1.1.1 Purpose and Need

The purpose of and need for the Black Mesa Project is to continue the supply of coal from Peabody's Kayenta mining operation to the Navajo Generating Station near Page, Arizona. The action proposed by Peabody is to revise LOM operation and reclamation plans for its permitted Kayenta mining operation and, as a part of this revision, to incorporate into these plans the initial program surface facilities and coal-resource areas of its adjacent Black Mesa mining operations, which previously supplied coal to the Mohave Generating Station in Laughlin, Nevada. This BA refers to the area collectively occupied by the Kayenta mining operation and Black Mesa mining operation as the Black Mesa Complex.

1.1.2 Regulatory Authority

Under the SMCRA, OSM may approve, disapprove, or approve with conditions the LOM revision for the Black Mesa Complex. If requirements of SMCRA are met, OSM must approve the application. In making its decision, OSM will consider the concerns of the Hopi Tribe and Navajo Nation associated with the use of water from the Navajo aquifer (N aquifer); however, OSM has no authority under SMCRA to adjudicate water rights or to conditionally permit to prohibit or limit the use of N-aquifer water allowed by the leases. Other Federal agencies (i.e., BLM, U.S. Army Corps of Engineers [USACE], USEPA, and U.S. Fish and Wildlife Service [FWS]) have authorities and/or actions (decisions) to perform for the various proposals related to the mining operations. These authorities and actions are summarized briefly below.

Authorities and actions regarding Peabody's LOM revision include the following:

- OSM approval, conditional approval, or disapproval of Peabody's LOM revision
- BLM approval of changes to Peabody's mining plan
- USACE's approval of modification of Peabody's Clean Water Act Section 404 permit and USEPA (Hopi lands) and Navajo Nation Environmental Protection Agency (Navajo lands) Clean Water Act Section 401 water-quality certification
- USEPA and Navajo Nation Environmental Protection Agency (NNEPA) approval of modifications of Peabody's National Pollutant Discharge Elimination System permit
- USEPA approval of Peabody's notice of intent for coverage under the 2006 Multi-Sector General Permit for Storm Water (National Pollutant Discharge Elimination System)
- FWS review of OSM's BA and, if OSM and FWS enter into formal consultation, issuance of a biological opinion related to Section 7 of the ESA

Also, through the conditions of the existing mine permit, OSM will require Peabody's continued compliance with the National Historic Preservation Act (16 U.S.C. § 470f), Native American Graves Protection and Repatriation Act (104 STAT 3048, Public Law 101-601, 25 U.S.C. §§ 3001-3013), and policies of the Hopi Tribe and Navajo Nation.

1.2 SUMMARY OF CONSULTATION ACTIVITIES

Informal consultation for the project began with the submittal of a letter to the FWS from the project environmental consultant, URS Corporation (URS), on behalf of OSM on May 5, 2005. During the months of May, June, and July, representatives of FWS, OSM, Reclamation, and URS coordinated via electronic mail and teleconferences. On June 24, 2005, an informal coordination meeting of representatives of FWS, Reclamation, and URS, on behalf of OSM, was held in Phoenix, Arizona, to discuss the concept of the multiagency consultation and process, and to discuss convening a Biological Resources Subcommittee for the Black Mesa Project. The Biological Resources Subcommittee meetings focused on species that would be impacted by pumping water from the Coconino aquifer (C aquifer). As

the proposed action no longer includes pumping water from the C aquifer, information regarding the subcommittee meetings is not included here, but is available from the OSM Western Region Office and the FWS Flagstaff Service Office. A BA was submitted to FWS in March 2007; however, work on the Black Mesa Project was suspended on May 18, 2007. In July 2007, FWS informed OSM by letter that it had terminated its review of the BA. About one year after work was suspended, Peabody's intent to reduce the size and complexity of the Black Mesa Project was expressed to OSM and it became clear that the BA submitted to FWS would have to be revised. On June 17, 2008, a conference call took place with representatives from FWS, OSM, and URS to determine which species should be carried forward into the revised BA. Those species addressed in the BA as determined in the June 17, 2008, conference call are found in section 1.3 below.

1.3 SPECIES ADDRESSED IN THE BIOLOGICAL ASSESSMENT

On June 13, 2005, the FWS provided URS with a list of threatened and endangered species that may occur in the area affected by the Black Mesa Project. After changes were made to the proposed action, a conference call took place on June 17, 2008, with representatives from FWS, OSM, and URS to determine which species should be carried forward into the revised BA. Species identified as potentially affected by implementation of the proposed project actions were retained for evaluation in this BA and are presented in Table 1-1. Seven federally listed species or subspecies of plants and animals are addressed in this BA. Critical habitat has been designated for five of these species, as indicated in Table 1-1. Species for which the proposed actions were determined to have no effect are listed in Table 1-2 with a brief indication of why the species were considered not to be affected.

The development of this BA is intended to fulfill the compliance requirements of pertinent environmental laws, regulations, and policies in accordance with the requirements of Section 7(b) of the ESA of 1973, as amended, and implementing regulations [16 U.S.C. § 1536 (c), 50 Code of Federal Regulations (CFR) 402.12 (f) and 402.14 (c)], and ESA guidance contained in the Endangered Species Consultation Handbook (FWS and National Marine Fisheries Service 1998).

Table 1-1 Federally Listed Species Considered for Evaluation in the Biological Assessment

Species	Status	Species Listing		Critical Habitat	
		Date Listed	Federal Register No.	Date Designated	Federal Register No.
Mammals					
Black-footed ferret (*Mustela nigripes*)	E	March 11, 1967	32 FR 4001	N/A	N/A
Birds					
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	February 27, 1995	60 FR 10694	October 19, 2005	70 FR 60886
Mexican spotted owl (*Strix occidentalis lucida*)	E	March 16, 1993	58 FR 14248	August 31, 2004	69 FR 53182
Bald eagle (*Haliaeetus leucocephalus*)	T	July 12, 1995	60 FR 36000	N/A	N/A
California condor (*Gymnogyps californicus*)	E	March 11, 1967	32 FR 4001	September 24, 1976	41 FR 41914
Plants					
Navajo sedge (*Carex specuicola*)	T	May 8, 1985	50 FR 19370	May 8, 1985	50 FR 19370

SOURCE: FWS 1967, 1985, 1987a, 1993b, 1995a, 1996a, 1996 b, 2004, 2005a
NOTES: E = endangered, FR = Federal Register, N/A = not applicable, No. = number, T = threatened

Table 1-2 Special Status Species Excluded from Further Consideration and Reasons for Their Exclusion

Species	Status	Habitat Requirements	Reason For Exclusion
Birds			
Yellow-billed cuckoo (*Coccyzus americanus*)	C	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) at elevations below 6,600 feet (2,012 m).	No suitable habitat.
California brown pelican (*Pelecanus occidentalis californicus*)	E	Water or inaccessible rocks (either offshore or on mainland), and mudflats, sandy beaches, wharfs, and jetties.	No breeding records of the California brown pelican in Arizona, but an uncommon transient on many Arizona lakes and rivers, including the Colorado River.
Reptiles/Amphibians			
Chiricahua leopard frog (*Rana chiricahuensis*)	T	Streams, rivers, backwaters, and stock tanks at elevations from 3,300 to 8,900 feet (1,006 to 2,713 m) that are mostly free of introduced fish, bullfrogs, and crayfish.	Outside current range of species.
Fish			
Apache trout (Arizona) (*Oncorhynchus apache*)	T	Presently restricted to cold mountain streams with many low-gradient meadow reaches at elevations above 5,000 feet (1,524 m).	No suitable habitat.
Little Colorado spinedace (*Lepidomeda vittata*)	T	Moderate to small streams in pools and riffles with running water over sand and silt at elevations from 4,000 to 8,000 feet (1,219 to 2,438 m).	No suitable habitat.
Spikedace (*Meda fulgida*)	T	Moderate to large perennial streams over sand and gravel substates with moderate to swift water velocities below 6,000 feet (1,829 m).	No suitable habitat.
Loach minnow (*Tiaroga cobitis*)	T	Large to small perennial streams with swift, shallow water over cobble and gravel at elevations below 8,000 feet (2,438 m).	Outside current range of species.
Plants			
Peebles Navajo cactus (*Pediocactus peeblisianus* var. *peeblesianus*)	E	Limited geographic distribution in gravelly soils of the shinarump conglomerate of the Chinle formation at elevations from 5,400 to 5,600 feet (1,646 to 1,707 m).	Outside current range of species.
Welsh's milkweed (*Asclepias welshii*)	T	Active sand dunes derived from the Navajo Formation, in sagebrush, and in juniper and ponderosa pine communities between 4,700 and 6,250 feet (1,433 to 1,905 m) in elevation.	Habitat is located northeast, southwest, and northwest of the Black Mesa Complex; however, no habitat is present in the project area. Habitat is present near the Black Mesa and Lake Powell Railroad, but the rail line is not an interrelated or interdependent action to the LOM revision.

SOURCE: FWS 2008a, 2008b
NOTES: C = candidate, E = endangered, T = threatened

Under provisions of Section 7 (a)(2) of the ESA (16 U.S.C. § 1536), Federal agencies must ensure that any action authorized, funded, or implemented by the agency does not jeopardize the continued existence of any species listed or proposed for listing, or result in the destruction or adverse modification of critical habitat of such species. Section 7(b) of the ESA requires the FWS to issue a written statement providing an opinion of how the project actions may or may not affect listed species or critical habitat. A BA is required under Section 7(c) of the ESA if listed species or critical habitat may be present in an area affected by any "major construction activity." A major construction activity is defined in 50 CFR 402.02 as a construction project (or other undertaking having similar physical impacts), which is a major Federal action significantly affecting the quality of the human environment as defined in the National Environmental Policy Act of 1969. A BA is required both to evaluate the potential effects of an action on the federally listed species or critical habitat and to determine whether the species or habitat is likely to be adversely affected by the action.

This BA serves as part of the consultation package, under provisions of 50 CFR Part 402.14, to initiate informal consultation with the FWS on the Black Mesa Project. Under 50 CFR Part 402.12 (j), a Federal agency may initiate informal consultation concurrently with the submission of a BA and other appropriate information to FWS. OSM and the other consultation participants are requesting informal consultation based on its "may affect, not likely to adversely affect" determinations as discussed in Chapter 6 of this document.

The primary objectives of this BA are to (1) describe the purpose and need for the proposed project, and provide a conceptual framework of the history of consultation activities including a consultation agreement that was entered into by the FWS and a number of other Federal agencies; (2) describe the project components that are being considered to carry out the proposed action; (3) provide detailed information on the natural history of federally listed species potentially occurring in the vicinity of the project; (4) evaluate the potential effects of the proposed project on these species; (5) provide a determination of effect ("no effect," "may affect, not likely to adversely affect," or "may affect, likely to adversely affect") for the listed and proposed species; and (6) describe conservation measures that have been incorporated into the proposed action, or to promote conservation and recovery of listed species pursuant to Section 7(a)(1) of the ESA.

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 PROJECT LOCATION

The Black Mesa Complex (which includes the areas of the Kayenta mining operation and Black Mesa mining operation) is located on about 64,585 acres (26,136 ha) of land either leased or within grants-of-easements within the boundaries of the Hopi and Navajo Indian Reservations near Kayenta in Navajo County in northern Arizona, about 125 miles (201 kilometers [km]) northeast of Flagstaff, Arizona (Figure 2-1). Coal from the Kayenta mining operation is delivered by electric railroad 83 miles (134 km) northwest to the Navajo Generating Station near Page in northern Coconino County in northern Arizona.

2.2 PROPOSED ACTION

The action proposed by Peabody would revise the LOM operation and reclamation plans for the Black Mesa Complex to incorporate the initial program area, formerly known as the Black Mesa mining operation, into the LOM permit for the permanent program, along with associated structures and facilities that have been shared by the Kayenta and Black Mesa mining operations (Figure 2-2).

The Kayenta mining operation is authorized under a permanent Indian Lands Program permit originally issued by OSM in 1990 (OSM Permanent Program Permit AZ-0001D). The Permanent Program Permit AZ-0001D is a LOM permit renewable at five-year intervals and has been renewed on three occasions: 1995, 2000, and 2005. The current permit area is 44,073 acres (17,836 ha). The Kayenta mining operation produces about 8.5 million tons (7.7 million metric tons) of coal per year, all of which are delivered to the Navajo Generating Station.

The Black Mesa mining operation was conducted in accordance with OSM's initial program under an administrative delay of OSM's permanent Indian Lands Program permitting decision instituted in 1990 by the Secretary of the Interior. If OSM approves the LOM revision for the Black Mesa Complex, the 18,857 acres (7,631 ha) where the Black Mesa mining operation was conducted would be added to the 44,073 acres (17,836 ha) in the existing OSM permanent permit area, bringing the total acres of the permanent permit area to 62,930 (25,467 ha). If approved, the permanent permit area would not distinguish between the Kayenta mining operation and Black Mesa mining operation; they would be considered one operation for the purpose of regulation by OSM.

