance of refrigeration equipment with remaining refrigerant per Ozone Standards.	40 *CFR* 82.154(b)
A prohibition on the placement of acid batteries.	40 *CFR* 273.31 *OAC* 3745-273-31
A prohibition on the placement of bulk used oils in liquid form.	40 *CFR* 279.81 *OAC* 3745-279-81
Prohibition on the disposal of PCB-contaminated electrical equipment (except capacitors) containing free-flowing liquids.	40 *CFR* 761.60(b)(4)
Prohibition on the disposal of PCB-contaminated articles containing free flowing liquids.	40 *CFR* 761.60(b)(6)(ii)
Prohibition on the disposal of PCB liquids drained from electrical equipment.	Must be disposed in an incinerator or high-efficiency boiler depending on concentration
Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	*OAC* 3701:1-54-10(B)(6)
Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.	*OAC* 3701:1-S4-10(B)(4)
Waste must not contain or be capable of generating quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste.	*OAC* 3701:1-S4-10(B)(S)
Prohibition on the acceptance of RCRA hazardous waste containing bulk or non-containerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added).	40 *CFR* 264.314(a) *OAC* 3745-27-19(E)(8)(b) and (h)(i) *OAC* 3745-57-14(A)(E)
When a CAMU designation is obtained, prohibition on the placement of bulk or non-containerized liquid hazardous waste or free liquids contained in hazardous waste (whether or not sorbents have been added) in any CAMU except where placement of such wastes facilitates the remedy selected for the waste. (This prohibition applies to CAMU-eligible waste.)	40 *CFR* 264.552(a)(3) *OAC* 3745-57-72(A)(3)

Table B.1. Proposed Waste Acceptance Criteria for a Potential OSDC

Prohibited Waste Streams by Agreement (Component 1B)	
Waste Stream	**Description**
Off-PORTS generated waste	A prohibition on the acceptance of waste from off-PORTS generating sources (excluding lab returns and treatability testing wastes and material currently stored on the Facility).
Compressors, Converters, and Coolers from X-326	Components in-place within the X-326 Process Building as of April 15, 2010, the initial date of the DFF&O.
Enriched materials	Containerized nuclear material inventories of uranium compounds exhibiting enrichments greater than 20 percent (excludes items such as miscellaneous parts, pipes, valves, empty containers, etc., with only residual contamination which were packaged for ease of handling and safety reasons).
Activity and Chemical Concentration Criteria (Component 2)	
Waste Stream	**Requirement**
Hazardous waste	Treatment standards, arranged by hazardous waste code, are located in the "Treatment Standards for Hazardous Waste" table in *OAC* rule 3745-270-40.
Hazardous waste contaminated debris	Alternate treatment standards are located in *OAC* rule 3745-270-45.
Hazardous waste contaminated soil	Alternate treatment standards are located in *OAC* rule 3745-270-49.
CAMU-eligible hazardous waste	When a CAMU designation for a potential OSDC is obtained, TCE will be adopted as a PHC. A treatment standard of 5,000 ppm would be used to replace those standards in 3745-270-40, -45, and -49.
Documents that Become Part of WAC Upon Approval (Components 3 through 7)	
Document[a]	**WAC Components Included[b]**
WAC Implementation Plan	Prohibitions **Activity Criteria and Chemical Concentration Criteria** **Waste Evaluation and Characterization Standards** **Waste Safe Handling Standards**
OSDC Operations Plan	**Waste Physical Characteristics Standards** **Waste Packaging Standards** **Waste Transportation Standards**

[a]The noted documents will become part of the enforceable WAC upon Ohio EPA review and approval.
[b]Bolded components in Components 3 – 7 are from the DFF&O WAC definition in Section III Paragraph 5.mm.

CAMU = Corrective Action Management Unit
CFR = Code of Federal Regulations
DFF&O = *The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto*
DOE = U.S. Department of Energy
HLW = high-level (radioactive) waste
LDR = land disposal restriction
OAC = Ohio Administrative Code
Ohio EPA = Ohio Environmental Protection Agency
OSDC = On-Site Disposal Cell
PCB = polychlorinated biphenyl
PHC = Principal Hazardous Constituent
PORTS = Portsmouth Gaseous Diffusion Plant
RCRA = Resource Conservation and Recovery Act of 1976, as amended
ROD = Record of Decision
TCE = trichloroethene
TRU = transuranic
WAC = waste acceptance criteria

Table B.1. Proposed Waste Acceptance Criteria for a Potential OSDC (Continued)

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APPENDIX C
U.S DEPARTMENT OF ENERGY'S PROPOSED CORRECTIVE ACTION MANAGEMENT UNIT AND AREA OF CONTAMINATION DESIGNATIONS FOR THE PREFERRED ALTERNATIVE

