

3. ENVIRONMENTAL PROGRAM INFORMATION

3.1 SUMMARY

In 2009, DOE contractors installed an additional groundwater extraction well in the Quadrant I Groundwater Investigative Area, conducted an investigation of potential contaminant sources in the Quadrant II Groundwater Investigative Area, and evaluated remedial alternatives for the X-701B Holding Pond and the groundwater plume near the former X-740 Waste Oil Handling Facility. DOE proposed to excavate soil in the western portion of the X-701B area and directly mix oxidant into the contaminated soil. Ohio EPA approved this additional action in October 2009 and excavation and soil mixing began in December 2009.

In 2009, DOE PORTS received \$118 million in funding under the American Recovery and Reinvestment Act (ARRA). Five projects that involve environmental remediation, D&D of inactive facilities, or materials disposition were funded by ARRA and underway at the end of 2009. These projects are environmental remediation (source removal) at the X-701B Holding Pond as described in the previous paragraph; D&D of the X-533 Switchyard Complex, X-633 Cooling Towers Complex, and X-760 Chemical Engineering Building; and repackaging and disposition of excess uranium materials.

In 2009, approximately 7 million pounds of waste from DOE PORTS were recycled, treated, or disposed at off-site facilities. Activities undertaken by the Environmental Sustainability, Training, Inactive Facilities Removal, and Public Awareness programs are also discussed in this chapter.

Chapter 2, Section 2.3.6, provides information on DOE Order 450.1 and implementation of the DOE PORTS EMS.

3.2 ENVIRONMENTAL RESTORATION PROGRAM

The DOE established the Environmental Restoration Program in 1989 to identify, control, and remediate environmental contamination at PORTS. The Environmental Restoration Program addresses inactive sites through remedial action and deals with soil and groundwater associated with active facilities through eventual D&D. Options for correcting or mitigating the contaminated sites and facilities include removal, containment, and treatment of contaminants. Because PORTS is a large facility, it is divided into quadrants (Quadrant I, II, III, and IV) to facilitate the cleanup process.

The Environmental Restoration Program was established to fulfill the cleanup requirements of the Ohio Consent Decree and U.S. EPA Administrative Consent Order. As required by these enforcement actions, DOE PORTS Environmental Restoration Program activities are conducted in accordance with the RCRA corrective action process, which consists of the following:

- *Description of current conditions* – to provide knowledge of the groundwater, surface water, soil, and air.
- *RCRA facility assessment* – to identify releases of contaminants and determine the need for further investigation.
- *RCRA facility investigation* – to determine the nature and extent of any contamination.

- *Cleanup alternatives study/corrective measures study* – to identify and evaluate remedial alternatives to address contamination identified during the RCRA facility investigation.
- *Corrective measures implementation* – to implement the selected remedial alternative(s).

DOE PORTS has completed the description of current conditions, RCRA facility assessment, RCRA facility investigation, and cleanup alternatives study/corrective measures study for each quadrant. Following the approval of the final cleanup alternative study/corrective measure study, the Ohio EPA selects the remedial alternatives that will undergo further review for determining the final remedial actions for each quadrant (the Preferred Plan). Upon concurrence from the U.S. EPA and completion of the public review and comment period, the U.S. EPA and Ohio EPA select the final remedial actions for each quadrant. The Ohio EPA issues a decision document to select the final remedial actions.

Implementation of remedial actions is underway in each quadrant. Remedial actions are described for each quadrant in the sections presented below. Table 3.1 lists completed activities for the groundwater monitoring areas at PORTS, which include remedial actions required by decision document and other actions. Remedial actions required by a decision document are reviewed by Ohio EPA on a schedule agreed upon by Ohio EPA and DOE (approximately every five years) to ensure that the remedial actions are performing as intended by the decision document and are protective of human health and the environment. No five-year reviews were completed during 2009.

The Ohio EPA has deferred further investigation and/or remedial action for certain areas known as “deferred units.” Deferred units are areas that are in or adjacent to current production and operational areas such that remedial activities would interrupt operations, or are areas that could become recontaminated from ongoing operations. The Ohio EPA has deferred investigation/remedial action of soil and groundwater associated with these units until D&D of PORTS or until the unit no longer meets the requirements for deferred unit status.

