

SECTION 39

FISH AND WILDLIFE

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FISH AND WILDLIFE

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FISH AND WILDLIFE

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39 FISH AND WILDLIFE ENHANCEMENT

Mitigation to prevent or substantially reduce significant impacts to wildlife resources is discussed in the following material. Some of the mitigation measures will be employed to prevent or lessen potentially serious impacts to wildlife as a general group, and other measures will be directed at specific species. Certain mitigation measures will be necessary only while the mine is operating, and the effects of other mitigation measures will persist long after the mine ceases operation.

39.1 Long-term Mitigation

The primary long-term mitigation measure is the reclamation of disturbed sites to provide the habitat components necessary to support wildlife species that inhabited the site prior to mining. The effectiveness of this mitigation measure is a function of the success achieved in reclamation. From a wildlife standpoint, the primary factors to be reestablished are topography, vegetation, and water sources. The reclamation approaches used are based on experience gained during many years of reclamation of disturbed areas on the Navajo Mine and methods that have been successfully employed to reestablish wildlife habitat on other mines in the western United States.

39.2 Topography

The postmine topography is important for providing specific types of habitat components preferred by certain species (e.g., open plains preferred by horned larks and rock outcrops preferred by rock wrens), but it is probably more important for the influence it will have on the vegetation that ultimately becomes established on the reclaimed area. Certain vegetation grows best on uplands, other species dominate side slopes, and others are more adapted to growth on lowlands or along washes. The types and distribution of vegetation that will ultimately occur on the reclaimed site will be partially determined by site topography as the process of vegetation succession allows certain species to grow on one portion of the site, while other species are favored on another portion. More variable topography provides the conditions that promote establishment of a diversity of vegetation types and distribution.

The topography established on a reclaimed area is constrained somewhat by regulatory requirements that currently do not allow retention of highwalls, internal depressions, or conditions that allow erosion, which form some of the diverse topography on unmined lands in the area. The spoils are blended into the surrounding topography to reestablish drainage. The post-mine topography is similar to the pre-mine situation with more relief in the northern portion and larger areas with less relief in the southern portion as shown on the postmine topography maps (see Section 34 – Post-Reclamation Topography). The steep slopes in the pre-mine condition are not restored, but minor undulations are present on the surface of the reclaimed areas, which replaces some of the variability in topography.

Rock piles are placed on the reclaimed areas to increase topographic diversity and replace some of the rock outcrop type of habitat lost during mining. Wildlife use of reclaimed areas on surface mines in Wyoming and Montana is significantly related to the presence and configuration of rock piles (Stoecker et al., 1985). Rock piles placed on reclaimed areas on the Navajo Mine currently provide perches for birds and cover for small and medium-sized mammals and reptiles as shown by white-wash, trails, and observations of animals. Rock piles of various configurations are placed in a variety of locations relative to the topography to promote use by a variety of species. Rock piles along bottoms and other protected areas promote use by mammals (Tessman, 1982; Green and Salter, 1987) while rock piles near, but not on the top of, hills and ridges and protected from prevailing winds serve as perching and nesting sites for raptors (personal communication with Robert Phillips, USFWS, Sheridan, Wyoming; Tessman, 1982; Green and Salter, 1987).

The density and composition of the rock piles on the reclaimed areas are dependent on the kind and amount of suitable material that is available from the mining operations. Rock piles of variable lengths comprised of a core of large boulders (i.e., greater than three feet diameter) surrounded by rocks of one to three foot diameter have been recommended by Tessman (1982) and Green and Salter (1987). Rock piles constructed on the reclaimed areas on the Navajo Mine generally correspond to those recommendations. The Office of Surface Mining (OSM) has recommended a minimum density of one rock pile covering an area of 500 square feet per 80 acres. Navajo Mine may not be able to achieve this standard because the actual size and number of rock piles will be dictated by the availability of suitable material. Based on past experience, much of the overburden material is not resistant to weathering and quickly breaks down when exposed to erosional elements. Only the more resistant material will be used for rock piles.