The LOM revision would allow changes to the operation and reclamation plans for the Kayenta mining operation. Approximately 1,236 acre-feet per year (af/yr) (1,524,584 cubic meters per year [m^3/yr]) of water, used for mine-related purposes, would be withdrawn on average from the Navajo aquifer (N aquifer). The LOM revision would not change the mining methods or the average annual production rate of the Kayenta mining operation. Mine plan areas are shown on Figure 2-3. Table 2-1 is a list of coal-resource areas and their status as it pertains to mining and reclamation.

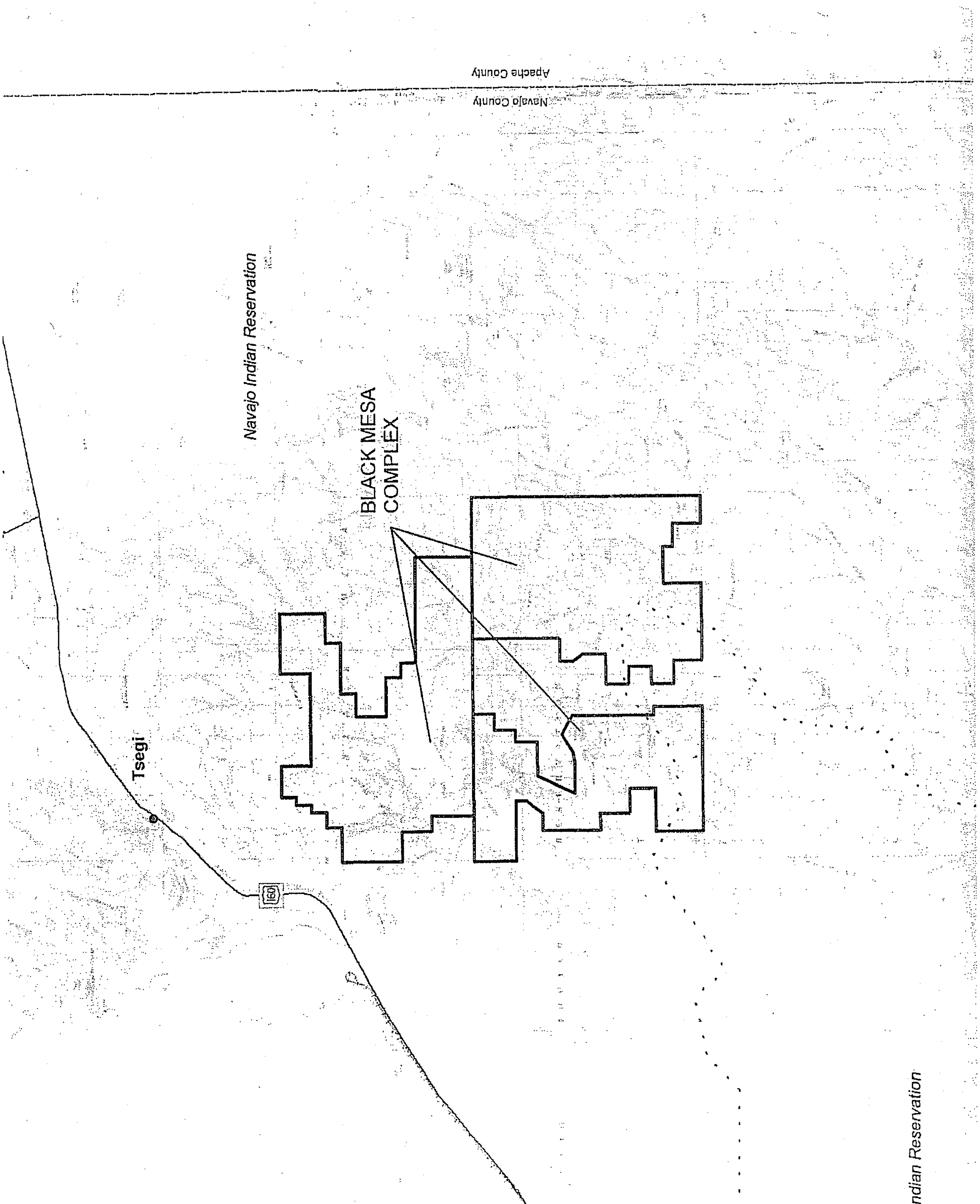
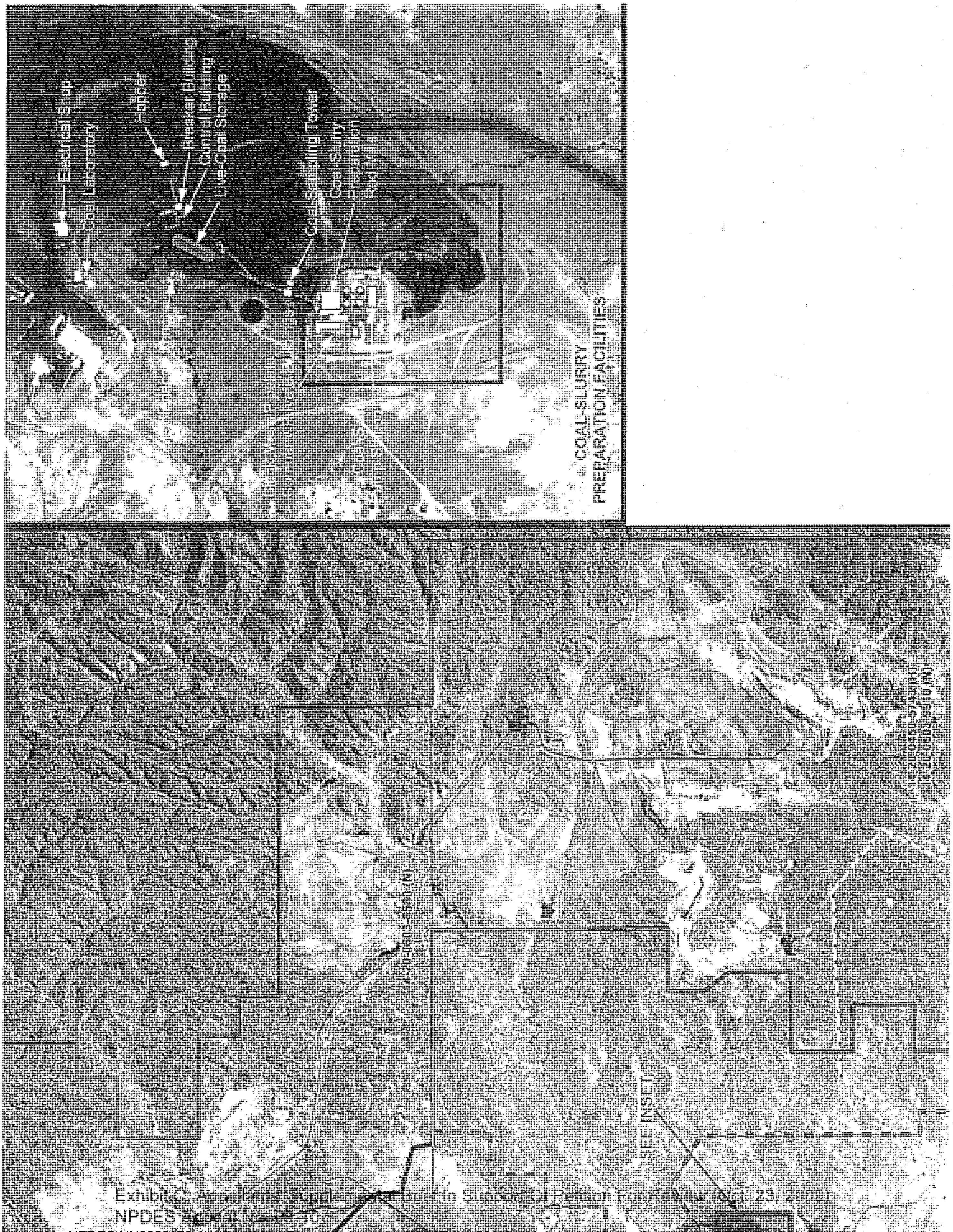
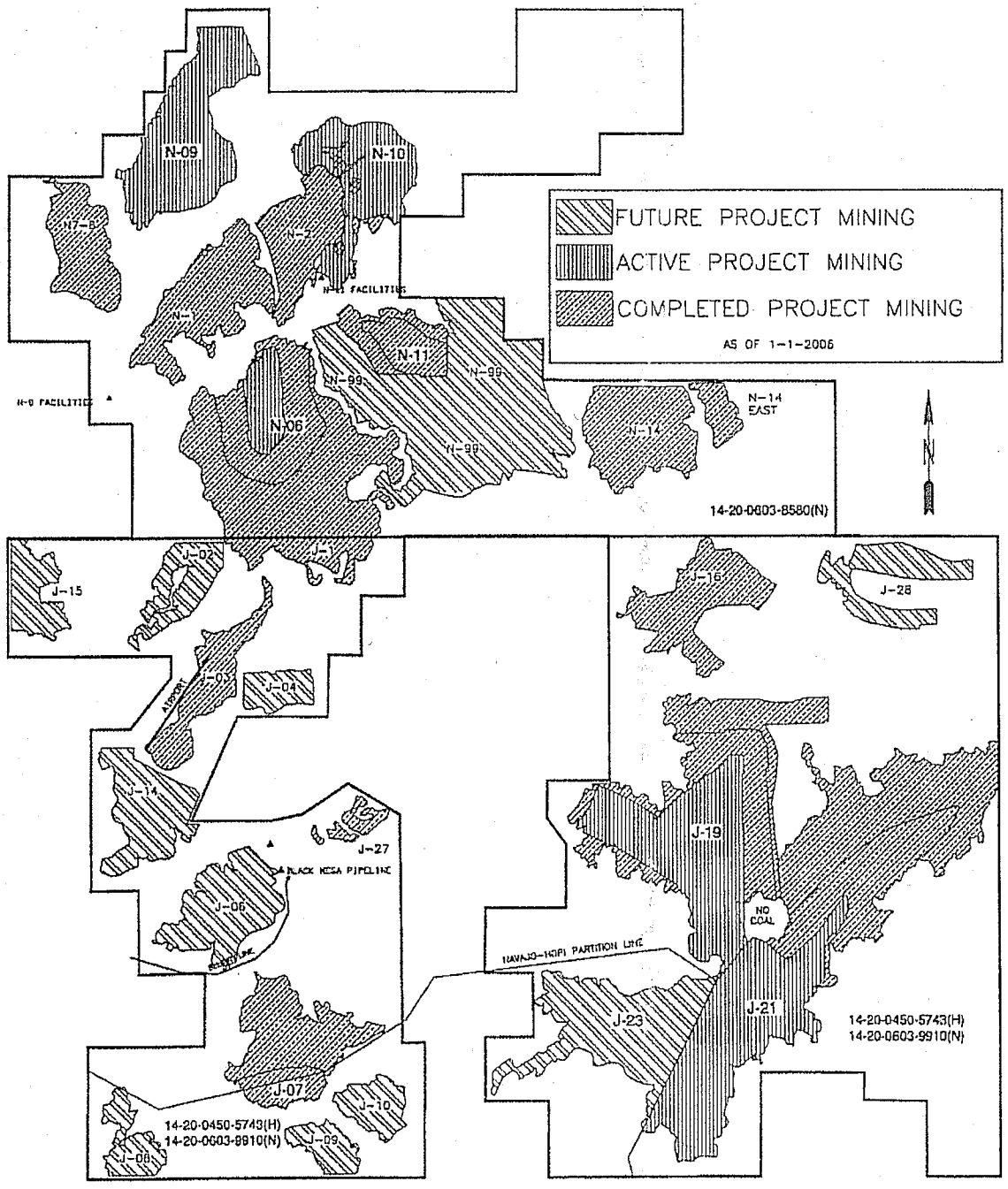


Exhibit C, Appellants' Supplemental Brief In Support Of Petition For Review (Oct. 23, 2009)
NPDES Appeal No. 09-10


Electrical Shop
Coal Laboratory
Hopper
Breaker Building
Control Building
Live Coal Storage
Coal Sampling Tower
COAL-SLURRY
PREPARATION FACILITIES
SEE INSET



Source: Peabody Western Coal Company 2006

Figure 2-3 Mine Plan Areas

Table 2-1 Coal-Resource Areas and Mining Status[1]

