



# **Environmental Impact Statement for the Proposed American Centrifuge Plant in Piketon, Ohio**

**Final Report**

**U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
Washington, DC 20555-0001**



License, Permit, or Other Required Approval	Responsible Agency	Authority	Relevance and Status
<b>Cultural Resources Protection</b>			
<b>Archaeological and Historical Resources Consultation:</b> Required before a Federal agency approves a project in an area where archaeological or historic resources might be located.	Ohio State Historic Preservation Officer	<i>National Historic Preservation Act</i> of 1966, as amended (16 USC 470 et seq.); <i>Archaeological and Historical Preservation Act</i> of 1974 (16 USC 469-469c-2); <i>Antiquities Act</i> of 1906 (16 USC 431 et seq.); <i>Archaeological Resources Protection Act</i> of 1979, as amended (16 USC 470aa-mm)	NRC has consulted with the Ohio State Historic Preservation Officer and Indian tribes regarding previous archaeological and architectural surveys at the DOE reservation. Consultation letters are included in Appendix B of this EIS and summarized in Section 1.5.6.2. In consultation with the Ohio State Historic Preservation Officer and the Indian tribes, NRC has concluded that the proposed action would have no effect (direct or indirect) on the eligible or potentially eligible properties on or immediately adjacent to the DOE reservation.

Source: USEC, 2005.

#### 1.5.6.1 *Endangered Species Act of 1973 Consultation*

The *Endangered Species Act* was enacted to prevent the further decline of endangered and threatened species and to restore those species and their critical habitats. Section 7 of the Act requires consultation with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats.

NRC initiated consultation with the U.S. Fish and Wildlife Service in September 2004 by reviewing the information that the FWS submitted to USEC on June 21, 2004 regarding the threatened, endangered, proposed, and candidate species, and designated critical habitats that may be present in the project area. In a phone conversation on September 23, 2004 between the NRC and the U.S. Fish and Wildlife Service, the U.S. Fish and Wildlife Service indicated that the information presented in the letter was still current and accurate.

The U.S. Fish and Wildlife Service letter dated June 21, 2004, states that the proposed project lies within the range of the Federally endangered Indiana bat (*Myotis sodalis*), and within the range of timber rattlesnake (*Crotalus horridus*), a species of concern and Ohio-listed endangered species. After publication of the Draft EIS, the NRC provided the FWS, on November 1, 2005, with its finding of "no effect" on listed species and critical habitat. The FWS provided its concurrence on November 16, 2005.

mouse (*Peromyscus leucopus*), short-tailed shrew (*Blarina brevicauda*), opossum (*Didelphis virginiana*), eastern cotton tail rabbit (*Sylvilagus floridanus*), and white-tailed deer (*Odocoileus virginianus*). Common birds found at the reservation include year-round residents, winter residents, and migratory species. The species include red-tailed hawk (*Buteo jamaicensis*); water birds such as the mallard (*Anas platyrhynchos*) and wood duck (*Aix sponsa*); game birds such as wild turkey (*Meleagris gallopavo*); and non-game birds such as nuthatches (*Sitta* sp.) and wrens (*Troglodytes* sp.). The most common of the 11 reptile species and six species of amphibians observed on the site include the eastern box turtle (*Terrapene carolina*), black rat snake (*Elaphe obsoleta*), northern black racer (*Coluber constrictor constrictor*), American toad (*Bufo americanus*) and northern dusky salamander (*Desmognathus fuscus*) (DOE, 1996a).

Common species occurring in open grassland areas like those at the proposed ACP site include eastern cottontail (*Lagomorpha Leporidae*), meadow vole (*Rodentia muridae*), and eastern meadowlark (*Sturnella magna*). Small wooded areas, such as those in the vicinity of the proposed ACP site, support numerous woodland and forest edge species such as raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), red-headed woodpecker (*Melanerpes erythrocephalus*), cardinal (*Cardinalis cardinalis*), white-breasted nuthatch (*Sitta carolinensis*), and yellow-rumped warbler (*Dendroica coronata*). Species that occur in the open grasslands and forest edges that are either actively managed (mowed) or adjacent to developed areas are tolerant of human activities and disturbances.