39.3 Revegetation

Vegetation is one of the primary habitat components that influences the suitability of an area for wildlife. The primary use of the area after mining will be for livestock grazing; however, provision for wildlife habitats is also incorporated in the mine's revegetation plan. A detailed description of the revegetation program is presented in the reclamation plan (Section 37 – Post-Reclamation Vegetation). Specific items relative to replacing wildlife habitat are summarized below.

The seed mix for revegetation of the area is outlined in Section 37 – Post-Reclamation Vegetation. The selection of the seed mix was based on adaptability of the species to the revegetation requirements of the mine based on results of previous revegetation efforts on the mine. Most of the species are palatable to various wildlife species, and all, particularly shrubs, provide cover for wildlife. Methods of seeding reclaimed areas are described in Section 37 – Post-Reclamation Vegetation. Shrub density, as prescribed in Section 37 – Post-Reclamation Vegetation, reflects the emphasis put on establishment of herbaceous species in the early stages of reclamation and to promote the land use of livestock grazing. Experience with

vegetation establishment on the mine's reclaimed areas to date indicates that shrubs will become established in the drainage bottoms and small swales in the topography and the herbaceous species will dominate the upland areas to simulate the distribution pattern of habitat types on undisturbed areas. Shrubs in the drainages will become dense and tall commensurate with the availability of moisture. These areas of high shrub density will mitigate for the arroyo shrub habitat lost to mining activity in the major washes. Tamarisk has been observed on some of the previously reclaimed areas and will likely invade the bottom of the reconstructed drainages that provide suitable moisture just as it has in arroyos in the undisturbed portions of the surrounding area.

39.4 Water Sources

Exhibit 16-3 shows the location and approximate configuration of the known water sources (livestock ponds) which occurred on the Navajo Mine Permit Area before mining started. The source of this information was obtained by reviewing 1" = 1000' scale maps which were produced from two aerial surveys conducted before mining started. The first aerial survey was conducted by Jack Ammann, Inc., Engineering & Surveyors of San Antonio, Texas in 1960 and covered the permit area from Watson Pit to Barber Pit. The second aerial survey was conducted by Fairchild Aerial Surveys of Los Angeles, California in 1964 and covered from Barber Pit through Area IV North. The water sources were constructed for livestock watering by local people, Tribal or Federal agencies.

During the life of the mine, those ponds shown on Exhibit 16-3 which have not been impacted to date will be impacted by mining, except for Pond P1. [Table 39-1](#) lists all the ponds found before mining and their approximate size (area & volume). Replacement of impacted ponds is discussed in Section 35.

In addition to replacement of the pre-mining ponds, the combined effects of the development of the Navajo Indian Irrigation Project (NIIP) and the Navajo Mine, has greatly increased the availability of water just off-lease of the mine permit area. The increase in water availability comes about because of the reconstruction of new ponds for surface water control, relocation of ponds off lease (Exhibit 16-3), and the creation of surface run-on from irrigation.

The increased water availability will be beneficial for livestock and will be a positive effect on wildlife. The combination of the water sources created by the development of NIIP and the Navajo Mine and the reconstruction of pre-mining ponds should exceed the water sources which were available before mining to wildlife.

39.5 Short-term Mitigation

Procedures employed to minimize or prevent impact to wildlife during the operation of the mine will include (1) limiting the amount of vegetation and topography disturbed to only that necessary to conduct

mining; (2) designing facilities, such as transmission lines, to prevent mortality of raptors; and (3) monitoring important wildlife habitat, such as raptor nests, so appropriate plans to avoid significant undesirable impact can be developed and implemented.