Coal-Resource Area	Total Acres of Unit[2]	Total Hectares of Unit[2]	Mining and Reclamation Status
N-01	350	142	Mined and reclaimed[4]
N-02	650	263	Mined and reclaimed[4]
N-06	2,890	1,170	Active mining and reclamation in 780 acres (316 ha), 2,060 acres (834 ha) reclaimed, 50 acres (20 ha) proposed to be mined and reclaimed in the future[3]
N-7/8	940	380	Mined and reclaimed[4]
N-09	2,170	878	Active mining and reclamation on 375 acres (152 ha), no acres reclaimed, 1,795 acres (726 ha) to be mined and reclaimed in the future[3]
N-10	1,790	724	Active mining and reclamation in temporary cessation; 55 acres (22 ha) disturbed, 130 acres (53 ha) reclaimed, 1,605 acres (650 ha) to be mined and reclaimed in the future[3]
N-11	800	324	Mined and being reclaimed, 295 acres (119 ha) reclaimed, 505 acres (204 ha) in reclamation, no additional areas to be mined in the future[3]
N-14	1650	668	Mined and reclaimed[5]
N-99	3,880	1,570	Undisturbed, to be mined and reclaimed in the future[6]
J-01	480	194	Mined and reclaimed
J-02	900	364	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-03	100	41	Mined and reclaimed
J-04	520	210	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-06	1,220	494	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-07	1,040	421	Mined and reclaimed
J-08	730	295	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-09	470	190	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-10	430	174	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-14	950	384	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-15	730	295	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-16	1,350	546	Mined and reclaimed
J-19	3,910	1,582	Active mining and reclamation in 2,080 acres (842 ha), 1,060 acres (429 ha) reclaimed, 770 acres (312 ha) to be mined and reclaimed in the future[3]
J-21	5,280	2,137	Active mining and reclamation in 980 acres (397 ha), 2,630 acres (1,064 ha) reclaimed, 1,670 acres (676 ha) to be mined and reclaimed in the future[3]
J-23	2,500	1,012	Undisturbed, proposed to be mined and reclaimed in the future[6]
J-27	70	28	Mined and reclaimed
J-28	1,440	583	Undisturbed, proposed to be mined and reclaimed in the future[6]

SOURCE: Peabody Western Coal Company 2008

NOTES:
[1] In addition to the coal-resource areas, about 3,270 acres (1,323 hectares) are disturbed by actively used long-term support facilities including haul roads, other primary roads, coal-handling areas, conveyors, railroad-loading facilities, storage areas, shops, offices, and other structures and facilities.
[2] Approximate acres (or hectares) subject to Office of Surface Mining regulation—areas mined before the effective date of the Surface Mining Control and Reclamation Act (December 13, 1977), totaling approximately 2,760 acres (1,117 hectares), are not included.
[3] Approximate acres on January 1, 2008.
[4] OSM has terminated its jurisdiction over this area under the initial program.
[5] Phase I bond release approved by OSM.
[6] Mining in this coal-resource area would not be authorized if the life-of-mine revision is approved.

Areas mined out by the Black Mesa operation by the end of 2005 have already been or are being reclaimed (areas J-01, J-03, J-07, and J-27) (refer to Figure 2-3). One coal-resource area that was not completely mined out by the end of 2005 (N-06) is currently producing coal for the Navajo Generating Station. Several coal-resource areas, totaling 5,950 acres (2,408 ha) that were never mined by the Black Mesa mining operation (J-02, J-04, J-06, J-08, J-09, J-10, J-14, and J-15) would be incorporated into the expanded permit area for the Black Mesa Complex, although Peabody does not propose in the current LOM revision to mine them. If the LOM revision were approved, Peabody would not be authorized to mine these coal-resource areas. However, the unmined coal-resource areas could be mined in the future if applications were submitted to, and approved by, BLM and OSM. Under the current permit, Peabody has approval to produce from other mining areas (N-09, N-10, N-99, J-19, and J-21) all of the coal needed by the Navajo Generating Station through 2026. It is anticipated that Peabody would continue to request that OSM renew its permit every five years until the coal is mined out. From 2006 through 2026, the Black Mesa operation infrastructure would be used as necessary to facilitate mining and reclamation by the Kayenta mining operation.

The Kayenta mining operation would continue into 2026 but would stop before the year is completed. It would use N-aquifer water in amounts averaging 1,236 af/yr (1,524,592 m^3/yr) from 2006 to 2025. As proposed in the LOM revision, the Kayenta mining operation would cease in 2026, and the mine would be reclaimed.

From 2026 through 2028, 505 af/yr (622,912 m^3/yr) of N-aquifer water would be used on average for reclamation and public use, 444 af/yr (547,669 m^3/yr) of N-aquifer water would be used on average from 2029 through 2038 for public use and well maintenance. Peabody must pump the N-aquifer wells periodically to keep them in operating condition; as stipulated by lease, the wells must be returned to the tribes in that condition. The wells would be returned to the tribes once Peabody successfully completed reclamation and relinquished the leases to the tribes. Under the proposed action, pumping the N aquifer for project-related uses would cease when the water was no longer needed for project-related uses (i.e., mine operations, and reclamation).

2.3 CONSERVATION MEASURES

Impact minimization and avoidance measures for all federally listed and candidate species and designated critical habitat within the project area are included, where appropriate, in Chapter 6.

3.0 METHODS

The assessment and conservation measures contained within this BA are based on coordination with regulatory and resource agency personnel, and the best available scientific information on the distribution and abundance of the affected species and the associated effects of the proposed action on them. This assessment includes the most recent results of survey and monitoring efforts, consultation with technical experts, and detailed review of pertinent biological and management literature.

3.1 AGENCY COORDINATION

Informal consultation for the project began with the submittal of a letter to the FWS from the project environmental consultant, URS, on behalf of OSM on May 5, 2005. Since that time, there have been a number of meetings and correspondence between URS and representatives of FWS and other Federal agencies including OSM, Bureau of Indian Affairs, BLM, Forest Service, USEPA, and U.S. Army Corps of Engineers, the most notable of which were described in Section 1.2. These collaborative efforts helped to identify gaps in information, provided opportunity for discussion and agreement on the technical approach for the project, helped identify environmental issues and concerns, contributed to the screening of alternatives and development of the proposed action, and aided in the development and implementation of a number of proposed conservation measures or opportunities. While many of these meetings were regarding species that are no longer included in the BA, due to the change in the proposed action, information regarding coordination and meetings is available from the OSM Western Region Office and the FWS Flagstaff Service Office. About one year after work on the Black Mesa Project had been suspended, on June 17, 2008, a conference call took place with representatives from FWS, OSM, and URS to determine which species should be carried forward into this revised BA.

3.2 FIELD SURVEYS

To document existing conditions and provide a baseline for subsequent evaluation and analysis, several field reconnaissance efforts were conducted for the project in the summer and fall of 2005. Surveys included those for species that are no longer addressed in the BA due to changes in the proposed action. A record of surveys conducted is available from the OSM Western Region Office and the FWS Flagstaff Service Office. Additionally, annual wildlife monitoring occurs at the Black Mesa Complex that includes raptor surveys and nest monitoring, prairie-dog-colony assessment, surveys for Navajo and federally listed special status species, and reclamation monitoring.

3.3 PUBLISHED AND UNPUBLISHED LITERATURE AND SIGHTING RECORDS

A variety of informational sources were used to describe the existing environment in the study area and evaluate potential impacts from the project. Primary data sources reviewed and incorporated into this document include biological surveys and reports conducted by the following government agencies and consultants: species occurrence information from the Arizona Natural Heritage Program and Navajo Natural Heritage Program (NNHP), geographical information system data from the FWS on federally designated critical habitat for listed species, geographical information system data developed by Arizona Game and Fish Department (AGFD) to assess southwestern willow flycatcher breeding habitat, proposed and final rules for the Federal listing of species from the Federal Register, recovery plans from FWS for listed species, published scientific documents that pertain directly to the specific circumstances and issues involved in this analysis, and personal communication with local species experts.

4.0 EXISTING ENVIRONMENT

This chapter describes the physical and biological environment of the project area and emphasizes those factors most likely to influence essential habitat components for federally listed species. Collectively, these descriptions provide the background for the analysis of impacts on federally listed species in Chapter 6, since some alteration of these environmental elements would result if the proposed action is approved.

4.1 PHYSIOGRAPHY

The project area is located in northern Arizona, within the Colorado Plateau and Basin and Range physiographic provinces. The Black Mesa Complex is located within the Colorado Plateau province. The Colorado Plateau consists of uplifted and tilted sedimentary layers and steep-sided valleys at elevations of 5,000 to 7,000 feet (1,524 to 2,134 meters [m]). On the southwest and west, the Colorado Plateau gives way to the Basin and Range province, which is characterized by steep-sided mountain ranges separated by relatively level valleys.

The Kayenta and Black Mesa mining operations are located within Black Mesa, a massive highland within the Colorado Plateau that covers approximately 2.1 million acres (0.85 million ha). Along its northern boundary, Black Mesa rises abruptly in a 1,200- to 2,000-foot (366- to 610-m) high uneven wall, but elevations descend gradually downward to the south and west to the Little Colorado River. The maximum elevation of Black Mesa is 8,200 feet (2,500 m), but the mine facilities are located within an approximate elevation range of 6,200 to 7,200 feet (1,890 to 2,195 m). The Peabody leasehold covers 64,858 acres (26,247 ha) in the northern part of Black Mesa just south of Kayenta, Arizona.

4.2 LAND USE

The project area spans an area of northern Arizona in Navajo County that includes American Indian reservations held in trust by the Federal government for the Hopi Tribe and Navajo Nation. Most of the land within and near the project area is unoccupied, or is occupied by residents living remotely in small- to medium-sized communities dispersed over the landscape. The majority of the Hopi population lives within community mixed-used areas that include residential, commercial, industrial, and public facilities, such as Kykotsmovi, Redrock, Moenkopi, and Hotevila. Navajo people have traditionally lived in dispersed, remote locations surrounded by ample land, but today many live in government-subsidized housing projects located in large mixed-use communities such as Leupp, Hard Rock, Kayenta, Cameron, and Tuba City.

Most land in the project vicinity is used for ranching and livestock grazing. Land within and near large towns generally has developed subdivisions with accompanying commercial and industrial areas. The largest industrial facilities within the project area are the Kayenta and Black Mesa mining operations. Most of the agriculture in the project vicinity is associated with residences and consists of small family gardens. Agricultural plots tend to be larger on the Hopi Reservation, where most farmers use dry farming and have several small fields in different locations, such as the bases of mesas, on sand slopes, in small canyons, along alluvial plains in washes, and in the valleys between mesas.

A number of areas within or near the project area have been designated for special management by land-managing agencies. The Hopi Tribe and Navajo Nation have designated areas for purposes of conservation/environmental reserves and wildlife areas.

The Kayenta and Black Mesa mining operations are located on approximately 101 square miles (262 square kilometers [km^2]) of land leased from the Hopi Tribe and Navajo Nation. The mine lease area covers 64,858 acres (26,247 ha) on the northern part of Black Mesa, with an additional grant-of-easement

for approximately 361 acres (146 ha). The Kayenta mining operation is located on approximately 3,000 acres (1,214 ha) of the Hopi Reservation and 43,460 acres (17,588 ha) of the Navajo Reservation (refer to Figure 2-1). The Black Mesa mining operation is located on approximately 3,135 acres (1,269 ha) of the Hopi Reservation and 15,625 acres (6,323 ha) of the Navajo Reservation. Coal mining is the primary land use within the lease area. Other uses of non-mine land include residential, grazing, agricultural, wood harvesting, and gathering of plant materials.

4.3 HYDROLOGY

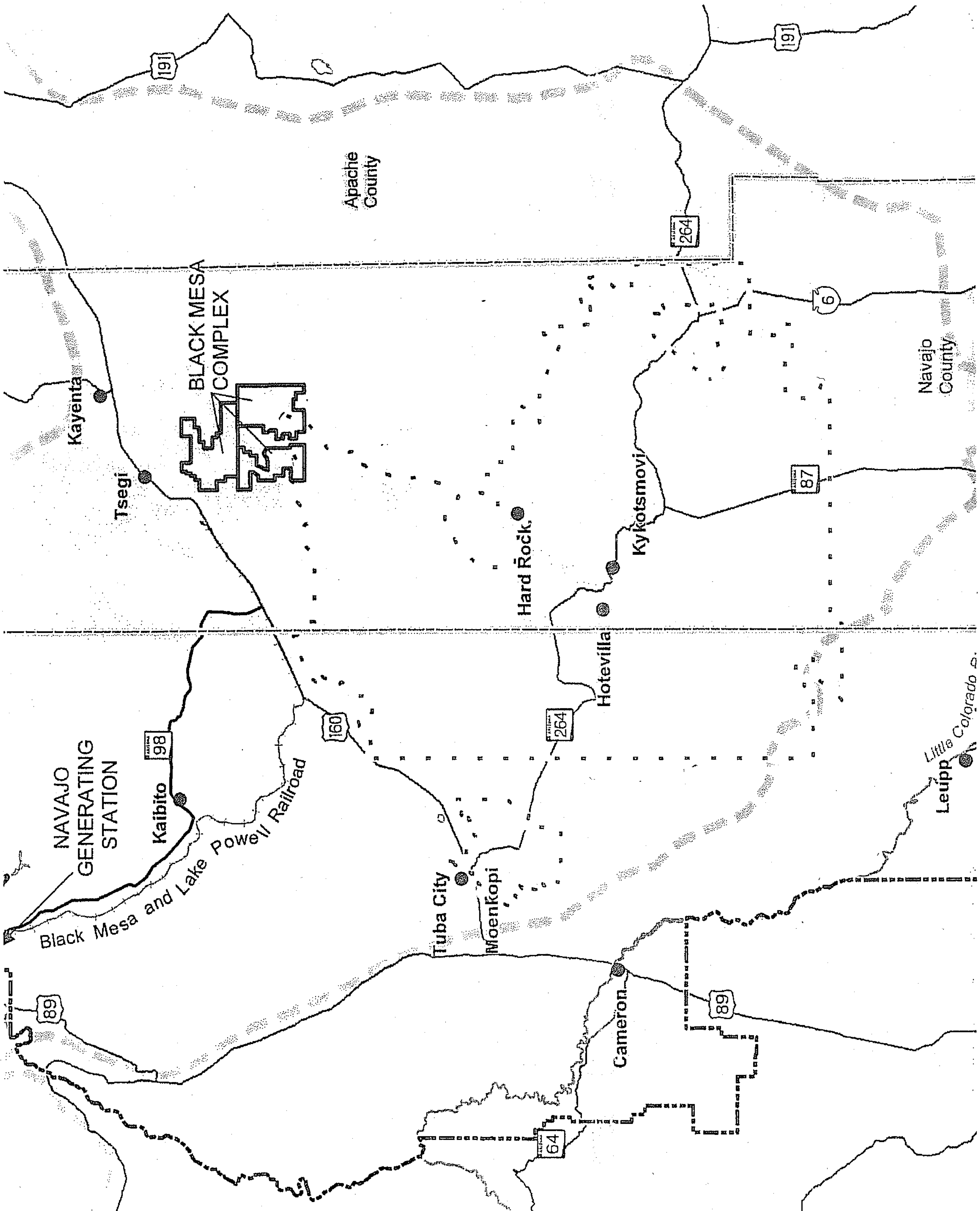
Two major drainages convey runoff and spring discharge from the Black Mesa Complex, Moenkopi, and Dinnebito Washes. All of these washes are intermittent, as defined by OSM (30 CFR 701.5) and discharge to the Little Colorado River. Additionally, five large washes feed Moenkopi Wash—Yucca Flat Wash, Red Peak Valley Wash, Reed Valley Wash, Coal Mine Wash, and Yellow Water Canyon Wash.