The aquatic habitats on the DOE reservation include the various holding ponds, intermittent streams, and streams that flow from or through the reservation. The aquatic habitats downgradient of the activities associated with the proposed action include Little Beaver Creek, the West Ditch, and the DOE Piketon Tributary, all of which discharge into the Scioto River. Little Beaver Creek and the West Ditch are designated warm water habitats. Warm water habitats are capable of supporting and maintaining a balanced, integrated, adaptive community of warm water aquatic organisms having a diverse species composition and functional organization. The aquatic habitat associated with Little Beaver Creek supports good to exceptional fish communities downstream of the X-230-J7 discharge from the DOE reservation, and fair fish communities upstream due to intermittent stream flow (OEPA, 1998). The most common of the 34 total fish species and four hybrids found in Little Beaver Creek are the Bluntnose Minnow (*Pimephales notatus*), Central Stoneroller (*Campostoma anomalum*), Creek Chub (*Semotilus atromaculatus*), Rainbow Darter (*Etheostoma caeruleum*), Spotfin Shiner (*Cyprinella spiloptera*), and Striped Shiner (*Luxilus chrysocephalus*). The aquatic habitat associated with the DOE Piketon Tributary is a limited resource water, which does not meet one or more of the warm water habitat characteristics and provides limited aquatic habitat.

### 3.8.3 Rare, Threatened, and Endangered Species

The potential existence of Federal and State rare, threatened, and endangered species as well as candidate species in the vicinity of the DOE reservation was determined through a review of previously prepared *National Environmental Policy Act* documents, reviewing the results of previous site-specific studies, and through consultation with the Ohio Department of Natural Resources, Division of Wildlife and Division of Natural Areas and Preserves, and the U.S. Fish and Wildlife Service.

The review of the previous documents and site-specific studies, as well as the consultations indicated that the Indiana bat (*Myotis sodalis*) a Federally listed endangered species; the Carolina yellow-eyed grass (*Xyris difformis*) and the sharp-shinned hawk (*Accipiter striatus*), both Ohio State-listed endangered species; the Virginia meadow-beauty (*Rhexia virginica*), an Ohio State-listed potentially threatened plant; and the rough green snake (*Opheodrys aestivus*), an Ohio State-listed special interest species may occur or have been found on the DOE reservation. Other species that have been identified in the region, but not on the DOE reservation include the Timber rattlesnake (*Crotalus horridus*), and the long-beaked

arrowhead (*Sagittaria australis*). Table 3-12 lists the threatened, endangered, rare, and species of concern in the vicinity of the DOE reservation.

**Table 3-12 Federal and State Listed Endangered, Potentially Threatened, and Special Concern Species near the DOE Reservation at Piketon**

Category and Scientific Name	Common Name	Status <sup>a</sup>	
		Federal	State
Mammals <i>Myotis sodalis</i>	Indiana bat	E	E
Birds <i>Accipiter striatus</i>	Sharp-shinned hawk	NL	E
Reptiles <i>Crotalus horridus horridus</i> <sup>b</sup> <i>Opheodrys aestivus</i>	Timber rattlesnake Rough green snake	NL NL	E S
Plants <i>Rhexia virginica</i> <i>Xyris difformis</i> <i>Sagittaria australis</i> <sup>b</sup>	Virginia meadow-beauty Carolina yellow-eyed grass Long-beaked arrowhead	NL NL NL	P E T

Notes:

<sup>a</sup> E = endangered; P = potentially threatened; S = special concern; T = threatened, NL = not listed.

<sup>b</sup> Not located on the DOE reservation; located in the region.

Source: DOE, 1993a; DOE, 1996b.

Past and current consultations with the U.S. Fish and Wildlife Service indicate that some of the riparian areas on the DOE reservation may be suitable summer habitat for the Indiana bat. In 1994 and 1996, DOE conducted on-site surveys to identify suitable habitat and then conducted mist netting in those areas to determine if Indiana bats were present. The surveys identified two potential riparian areas for Indiana bats and the mist netting results documented four different species of bats in the two riparian areas, but no Indiana bats were identified.

Past isolated sightings of State-listed species on the DOE reservation include the sharp-shinned hawk and the rough green snake, but no recent sightings have been reported (DOE, 1993a; DOE, 1996b).