Minimizing the area disturbed to only that necessary to safely conduct mining and avoiding important wildlife habitat that will be disturbed is a desirable mitigation measure. Limiting the extent of the disturbed area is not only a conservation measure for wildlife habitat that currently exists, it is economically advantageous since areas that are not disturbed do not require reclamation. Location of important wildlife habitats (such as rimrocks, raptor nests, water sources) will be considered when planning the location of haul roads and ancillary facilities so that they can be avoided as much as practicable.

To protect raptors from direct mortality due to electrocution, the design and construction of electric powerlines and other transmission facilities on the permit area will meet the guidelines set forth in "Suggested Practices for Raptor Protection on Powerlines - the State of the Art in 1996" (Avian Power Line Interaction Committee (APLIC. 1996).

Significant mortality has not been observed for any wildlife species as a result of the current operations, and none is expected in the future; however, if monitoring studies identify an adverse change, appropriate mitigation plans will be developed and implemented at that time to remedy the specific problem.

Buffer zones will be established around active raptor nests located on and adjacent to the permit area. The buffer zones will be established through consultation with the BIA and NFWD on a site and species specific basis as necessary. Activity not currently being conducted in the buffer zones will be restricted while the nest is active to prevent desertion of the nest. Raptor nests will be monitored to identify potential problem areas relative to the mining operations on the permit area. If raptor nesting success is affected by mining activity, NTEC will consult with the NFWD, BIA, and USFWS to develop plans to limit impacts. Such plans will be developed on a site by site basis and could include rescheduling of mining activities and moving or taking of nests as necessary. Any work involving the handling of raptors or their nests will require special permits and would be closely coordinated with the NFWD and USFWS to the safety of the birds and promote the use of the breeding territory in the future. [Commitment statement found in Section 40 – Environmental Protection].

Raptors currently use certain power poles at Yazzie Point, on the east edge of Area 3, and between Areas 3 and 4 North as perches and nest sites. Frequently used poles will be left or reestablished during reclamation to allow continued use of these sites (or other sites used frequently during the life of the mine) by raptors.

Unless authorized, prairie dog colonies with active nesting burrowing owls will not be disturbed during the nesting season (late March through July) (Marks and Ball, 1983) to avoid active nests. Reoccupation of the reclaimed area by prairie dogs and other burrowing mammals will be monitored to determine if burrows will be available for use by burrowing owls. If no burrows are present on reclaimed areas, NTEC will consult with the NFWD and BIA to determine if artificial burrows are necessary on the reclaimed area to promote use by burrowing owls. Burrowing owls have readily accepted artificial burrows (Collins and Landry, 1977; Henry and Blus, 1981), but the acceptance of artificial burrows on reclaimed areas has not been proven (Marks and Ball, 1983). [Commitment statement found in Section 40 – Environmental Protection].

39.6 Monitoring Plan

NTEC conducts periodic monitoring of wildlife on the permit area to assure that the mitigation measures are limiting the impact of mining as intended; to identify the presence of additional important wildlife habitats that may occur (e.g., new raptor nests); to identify additional unanticipated impacts that require development of specific mitigation measures; to describe and characterize the wildlife use of reclaimed areas; and to generally keep track of important wildlife activities on the area.

Starting with a raptor monitoring program, on the first year, all raptor nesting habitat on and within a one mile buffer zone of the permit area are surveyed once every three years by aerial means. On years two and three, all raptor habitat on and within one mile buffer zone of the most active mining areas (active pits, coal stockpiles, shop and office areas, major topdressing stockpiles, and future mining pits) for the next 16 years, are surveyed on the ground by a combination of walking and vehicles. These areas to be surveyed are those areas where the majority of the noise and disturbance by mining or mine personnel activity will take place and would be of most concern. The areas not surveyed in years two and three, within one mile of the permit, are surveyed every third year so that raptor nesting activity will be monitored. Fields disturbed and operated by the NAPI which are within either the aerial or ground buffer zones, will not be surveyed at any time since the fields are managed and controlled by a different private entity. Concerns from this area should be directed to NAPI. The surveys will be conducted during the breeding season (April through June) to document the status of known and unknown nests (e.g., active, inactive). Potential raptor nesting habitat that does not currently support nesting raptors will also be examined to determine if and where new nests are established relative to mining activities. Monitoring and surveying for raptors during the aerial survey will be conducted between April 01 and 15 (or closest date a suitable aircraft is available) as part of the initial survey for that year. A second follow-up survey will be done on the ground between May 15 and June 15 of those areas determined as active territories during the aerial survey. The initial surveys conducted during years two and three will be conducted on all raptor habitat areas, as described above, between March 15 and April 15 and a follow-up survey of the active territories, discovered during the initial survey, will be conducted between May 15 and June 15. Exhibit 16-1 delineates the areas to be