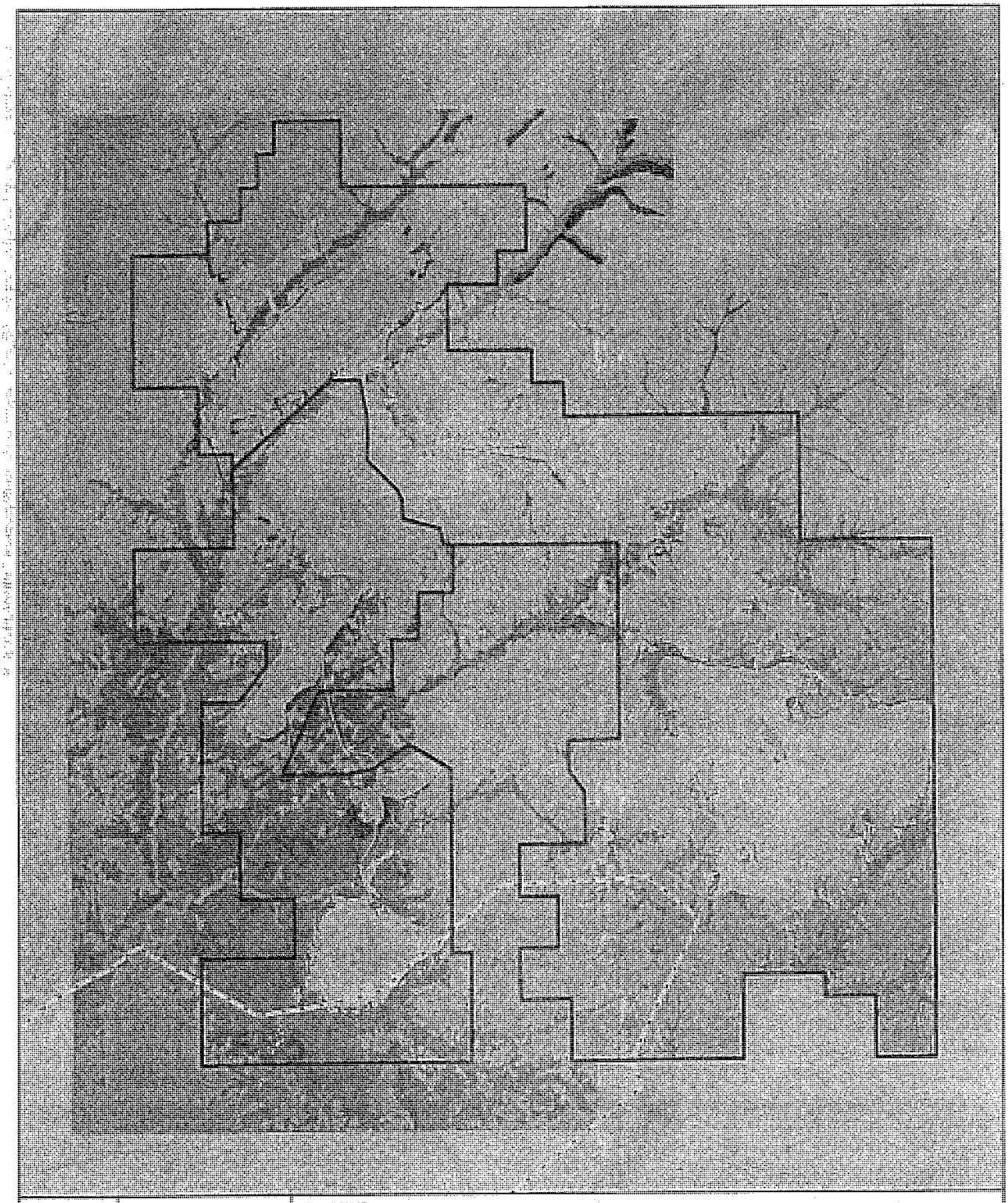
Flows are highly variable and primarily consist of storm water runoff. Perennial reaches are the result of saturated rock at the surface and the discharge of alluvial aquifers that hold storm water. When possible, Peabody has measured base flows in each of the washes within the Black Mesa Complex, which ranged from 0.020 to 0.29 cubic feet per second (cfs) (0.0006 to 0.008 cubic meters per second [cms]) for Coal Mine Wash, 0.09 to 0.17 cfs (0.003 to 0.005 cms) for Moenkopi Wash, 0.002 cfs (0.00006 cms) for Dinnebito Wash, 0.08 cfs (0.002 cms) for Reed Valley Wash, 0.071 cfs (0.002 cms) for Red Peak Valley Wash, and 0.027 cfs (0.0008 cms) for Yellow Water Canyon Wash. However, perennial stream reaches do not exist within the permit area.

The N aquifer (Figure 4-1) includes water-bearing rocks of the Lukchukai Member of the Wingate Formation and Navajo Sandstone and the intervening Kayenta Formation. Within the project area, the N aquifer recharges mainly in the north-central part of the aquifer, north and west of Kayenta. It discharges into Laguna Creek to the northeast, into Navajo Creek to the northwest, and to the southwest where it discharges into Moenkopi Wash. Annual recharge of the N aquifer is estimated to be approximately 13,000 af/yr (16 million m^3/yr) (Eychaner 1983, Hart et al. 2002) and an estimated 166 million acre feet (205 billion m^3) of water is in storage in the N aquifer (Arizona Department of Water Resources 1989, Eychaner 1983). The N aquifer is used extensively by the Hopi and Navajo tribal authorities and by individual members as a public drinking supply. Until December 2005, it supplied the water for the coal slurry from the Black Mesa mining operation. Total withdrawals from the N aquifer have increased from about 70 to 8,000 acre-feet (86,344 to 9.8 million m^3) per year from 1965 to 2002, with the major increase due to industrial use by the eight wells for the mine and coal-slurry pipeline. In addition, the Hopi and Navajo operate about 70 municipal wells, and about 270 windmills produce N-aquifer water, primarily for stock watering.

4.4 VEGETATION

The Black Mesa Complex is located within the Great Basin conifer woodland biotic community (Figure 4-2) (Brown 1982; Brown and Lowe 1980). Detailed vegetation data have been collected at various times for coal-mine permitting (Peabody 2004), and baseline vegetation sampling of the coal-resource areas was conducted in 2003 (ESCO Associates 2000a, 2000b, 2003). The Black Mesa Complex mining areas generally occur within four native plant communities: piñon/juniper woodland, sagebrush shrub, saltbush shrubland, and greasewood shrubland, which are described below. A reclaimed-land plant community is created where mine land has been revegetated, which also is described below (Figure 4-2).


NAVAJO GENERATING STATION
Kaibito
98
Black Mesa and Lake Powell Railroad
160
Tuba City
Moenkopi
89
64
Cameron
Leupp
Little Colorado
264
Hotevilla
Kykotsmovi
Hard Rock
87
Navajo County
6
BLACK MESA COMPLEX
Tsegi
Kayenta
Apache County
191



Vegetation
Black Mesa Project BA

Figure 4-2

Piñon/juniper woodland is the dominant plant community within the Black Mesa Complex and occupies approximately 65 to 70 percent of the undisturbed land area. Piñon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) are dominant, with tree canopy mostly covering 14 to 18 percent of the area. Common shrubs include big sagebrush (*Artemisia tridentata*), fourwing saltbush (*Atriplex canescens*), cliffrose (*Cowania mexicana*), Douglas rabbitbrush (*Chrysothamnus viscidiflorus*), and shadscale (*Atriplex confertifolia*). Grasses and forbs provide a small amount of cover, with the most common grasses being bottlebrush squirreltail (*Sitanion hystrix*), Indian ricegrass (*Oryzopsis hymenoides*), and muttongrass (*Poa fendleriana*). Some piñon/juniper stands appear to have very little understory vegetation, while others have a moderate presence of shrubs. Piñon/juniper woodland has extensive areas of bare soil, rock, and litter below trees. It occurs at an elevation range of 6,300 feet (1,920 m) to more than 7,200 feet (2,195 m) in the area of the mines. Piñon tends to be dominant over juniper at higher elevations, and juniper is dominant at lower elevations.

Sagebrush shrub is the second most dominant vegetation type at the Black Mesa Complex, covering 30 to 35 percent of undisturbed land areas. This community occurs on flatter areas and in valley bottoms within the matrix of piñon/juniper woodland. It is dominated by big sagebrush and blue grama (*Bouteloua gracilis*). There is varying and sometimes substantial presence of other shrubs and subshrubs, especially fourwing saltbush, Douglas rabbitbrush, Greene rabbitbrush (*Chrysothamnus greenei*), and rubber rabbitbrush (C. *nauseosus*). Along with blue grama, galleta (*Hilaria jamesii*) was a common warm-season grass. Cool-season grasses were less common and included big squirreltail (*Sitanion jubatum*), bottlebrush squirreltail (*Sitanion longifolium*), needle and thread (*Stipa comata*), Indian ricegrass, and western wheatgrass (*Agropyron smithii*). Sagebrush extends up to 7,000 feet (2,134 m) in elevation within the Black Mesa Complex.

Saltbush and greasewood shrublands are two additional upland shrub communities that occupy relatively small areas. Saltbush and greasewood shrublands occupy the margins of terraces associated with the primary, secondary, and occasionally tertiary drainages. The terraces are mostly 5 to 20 feet (1.5 to 6 m) above the drainage-channel floodplains where alluvial-soil materials may be as much as 30 feet (9 m) deep. Fourwing saltbush and greasewood (*Sarcobatus vermiculatus*) are dominant in these communities, with sparse-to-dense understories of annual forbs and grasses.

Reclaimed land occupies thousands of acres of mined land in the Black Mesa Complex. This community is dominated by native and introduced grasses and shrubs. Cool-season native grass species include western wheatgrass, thickspike wheatgrass (*Agropyron dasystachyum*), Indian ricegrass, needle and thread, big squirreltail, and bottlebrush squirreltail; and common warm-season native grass species are blue grama, galleta, and alkali sacaton (*Sporobolus airoides*). The most abundant introduced perennial grass species is Russian wildrye (*Elymus junceus*). Crested wheatgrass (*A. desertorum*) and intermediate wheatgrass (*A. intermedium*) also are present. Fourwing saltbush is the dominant shrub species, but several other species are common.

Elevations of the Black Mesa Complex generally decrease from northeast to southwest; therefore, the western and southern areas of the Black Mesa Complex have lower cover of piñon/juniper woodland and a higher cover of sagebrush shrub in unmined areas. In addition, the greasewood and tamarisk (*Tamarix ramosissima*) communities are more common because these communities occur where drainages are larger and more developed.

Riparian habitat occurs along major drainageways in linear stringers of vegetation. The stringers range from 10 to 20 feet (3 to 6 m) in width, and extend from a few yards to more than 0.5 mile (0.8 km) in length. This community occurs on the bottoms of the washes, typically occupying agrading portions such as sandbars. The dominant species is tamarisk (*Tamarix pentandra*). Small amounts of greasewood, fourwing saltbush, and coyote willow (*Salix exigua*) are associated with the tamarisk on stable sites. The

herbaceous vegetation is composed of cheatgrass (*Bromus tectorum*), European alkali grass (*Puccinellia distans*), stickseed (*Lappula occidentalis*), and desert seepweed (*Suaeda torreyana*). This community is the same as the *Tamarix pentandra* community type in a general classification of riparian forest and scrubland types of Arizona (Szaro 1989). Similar riparian habitat occurs downstream from the mine area in Moenkopi Wash and Coal Mine Wash.