In 2009, DOE Headquarters continued the planning process for D&D of the PORTS gaseous diffusion facilities and associated buildings. DOE and Ohio EPA were working together to develop the Director’s Final Findings and Orders (a legal agreement between the DOE and Ohio EPA) that will provide the requirements for D&D of PORTS.

3.2.1 Quadrant I

The *Quadrant I Cleanup Alternative Study/Corrective Measures Study* was approved by the Ohio EPA in 2000. The Ohio EPA issued the Decision Document for Quadrant I in 2001, which provided the required remedial actions for the X-749/X-120 groundwater plume and the Quadrant I Groundwater Investigative Area (the Five-Unit Groundwater Investigative Area and X-231A/X-231B Oil Biodegradation Plots). Remedial actions required for the X-749B Peter Kiewit Landfill (PK Landfill) were provided in separate Decision Documents issued by Ohio EPA in 1996 and U.S. EPA in 1997. The following sections discuss the remedial actions required for the X-749/X-120 groundwater plume, PK Landfill, and the Quadrant I Groundwater Investigative Area. Soil and groundwater associated with the deferred units in Quadrant I will be addressed during D&D of PORTS.

3.2.1.1 X-749/X-120 groundwater plume

The remedial actions identified for X-749/X-120 groundwater plume include phytoremediation of the groundwater plume, installation of a barrier wall around the eastern and southern portion of the X-749 Landfill, and continued operation of the groundwater collection trenches installed at the PK Landfill and X-749 Landfill.

Table 3.1. Remedial actions completed at PORTS in groundwater monitoring areas

Quadrant/monitoring area	Remedial action/year completed
Quadrant I X-749/X-120 plume	<p>X-749 multimedia cap – 1992</p> <p>X-749 barrier wall (north and northwest sides of landfill) – 1992</p> <p>X-749 subsurface drains and sumps – 1992</p> <p>South barrier wall – 1994</p> <p>X-120 horizontal well – 1996</p> <p>X-625 Groundwater Treatment Facility – 1996</p> <p>X-749 barrier wall (east and south sides of landfill) – 2002</p> <p>Phytoremediation (22 acres) – 2002 & 2003</p> <p>Injection of hydrogen release compounds – 2004</p> <p>X-749 South Barrier Wall Area extraction wells – 2007</p> <p>Two additional extraction wells in the groundwater collection trench on the southwest side of the X-749 Landfill – 2008</p>
Quadrant I PK Landfill (X-749B)	<p>Relocation of Big Run Creek – 1994</p> <p>Groundwater collection system – 1994</p> <p>Groundwater collection system expansion – 1997</p> <p>PK Landfill Subtitle D cap – 1998</p>
Quadrant I Quadrant I Groundwater Investigative Area (Five-Unit Groundwater Investigative Area)	<p>Groundwater extraction wells (3) – 1991</p> <p>X-622 Groundwater Treatment Facility – 1991 (upgraded in 2001)</p> <p>Interim soil cover at X-231B – 1995</p> <p>X-231A/X-231B multimedia caps – 2000</p> <p>Groundwater extraction wells (11) – 2002</p> <p>Groundwater extraction well (1) – 2009</p>
Quadrant I X-749A Classified Materials Disposal Facility	<p>Cap – 1994</p>
Quadrant II Quadrant II Groundwater Investigative Area (Seven-Unit Groundwater Investigative Area)	<p>Operation of X-700 and X-705 building sumps – 1989</p> <p>X-622T Groundwater Treatment Facility – 1992</p> <p>Removal of X-720 Neutralization Pit – 1998</p> <p>Removal of X-701C Neutralization Pit – 2001</p> <p>Removal of contaminated soil near X-720 Neutralization Pit – 2001</p> <p>X-627 Groundwater Treatment Facility – 2004 (replaced the X-622T facility)</p>
Quadrant II X-701B Holding Pond	<p>X-237 Groundwater Collection System – 1991</p> <p>X-624 Groundwater Treatment Facility – 1991 (upgraded 2006)</p> <p>Extraction wells (3) – 1993</p> <p>X-623 Groundwater Treatment Facility – 1993</p> <p>X-701B sump – 1995</p> <p>Groundwater remediation by oxidant injection</p> <p>Phase I oxidant injections – 2005</p> <p>Phase IIa oxidant injections – 2006</p> <p>Phase IIb and IIc oxidant injections – 2007</p> <p>Phase IId, IIe, and IIf oxidant injections – 2008</p>