surveyed during the aerial and ground surveys as described above. [Commitment statement found in Section 40 – Environmental Protection].

All ground surveys in years two and three and the follow-up for the aerial survey will be conducted by driving through existing and accessible roads. Wherever possible, vistas and high ground will be used to view larger areas with binoculars so that enough overlapping will take place and good coverage of the survey area will be accomplished. On Exhibit 16-1 the areas designated by shading do not have good vehicle road access. In these areas, a zig-zag walking transect, using higher grounds, and inspecting mesa cliffs and steep arroyo embankments will be made during this survey. Historic and current active prairie dog towns will also be checked carefully for possible burrowing owl (*Athene cunicularia*) sightings. The prairie dog towns will be walked by using a zig-zag transect which will allow better survey coverage of the area.

Annual raptor survey results are compiled into a report. The report is organized to outline the methods, results, and to summarize the historical and new active breeding areas. Mapping of nesting site locations is maintained by the NFWD. Permits required to conduct off lease monitoring activities under this plan will be obtained from the NFWD. Distribution and reporting date of the annual report is explained in Section 40 – Environmental Protection

Annual mine operation plans are reviewed to identify potential conflicts with raptor nesting so that consideration can be made for mitigation. Early identification of conflicts is desirable to allow flexibility in resolving the conflicts with the least possible impact to the birds or the mines activities. For example, it is much easier and less costly to move a raptor nest before or after the nesting season than when it contains young. Any moving of raptors or their nests will require special purpose permits and will be closely coordinated with the NFWD and USFWS as necessary. The raptor nest monitoring program gathers data on the species using each nest, activity status, and number of young produced. If any golden or bald eagle nest are found on the mine permit area, its discovery and location will be reported to OSMRE/Denver. [Paragraph also found in Section 40 – Environmental Protection].

Prairie dog colonies will be surveyed for the black-footed ferret, as determined necessary after consultation with the NFWD. Reporting of survey results will be conducted as described in Section 40 – Environmental Protection. Also, if topdressing stripping activities (as described in Section 20 – Mining Operations), are scheduled, the area to be disturbed will be examined prior to disturbance to determine if burrowing owls are nesting in the area. If burrowing owls are nesting, activities that would disturb the site would be rescheduled to prevent destruction of an active nest, or other appropriate measures employed after consultation with the regulatory authorities. [Paragraph also found in Section 40 – Environmental Protection].

The southwestern willow flycatcher was officially listed as an endangered species by the USFWS on March 29, 1995, under the authority of the Endangered Species Act of 1973, as amended (60 FR 10694). USFWS has determined that at least two years of survey data are necessary to make a negative determination of occurrence. To meet USFWS recommendations NTEC has taken and will take the following steps:

1. Potential habitat surveys were conducted in December 5-8, 1994, where several areas of potential southwestern willow flycatcher breeding/nesting habitat were identified. Identified were three small ponds scattered throughout the permit, the lower section of Chinde Wash before it leaves Navajo Mine Lease, and two alluvium areas along the Cottonwood Arroyo.
2. During on site inspections on May 22, 1995, of the potential habitat surveys, the Chinde Wash area was determined to be the only potentially suitable southwestern willow flycatcher habitat for which surveys are necessary. Thus in 1995 and 1996, surveys will be conducted in this area. The site inspections were made by Mr. Dave Mikesic (Zoologist, NFWD Navajo Natural Heritage Program), Mr. Pete Guernsey (Project Manager, TRC Mariah Associates Inc.), and Mr. Orlando Estrada (Environmental Specialist, BHP Navajo Mine).
3. Formal surveys (following protocol described in Tibbitts et al. [1994]) were conducted by Eric Meyer (sub-permit 95-25 under the authority of permit PRT-704930, and permit PRT-803203, USFWS; permit 940-517-041, NFWD) in June and July 1995. No southwestern willow flycatchers were observed or heard during the 1995 surveys of the Chinde Wash area. Formal results for 1995 surveys are presented in the 1995 General Wildlife survey report (see Section 40 – Environmental Protection). Formal survey results for the 1996 breeding season, were provided to OSM in a brief status report sent August 7, 1996 (Mariah 1996). A detailed account of these surveys and results are provided in the Annual General Wildlife survey reports.
4. Positive identification of one or more individuals occurs at any time, the appropriate agencies (i.e., USFWS, New Mexico Ecological Services State Office, NFWD) will be notified immediately, and consultation with USFWS and NFWD will be initiated, as stated above, to determine the conditions under which NTEC may proceed in areas of southwestern willow flycatcher occurrence.

General wildlife monitoring activities are conducted constantly by the NTEC environmental staff as they travel around the mine during their daily activities and note wildlife on the area. Particular attention is paid to documenting any use of the permit area by threatened or endangered species or other species of high interest. Sightings of threatened or endangered species will be reported as outlined in Section 40 – Environmental Protection.

It is generally accepted that if the native vegetation can be replaced and if suitable cover similar to undisturbed areas is provided, then small and medium-sized mammals, predators, and birds will be

restored. The studies by Westinghouse (1975) indicate that many of the small and medium-sized mammal species had returned to reclaimed areas within two years after seeding. Primary importance will be placed on the revegetation monitoring program to identify and correct any problems in establishing vegetation on the reclaimed area. Limited small mammal trapping and breeding bird surveys will be conducted during the last year prior to bond release to identify the species and relative abundance of wildlife using the reclaimed area. These data and results of the periodic wildlife surveys on the reclaimed area will be used as the basis for discussion regarding reestablishment of wildlife habitat and wildlife populations for bond release.

References

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Westinghouse. 1975. Terrestrial Survey of Navajo Mine Lease Associated with the Four Corners Power Plant. Environmental Systems Department Westinghouse Electric Corporation, Pittsburgh, PA. [Permit NM-0003C, Chapter 17, Appendix 17-A]

Table 39-1 Water Sources – Ponds

Pond I.D.	Location	Surface Area ¹	Volume ²
P1	East Dodge	1.3 ac	2.50 ac. ft. (field estimate)
P2 (a +b)	East Doby	0.7 ac	1.19 ac. ft. (extrapolated)
P3 (a +b)	West Hosteen	0.2 ac	0.34 ac. ft. (extrapolated)
P4 (a +b)	East Barber	1.4 ac	2.38 ac. ft. (extrapolated)
P5	East Lowe	0.4 ac	0.68 ac. ft. (extrapolated)
P6	East Dixon	1.0 ac	1.70 ac. ft. (extrapolated)
P7	North Area 4	0.6 ac	0.11 ac. ft. (field estimate)
P8	South Area 4	3.8 ac	6.94 ac. ft. (field estimate)

¹Surface areas were calculated by estimating approximate size of the pond from the average size of the pond found on the map.

²Volumes were calculated by establishing an average volume per surface area from three known undisturbed ponds (P1, P7 and P8), then using the average to extrapolate a total volume of each of the remaining ponds. The average volume was calculated at 1.7 ac. ft. of water per surface area of pond.