

## **UMTRA Ground Water Project**

### **Wildlife Management Plan for the Evaporation Pond at the Shiprock, New Mexico, UMTRA Site**

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Prepared by  
U.S. Department of Energy  
Grand Junction Office  
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## 1.0 Introduction

The Proposed Action in the *Environmental Assessment of Ground Water Compliance at the Shiprock Mill Tailings Site* (EA) (DOE 2001) recommends active ground water remediation for the portion of the Shiprock Uranium Mill Tailings Remedial Action (UMTRA) Project site referred to as the terrace east. The objective of this remedial action is to eliminate the current exposure pathways in the washes and seeps at the site and to reduce the potential for ground water flow to the floodplain of the San Juan River. Active remediation will include pumping contaminated ground water from the terrace east and floodplain areas to an 11-acre evaporation pond. The pond is located in a disturbed area just south of the Shiprock disposal cell.

The evaporation pond may attract sensitive, threatened, or endangered wildlife. Over time, the effluent may accumulate elevated levels of contaminants that could be harmful to wildlife protected by federal and tribal regulations, including the Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MBTA). Federally protected species are listed in Title 50 of the *Code of Federal Regulations*, Part 10.13 (50 CFR 10.13) and 50 CFR 17.11. Wildlife listed under these regulations, and critical habitat listed under 50 CFR 17.95, are not expected to be adversely affected. This due to the degree of limited habitat, human activity in the area, the proximity of the clean water source provided by the San Juan River. However, if it is determined that wildlife species may be affected, the U.S. Department of Energy, Grand Junction Office (DOE-GJO) is committed to work with the Navajo Nation Fish and Wildlife Department (NNFWD) and U.S. Fish and Wildlife Service (USF&WS) to minimize effects. If necessary, DOE will conduct consultation with the USF&WS and NNFWD in accordance with federal and tribal regulations (50 CFR 402), for threatened and endangered species. This plan describes the proposed measures to minimize the potential for adverse effects to wildlife. Species that are listed on the Navajo Nation Endangered Species List, but are not listed in 50 CFR 10.13 or 50 CFR 17.11, are also included in the scope of this plan.

Contaminants are classified under the Uranium Mill Tailings Radiation Control Act as residual radioactive material. Although an ecological risk assessment was not completed for the effects of residual radioactive material on terrestrial wildlife, adverse effects could result if the pond water concentrations reach toxic levels and if exposure pathways (e.g., absorption, ingestion) are used. Upon observing any indication of intrusion to and use of the pond by the species identified in this plan, samples from the evaporation pond will be collected and analyzed for the constituents in Table 1. This plan will be reviewed and revised as necessary to maintain protection of key wildlife species.

Table 1. Contaminants of Potential Concern

Contaminants of Potential Concern	Average Ground Water Concentration for Terrace and Floodplain in mg/L <sup>a</sup>
Ammonium	58
Manganese	2.72
Nitrate	1015
Selenium	0.38
Strontium	11.9 <sup>b</sup>
Sulfate	7017
Uranium	0.78

<sup>a</sup> from DOE 2000, Table 4-13 for all but Sr.

<sup>b</sup>UCL95 from Ecological Risk data, DOE 2000

## 2.0 Site Description

The Shiprock UMTRA Project site (Figure 1) is on the Navajo Indian Reservation in San Juan County in the northwest corner of New Mexico. The site is accessible by Uranium Boulevard, which extends from U.S. Highway 491 eastward about 0.5 mile to the Navajo Engineering and Construction Authority (NECA) facility. The site of the former uranium mill, which operated from 1954 to 1968, is on the NECA facility. Immediately east of the NECA facility is the 76-acre UMTRA Project disposal cell, completed in 1986 to permanently stabilize two former tailings piles. An overview of the site's physical setting and climate, a history of the former milling operation and other site activities, sources of ground water contamination, and current and future land and water uses are provided in the EA.