Table 3.1. Remedial actions completed at PORTS in groundwater monitoring areas (continued)

Quadrant/monitoring area	Remedial action/year completed
Quadrant III X-740 Waste Oil Handling Facility	Phytoremediation – 1999 Oxidant injections – 2008
Quadrant IV X-611A Former Lime Sludge Lagoons	Soil cover – 1996 Prairie vegetation planted – 1997
Quadrant IV X-735 Landfills	Cap on northern portion – 1994 Cap on southern portion – 1998
Quadrant IV X-734 Landfills	Cap on X-734B Landfill (Phase I) – 1999 Cap on X-734 and X-734A Landfills (Phase II) – 2000

Phytoremediation is a process that uses plants to remove, degrade, or contain contaminants in soil and/or groundwater. Phytoremediation at the X-749/X-120 groundwater plume was installed in two phases during 2002 and 2003. The *Preliminary Evaluation Report for the X-749/X-120 Phytoremediation System*, completed in January 2008, provided a preliminary evaluation of the phytoremediation system. The trees selected for the phytoremediation system had just begun to develop sufficient leaf area (approximately equal to root volume) so that groundwater was transpired through the trees; therefore, a complete system evaluation could not be completed. Water level data and tree core sampling results indicated that contaminated groundwater was being transpired by the trees; however, the volume of contaminated groundwater uptake by the trees was uncertain. Continued operation of the phytoremediation system was recommended in order for the trees to grow and develop a more extensive root system. The next review of the remedial actions implemented at the X-749/X-120 groundwater plume will be submitted to Ohio EPA in 2011.

In 2009, monitoring data collected from wells in the X-749/X-120 groundwater plume indicated that the extraction wells installed in the X-749 South Barrier Wall area and the groundwater collection trench on the southwest side of the X-749 Landfill are reducing concentrations of trichloroethene within the groundwater plume and causing the plume perimeter to shrink. Chapter 6, Section 6.4.1.4, provides additional information about the 2009 groundwater monitoring results for the X-749/X-120 groundwater plume.

3.2.1.2 PK Landfill

The remedial actions required by the PK Landfill Decision Documents consisted of the continued operation of the eastern groundwater collection system installed in 1994 and construction of an engineered cap that meets the RCRA Subtitle D and related requirements. In addition, the southeastern groundwater collection system was constructed in 1997 to contain surface seeps, groundwater from the southern slope of the PK Landfill, and the groundwater plume migrating toward Big Run Creek from the X-749 Landfill.

The second five-year review for the PK Landfill was completed in 2008. This report, the *Second Five-Year Review for the X-749B Peter Kiewit Landfill*, found that the remedial actions implemented at the PK Landfill (the groundwater collection systems and landfill cap) were achieving remedial action objectives by eliminating exposure pathways and reducing the potential for contaminant transport. Concentrations of many of the contaminants detected in the PK Landfill wells, sumps, and manholes had decreased significantly from 1999 to 2007. Contaminants detected in the PK Landfill wells, sumps, and

manholes were not detected in surface water samples collected from Big Run Creek adjacent to or downstream from PK Landfill. Based on these data, construction of a barrier wall on the upgradient sides of the PK Landfill did not appear to be necessary. The next review of the remedial actions implemented at the PK Landfill will be submitted to Ohio EPA in 2013.

Chapter 6, Section 6.4.1.4, provides 2009 groundwater monitoring results for the PK Landfill area.

3.2.1.3 Quadrant I Groundwater Investigative Area

Remedial actions identified for the Quadrant I Groundwater Investigative Area (also called the Five-Unit Groundwater Investigative Area) are: 1) installation of multimedia caps over the X-231A and X-231B Biodegradation Plots; and 2) installation of 11 additional groundwater extraction wells to extract contaminated groundwater for treatment in the X-622 Groundwater Treatment Facility. The caps were constructed in 2000 and operation of the groundwater extraction wells began in 2002. In 2009, an additional extraction well was installed south of the X-326 Process Building to control and remediate a newly identified source of trichloroethene beneath the building. Table 3.1 lists the remedial actions completed for the Quadrant I Groundwater Investigative Area.