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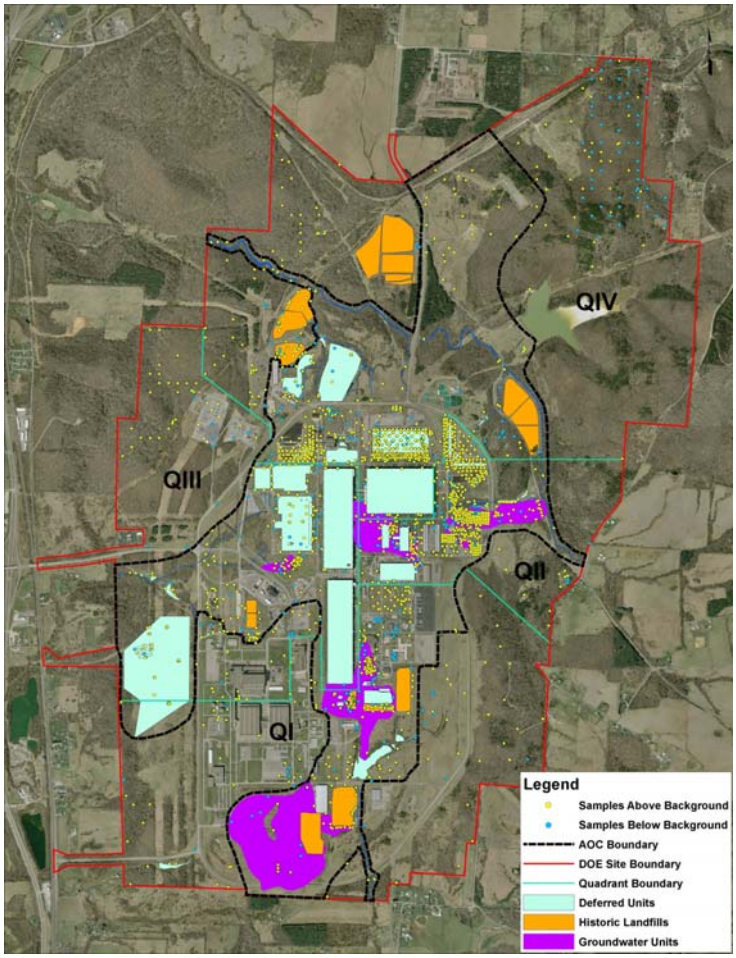
This appendix summarizes the basis for the U.S. Department of Energy's (DOE's) proposed designation under *Ohio Administrative Code* (*OAC*) 3745-57-72(A) of the On-Site Disposal Cell (OSDC) as a treatment, storage, and disposal Corrective Action Management Unit (CAMU). It also provides the Impacted Materials Transfer Area (IMTA) as a treatment and storage CAMU. CAMU means an area within a facility that is used only for managing CAMU-eligible wastes for implementing corrective action or cleanup at the facility. CAMUs are created under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, to facilitate treatment, storage, and disposal of hazardous wastes managed for implementing cleanup, and to remove the disincentives to cleanup that the application of RCRA to these wastes can sometimes impose. RCRA, also known as the Solid Waste Disposal Act, is a federal law that allows for the regulation and management of hazardous waste.

The designation of the OSDC as a CAMU at the Portsmouth Gaseous Diffusion Plant (PORTS) would allow for the excavation, consolidation, and on-Site disposal of cleanup wastes that are contaminated with RCRA-regulated hazardous wastes and hazardous wastes constituents into the OSDC, provided the wastes meet all waste acceptance criteria (WAC) limits including any waste treatment standards established for disposal in the CAMU. A CAMU is an area located within a facility which manages only "CAMU-eligible" waste. CAMU-eligible waste is generally remediation waste (e.g., contaminated soil). At PORTS, the building demolition wastes are also considered to be CAMU eligible. The CAMUs were developed to promote more aggressive remediation by providing a more flexible approach to the management and disposition of hazardous waste-contaminated cleanup wastes. At PORTS, the OSDC CAMU will serve this purpose by providing the mechanism to potentially remove and consolidate facility-wide contamination from various areas (e.g., closed landfill units within Perimeter Road), into a new state-of-the-art OSDC. These regulations provide that CAMU-eligible wastes are placed in engineered storage or disposal facilities to assure the protection of human health and the environment.