Wetland and aquatic plants occur at some of the many impoundments, including freshwater ponds, sediment ponds, and internally draining ponds in reclaimed areas. Some larger ponds have wetland plants along the margin, including tamarisk, coyote willow, bulrush (*Scirpus acutus*) and cattail (*Typha latifolia*). Aquatic plants include common poolmat (*Zanichellia palustris*), pondweeds (*Potamogeton filiformis* and *P. pectinata*), and holly-leafed water nymph (*Najas marina*). The only aquatic macrophyte in most ponds is a blue-green algae (*Chara* spp.).

4.5 WILDLIFE

4.5.1 Terrestrial Habitats and Wildlife

The project area and surrounding region support a variety of natural vegetation communities and landscape features that offer a diversity of wildlife habitat types. While these habitat types correspond with the vegetation community types discussed in Section 4.4, they also are defined by a number of distinct landscape features such as washes and gullies, rock outcrops and hillsides, cliffs and taluses, and cave and mine entrances. All contribute to the diversity and abundance of wildlife in the area as they generally provide a microhabitat for wildlife uniquely adapted to or dependent on these features.

Twenty-six mammal species were recorded in the Black Mesa Complex during baseline wildlife studies conducted in 1979 through 1983 (Peabody 2004). Updated information on wildlife distribution and habitat was collected during a 2003 field reconnaissance (BIOME Biological and Wildlife Research [BIOME] 2003). A 1979-1980 census for ungulates recorded two observations of mule deer (*Odocoileus hemionus*), both north of the Black Mesa Complex. In 2003, 10 mule deer and numerous pellet groups of mule deer and elk (*Cervus elaphus*) were observed during biological surveys for birds and threatened and endangered species (BIOME 2003).

The sagebrush shrubland and piñon/juniper woodland support the largest populations of small mammals. Deer mice (*Peromyscus maniculatus*) are the most common species trapped in the Black Mesa Complex. Piñon/juniper woodland supports piñon-mice (*Peromyscus truei*), brush mice (*Peromyscus boylii*), Ord's kangaroo rat (*Dipodomys ordii*), Stephen's woodrat (*Neotoma stephensi*), and Colorado chipmunk (*Tamias quadrivittatus*). Gunnison's prairie dogs (*Cynomys gunnisoni*) occur in grassland habitats. Black-tailed jackrabbits (*Lepus californicus*) and desert cottontails (*Sylvilagus audubonii*) occur in all habitats at Black Mesa, as do coyotes (*Canis latrans*), red foxes (*Vulpes fulva*) and grey foxes (*Urocyon cinereoargenteus*). Bat surveys will not be conducted, but up to 16 species may occur.

Bat studies were conducted in reclaimed areas and in piñon/juniper habitat on Black Mesa during the summer of 1999. Nine bat species were identified through mist netting and the use of an Anabat II detection unit to gather acoustic records of bats. The documented species included the big brown bat (*Eptesicus fuscus*), long-legged myotis (*Myotis volans*), silver-haired bat (*Lasionycteris noctivagans*), pallid bat (*Antrozous pallidas*), fringed myotis (*Myotis thysanodes*), Mexican free-tailed bat (*Tadarida brasiliensis*), big free-tailed bat (*Nyctinomops macrotis*), western pipistrelle (*Parastrellus hesperus*), and an unknown myotis species (SWCA Environmental Consultants 2000). Only the first six species listed above were found in piñon/juniper habitat, while all nine detected species were found in reclaimed areas

Bird surveys have recorded a total of 235 bird species in the Black Mesa Complex, more than half of which are known to or potentially nest in the area (Peabody 2004). The highest number of birds and the greatest diversity of species is observed in summer, partly due to fledged offspring (Peabody 2004). The more common species and their habitats are presented in Table 4-1.

Raptor studies in the 1980s recorded a total of 22 raptor species with 9 of those likely to nest in the Black Mesa Complex. Red-tailed hawks (*Buteo jamaicensis*) were the most abundant raptor species; Cooper's hawks (*Accipiter cooperii*) and sharp-shinned hawks (*Accipiter striatus*) were relatively common in coniferous woodland habitats. Later raptor surveys in 2003 recorded American kestrel (*Falco sparverius*) and Cooper's hawk. A historic red-tailed hawk nest remained inactive in 2003 (BIOME 2003). Other less common species that may breed in the area include northern goshawk (*Accipiter gentilis*), prairie falcon (*Falco mexicanus*), western screech owl (*Otus kennicottii*), great horned owl (*Bubo virginianus*), northern pygmy-owl (*Glaucidium gnoma*), and long-eared owl (*Asio otus*).

A high diversity of migratory waterfowl and shorebirds utilize the larger impoundment ponds. Mallards (*Anas platyrhynchos*) are likely the only nesting species, though redheads (*Aythya americana*), ruddy ducks (*Oxyura jamaicensis*), and American coots (*Fulica americana*) also may nest in the vicinity (Corman and Wise-Gervais 2005). Many other species may utilize the ponds during migration such as eared grebe (*Podiceps nigricollis*), great blue heron (*Ardea herodias*), blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*), cinnamon teal (*Anas cyanoptera*), northern shoveler (*Anas clypeata*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), and lesser scaup (*Aythya affinis*) (Corman and Wise-Gervais 2005). Killdeer (*Charadrius vociferous*) are the only shorebirds that may nest in the Black Mesa Complex (Corman and Wise-Gervais 2005).

Amphibians and reptiles species observed during 2003 field reconnaissance include whiptail lizard (*Aspidoscelis* spp.), collared lizard (*Crotophytus collaris*), sagebrush lizard (*Sceloporus graciosus*), fence lizard (*Sceloporus undulates*), and side-blotched lizard (*Uta stansburiana*) (BIOME 2003).

Table 4-1 Common Wildlife Species by Habitat

Wildlife Species		Habitat		
Common Name	Scientific Name	All Habitats	Great Basin Conifer-Woodland	Streams and Ponds (intermittent and perennial)
Mammals				
Mule deer	*Odocioleus hemionus*	X		
Elk	*Cervus elaphus*		X	
Mountain lion	*Felis concolor*		X	
Coyote	*Canis latrans*	X		
Bobcat	*Felis rufus*	X		
Grey fox	*Urocyon cinereoargenteus*	X	X	
Badger	*Taxidea taxus*	X		
Raccoon	*Procyon lotor*			X
Big brown bat	*Eptesicus fuscus*	X		
Western spotted skunk	*Spilogale gracilis*	X		
Striped skunk	*Mephitis mephitis*			X
Black-tailed jackrabbit	*Lepus californicus*	X		
Desert cottontail	*Sylvilagus audubonii*	X		
Porcupine	*Erethizon dorsatum*		X	
Gunnison's prairie dog	*Cynomys gunnisoni*		X*	
White-throated woodrat	*Neotoma albigula*	X		
Ord's kangaroo rat	*Dipodomys ordii*	X		

Wildlife Species		Habitat		
Common Name	Scientific Name	All Habitats	Great Basin Conifer Woodland	Streams and Ponds (intermittent and perennial)
Botta's pocket gopher	*Thomomys bottae*	X		
Piñon mouse	*Peromyscus truei*		X	
Birds				
Turkey vulture	*Carthartes aura*	X		
Red-tailed hawk	*Buteo jamaicensis*	X		
Cooper's hawk	*Accipiter cooperii*		X	
American kestrel	*Falco sparverius*	X		
Great horned owl	*Bubo virginianus*	X		
Common poorwill	*Phalaenoptilus nuttallii*		X	
Mallard	*Anas platyrhynchos*			X
Killdeer	*Charadrius vociferus*			X
Northern flicker	*Colaptes auratus*		X	
Black-chinned hummingbird	*Archilochus alexandri*		X	
Mourning dove	*Zenaida macroura*	X		
Common raven	*Corvus corax*	X		
Ash-throated flycatcher	*Myiarchus cinerascens*	X		
Cassin's kingbird	*Tyrannus vociferans*		X	
Gray flycatcher	*Empidonax wrightii*		X	
Piñon jay	*Gymnorhinus cyanocephalus*		X	
Western scrub jay	*Aphelocoma californica*		X	
Plain titmouse	*Parus inornatus*		X	
Bushtit	*Psaltriparus minimus*		X	
Rock wren	*Salpinctes obsoletus*	X		
Bewick's wren	*Thryomanes bewickii*		X	
Northern mockingbird	*Mimus polyglottos*	X		
Gray vireo	*Vireo vicinior*		X	
Plumbeous vireo	*Vireo solitarius plumbeus*		X	
Black-throated gray warbler	*Dendroica nigrescens*		X	
Black-headed grosbeak	*Pheucticus melanocephalus*		X	
Spotted towhee	*Pipilo maculatus*		X	
Chipping sparrow	*Spizella passerina*		X	
Scott's oriole	*Icterus parisorum*		X	
House finch	*Carpodacus mexicanus*	X		
Reptiles and Amphibians				
Western terrestrial garter snake	*Thamnophis elegans*			X
Sagebrush lizard	*Sceloporus graciosus*		X	
Plateau striped whiptail	*Aspidoscelis velox*		X	
Tiger salamander	*Ambystoma tigrinum mavortium*			X
Red-spotted toad	*Bufo punctatus*			X
Great Plains toad	*Bufo cognatus*			X
Mexican spadefoot	*Spea multiplicata*			X
Canyon treefrog	*Hyla arenicolor*			X

SOURCES: Hoffmeister 1986; Corman and Wise-Gervais 2005; Brown 1982; Arizona Partners in Amphibian and Reptile Conservation 2005

NOTE: *Gunnison's prairie dogs are found in grassland areas of the Black Mesa Complex.

5.0 SPECIES' ACCOUNTS

This chapter of the BA provides information on the status, threats, habitat requirements, and life history of covered species. This section also includes information on the distribution and population status of covered species in the proposed project area and surrounding region as determined through recent survey efforts, published literature, management plans, and communication with local experts.

5.1 BLACK-FOOTED FERRET

5.1.1 Species' Description

The black-footed ferret (*Mustela nigripes*) is a small, weasel-like mammal approximately 2 feet (60 centimeters [cm]) in length and can reach up to 2.5 pounds (1.1 kilogram [kg]) in weight. It has a black face mask, black legs, and a black-tipped tail. Its fur is buffy yellow with lighter coloration on the belly, and its forehead, muzzle, and throat are nearly all white. One of 14 recognized species of mustelids in North America, the black-footed ferret is a mostly nocturnal, solitary carnivore that is considered an obligate associate of the prairie dog (*Cynomys* spp.) (Henderson et al. 1969; Hillman and Linder 1973).

5.1.2 Species' Status—Past and Present

Considered as the rarest mammal in North America, with only one wild population that was discovered in South Dakota in 1964, the black-footed ferret was listed as endangered on March 11, 1967 (32 Federal Register [FR] 4001) and has since remained on the endangered species list as one of the most endangered mammals in North America. Various "nonessential experimental populations" have been established in the United States under subsection 10(j) of the ESA. Under this section, the FWS can designate reintroduced populations established outside the species' current range but within its historical range as "experimental." The FWS can designate experimental populations as either "essential" or "nonessential." Nonessential populations are not essential to the continued existence of the species (FWS 1996a).

On March 20, 1996, the FWS established a nonessential experimental population of black-footed ferrets in Aubrey Valley, Arizona, outside the city of Seligman (61 FR 11320), thus making Arizona the fourth state in the nation to reintroduce black-footed ferrets into the wild. Reintroduction programs in the previous three states include the Shirley Basin in central Wyoming; Badlands National Park and the adjacent Buffalo Gap National Grassland in South Dakota; and the Charles M. Russell National Wildlife Refuge and Fort Belknap Indian Reservation in Montana (Black-Footed Ferret Recovery Implementation Team [BFFRIT] 2005).

5.1.3 Threats to Species' Survival

The black-footed ferret experienced a dramatic decline during the first half of the twentieth century, and by the late 1970s it was thought to be extinct. Conversion of native prairie to farmland and widespread poisoning of prairie dogs has drastically reduced the habitat of this species to less than 2 percent of what once existed (FWS 1996a). Remaining habitat is now fragmented, with prairie dog towns separated by extensive areas of cropland and human development.

Sylvatic plague, which was introduced into North America around the turn of the century, also has been responsible for decimating prairie dog populations, which consequently has had a profound effect on the black-footed ferret. The decline of the black-footed ferret also may have been caused by a number of other factors, including secondary poisoning from prairie dog toxicants and canine distemper (FWS 1988; Line 1997). The Meeteetse population of black-footed ferrets declined severely from 1985 to 1986 (from 58 to 16 animals) due to canine distemper. The remaining animals were taken into captivity to prevent the species' extinction and to serve as founder animals for a captive-breeding program (FWS 1996a).