The Virginia meadow-beauty has been found near X-611A, a former sludge lagoon, and the Carolina yellow-eyed grass has been tentatively identified at the X-611B sludge lagoon. The Virginia meadow-beauty is associated with the wetlands of the former sludge lagoon and its preferred habitat is on wet, sandy soils, particularly in sandy swamps. The Carolina yellow-eyed grass was observed in 1994; however, formal documentation of the species could not be performed as the grass was not in fruit or flower. Carolina yellow-eyed grass prefers wet peaty or sandy soils typically found in marshes or bogs.

The Ohio EPA determined that two State endangered fish species and four State threatened fish species exist near the DOE reservation, but are restricted to the Scioto River. Little Beaver Creek, the main body of water running through the site, does not provide sufficient habitat to support threatened or endangered species of fish. (OEPA, 1997)

#### **4.2.7.1 Site Preparation and Construction**

The following subsections discuss the potential impacts of the proposed site preparation and construction activities on flora and fauna; rare, threatened, and endangered species; and wetlands.

##### **Flora and Fauna**

Site preparation and construction for the proposed ACP facilities in the central area of the DOE reservation would be adjacent to existing structures. The proposed new buildings in this area would result in the loss of approximately 12 hectares (30 acres) of landscaped area (fields and lawns). Such areas provide habitat for a limited number of wildlife species that are tolerant of active human disturbance and would result in SMALL impacts on flora and fauna.

Site preparation and construction activities for X-745H Cylinder Storage outside of the Perimeter Road in the northern portion of the reservation would result in more extensive soil disturbances, as described in Section 4.2.5.1. This cylinder storage yard would be bounded on the south by the Perimeter Road; on the east by an unnamed tributary to Little Beaver Creek (adjacent to the North Access Road); on the west by the eastern drainage channel to and the discharge from the X-230L North Holding Pond; and on the north by the valley of Little Beaver Creek. The yard would be located in a relatively flat upland area made up of grasslands and old fields adjacent to riparian and upland forests and wetland areas of the Little Beaver Creek and its tributaries. However, the site preparation and construction activities would not require removal of, or disturbance of, vegetation in these adjacent areas (USEC, 2005c). The site preparation and construction activities within the grassland and old field area would result in a temporary increase in erosion and sedimentation during the 24-month construction period. The runoff, if not controlled, would directly enter the unnamed tributaries as well as Little Beaver Creek. Because of the size of the area to be disturbed (10 hectares [24 acres]), the steep topography, the extent of cut and fill activities needed, and the proximity to Little Beaver Creek, which is a State Resource Water that exhibits exceptional ecological values and/or exceptional recreational values (as defined in OAC 3745-1-09 for the Scioto River Drainage Basin), the erosion and sediments that could enter the creek could result in a MODERATE impact.

Implementation of the best management practices described in Section 4.2.5.1 on soil impacts, together with USEC's plan not to disturb the upland mixed hardwood forest and the riparian forest adjacent to the managed field and old field (USEC, 2005c), would reduce this potentially MODERATE impact to a SMALL impact. Such measures would ensure that the existing forested buffer area between the proposed cylinder storage yard and the riparian areas associated with the tributaries and Little Beaver Creek would be preserved. Such measures would also reduce the level and amount of sedimentation and erosion that would occur in the adjacent surface waters.

##### **Rare, Threatened, and Endangered Species**

Table 3-11 in Chapter 3 of this EIS lists the Federal and State Listed endangered, potentially threatened, and special concern species near the DOE reservation. Of the wildlife species, none would be impacted by the proposed site preparation and construction activities in the central area. The central area of the DOE reservation is a highly disturbed and managed area that does not provide suitable habitat for any of the species, and the nearest suitable habitats are over 1.5 kilometers (0.9 mile) away (USEC, 2005a).