The site is on the eastern fringe of the Pacific flyway at an elevation of about 5,000 feet above sea level. The Shiprock area is characterized as a southwest desert ecosystem dominated by desert grassland species. The floodplain adjacent to the San Juan River to the north is dominated by riparian plant and wildlife species. The closest natural surface water is the San Juan River approximately 2,000 feet northeast of the evaporation pond.

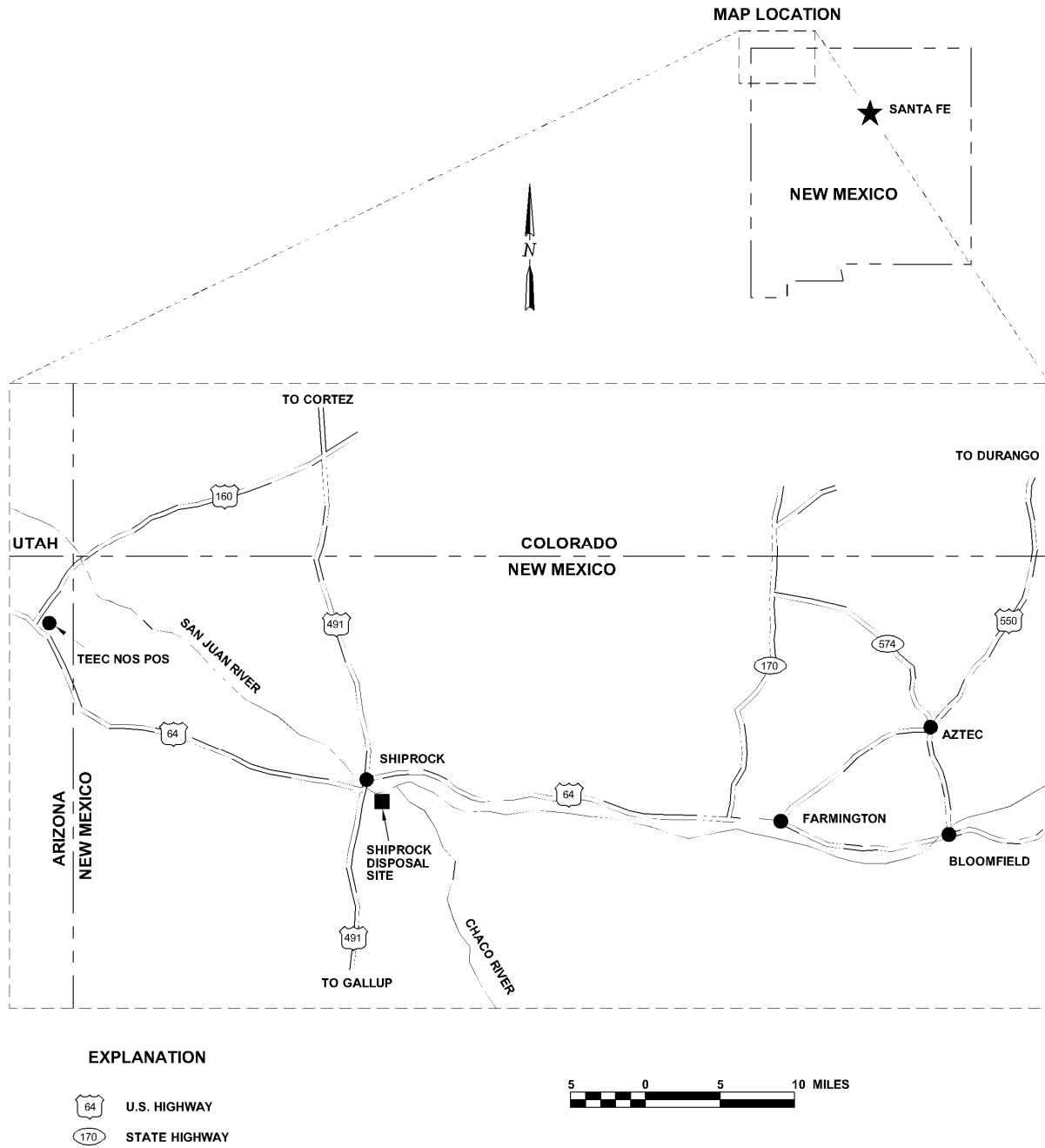
## 3.0 Objectives and Limitations

The primary objective in developing this plan is to minimize potential adverse effects to federally listed (ESA or MBTA) or Navajo Nation-listed threatened, endangered, or sensitive species that may be affected by elevated concentrations of contaminants in the evaporation pond (Figure 2). Protection for a species may be necessary depending upon several factors, including the effect of the pond contaminants on a species' population abundance, distribution, density, or mortality rate relative to naturally occurring factors such as