A five-year review of both the groundwater extraction system for the Quadrant I Groundwater Investigative Area and the multi-layered caps for the X-231A and X-231B Oil Biodegradation Plots was completed in 2008. This report, the *First Five-Year Review for the Five-Unit Groundwater Investigative Area and X-231A/X-231B Oil Biodegradation Plots*, found that the remedial actions had eliminated potential exposure pathways to contaminants and reduced concentrations of trichloroethene in the groundwater, although more slowly than expected. The next review of the remedial actions implemented at the Quadrant I Groundwater Investigative Area and X-231A/B Oil Biodegradation Plots will be submitted to Ohio EPA in 2013.

Chapter 6, Section 6.4.2.3, provides information on the groundwater monitoring completed in the Quadrant I Groundwater Investigative Area during 2009.

3.2.2 Quadrant II

The *Quadrant II Cleanup Alternative Study/Corrective Measures Study* was approved by the Ohio EPA on March 26, 2001. After approval of the document, however, the Ohio EPA requested an amendment to the approved study to address additional remedial alternatives for the X-701B area. Amendments were submitted in 2001 and 2002. In January 2003, the Ohio EPA informed the DOE that a separate Preferred Plan and Decision Document would be prepared for the X-701B area. The Ohio EPA issued the X-701B Preferred Plan in September 2003 and the X-701B Decision Document in December 2003.

Chapter 6 provides 2009 groundwater monitoring results for the following areas in Quadrant II that require groundwater monitoring: X-701B Holding Pond (Section 6.4.4.1), Quadrant II Groundwater Investigative Area (Section 6.4.3.1), and X-633 Pumphouse/Cooling Towers Area (a deferred unit) (Section 6.4.5.1).

3.2.2.1 X-701B Holding Pond

Remedial actions required by the Decision Document include groundwater remediation by injection of a chemical oxidant. Following groundwater remediation, remedial actions for soil in the X-701B area include removal of contaminated soil in the western portion of the area and consolidation of the soil under two landfill caps to be constructed over the X-701B Holding Pond/East Retention Basin and the West

Retention Basin. Two landfill caps will be constructed so that an existing storm water drainage pipe will not be covered.

Phase I field activities for the X-701B groundwater remediation began in 2005 to determine operating parameters for the oxidant injection system. Based on the results of the Phase I field activities, DOE developed a work plan for the completion of the groundwater remediation at X-701B, which was approved by Ohio EPA in 2006. Six rounds of oxidant injections were completed between October 2006 and October 2008. Following the October 2008 injections, DOE PORTS requested an independent review of the X-701B project by DOE Headquarters to evaluate remediation results to date and provide recommendations for a path forward.

The review of the X-701B oxidant injections determined that the method used to inject oxidant into the contaminated area was not able to address contaminants in the deepest portion of the contaminated soil. If contaminants remain in this portion of the soil, they would continue to be released into the groundwater plume. Therefore, DOE proposed to excavate soil in the western portion of the X-701B area and directly mix oxidant into the contaminated soil. Ohio EPA approved this additional action in October 2009 and excavation and soil mixing began in December 2009. This remediation of the X-701B groundwater plume is one of the projects funded by ARRA.

3.2.2.2 Quadrant II Groundwater Investigative Area

A number of deferred units are in the groundwater plume in the Quadrant II Groundwater Investigative Area (also known as the Seven-Unit Area). A special investigation conducted in 2009, which sampled soil and groundwater, identified areas of higher trichloroethene concentrations that appeared to be associated with continuing sources of groundwater contamination in the southeastern portion of the plume. At the end of 2009, DOE was evaluating options to remediate these contaminant sources.

3.2.3 Quadrant III

The *Quadrant III Cleanup Alternative Study/Corrective Measures Study* was approved by the Ohio EPA in 1998. The Decision Document for Quadrant III required phytoremediation of the groundwater plume near the X-740 Waste Oil Handling Facility. Soil and groundwater associated with the deferred units in Quadrant III will be addressed during D&D of PORTS.

Over 700 hybrid poplar trees were planted on a 2.6-acre area above the X-740 groundwater plume in 1999. In 2003, a five-year review was completed for the X-740 groundwater plume to evaluate the effectiveness of the phytoremediation system. The report, entitled *Five-Year Evaluation Report for the X-740 Phytoremediation Project*, indicated that the trees in the phytoremediation system did not noticeably affect the overall groundwater flow in the Gallia at this area, although the trees did appear to influence water levels in individual wells. Concentrations of trichloroethene in the X-740 groundwater plume had not decreased appreciably.