Activities associated with the two cylinder storage yards outside of the central area would not impact the birds, reptiles, or plants listed in Table 3-11. The sharp-shinned hawk and the rough green snake have not been observed on the reservation for several years, and the timber rattlesnake has never been documented on the reservation. The plant species located on the reservation are associated with lagoon systems

located more than 1 kilometer (0.6 mile) from all the proposed site preparation and ground disturbing activities (USEC, 2005a)

There is a small potential for site preparation and construction activities at the cylinder storage yards outside of the central area to affect the potential summertime habitat for the Indiana bat. Previous studies have not documented the presence of the Indiana bat on the DOE reservation at Piketon, but have identified suitable summertime habitat on the reservation (USEC, 2005a). The proposed site preparation and construction activities for X-74H Cylinder Storage Yard, and any refurbishment activities needed at the X-745G-2 Cylinder Storage Yard, would be located approximately 500 meters (1,640 feet) from the suitable summer habitat for the Indiana bat. The construction noise, up to 94 decibels, could temporarily disrupt the activities or preclude Indiana bats from their potentially suitable habitat. However, the construction of the proposed X-745H Cylinder Storage Yard would only remove grassland and old field habitats and would preserve the existing upland mixed hardwood and riparian forests that act as a buffer between the proposed storage yard and the potential summertime habitat (USEC, 2005c). In addition, USEC indicated that it may implement the following mitigation measures:

- If trees (either live or dead) with exfoliating bark are encountered in the construction area, they should be saved if possible to avoid destroying potential habitat for the Indiana bat. If necessary, trees should be cut before April 15 or after September 15.
- Flexible construction schedules should be followed to avoid sensitive wildlife breeding or rearing periods.
- Temporarily disturbed areas should be revegetated with native vegetation.
- Bat habitat should be enhanced by installing bat houses.
- Natural material should be used for slope stabilization instead of engineered materials (concrete retaining walls). (USEC, 2005a)

The potential impacts on the Indiana bat and its potential habitat would be SMALL because, in addition to the potential mitigation measures, the Indiana bat habitat is only potential summertime bat habitat located approximately 500 meters (1,640 feet) away, and USEC would preserve the existing upland mixed hardwood and riparian forests around the proposed Cylinder Storage yard X-745H, which would act as a buffer. Because the Indiana bat habitat is only potential summertime bat habitat and is located approximately 500 meters (1,640 feet) away, because no forested habitat would be removed, and because USEC may implement the other mitigation measures listed above, the potential impact on the Indiana bat and its potential habitat would be SMALL.

#### Wetlands

None of the proposed site preparation and construction activities would occur in any of the jurisdictional or nonjurisdictional wetlands on the DOE reservation; however, such activities would be adjacent to jurisdictional wetlands regulated by the U.S. Army Corps of Engineers. The proposed site preparation and construction activities would not require the dredging or filling of any wetlands, but as discussed in the surface water section above, a temporary increase in erosion and sedimentation associated with construction would increase the turbidity for a short time and would alter water quality parameters of the surface flow that may enter wetlands adjacent to the land disturbing activities. Because no wetlands acreage would be lost and no Section 404 permit would be required, there is no need to develop a mitigation plan to enhance or replace any wetlands. However, standard erosion control best management practices would be implemented, as described in Section 4.2.5.1 on soils, and existing upland vegetative

buffers would be maintained, as described in the immediately preceding section on rare, threatened, and endangered species. With these mitigation measures, the impacts on wetlands would be SMALL.

#### **4.2.7.2 Facility Operation**

This section evaluates the potential impacts of proposed ACP operations on flora and fauna; rare, threatened, and endangered species; and wetlands.

##### **Flora and Fauna**

Operation of the proposed ACP would result in an increase in personnel traveling to and from the facility and in minor increases in noise emitted from the facility. Because the active operation of the proposed ACP is within an existing highly industrialized area with ongoing activities, the additional personnel and noise would result in a SMALL impact on the flora and fauna in the area, to the limited extent they are present in this area.

The proposed ACP operations would also result in minor increases in air emissions and point source water discharges. The additional air emissions and liquid discharges (effluent), as described in Sections 4.2.4 and 4.2.6, respectively, would result in SMALL impacts on the flora and fauna downwind or downstream of the facility. In terms of radiological air emissions and effluent releases, the small discharge rates from the proposed ACP are projected to result in ambient concentrations of radionuclides that are safe for humans (see Section 4.2.12). Since the level of radiation safety required for the protection of humans is adequate for other animals and plants (IAEA, 1992), no additional mitigation efforts would be necessary beyond those required to protect humans.