weather, predation, or habitat loss. It is not anticipated that the pond would have a significant adverse effect on wildlife species. However, some mortality could occur if contaminants in the pond water reach toxic levels (e.g., levels that exceed risk benchmarks) to the wildlife and if species have access to and use the pond water.

Investigations, surveys, meetings, and discussions with the NFWF and the USF&WS took place between 1997 and 2002. Ecosphere Environmental Services conducted surveys in August 1998 (Ecosphere Environmental Services 1998) and November 1999 (Ecosphere Environmental Services 1999) to evaluate the presence of listed species or critical habitat.

Protection for wildlife species includes the following considerations:

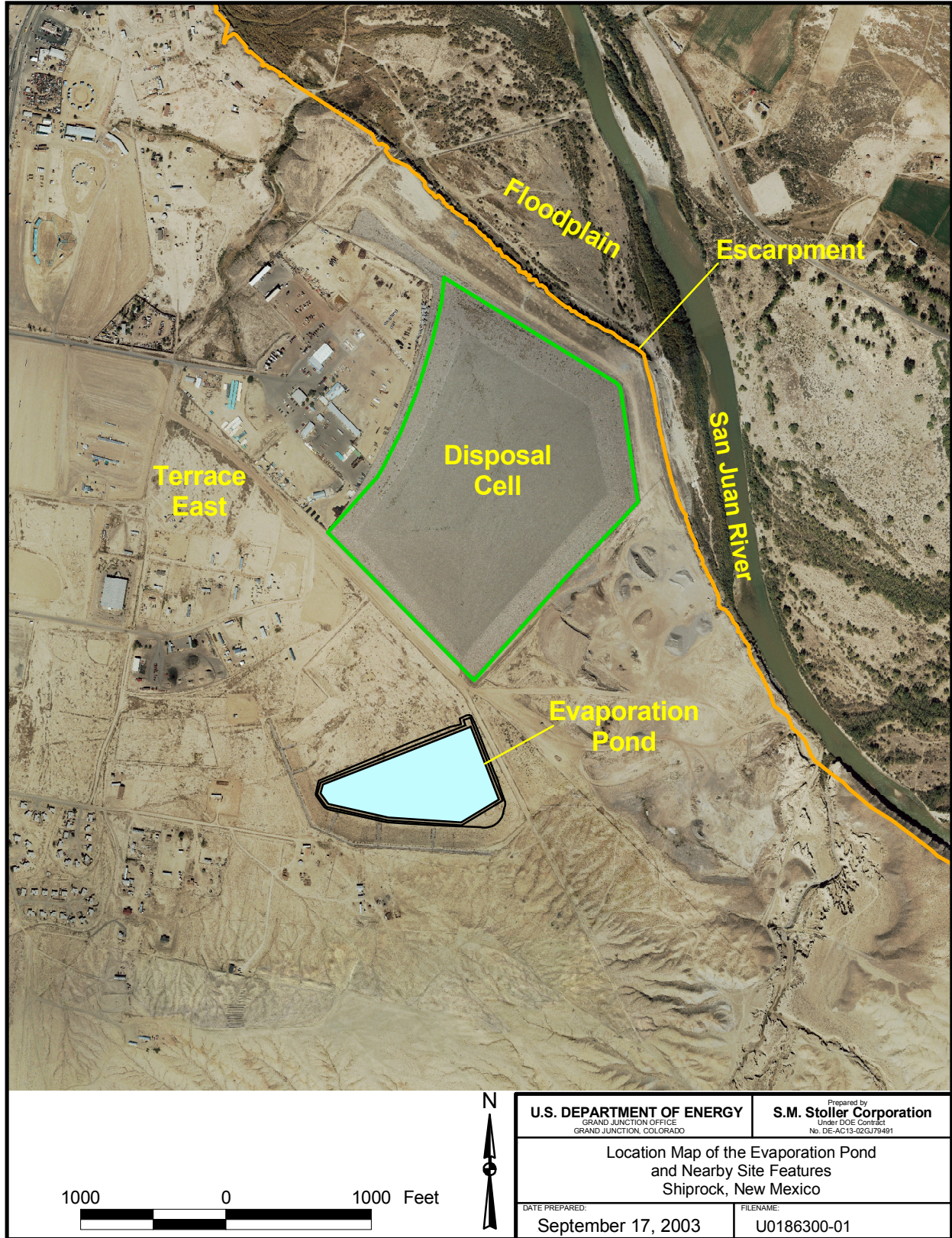
- Species present that may use the ponds
- Surrounding habitat suitability
- Accessibility to the ponds
- The potential for, and frequency of, visitation
- Exposure pathways
- Relative levels of toxicity
- Critical periods (e.g., nesting, mating)
- Monitoring and management