Upon review of the 2003 Five-Year Evaluation Report, the Ohio EPA required another evaluation of this area in three years to determine if the phytoremediation system was effective in remediating the groundwater plume. Additional data collected for this evaluation included soil moisture at specified depths below ground surface, wind speed/direction, rainfall, air/soil temperature, tree growth rates, and sap flow measurements. The *Supplemental Evaluation to the Five-Year Evaluation Report for the X-740 Phytoremediation System*, submitted to Ohio EPA in January 2007, found that the phytoremediation system had not performed as expected to remove trichloroethene from groundwater in this area.

In response to Ohio EPA comments on this report, DOE developed a work plan for additional remedial activities for the X-740 area. Three rounds of oxidant injections were completed in May, June/July, and September of 2008 to remove trichloroethene from the groundwater. Although the oxidant briefly reduced trichloroethene concentrations detected in some of the wells, trichloroethene concentrations in groundwater returned to typical levels in 2009. At the end of 2009, the DOE was evaluating additional alternatives to remediate groundwater in the X-740 area.

Chapter 6 provides 2009 groundwater monitoring results for the following areas in Quadrant III that require groundwater monitoring: X-616 Chromium Sludge Surface Impoundments (Section 6.4.6.1) and X-740 Waste Oil Handling Facility (Section 6.4.7.1).

3.2.4 Quadrant IV

The *Quadrant IV Cleanup Alternative Study/Corrective Measures Study* was approved by the Ohio EPA in 1998. The DOE received the Decision Document for Quadrant IV in 2000. No new remedial actions were required in Quadrant IV (remedial actions had already taken place at the X-344D Hydrogen Fluoride Neutralization Pit, X-735 Landfills, X-611A Former Lime Sludge Lagoons, and X-734 Landfills). Soil and groundwater associated with the deferred units in Quadrant IV will be addressed during D&D of PORTS.

Ohio EPA and U.S. EPA issued a Decision Document for the X-611A area in 1996, which required a soil cover over the former lagoons and establishment of a prairie habitat. The soil cover and planting of the prairie were completed in 1997. The *Second Five-Year Review for the X-611A Prairie* was submitted to Ohio EPA in 2008. The report found that the soil cover and prairie habitat were continuing to meet the remedial action objectives for this unit by eliminating exposure pathways to the contaminants in the sludge at this area. The next review of the remedial actions implemented at the X-611A area will be submitted to Ohio EPA in 2013.

Ohio EPA issued a Decision Document for the X-734 Landfills in 1999. Remedial actions required by the Decision Document included construction of a multimedia cap over the northern portion of the landfills and a soil cap over the southern portion of the area. These caps were installed in 1999 and 2000.

The *First Five-Year Review for the X-734 Landfill Area* was submitted to Ohio EPA in 2008. The report found that construction of the caps on the landfills had achieved remedial action objectives by isolating contaminants in soil and sediment from potential receptors. The caps were preventing contaminants in soil and sediment from migrating to groundwater and surface water. The next review of the remedial actions implemented at the X-734 Landfills will be submitted to Ohio EPA in 2013.

Chapter 6 provides 2009 groundwater monitoring results for the following areas in Quadrant IV that require groundwater monitoring: X-611A Former Lime Sludge Lagoons (Section 6.4.8.1), X-735 Landfills (Section 6.4.9.1), X-734 Landfills (Section 6.4.10.1), and X-533 Switchyard Area (a deferred unit) (Section 6.4.11.1).

3.3 WASTE MANAGEMENT PROGRAM

The DOE PORTS Waste Management Program directs the safe storage, treatment, and disposal of waste generated by past and present operations and from current Environmental Restoration projects. DOE PORTS also stores USEC-generated waste in the RCRA Part B permitted storage areas. Waste managed under the program is divided into the following seven categories, which are defined below:

- *Low-level radioactive waste* – radioactive waste not classified as high level or transuranic waste.
- *Hazardous (RCRA) waste* – waste listed under RCRA or waste that exhibits one or more of the four RCRA hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity. Universal waste, which includes common items such as batteries and light bulbs, is a subset of RCRA waste that is subject to reduced requirements for storage, transportation, and disposal or recycling.
- *PCB wastes* – waste containing PCBs, a class of synthetic organic chemicals. Disposal of PCB-contaminated materials is regulated under TSCA.
- *RCRA/low-level radioactive mixed waste* – waste containing both hazardous and radioactive components. The waste is subject to RCRA, which governs the hazardous components, and to the Atomic Energy Act that governs the radioactive components.
- *PCB/low-level radioactive mixed waste* – waste containing both PCB and radioactive components. The waste is subject to TSCA regulations that govern PCB components, and to the Atomic Energy Act that governs radioactive components.
- *PCB/RCRA/low-level radioactive mixed waste* – waste containing PCB and radioactive components that is also a RCRA hazardous waste. The waste is subject to RCRA regulations, TSCA regulations that govern PCBs, and to the Atomic Energy Act that governs radioactive components.
- *Solid waste* – Waste that includes construction and demolition debris, industrial waste, and sanitary waste, as defined by Ohio regulations. These wastes can include waste from construction or demolition activity and office waste. Waste contaminated with asbestos may also be included in this category if it is not included in any of the categories listed above (PCB, RCRA, and/or low-level radioactive waste).

In 2009, approximately 7 million pounds of waste from PORTS were recycled, treated, or disposed at off-site facilities (see Table 3.2). A project funded by ARRA, the disposition of excess uranium materials, was initiated in 2009. Over 500,000 pounds of uranium materials were disposed at Nevada Test Site in 2009.

Waste management requirements are varied and are sometimes complex because of the variety of waste streams generated by DOE PORTS activities. DOE Orders, Ohio EPA regulations, and U.S. EPA regulations must be satisfied to demonstrate compliance for waste management activities. Additional policies have been implemented for management of radioactive, hazardous, and mixed wastes. These policies include the following:

- minimizing waste generation;
- characterizing and certifying wastes before they are stored, processed, treated, or disposed;
- pursuing volume reduction (such as blending and bulking) as well as on-site storage in preparation for safe and compliant final treatment and/or disposal; and
- recycling.

Table 3.2. Waste Management Program off-site treatment, disposal, and recycling accomplishments for 2009

Waste type	Waste stream	Quantity (pounds)	Treatment, disposal, or recycling facility
RCRA	Soil, plastics, and other solids contaminated with metals and/or solvents	18,402	PermaFix
LLW ^a	Depleted uranium tetrafluoride	7423	Materials & Energy Corp
LLW	Scrap metal, demolition debris, soil, and other solids	5,536,199	EnergySolutions
LLW	Uranium materials, scrap metal, and other solids	1,349,259	Nevada Test Site
PCB	Light ballasts and other contaminated solids	11,949	PermaFix
PCB/LLW	Sheet metal, empty containers, concrete, and other solids contaminated with PCBs	5037	EnergySolutions
PCB/LLW/ RCRA	Miscellaneous solids contaminated with PCBs and metals or organics	1266	EnergySolutions
PCB/LLW/ RCRA	Liquids or solids contaminated with PCBs and organics	3832	Diversified Scientific Solutions
RCRA/LLW	Carbon contaminated with solvents from groundwater treatment facilities	10,750	Diversified Scientific Solutions
RCRA/LLW	Solids (soil, incinerator ash, trap material, etc.) and liquids contaminated with metals or solvents	43,169	EnergySolutions
RCRA/LLW	Soil, plastic, and other solids contaminated with solvents from X-701B remediation project	10,538	PermaFix
Universal waste	Light bulbs (fluorescent, mercury vapor, incandescent, and compact fluorescent)	837	PermaFix
Universal waste	Batteries (ni-cad, lead acid, and gell cell)	108	PermaFix
Universal waste	Waste oil (recyclable)	3522	PermaFix

^aLow-level radioactive waste.

3.4 ENVIRONMENTAL SUSTAINABILITY PROGRAM

DOE PORTS is committed to reducing environmental risks, costs, wastes, and future liability by effectively integrating environmental sustainability principles into DOE PORTS activities in a cost effective and environmentally conscious manner. The DOE PORTS Environmental Sustainability Program is a balanced, holistic approach that links planning, budgeting, measuring, and improving PORTS overall environmental performance to specific goals and outcomes. The DOE PORTS approach is described in the *Environmental Sustainability Plan* and integrates the tenets of an EMS. The PORTS Environmental Sustainability Program includes elements of pollution prevention, waste minimization, affirmative procurement, sustainable design, and energy and water efficiency.

DOE PORTS is committed to minimizing and/or eliminating the amounts and types of wastes generated and to achieving reduced life cycle costs for managing and dispositioning property and wastes during all of DOE PORTS projects and activities.