5.1.4 Habitat Requirements

The black-footed ferret depends heavily on the presence of prairie dogs. Prairie dogs require short- and medium-grass prairies and plateaus and will avoid highly vegetated areas due to poor visibility of oncoming predators. Prairie dogs excavate tunnels that extend downward from 3 to 10 feet (0.9 m to 3 m) and horizontally for another 10 to 15 feet (3 m to 4.5 m) (FWS 1988). Black-footed ferrets utilize these tunnels for eating, sleeping, and raising their young (BFFRIT 2005).

5.1.5 Natural History

Black-footed ferrets are secretive animals, spending about 90 percent of their time underground where they eat, sleep, and raise their young in prairie dog burrows. They are primarily nocturnal, so they are most active at night. During the winter months, they are considerably less active, but they do not hibernate. They live three to four years in the wild and eight to nine years in captivity (BFFRIT 2005).

Black-footed ferrets lead solitary lives except during the breeding season or when females are caring for young. Mating occurs during the spring months between March and April. Litters of two to five kits are born after a 42- to 45-day gestational period. At birth, kits resemble small mice. They are born blind and helpless, weighing only 0.2 to 0.3 ounces (5 to 9 grams) at birth with thin, white hair covering their bodies. Their dark markings appear at about three weeks of age, and young kits begin to open their eyes about 35 days after birth. Kits develop rapidly and become increasingly active after their eyes open (BFFRIT 2005). They stay with their mother until they reach adulthood at approximately four months of age, at which point they leave their den and disperse to establish their own territories. Both males and females reach sexual maturity at one year of age (AGFD 2001).

Prairie dogs make up 91 percent of the black-footed ferret's diet. When necessary, ferrets will prey on other animals that they can overpower, such as ground squirrels, cottontail rabbits, and deer mice (AGFD 2001).

5.1.6 Distribution and Population Status

The black-footed ferret has been extirpated from approximately 98 percent of its former range. Historically, the black-footed ferret occurred over a wide area, but it is difficult to determine its historical abundance because of its nocturnal and secretive habits. The historical range of the species, based on specimen collections, includes 12 states (Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming) and the Canadian provinces of Alberta and Saskatchewan. Prehistoric evidence shows that this ferret once occurred from the Yukon Territory in Canada to New Mexico and Texas (FWS 1996a). Currently, the black-footed ferret has been reintroduced into parts of Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming.

Within Arizona, a nonessential experimental population of black-footed ferrets was released into Aubrey Valley in northwestern Arizona. The area selected was designated the Aubrey Valley Experimental Population Area (AVEPA). The AVEPA encompasses some 221,894 acres (89,820 ha) and includes portions of Coconino, Mojave, and Yavapai Counties in northwestern Arizona (FWS 1996a). Surveys conducted in 1992 indicated that approximately 17,297 acres (7,000 ha) of prairie dog towns exist within the AVEPA. Using an index outlined in FWS (1989), it was calculated that this area is capable of supporting a black-footed-ferret family rating of 35, which means that the AVEPA can potentially support approximately 53 adult black-footed ferrets (FWS 1996a). The AVEPA is located approximately 150 miles (241 km) from the Black Mesa Complex.

5.2 SOUTHWESTERN WILLOW FLYCATCHER

5.2.1 Species' Description

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a small passerine bird approximately 5.7 inches (15 cm) in length that weighs approximately 0.4 ounces (11 grams). It has a grayish-green back and wings, whitish throat, a light gray-olive breast, and pale yellowish belly. Two white wing bars are visible and the eye ring is faint or absent. Their song has been described as a sneezy "fitz-bew" or "fit-za-bew" and their call is a repeated "whit."

One of four currently recognized willow flycatcher subspecies (Browning 1993; Unitt 1987,), the southwestern willow flycatcher is a neotropical migratory species that breeds in the southwestern United States from mid-April to early September and migrates to wintering grounds in Mexico, Central America, and portions of South America during the nonbreeding season (Peterson 1990; Ridgely and Tudor 1994).

5.2.2 Species' Status—Past and Present

In response to the dramatic decrease in the number of southwestern willow flycatchers in Arizona and other southwestern states, the FWS proposed to list the species as endangered on July 23, 1993, and it was subsequently listed as federally endangered on February 27, 1995 (60 FR 10694), under the ESA of 1973, as amended. The FWS designated critical habitat for the species on July 22, 1997 (62 FR 39129), and on August 20, 1997, a correction notice was published in the Federal Register to clarify the lateral extent of the designation (62 FR 161). On May 11, 2001, the Tenth Circuit Court of Appeals set aside the southwestern willow flycatcher's critical habitat designation and instructed the FWS to issue a new critical habitat designation in compliance with the court's ruling. On April 28, 2005, the FWS issued a proposed rule on critical habitat for the southwestern willow flycatcher (70 FR 21988), and the critical habitat that was formally designated for the species on October 19, 2005, included 15 management units totaling 737 miles (1,186 km) of river in Arizona, California, Nevada, Utah, and New Mexico (70 FR 60886). In Arizona, critical habitat was designated within portions of Apache, Cochise, Gila, Graham, Greenlee, Maricopa, Mohave, Pinal, Pima, and Yavapai Counties (FWS 2005a).

5.2.3 Threats to Species' Survival

Throughout its range, the southwestern willow flycatcher has shown both historic and recent population declines. The most significant factor in the cause of these declines is the extensive loss, fragmentation, and adverse modification of riparian breeding habitat, particularly cottonwood/willow associations (FWS 1995b; Johnson et al. 1987; Katibah 1984; Unitt 1987). These losses have occurred in association with urban and agricultural development, fire, water diversion and impoundment, channelization, livestock grazing, off-road-vehicle use and recreation, replacement of native habitats by introduced plant species, and hydrological changes resulting from these and other land uses (FWS 1993a; Tibbitts et al. 1994). Brood parasitism by the brown-headed cowbird (*Molothrus ater*) is another major threat to the southwestern willow flycatcher (Brown 1988; FWS 1993a, 1995b; Sogge 1995; Whitfield and Strong 1995). In addition, the small size and fragmentation of remaining flycatcher populations suggests that environmental stochasticity, demographic stochasticity, and genetic deterioration may be contributing to the species decline.

5.2.4 Habitat Requirements

The southwestern willow flycatcher is a riparian obligate that breeds along rivers, streams, and other wetlands where a dense growth of willow (*Salix* spp.), seepwillow (*Baccharis* spp.), buttonbush (*Cephalanthus* spp.), box elder (*Acer negundo*), salt cedar (*Tamarix ramosissima*), or other similarly structured riparian vegetation is present, often with a scattered overstory of cottonwood (*Populus fremontii*) (Brown 1991; Hubbard 1987; Sogge et al. 1997; Unitt 1987; Whitfield 1990). Both even- and

uneven-aged stands that are structurally homogenous with extensive canopy coverage are used by the southwestern willow flycatcher (FWS 1995b). Occupied habitat is generally dominated by shrubs and trees 13 to 23 feet (4 to 7 m) or more in height, which provide dense lower- and mid-story vegetation from 0 to 13 feet (0 to 4 m) aboveground (Brown 1988; Sogge et al. 1993; Whitfield 1990). This dense vegetation is often interspersed with small openings, open water, or sparse vegetation, creating a mosaic that is not uniformly dense. In most cases, slow-moving or still surface water and/or saturated soil is present at or near breeding sites during wet or normal precipitation years (Finch and Stoleson 2000; FWS 1995b).

Southwestern willow flycatchers in low-elevation riparian systems are associated with both tamarisk and cottonwood/willow riparian forests (Paradzick and Woodward 2003). At higher elevations, flycatchers are associated with shrub willow (*Salix geyeriana*) habitats (Paradzick and Woodward 2003) and are frequently associated with riparian habitats dominated by exotics, such as tamarisk and Russian olive at higher-elevation sites (Hunter et al. 1987). In Arizona, 93 percent of the 758 nests documented from 1993 to 1999 in mixed and exotic habitats were located in tamarisk (Paradzick et al. 2001).

5.2.5 Life History

Southwestern willow flycatchers typically arrive in suitable breeding habitat between early May and early June, although a few individuals may arrive as early as mid-April (Maynard 1995; Sferra et al. 1997; Unitt 1987). Because arrival dates can vary geographically and annually, presence and status are often confused by the migrating individuals of northern subspecies passing through the southwestern willow flycatcher's breeding habitat (Unitt 1987). The flycatcher has one or more territories within a home range during the breeding season. Although territory size varies considerably, flycatchers are generally found in habitat patches ranging from 1.2 to 2.7 acres (0.5 to 1.2 ha) (FWS 1995b).

Nests are typically constructed over a three- to eight-day period within a week of pair formation (FWS 1995b). The southwestern willow flycatcher constructs a compact, open, cup-shaped nest composed of grasses and bark strips, located in a fork or on a horizontal branch, approximately 3.2 to 15 feet (1 to 4.5 m) aboveground in a medium-sized bush or small tree (Brown 1988; Whitfield 1990). Nest-site vegetation may be even- or uneven-aged, but is usually dense and structurally homogeneous (Sogge et al. 1993). From three to four eggs are laid at one-day intervals. Eggs are incubated by the female for approximately 12 days, and the young fledge 13 to 14 days after hatching. Southwestern flycatchers will attempt to renest if the first attempt is unsuccessful, and occasionally a pair will raise a second brood in the same nesting season (FWS 1995b). Southwestern willow flycatchers depart from their breeding grounds from mid-August to middle or late September and migrate to their wintering grounds in Mexico, Central America, and portions of northern South America (Peterson 1990; Ridgely and Tudor 1994; Sogge et al. 1997).

The southwestern willow flycatcher is an insectivore that forages within and above the canopy, along the patch edge, in openings within its territory, and above surface water. Adults typically take insects on the wing or glean them from leaves and other vegetation (FWS 1993a). Larger prey (such as dragonflies or butterflies) is often beaten against the perch, killing and softening it prior to consumption (Finch and Stoleson 2000). Overall, the flycatcher is considered somewhat of a generalist in its diet, with wasps and bees (*Hymenoptera*) being the most common food item. Beetles (*Coleoptera*), flies (*Diptera*), and butterflies/moths (*Lepidoptera*) comprise other major components of the diet (Finch and Stoleson 2000).

5.2.6 Distribution and Population Status

Historically, the southwestern willow flycatcher was widespread in riparian areas throughout the Southwest. Its breeding range extended across southern California, extreme southern Nevada, southern Utah, Arizona, New Mexico, southwestern Colorado, western Texas, and northernmost Sonora and Baja

California del Norte (Browning 1993; Hubbard 1987; Unitt 1987). Its current range is similar to the historical range, but the quantity of suitable habitat within that range is much reduced from historical levels (FWS 2002). In 2002, approximately 1,153 southwestern willow flycatcher territories were located among 243 sites in suitable riparian areas throughout the Southwest (Sogge et al. 2003).

The historical range of the southwestern willow flycatcher in Arizona included portions of all major watersheds (Unitt 1987). Currently, there are approximately 430 pairs of southwestern willow flycatchers documented at 37 sites within Arizona. These individuals are primarily located along 12 drainages, including the Colorado, Little Colorado, Gila, Hassayampa, Salt, San Francisco, San Pedro, Verde, Bill Williams, Big Sandy, and Agua Fria Rivers (Munzer et al. 2005). The greatest concentrations of flycatchers within Arizona are found in the Winkelman area (near the confluence of the Gila and San Pedro Rivers), Roosevelt Lake (Salt River and Tonto Creek areas), Big Sandy River downstream of U.S. Highway 93 (on the Big Sandy River near the U.S. Highway 93 bridge), Alamo Lake (Brown's Crossing), and Topock Marsh (Lower Colorado River) (Munzer et al. 2005).

5.3 MEXICAN SPOTTED OWL

5.3.1 Species' Description

The Mexican spotted owl (*Strix occidentalis lucida*) is one of three subspecies of spotted owls found from western Canada to central Mexico. Although the spotted owl is often referred to as a medium-sized owl, it ranks among the largest owls in North America at approximately 17 inches (43 cm) in length. The Mexican spotted owl is a brown-colored owl with characteristic large, irregular, and numerous spots on the head, neck, back, and underparts. The large, round head is light brown with concentric, darker brown bars. The bill is a pale yellowish green and legs are fully feathered (AGFD 2005a; FWS 2005b).

5.3.2 Species' Status—Past and Present

In response to declines in populations of Mexican spotted owls, due primarily to alteration and fragmentation of their habitat and the threat of catastrophic forest fires, the species was federally listed as threatened throughout its range on March 16, 1993 (58 FR 14248). Critical habitat was first designated on June 6, 1995, but it was revoked on March 25, 1998 after several Federal courts ruled that FWS had not correctly followed the National Environmental Policy Act process (60 FR 29913, 63 FR 14378). Critical habitat was again designated in 2003, but again nullified through litigation (66 FR 8530). The most recent critical-habitat designation for the species was published on August 31, 2004, and remains in effect (69 FR 53181).