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Figure 1. Shiprock Site Map





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Figure 2. Location Map of the Evaporation Pond and Nearby Site Features Shiprock, New Mexico



Because the pond will be located within a 6-foot-high fenced area, large mammals would have no access to the pond. However, small burrowing mammals, reptiles, and amphibians (depending upon the species' home range) may be attracted to the pond as an additional source of water or habitat. Bird and bat species would likely be the most difficult to monitor and manage due to intermittent or transitory use and accessibility. The NNFWD and USF&WS have identified several species of birds and a species of amphibian that should be considered within the scope of this management plan.

Table 2 identifies ESA protected species that may occur in the project area. The 1998 Ecosphere survey determined that one sensitive fauna species, the western burrowing owl, is known to exist in the terrace east area.

*Table 2. Wildlife Species of Concern Likely To Inhabit the Project Area*

Species	Federal Status <sup>a</sup>	Navajo Status <sup>b</sup>	Observed	Comments
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	MBTA, EPA	Group 2	No	ESA threatened, known winter resident but no nests observed.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	MBTA, ESA	Group 2	No	Suitable habitat exists in two areas of the floodplain.
Western burrowing owl ( <i>Speotyto cunicularia hypugea</i> )	MBTA, ESA	Group 4	Yes	Six (6) owls observed (1998) in a prairie dog colony about 1 mile east of the evaporation pond
Black-footed ferret ( <i>Mustela nigripes</i> )	ESA	Group 2	No	No observations to date. Based on the size of the prairie dog town, none are anticipated to be in this area.

<sup>a</sup>ESA = Endangered Species Act; MBTA = Migratory Bird Treaty Act; EPA = Eagle Protection Act

<sup>b</sup>Navajo Endangered Species List (NESL); Group 2 is protected, Group 4 is not.

The Ecosphere surveys also identified marginal to good habitat for the southwestern willow flycatcher in two areas of the floodplain approximately 0.5 mile from the evaporation pond. On the basis of one to two “whitting” birds, Ecosphere documented the potential presence of this species in 1998 and 1999, but no nests have been located. The survey included a letter (dated August 3, 1998) from the NNFWD identifying a comprehensive list of Navajo Nation species of concern, including the species protected under the ESA. Table 3 lists the other sensitive wildlife species that are known to occur in the region, although their presence in the project area has not been confirmed.

Migratory birds, particularly waterfowl, generally migrate along established routes that provide essential transient habitat requirements such as cover, roosting sites, and water. The climate, vegetation types, and topography in the floodplain area along the San Juan River generally provide these essential elements. Although habitat is present in surrounding areas that would support the intermittent presence of the bald eagle and peregrine falcon, it is unlikely that either species would nest or remain in the area for an extended period. Because the San Juan River is so close and has riparian habitat, it is highly unlikely that the evaporation pond would be the sole water source for any species using it.