Effective environmental sustainability management begins with an integrated strategy. In order to achieve the objectives and targets of the Environmental Sustainability Program, DOE PORTS has developed and implemented a well-defined strategy for setting, updating, and achieving PORTS objectives and targets in line with the EMS and in conjunction with DOE pollution prevention goals. The broad objectives are core elements of the DOE PORTS Environmental Sustainability Program. These objectives, presented below, are both qualitative and quantitative and reduce the life cycle cost and liability of DOE PORTS programs and operations:

- eliminating, minimizing, or recycling wastes that would otherwise require storage, treatment, disposal, and long-term monitoring and surveillance;
- eliminating or minimizing use of toxic chemicals and associated environmental releases that would otherwise require control, treatment, monitoring, and reporting;
- maximizing the use (procurement) of recycled-content materials and environmentally preferable products and services, thereby minimizing the economic and environmental impacts of managing by-products and wastes generated in the conduct of mission-related activities; and
- reducing the life-cycle cost of managing personal property at PORTS.

In 2009, DOE PORTS received the 2009 Federal Electronics Challenge Silver Level Award for achievement and leadership in managing federal electronics. DOE PORTS achievements included the following:

- establishing and promoting a policy to give preference to procurement of electronics registered by the Electronic Product Environmental Assessment Tool and ensuring that over 95% of computers and monitors were registered;
- modifying existing procurement policies and directives to give preference to environmentally-preferable electronic products;
- ensuring the DOE PORTS Environmental Management System addressed electronics stewardship;
- establishing and promoting a policy for personal computer power management; and

- establishing and promoting a policy to promote internal reuse, donation through Computers for Learning, federal government reuse, and donation to states or non-profits (in that order) as the preferred disposition methods for electronic equipment at the end of its first life.

Additional highlights of the DOE PORTS Environmental Sustainability Program in fiscal year 2009 include the following accomplishments:

- donating four excess flatbed railcars to the Moonville Rail Trail Association that will use the rail cars as bridge spans in its Vinton County, Ohio, public rail trail;
- utilizing a membrane interface probe instead of conventional soil sampling methods to identify soil contaminated with trichloroethene during an environmental investigation, thereby avoiding the generation of approximately 161 cubic feet of soil and other materials regulated as low-level radioactive waste and RCRA hazardous waste;
- reprocessing 377 pounds (171 kilograms) of highly enriched uranium for reuse at the Tennessee Valley Authority and the National Nuclear Security Administration, thereby avoiding transportation and disposal costs associated with material;
- recycling approximately 28,263 pounds of office and mixed paper, 9480 pounds of cardboard, 1367 pounds of aluminum cans, 661 pounds of toner cartridges, 2954 pounds of iron/steel, and 2712 pounds of plastic; and
- transferring 24 desktop computers, 158 monitors, and 37 printers to the Oak Ridge National Recycle Center for 100% recycling of all electronics.

In addition, DOE PORTS continued energy reduction programs focused on accomplishing the goals of Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and DOE Order 430.2B, *Departmental Energy, Renewable Energy, and Transportation Management*. DOE PORTS accomplished the following energy reduction efforts in fiscal year 2009:

- changing the firewater system in the X-330 and X-333 Buildings from wet to dry systems, thereby eliminating the need for space heaters and resulting in an estimated annual savings of 5000 to 9000 megawatt-hours (MWH);
- changing a system in the X-633 Pump house to eliminate use of a 1250 horsepower pump resulting in an estimated annual savings of 6000 MWH;
- shutting down the X-533 Switchyard and rerouting power to one major on-site switchyard resulting in an estimated annual savings of 7000 MWH and additional operational cost savings; and
- modifying the X-1000 Office Building heating, ventilation, and air conditioning system to control the system electronically resulting in improved indoor air quality and estimated annual power savings of 9000 MWH.

3.5 INACTIVE FACILITIES REMOVAL

In 2009, DOE PORTS received funding under ARRA for D&D of three inactive, surplus facilities: X-533 Switchyard Complex, X-633 Cooling Towers Complex, and X-760 Chemical Engineering Building. Planning for removal of these facilities was begun in 2008 as non-time critical removal actions under CERCLA and continued in 2009 with the development of Engineering Evaluation/Cost Analyses for the removal of each facility as well as other planning documentation. Demolition of the facilities began in 2010.