Along with seeking a CAMU designation, DOE is also seeking the Ohio Environmental Protection Agency (Ohio EPA) Director's concurrence that a portion of PORTS is an area of contamination (AOC) as a tool for the efficient management and consolidation of remediation wastes generated during implementation of the cleanup actions at PORTS. The AOC concept allows DOE to manage cleanup waste without triggering traditional RCRA requirements as long as the cleanup waste is managed within the AOC. The proposed boundaries of the AOC are presented in Figure C.1. Through extensive sampling, DOE has defined the horizontal boundaries of the AOC at DOE's Portsmouth reservation as depicted in Figure C.1. While the contiguous vertical depth of contamination within this area varies, by using this extensive sampling data, DOE will be able to navigate during the remediation to either ensure remedial activities comport with the AOC policy when working in contaminated media for purposes of RCRA compliance, or use other appropriate remedial regulatory tools, such as storage/treatment CAMUs as discussed in the document, when remedial activities are outside the scope of the AOC policy. Furthermore, while extensive sample data results have not been gathered from underneath buildings within the potential AOC, DOE believes that, at a minimum, these areas under the buildings would be within the general horizontal AOC presented.



*The AOC also includes the wastewater outfall line to the Scioto River.

Figure C.1. Area of Contamination Lateral Boundary

These buildings, as they exist currently, are encompassed by other areas of generally dispersed contamination and therefore fall within the scope of an AOC. Using this AOC allows for the unencumbered movement of decontamination and decommissioning wastes, waste not within *The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto* (DFF&O) (non-DFF&O waste), and other remediation waste within the confines of the AOC without triggering the generation of hazardous waste that would result in the need for additional handling requirements to be implemented.

This appendix includes a discussion of the basis for the Director's proposed designation of the OSDC as a CAMU, the process for identifying Principal Hazardous Constituents (PHCs), the basis for the adjusted treatment standard for trichloroethene (TCE), the only PHC currently identified, and the Director's proposed designation of the IMTA as a treatment and storage CAMU. The appendix also describes the process for identifying and designating future temporary treatment and storage CAMUs that may be necessary during the design and implementation of the remediation efforts at PORTS. More detail can be found in the Waste Disposition RI/FS Supplement No. 1, titled *Supplement No. 1 to the Remedial Investigation and Feasibility Study Report for the Site-Wide Waste Disposition Evaluation Project Proposed Corrective Action Management Unit and Area of Contamination Designations for Alternative 2 at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*.

In response to DOE's proposal to designate the CAMU, Ohio EPA has considered the criteria set forth in *OAC* 3745-57-72 and determined that the CAMU satisfies all of the following required criteria:

- The CAMU facilitates the implementation of a reliable, effective, protective and cost-effective remedy;
- The management of waste at the designated CAMU will not create unacceptable risk to human health or the environment resulting from exposure to hazardous wastes or hazardous waste constituents;
- The CAMU includes uncontaminated areas of the Site only to the extent inclusion of such areas is more protective than managing the waste at contaminated areas;
- Wastes in the CAMU that remain after closure would be managed and contained to minimize future release, to the extent practicable;
- The CAMU expedites the timing of remedial activity implementation;
- The CAMU uses, to the extent appropriate, treatment to reduce the toxicity, mobility, or volume of waste remaining after closure of the CAMU; and
- The CAMU, to the extent practicable, minimizes the land area of the facility upon which wastes will remain in place after closure of the CAMU.

There are four steps that have been used and will be used in the future to identify PHCs, which are recognized in the CAMU regulations as those constituents that may require treatment prior to disposal in a CAMU. First, any contaminant that is a RCRA hazardous waste or hazardous waste constituent defined under *OAC* 3745-270 is a potential PHC. Second, the maximum contaminant level of the constituent present is compared to a risk-based screening level equating to a 1×10^{-3} excess lifetime cancer risk (ELCR) through ingestion or inhalation (or a hazard quotient of 10 for non-carcinogenic contaminants) for the potential future outdoor industrial worker of PORTS. If that screening level is not exceeded, the contaminant is not a PHC. Third, if the maximum value does exceed the screening level, either a qualitative or quantitative evaluation is done to determine if the contaminant would cause an ELCR of 1×10^{-3} or a hazard quotient of 10 in an area. Finally, any hazardous constituent that poses a threat to groundwater resulting in an elevated risk to human health is also considered as a potential PHC.

Based on the large amount of existing soil data collected since the early 1990s for over 100 potential contaminants at PORTS, only TCE is currently identified as a PHC. It is designated as a PHC because it is considered a listed RCRA

hazardous waste at PORTS due to the process by which it was used and because the known soil concentrations in several investigation areas at PORTS exceed the calculated 282 mg/kg risk-based PHC screening value for TCE. Additionally, there are sufficient samples exceeding the level that are within or located just above the groundwater table, indicating that TCE currently represents an elevated risk to humans from groundwater use. Should future data identify the potential that other contaminants may be PHCs, the same process would be conducted to evaluate these contaminants.