Table 3. Other Sensitive Wildlife Species That May Exist in the Project Region

Species of Concern	Federal Status <sup>a</sup>	Navajo Status <sup>b</sup>	Observed	Comments
Rough-legged hawk	MBTA	None	No	Known winter resident in Shiprock area. May hunt in the project area.
Golden eagle	MBTA, EPA	Group 3	No	No observations to date. May hunt in the project area.
Ferruginous hawk	MBTA	Group 3	No	Known to occur in the region. May hunt in the project area.
Mountain plover	MBTA	Group 4	No	No observations to date. Known to occur in the region in terraces areas. May be limited by human disturbances.
Peregrine falcon <sup>c</sup>	MBTA	Group 3	No	No observations to date. Known to occur in the region. May hunt in this area as an occasional visitor. No suitable nesting sites available.
Pronghorn antelope	None	Group 3	No	No observations to date. Known to occur in the region. Unlikely to occur in the project area due to human disturbances.
Northern leopard frog	None	Group 3	No	Known to occur within 3 miles of the site.

<sup>a</sup> MBTA = Migratory Bird Treaty Act; EPA = Eagle Protection Act.

<sup>b</sup> Navajo Nation Endangered Species List; Group 3 is protected, Group 4 is not.

<sup>c</sup> Delisted from the ESA in August 1999.

Numerous techniques have been tested to keep birds out of contaminated ponds (personal communication with Doug Halford, Oak Ridge National Laboratory, September 1998; Boag and Lewin 1980). However, little research is available that is specific to keeping migratory birds away from evaporation ponds in an arid environment. In the area of the evaporation pond, existing surface water could attract migratory birds that stray off the major migratory flyways. Therefore, the most practical approach for protecting ESA and MBTA birds is to develop and implement an effective monitoring program to determine potential wildlife use of the pond. If it is determined that species of concern may be using the pond for extended periods as a sole water source, avoidance measures will be evaluated and implemented as necessary.

Research and discussions with wildlife professionals and federal and state agencies have resulted in several recommended methods of deterring birds from using contaminated water in ponds. Methods include noise (e.g., propane boom cannons), visual (e.g., reflectors, silhouettes, effigies, water color), human activity, unsuitable habitat (e.g., lack of food and cover), water palatability, and obstruction (e.g., netting, cables, and flagging). In some cases, luring birds away from an area has proven successful. Luring techniques include providing alternate food, cover, or water sources to entice birds away from exposure to possible adverse effects of the proposed pond.

## 4.0 Proposed Monitoring and Management Plan

Research indicates that a phased approach may be applicable to monitor and manage ESA, MBTA, and Navajo Nation Endangered Species List species. If determined necessary by the NNFWD and DOE-GJO, an investigation will be conducted before monitoring to determine the presence of identified bats and amphibians. The survey would be performed because these species may remain in the project area for extended periods. The investigation would determine if the pond is within home ranges or migratory distances of species identified within the scope of

this plan. Information would serve as the basis for the scope of the monitoring plan. Bird surveys are deemed unnecessary because of transitory or intermittent use.

## 4.1 Phase 1

Phase 1 will use a graded approach including monitoring and elimination of habitat, including food sources, close to the pond. Emphasis will be placed on developing and implementing a monitoring procedure consistent with NNFWD and USF&WS recommendations. All monitoring will be conducted within the fenced area of the pond (Figure 2). General observation of the evaporation pond and surrounding area started in March 2003 when water began accumulating in the pond. Monitoring is conducted by weekly observation of the pond and the immediate surroundings. Relevant information and observations are logged. If any wildlife concerns are noted or discovered, the following detailed elements are included as needed.

- Monitoring frequency (depending upon species).
- Species requiring monitoring and time frames for monitoring (e.g., one-half hour before sunset).
- Monitoring personnel and methods.
- Water levels in the ponds at the time that species are observed.
- Monitoring locations and area.
- Species identification.
- Weather conditions.
- Field investigation/surveying protocol and sample field data sheet.
- Frequency of reporting results to key agencies.
- Required data retention and required records.
- Permit requirements.