In terms of nonradiological releases, the primary pollutant of potential concern is HF in surrounding air. The chemical toxicity of airborne uranium (as opposed to its radiological hazard) is also of possible interest. As presented in Section 4.2.12.3, routine airborne emissions from the proposed ACP are projected to result in a maximum HF concentration of  $2.35 \times 10^{-3}$  micrograms per cubic meter and a maximum uranium concentration of  $6.09 \times 10^{-3}$  micrograms per cubic meter, both at the point of the Ohio National Guard building located onsite 555 meters (1,820 feet) from the proposed ACP buildings. No criteria exist to evaluate safe levels of HF and uranium exposures of plants and animals, but these predicted concentrations are orders of magnitude below criteria designed to ensure safe human exposures. Therefore, any impacts to flora and fauna are also expected to be SMALL.

##### **Rare, Threatened, and Endangered Species**

Normal operations for the proposed commercial centrifuge project would not affect any Federally listed threatened and endangered animal and plant species or critical habitat. The closest identified Indiana bat habitats on the DOE reservation is approximately 1,700 meters (5,600 feet) from the proposed ACP process facilities in the central area and is approximately 500 meters (1,640 feet) from the cylinder storage yards outside of Perimeter Road. During the summer months, airborne emissions from facility operations would be occurring at the same time when Indiana bats may be present. However, because of the distance from the actively used ACP facilities in the central portion of the facility, the low ambient levels of HF and total uranium as discussed above, and limited activity that would occur at the cylinder storage yards outside of the central area but closer to suitable summer habitat, the operation of the proposed ACP would not affect a listed species or critical habitat. Therefore, there would be a SMALL impact.

## **Wetlands**

The operation of the proposed ACP would not encroach on wetlands. The operations would not involve activities in, releases to, or filling of wetlands. Therefore, the impacts would be SMALL.

### **4.2.7.3 Ceasing Operations at Paducah**

Cessation of operations at the Paducah enrichment plant would not involve any excavation or disturbance of habitat. Potential impacts to ecological resources from storm water runoff to surface water from plant property would not be directly affected by cessation of enrichment plant operations. Existing storm water management systems and procedures would be maintained in operation after operations ceased. For the reasons, the impacts to ecological resources would be SMALL.

### **4.2.8 Socioeconomic Impacts**

Major industrial projects have the potential to affect the socioeconomic dynamics of the communities in or around which they are situated. Capital expenditures and the migration of workers and their families into a community may influence factors such as regional income; employment levels; local tax revenue; housing availability; area community services such as healthcare, schools, and law enforcement; and the availability and cost of public utilities such as electricity, water, sanitary services, and roads. The objective of a socioeconomic impact analysis is to assess the likely beneficial and adverse impacts of a project on these and other factors important to the social and economic well-being of local communities, and to suggest measures to mitigate potentially adverse impacts if necessary. Methodologies for impact assessment may include both quantitative and qualitative approaches, as described in the methodologies section below.

This section provides a detailed analysis of the socioeconomic impacts of the proposed action. The impacts are evaluated over a region of influence covering four counties in southern Ohio – Pike, Scioto, Ross, and Jackson Counties. As described in Section 3.9 of this EIS, approximately 92 percent of the 1,223 United States Enrichment Corporation and USEC workers employed in 2004 at the DOE reservation in Piketon resided in these four counties. Of these workers, 49 percent lived in Scioto County, 22 percent lived in Pike County, 12 percent lived in Ross County, and 10 percent lived in Jackson County. Geographically, Ross, Jackson, and Scioto counties bound Pike County to the North, East and South, respectively. This region is expected to encompass the area in which workers employed by the project are expected to live and spend most of their salary (approximately half their after-tax income), and in which a significant portion of site purchase and non-payroll expenditures are expected to occur.

#### **4.2.8.1 Methodology**

This analysis examines the socioeconomic impacts of the proposed site preparation and construction activities at Piketon, the proposed ACP operations, decommissioning of the ACP, and the cessation of uranium enrichment activities at Paducah. Each of these activities is assessed for its potential impact on the following socioeconomic factors: (1) regional employment; (2) tax revenues; (3) population characteristics; (4) housing; (5) community and social services (including education, healthcare, law enforcement, and fire services); and (6) public utilities (including electricity, water, sanitary wastewater, and solid waste disposal).

Employment impacts are evaluated by estimating the level of direct and indirect employment created by the proposed action. Direct employment refers to jobs created by the proposed site preparation and construction activities and facility operations. Indirect employment refers to jobs created in the region of