The Mexican spotted owl is protected in more limited geographic areas through special-status designations through the Forest Service (sensitive species), AGFD (wildlife of special concern), and the Navajo Nation (endangered) (AGFD 2005a).

5.3.3 Threats to Species' Survival

The primary and most serious threat to Mexican spotted owls appears to be habitat loss due to human activities. Historically, this species occupied low-elevation riparian forests, but these forests are now drastically altered or destroyed in most areas in Arizona. No owls have been documented in these areas in the past 20 years. The loss of riparian areas eliminated dispersal opportunities between isolated mountain ranges and breeding areas. In northern Arizona, fuelwood harvesting eliminated or altered owl habitat in ponderosa pine forests where large gambel oaks provided shade, nesting, and roosting habitat. As more of these trees were harvested, important habitat components for the owl were eliminated (Ganey 1998). Currently, there are additional threats to the owl, including grazing, agriculture or development for human habitation; forest insects; recreational activity; road development; and oil, gas, and mining development (FWS 1995c).

In the late 1980s and early 1990s, timber harvesting posed the greatest threat to the owl, especially on National Forest lands along the Mogollon Rim. This area provided the largest population of owls in the state. The Forest Service recognized that, to properly address the continued threats to the species, they would need to develop management guidelines that would protect the species and its habitat on Forest Service lands. Concurrently, the FWS assigned a recovery team to address the conservation of the owl and develop a recovery plan that would protect the owl and its habitat throughout its range (Ganey 1998).

5.3.4 Habitat Requirements

Typically, Mexican spotted owls occupy a variety of habitats for breeding and foraging. They breed in dense old-growth mixed-conifer forests along steep slopes and ravines. Within this habitat, the trees are dense, forming a closed canopy, a high basal area, and contain numerous downed logs and snags. The large trees provide suitable nest cavities, whereas the numerous smaller trees in combination with large trees provide roosting and foraging habitat (AGFD 2005a). On the Navajo Nation, spotted owls are not known to nest in ponderosa pine/oak forests, but instead occupy moderately sloped drainages in piñon/juniper woodland. This is especially present in the Black Mesa vicinity (Navajo Department of Fish and Wildlife [NDFW] 2001). On Black Mesa, the mixed-conifer habitat in the steep-sided sandstone canyons from mid to high elevations have been the habitat occupied by Mexican spotted owls. Nesting has been mostly on sandstone ledges.

FWS published the Mexican Spotted Owl Recovery Plan in 1995. The plan divides the owls' range into 11 recovery units, 6 of which are in the United States. Three recovery units (Colorado Plateau, Upper Gila Mountains and Basin and Range – West) occur in Arizona. The plan recommends a three-management-level approach. It distinguishes "protected areas" that are found on primary habitat with known roost/nest sites. Protected areas include all known nesting sites in mixed-conifer and pine/oak woodland types where the slope is greater than 40 percent and timber has not been harvested in the past 20 years (FWS 1995c). Around the known roost/nest sites, areas of at least 600 acres are designated as "protected activity centers" (PACs). Activity centers occur within each PAC. An activity center is defined as "the nest site, a roost grove commonly used during the breeding season in absence of a verified nest site, or the best roosting/nesting habitat if both nesting and roosting information are lacking" (FWS 1995c). The second management level includes "restricted areas" that include mixed-conifer, pine/oak, and riparian forests with species most often associated with Mexican spotted owls (FWS 1995c). The third management level is "other forest and woodland types," which includes more marginal, but potential habitat. These habitats include ponderosa pine, spruce/fir, piñon/juniper, and aspen woodland community types (FWS 1995c). The highest levels of protection are in "protected areas" with the "other forest and woodland types" receiving the lowest levels of protection. As recovery of the species continues, the plan calls for periodic reevaluation and delisting on a recovery-unit basis (FWS 1995c).

5.3.5 Natural History

In Arizona, Mexican spotted owls do not build their own nests. They use cavities or abandoned platform nests about 80 feet (24 m) up in coniferous trees, and also will utilize ledges on cliffs or potholes and mistletoe clusters in areas where these features are present (AGFD 2005a). Mexican spotted owls are generally resident birds; that is, they stay in the same area year-round. Some individuals may travel to lower elevations during the nonbreeding season (Corman and Wise-Gervais 2005).

Female owls stay very close to the nest site approximately two weeks prior to egg laying, and it is the responsibility of the male to provide adequate food. If he cannot, the female will not lay eggs (Ganey 1998). Because of this, it appears spotted owls breed in response to prey availability. Typical clutches consist of one or two eggs and the female incubates for about 30 days. The male provides all the food for the female and her young until they are about 10 days old. During this time, the female leaves the nest more frequently in search of food (Ganey 1998). Egg laying typically peaks in early March, and hatching

occurs in early to mid-May. The young leave the nest about five weeks of age, where they stay close to the nest site and are fed by both parents for several weeks. Dispersal of the young occurs in early fall (September-October). Reproductive success is low, averaging 50 percent; that is, only one nestling has the potential of surviving to fledgling age (FWS 1993b, 1995c).

Spotted owls are typically active at night (nocturnal), but will forage during the daylight hours when they are raising young. They prey on small mammals, birds, reptiles, and insects. Relative proportions of prey groups vary from region to region, but in northern Arizona, woodrats, white-footed mice, voles, rabbits, and pocket gophers constitute the majority of their diet (Ganey 1992). Many times, they cache (store) excess food on the branches of large trees (AGFD 2005a).

5.3.6 Distribution and Population Status

A reliable estimate of the numbers of owls throughout its entire range is not currently available (FWS 1995c) and the quality and quantity of information regarding numbers of Mexican spotted owl vary by source. FWS (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. The Forest Service Region 3 most recently reported a total of approximately 989 PACs established on National Forest lands in Arizona and New Mexico (FWS 2005c). Based on this number of sites, total numbers in the United States may range from 989 individuals, assuming each known site was occupied by a single Mexican spotted owl, to 1,978 individuals, assuming each known site was occupied by a pair of Mexican spotted owls.

In Arizona, the Mexican spotted owl occupies patches in forested mountains, steep canyons, and sloped, rocky drainages in mixed-conifer woodlands, except for the arid southwestern portion of the state (Figure 5-1). Generally, north of the Mogollon Rim, they are concentrated in the White Mountains, along the Mogollon Rim itself, the volcanic peaks near Flagstaff, and in scattered sites in the Grand Canyon and Navajo Nation. In addition, three historical records exist from the Hualapai Mountains (Ganey and Balda 1989). South of the Mogollon Rim, the Mexican spotted owl is scattered throughout the upper mountain elevations of southeastern Arizona (Ganey et al. 1998).

During the Arizona Breeding Bird Atlas period from 1993 to 2000, Mexican spotted owls were documented in most forested mountains of southeastern Arizona, and widespread breeding was documented in the White Mountains and along the Mogollon Rim from west of Heber to the Flagstaff area. On Navajo Reservation lands, the owl is documented on Black Mesa, within the Tsegi Canyon drainage, Canyon de Chelly, and in the Chuska Mountains. During the atlas period, the first record of this species was documented in the Carrizo Mountains (Corman and Wise-Gervalis 2005).

According to the NDFW, numerous PACs occur on Navajo Nation lands to the northwest of the Kayenta Mine on Black Mesa and within other areas of suitable habitat that have yet to be surveyed. Mexican spotted owls are known to occur near the Kayenta Mine and have been studied for a number of years as part of environmental compliance activities (Table 5-1). The nearest PAC occurs about 0.71 miles (1.14 km) from the N-10 mining area, and there are no records of nesting within the permit boundary. The owls occur in areas mapped as mixed-conifer forest, and the closest records are in Yellow Water Canyon and in side canyons of Coal Mine Wash and Moenkopi Wash (BIOME 2003). All known or suspected breeding sites on Navajo Nation lands in the vicinity of the mine have been in canyons supporting mixed-conifer woodland, and all confirmed nest sites have been in potholes and caves (Peabody 2004).

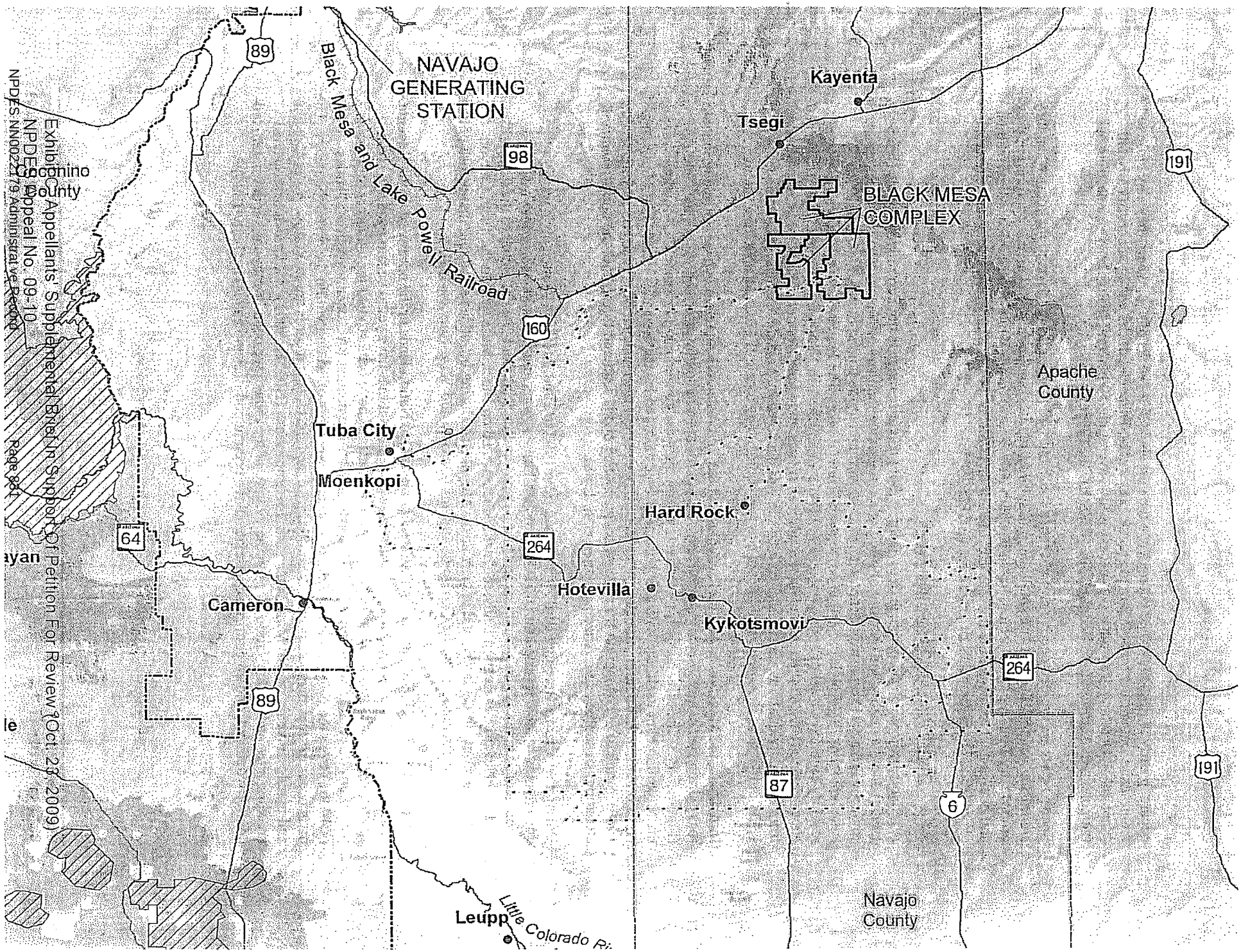


Table 5-1 Mexican Spotted Owl Nest Locations near Kayenta Mine 1983-2000

Site No.	Site Name	Confirmed Breeding	Distance to Permit Boundary	Approximate Distance to Future Mine Disturbance	Distance to Past Mine Disturbance
1	Owl Canyon	1992, 2000	2.6	3.5	2.6
2	Corral	1986, 1987	1.7	3.0	3.4
3	Brushy	1986, 1987, 1992, 2000	3.4	4.9	3.6
5	Scoria	1993	0.3	1.4	2.0
7	Alcove	1993	2.4	3.6	4.3
8	N/A	1999	2.5	—	—

SOURCE: Peabody Western Coal Company 1995, 1996, 2004; SWCA, Inc. 1997, 1998, 2000, 2001
NOTES: N/A = not applicable, No. = number

Mexican spotted owls have been monitored by Peabody since 1982 and were specifically addressed in annual monitoring studies from 1994 to 2000. These studies followed Forest Service protocols (Forest Service 1993), and included nocturnal surveys from call stations using owl calls, and morning and evening visits to 14 known nesting and activity areas at least twice during the breeding season. Annual monitoring reports were produced from 1994 to 2001 (Peabody 1995, 1996; SWCA, Inc. 1997, 1998, 2000, 2001). Five of the 14 regularly monitored sites had active nests recorded prior to 1994, and one was a suspected nest. During the 1994 to 2000 studies, active nests were observed at two of the previous nest sites and at one new site outside of the 2-mile buffer zone. No evidence of nesting was observed at the other 12 monitored sites from 1994 to 2000. No nesting was observed from 1994 to 1998, one active nest was found in 1999, and two were found in 2000. About six adult owls were observed each year, mostly single males, and one to three pairs were observed each year.