DOE continued demolition of other inactive, surplus PORTS facilities during 2009. Table 3.3 lists the facilities removed from 2006 (when the removals began) through 2009.

**Table 3.3 Inactive facilities removed from DOE PORTS
2006 – 2009**

Facility	Year removed	Location (Quadrant)
X-746 Shipping and Receiving Building	2009	I
X-744T Lithium Storage Warehouse	2008	I
X-744U Lithium Storage Warehouse	2008	I
X-770 Mechanical Testing Facility	2007	I
X-230J8 Environmental Storage Building	2006	I
X-230J1 Environmental Monitoring Station	2006	II
X-701D Water Deionization Building	2006	II
X-720A Maintenance & Stores Gas Manifold Shed	2006	II
X-105 Electronic Maintenance Building	2006	II
X-740 Waste Oil Storage Facility	2006	III
X-106B Old Fire Training Building	2006	III
X-616 Liquid Effluent Control Facility	2006	III
X-615 Old Sewage Treatment Plant	2006	III
X-344C Hydrogen Fluoride Storage Building	2006	IV
X-344E Gas Ventilation Stack	2006	IV
X-344F Safety Building	2006	IV
X-342C Waste Hydrogen Fluoride Neutralization Pit	2006	IV

In September 2009, D&D activities were completed for the X-746 Shipping and Receiving Building, including building demolition and soil sampling beneath and around the former building. No contamination that required additional sampling or remediation was identified around or beneath the building.

The X-770 Mechanical Testing Facility, a deferred unit with potentially contaminated soils, was demolished during 2007. This facility was located in the northern portion of the Quadrant I Groundwater Investigative Area (see Section 3.2.1.3 and Chapter 6, Section 6.4.2 for more information about the Quadrant I Groundwater Investigative Area). In 2008, DOE developed and implemented a work plan to investigate the soil beneath and around the former building. Two rounds of soil sampling were completed in September/October and December of 2008, which identified areas of soil contaminated with trichloroethene on the south and east sides of the former building. Based on the results of this investigation, DOE developed a remediation work plan to remove the concrete pad and contaminated soil associated with the former building. This plan was under development at the end of 2009.

3.6 ENVIRONMENTAL TRAINING PROGRAM

DOE PORTS provides environmental training to increase employee awareness of environmental activities and to enhance the knowledge and qualifications of personnel performing tasks associated with environmental assessment, planning, and restoration. The program includes on- and off-site classroom instruction, on-the-job training, seminars, and specialized workshops and courses. Environmental training conducted or prepared by DOE PORTS includes hazardous waste training required by RCRA and numerous Occupational Safety and Health Administration training requirements.

3.7 PUBLIC AWARENESS PROGRAM

A comprehensive community relations and public participation program is in place at PORTS. The purpose of the program is to foster a spirit of openness and credibility between PORTS officials and local citizens, elected officials, business, media, and various segments of the public. The program also provides the public with opportunities to become involved in the decisions affecting environmental issues at PORTS.

The PORTS Site Specific Advisory Board, comprised of up to 20 citizens from the local area, provides public input and recommendations to the DOE on environmental remediation, waste management, and related issues at PORTS. Additional information about the board can be obtained at www.ports-ssab.org or by calling 740-289-5249.

DOE PORTS also maintains a public Environmental Information Center to provide public access to documents used to make decisions on remedial actions being taken at PORTS. The Information Center is located just north of PORTS at the Ohio State University Endeavor Center (Room 207), 1862 Shyville Road, Piketon, Ohio 45661. The email address is eic@wems-llc.com. Hours for the Information Center are 9 a.m. to noon Monday and Tuesday, noon to 4 p.m. Wednesday and Thursday, or by appointment (call 740-289-8898). This Annual Environmental Report and other information can also be obtained from the PORTS web site at www.pppo.energy.gov.

Public update meetings and public workshops on specific topics are also held to keep the public informed and to receive their comments and questions. Periodically, fact sheets about major projects are written for the public. Additionally, notices of document availability and public comment periods, as well as other communications on the program, are regularly distributed to the local newspaper and those on the community relations mailing list, neighbors within 2 miles of the plant, and plant employees.

Points of contact have been established for the public to obtain information or direct questions regarding the Environmental Management Program. The DOE Site Office may be contacted at 740-897-5010. The LPP Office of Public Affairs (740-897-2336) also provides information on the program.

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