The perimeter fence around the evaporation pond ranges from 75 to more than 100 feet from the edge of the pond. Due to arid conditions, this area is largely void of vegetation. Should conditions allow the existence of potential habitat, the area between the pond and the fence would be maintained void of vegetation, thus eliminating both potential food and cover.

The NNFWD has requested that DOE consult with the USF&WS to determine the need for any permits in accordance with 50 CFR 13, 50 CFR 17.11, and 50 CFR 21.23 (personal communication with John Nystedt, NNFWD Natural Heritage Program, October 1, 1998). DOE consulted with USF&WS during construction of the brine ponds at the Tuba City UMTRA Project Site near Tuba City, Arizona. It was determined that no permits for wildlife were necessary to conduct that operation. The Shiprock evaporation pond is of a similar nature, but with lower potential for use due to the close proximity to the San Juan River, a suitable surface water source. Should mortality occur, DOE would work with the USF&WS to provide the deceased birds to parties permitted to conduct scientific and educational research in accordance with 50 CFR 21.23.

## 4.2 Phase 2

If monitoring indicates that species identified in this plan are using the pond and that management will be required, Phase 2 would identify management techniques to minimize use of



the pond by species identified as present. Techniques may include a combination of obstruction and visual deterrents, such as placing 6-foot-high galvanized posts at 10-foot intervals along two opposite sides of the pond. Light-gauge cable would be strung across the pond and attached to the posts, and reflective flagging would be attached to each cable at 10-foot intervals across the width of the pond. Flagging would hang to within one foot of the pond surface. The cables and flagging would block waterfowl flight paths into the pond and provide visual deterrents. A 3-foot-high fabric or plastic mesh fence would be attached to the posts to prevent geese and other large birds from entering the pond at the perimeter. This method has proven successful at other DOE sites (e-mail communication with James Donnelly, environmental engineer, Oak Ridge National Laboratory, September 8, 1998).

### 4.3 Phase 3

If methods used in Phase 2 are not deemed sufficient to deter wildlife, DOE will consult with the USF&WS and the NNFWD to determine alternative measures.

### 4.4 Research Scope

The scope of the research included a literature search and discussions with representatives of several regions of the USF&WS, Bureau of Land Management, Colorado Division of Wildlife, Oak Ridge National Laboratory, and DOE officials, contractors, and peers. Discussions were also held with manufacturers of bird deterrent devices and materials. The Tuba City, Arizona, Wildlife Management Plan served as the framework for this plan.

## 5.0 References

50 CFR (Title 50, *Code of Federal Regulations*), "Wildlife and Fisheries," October 1, 1998:

10.13, "List of Migratory Birds."

13, "General Permit Procedures."

17.11, "Endangered and threatened wildlife."

17.95, "Critical habitat—fish and wildlife."

21.23, "Scientific collecting permits."

21.27, "Special purpose permits."

402, "Interagency Cooperation—Endangered Species Act of 1973, As Amended."

Boag, D.A., and V. Lewin, 1980. "Effectiveness of Three Waterfowl Deterrents on Natural and Polluted Ponds," *J. Wildlife Management* 44(1):145–154.

Ecosphere Environmental Services, 1998. *A Survey for Sensitive, Threatened, and Endangered Species For the Proposed UMTRA Ground Water Project, Shiprock Site on Navajo Nation Tribal Land in San Juan County, New Mexico*, for U.S. Department of Energy, Grand Junction, Colorado.

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NNFWD letter, March 17, 1999. Letter from the Navajo Nation Fish and Wildlife Department to R. Bleil, MACTEC Environmental Restoration Services.

U.S Department of Energy, 2000. *Final Site Observational Work Plan for the Shiprock, New Mexico, UMTRA Project Site*, GJO-2000-169-TAR, Rev. 2, U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado, November.

———, 2001. *Environmental Assessment of Ground Water Compliance at the Shiprock Uranium Mill Tailings Site*, DOE/EA-1388, U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado, September.