There are two treatment options in the CAMU regulations. Typically for remediation waste, those requirements in *OAC* 3745-57-72(E)(4)(d) are used to identify the treatment standard that must be achieved. The goal of a 90 percent reduction in the starting representative concentration of the exposure unit is the basis for most treatment standards set under this provision. The other provision in *OAC* 3745-57-72(E)(4)(e) provides various options for the Director to adjust the treatment standard considering other factors such as community input, short-term risks, or cost-effectiveness based on the protectiveness provided by the CAMU. The adjusted standards selected by the Director must be protective of human health and the environment.

DOE has requested the Director to use the adjusted treatment standard approach identified in *OAC* 3745-57-72(E)(4)(e) to set treatment standards for TCE, which is primarily present in potential OSDC fill material that may be obtained from PORTS' existing landfills inside Perimeter Road, and from contaminated soils removed from the PORTS groundwater contamination plumes. The primary reason for using the (E)(4)(e) provision is the need for any OSDC fill actions to remain cost-effective to maximize the opportunity for consolidating contaminated soil in the OSDC and to direct funds towards improving the cleanup schedule. If additional PHCs are identified, consideration of both rule provisions will be evaluated.

The primary justification used to develop an adjusted standard for TCE under the (E)(4)(e) provision are as follows:

1) Dewatering of any soil containing free liquids including pure organic solvents would be the treatment method of choice.

2) Dewatering is considered a cost-effective treatment technology because other elements of the WAC prohibit the disposal of waste with free liquids present.

3) Residual TCE concentrations in the soil after dewatering are anticipated to be orders of magnitude below any levels required to be protective after disposal because of the robust design of the OSDC and the low permeability of the underlying bedrock. Therefore, use of dewatering would be a cost-effective and protective treatment technology.

4) A cost-effective means of handling the contaminated soil prior to use as OSDC fill improves the opportunity to use contaminated soil as OSDC fill, a preference by the local community.

5) Finally, considering the need to protect the OSDC lining system, an adjusted treatment standard of 5,000 ppm was selected and is presented in Appendix B as part of the OSDC WAC, to represent the final maximum TCE contamination in the soil after dewatering, if needed.

Treatment and storage CAMU(s) can also be used for storage and/or treatment of wastes which will not remain after closure of the CAMU. As part of this proposed plan, DOE is seeking the designation of the IMTA as a storage and treatment CAMU. It is likely that additional treatment or storage CAMU(s) may be established within the AOC during implementation of Alternative 2. The identification of such CAMUs would be presented in future regulatory documents and the CAMU information would be made available for public comment prior to approval/concurrence by Ohio EPA.

Consistent with the DFF&O, the Ohio EPA Director has considered all anticipated waste streams to be generated under the DFF&O work activities and the potential waste streams outside the DFF&O in the technical evaluation of the CAMU designations summarized in this Proposed Plan. Although all anticipated waste streams have been

considered in the technical CAMU evaluations, additional regulatory authorizations/approvals will be necessary to place those waste streams that originate outside of the DFF&O work activities into the CAMU.

If the future authorizations/approvals for the excavation and placement of waste streams that originate outside the DFF&O work activities in the OSDC occur, the identified PHC and adjusted treatment standard summarized in this Proposed Plan will serve as overarching WAC limits for TCE in all CAMU-eligible waste streams authorized for disposal in the OSDC, irrespective of their regulatory origin.

Under *OAC* 3745-57-72(H), the Ohio EPA Director is required to provide public notice and a reasonable opportunity for public comment before designation of the CAMU. DOE is using this Waste Disposition Proposed Plan to consider public comments on the proposed CAMU designation. Ohio EPA will provide public notice and seek public comments on the proposed CAMU designation through a separate notification. Following the receipt and review of public comments, the Ohio EPA Director will designate the CAMU, with any revisions necessary as a result of public comment, in the Site-wide Waste Disposition Evaluation Project Record of Decision.

Comment Form

DOE is interested in your comments on the waste disposal alternatives being considered in the RI/FS and Proposed Plan for the Site-wide Waste Disposition Evaluation Project at PORTS. The preferred alternative for waste disposal includes a combination of on-Site and off-Site waste disposal, with the majority of waste remaining on the Site in a newly constructed On-Site Disposal Cell. Please use the space provided below to write your comments, then fold, tape (**no staples**), and mail this form. We must receive your comments on or before the close of the public comment period on January 10, 2015. If you have questions about the comment period, please contact the hot line at 888-603-7722. Additional information or related cleanup documents are available to the public at the DOE Environmental Information Center, located at 1862 Shyville Road, Room 207, Piketon, OH 45661.

Providing Information Below is Optional

Name: _____

Address: _____

City: _____

Phone: _____

PORTS D&D Project Mailing List

Please add my name to the PORTS Mailing List to receive additional information on the cleanup progress at the PORTS D&D Project.

Yes _____ No _____

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