Designated critical habitat for the Mexican spotted owl includes 3,983,042 acres (1,611,879 ha) statewide, most of which occur on Forest Service lands. No designated critical habitat occurs on tribal, State, or private lands.

5.4 BALD EAGLE

5.4.1 Species' Description

The bald eagle is a large raptor nearly 3 feet (0.9 m) long with a wingspan nearly 7 feet (2 m). There is a significant difference between the adults and juvenile birds. Adults have a white head, neck, and tail. The body is dark brownish black and has a prominent yellow hooked bill and yellow unfeathered legs and feet (FWS 2001). The juveniles resemble golden eagles in that they are mostly dark without the distinguishing characteristics of the adult bald eagle. This species is unique in that it has five distinct plumage phases as it ages. The names and age groups of these phases are (1) immature—less than a year old, (2) white-belly I—one year of age, (3) white-belly II—two years of age, (4) adult transition—three years of age, and (5) adult—four years of age and beyond (AGFD 2002). Bald eagles are very vocal in comparison with other raptors, and their calls are distinctive but not robust as one would expect for a large raptor.

5.4.2 Species' Status—Past and Present

Initial protection from direct take of this species came in the form of the Bald Eagle Act of 1940. On March 11, 1967, more comprehensive protection, including protection of habitat, was secured through the ESA. The southern bald eagle (those eagles south of the 40th parallel) was listed as endangered, which was the only classification available under that version of the Act (32 FR 4001). After the Act was amended in 1973, the eagle was reclassified. Under a Special Rule published on February 14, 1978, the

listing was amended to include all eagles in the lower 48 states as FWS claimed that the distinction between southern and northern bald eagles was arbitrary and had no biological basis. In this rule, bald eagles in Michigan, Minnesota, Wisconsin, Washington, and Oregon were listed as threatened, while they were considered endangered in all other states, except Alaska and Hawaii (43 FR 6233).

In accordance with provisions of the Act, the FWS divided the lower 48 states into five recovery regions each recovery region drafting its own recovery plan (60 FR 35999). Just after the new rule was enacted, Tonto National Forest initiated the Bald Eagle Nest Watch Program, now managed by AGFD, which continues to collect data about nesting eagles in the state. Both the State of Arizona and the Forest Service designated special status, endangered and sensitive respectively, for this species in 1988 (AGFD 2002).

In 1995, FWS determined that reclassification goals of number of nesting pairs and productivity had to be met for at least three years in all five recovery regions and published a Final Rule reclassifying the species as threatened in the lower 48 states (60 FR 35999). By 1999, due to the reduction of organochlorine pesticides and the management of bald eagle habitat, the species had recovered to a sufficient degree for the FWS to publish a Proposed Rule to delist the species (64 FR 36453). On July 8, 2007 FWS removed the bald eagle from the list of threatened and endangered species (72 FR 37346). In response to a court ruling FWS listed the desert bald eagle as threatened in the Sonoran desert portion of central Arizona (73 FR 23966). A 12-month status review is currently under way by FWS to determine if listing of the species as a distinct population segment is warranted.

5.4.3 Threats to Species' Survival

Initial threats to bald eagles were generally the same as they were for other raptors in the Southwest, mainly due to reproductive failure from pesticide contamination and unrestricted killing by humans. However, in more recent times (late 1980s), additional threats contributed to their decline, including habitat loss, disturbance by humans around active nest sites, decreased food supply (in particular, native fish species), entanglement in fishing lines, illegal shooting, and heavy metals (Hunt 1998).

Today, the AGFD's Arizona Bald Eagle Nest Watch Program contributes greatly to the protection of critical nest sites by monitoring these sites during the breeding season and making recommendations on seasonal closures, gathering crucial data on annual nest productivity and population-trend data, as well as promoting increased appreciation for this species. However, according to AGFD (2002), "land managers should be aware of potential losses due to illegal shooting, trapping, food poisoning (ingestion of carrion from e.g. poisoned coyotes), electrocution from power lines, collisions, and various accidents."

5.4.4 Habitat Requirements

Breeding bald eagles are found near lakes, reservoirs, and perennial rivers ands streams throughout central Arizona (Corman and Wise-Gervais 2005). Eagles typically choose nest sites that are inaccessible to humans, on cliff faces or large tall trees near foraging areas where prey is abundant. According to Koloszar and Driscoll (2001), 68 percent of the breeding areas in Arizona were located along lowland desert riparian corridors dominated by cottonwoods, willows, and sycamores. Twenty percent were located in piñon/juniper communities and 12 percent were located in ponderosa pine forests. Most of these breeding areas were in proximity to large bodies of water.

5.4.5 Natural History

Breeding bald eagles form strong bonds—some believe, for life. In Arizona, a male and female may meet during migration and arrive at the breeding site at the same time, or sometimes separately, with the male establishing the nest site first. Pair-bonding behavior (i.e., joint nest-building, soaring, prey exchange, etc.) is observed just prior to the egg-laying stage.

In an area where eagle density is low, a young pair can breed as early as four years of age. When the concentration of nesters increases in a particular area, stress among individuals increases, and in many cases inhibits breeding. Typically, if an older mate is lost during the breeding season, a young bird may take its place. Once the first egg is laid, incubation begins. Clutch size is typically two or three white, rather rough, lackluster eggs (AGFD 2002).

If the first clutch fails, the female may lay a second clutch in about four weeks. In Arizona, the first clutch is laid from late January to the third week of February. The incubation stage lasts approximately 35 days, the nestling stage lasts 77 days, and finally, the fledglings take their first flights at 112 days. According to Palmer (1988), "After dispersal or migration, the usual pattern of birds aged one to three years, is to return to the general region of their birth."

The bald eagle's diet is composed mainly of fish (e.g., catfish, suckers, carp, yellow bass) but as opportunists, they will take advantage of other available prey like small mammals (e.g., squirrels, rabbits, woodrats), birds (e.g., waterfowl), small reptiles and amphibians (e.g., turtles and some snakes), and sometimes carrion. At feeding time, the eagle can be competitive and will often steal food from other raptors. This is especially evident in areas where other eagles and osprey are foraging.

5.4.6 Distribution and Population Status

The bald eagle occurs only in North America; however, the genus *Haliaeetus* includes seven other species occurring worldwide. Alaska and Canada are home to the largest populations of bald eagles within their range, but large numbers also occur in the Pacific Northwest, the Great Lakes, Chesapeake Bay, and throughout coastal Florida (Hunt 1998).

Historically, bald eagles nested in central Arizona along the Mogollon Rim and in the Flagstaff area at Stoneman Lake, Morman Lake, and Lake Mary. Today, a resident population of approximately 40 breeding pairs nest along the Salt, Verde, Gila, Bill Williams, Agua Fria, San Pedro, and San Francisco Rivers, and Tonto and Canyon Creeks. Wintering eagles occur throughout the state with concentrations found along the Mogollon Rim east through the White Mountains.

With funding from the Army National Guard, AGFD biologists in cooperation with Camp Navajo trapped six eagles during the winter of 2004. The purpose of this study was to monitor the movement of four adults and two juveniles to determine where and how far eagles travel during migration from northern Arizona. Results showed that many eagles follow the same travel corridor while migrating up to 2,100 miles (3,380 km) north from Arizona into different parts of Canada for the summer. Camp Navajo, located just east of Flagstaff, wanted to know if activities on their property impacted wintering eagles in northern Arizona. Currently, the study is ongoing and final results are still pending (AGFD 2005b). Approximately 325 eagles winter in Arizona every year; several are found in northern Arizona at Upper and Lower Lake Mary and at Mormon, Ashurst, Whitehorse, and Sholtz Lakes (AGFD 2005b).

5.5 CALIFORNIA CONDOR

5.5.1 Species' Description

The California condor is a member of the New World vulture family and is closely related to the Andean condor (*Vultur gryphus*) and the turkey vulture (*Cathartes aura*). They are the largest flying land bird in North America, and one of the largest in the world. The head and neck are mostly naked with gray skin present in juveniles and red skin in adults. In the immature birds, the wing linings are mottled, and by the time they reach fledgling age, their wingspan is already over 8 feet (2.4 m), the wing linings are white, and they weigh between 16 and 20 pounds (7.3 and 9.0 kg). Adult characteristics are not seen until they reach approximately five to six years of age. As adults, they weigh approximately 22 pounds (10 kg) and

have a wingspan of nearly 10 feet (3 m). They are mostly black with prominent white underwing linings and edges of the upper secondary coverts (small feathers covering the bases of the contour feathers). In flight, the condor soars on flat wings, circling to catch warm air thermals. When soaring and traveling in search of carrion, it characteristically soars for much of the day (up to 100 miles [161 km] or more) on very few deep, single wing beats. (AGFD 2004; FWS 2005d). The condor rarely vocalizes, but when it does, the sound is a soft grunt or wheeze.

5.5.2 Species' Status—Past and Present

In 1967, with the establishment of the ESA, the California condor was listed as endangered throughout its range (32 FR 4001). Shortly thereafter, in 1976 (subsequently amended in 1977) critical habitat was designated for the condor in nine areas in Ventura, Los Angeles, Santa Barbara, Obispo, Kern, and Tulare Counties, California (41 FR 41914, 42 FR 47840). In accordance with the provisions of the ESA, a recovery plan was completed by the FWS in 1979 (FWS 1996b).

Though conservation efforts continued, populations declined. In 1983, the San Diego Zoo, San Diego Wild Animal Park, and Los Angeles Zoo began a cooperative captive breeding program. By 1987, the last wild condor had been captured and made a part of the program. Reintroductions into critical habitat began in 1991. The FWS California Condor Recovery Plan was revised in 1984 and 1996 to reflect these changes in the condor recovery strategy (FWS 1996b).

The stated goal of the 1996 California Condor Recovery Plan was the reclassification of the condor from endangered to threatened status. One criterion established for the reclassification of the species was the establishment of a second wild population, geographically disjunct from the existing, reintroduced California population (FWS 1996b). Two sites in northern Arizona were selected for the second reintroduction—Vermillion Cliffs in 1996 and Hurricane Cliffs in 1998. California condors have had State endangered status in Arizona since 1988 (AGFD 2004). Under subsection 10(j) of the ESA, the FWS can designate reintroduced populations established outside the species' current range, but within its historical range as "experimental." The FWS can designate experimental populations as either "essential" or "nonessential." Nonessential populations are not considered essential to the continued existence of the species. The northern Arizona population carries experimental, nonessential status. Such populations are considered "proposed for listing" for the purposes of Section 7 of the Act (61 FR 54043).

5.5.3 Threats to Species' Survival

The California condor is a true relict of the Pleistocene epoch (beginning approximately 11,000 years ago) through the 1700s. They fed on carcasses of giant sloths, mastodons, and other large mammals that roamed the continent during the last Ice Age. When these animals became extinct, the condors disappeared everywhere except the Western Coast. From the 1800s through the early 1900s, with the expansion of Europeans into the western United States, shooting and egg-collecting caused some decline. Since the mid-1900s, environmental contaminants, habitat fragmentation and degradation, prey-base declines, lead poisoning, and collisions with manmade structures have all contributed to the near extinction of the species (Arnold 1993; FWS 1996c; Johnson and Garrison 1996).

5.5.4 Habitat Requirements

Historically, the California condor was not considered a habitat specialist, but rather an opportunist, occupying habitats where available prey and potential nest sites were available, especially in the open grassland regions of the United States where cattle and sheep carcasses were plentiful. Currently, they are limited to vast, open, rugged country in northern Arizona. Roost sites are nearly always on the upper limbs of tall conifers and cliff edges. Wind conditions are an important component to suitable habitat. They require areas where the wind blows consistently and strongly enough to provide lift for soaring

(Snyder and Rea 1998). Typically, condors lay eggs on shelves in potholes of cliff faces or caves, but they may also use large, sheltered hollows in logs or in dense thickets.

5.5.5 Natural History

Early in the breeding season, pairs will frequent potential nest sites while displaying territorial behavior over a particular area. Within a single breeding season, condors may alternate nest sites as far apart as approximately 7.5 miles (12.0 km). The pairs will stay together from year to year, usually occupying the same nesting territory. Condors do not reach sexual maturity until they reach at least six years of age. A single egg is laid directly on the substrate; however, sometimes loose material, small rocks, etc., are placed in a concentrated area, to be used as a cushion. If the egg is lost, the female usually lays a replacement egg about a month later (Snyder and Hamber 1985). Incubation averages 56 days and is shared equally between the male and female. When birds finally fledge around six months of age, they are extremely clumsy and are dependent on the parents to feed and care for them for at least six months after leaving the nest. Alone, these young birds are extremely vulnerable to predators, such as coyotes, golden eagles, and ravens.

California condors, like other vultures, are exclusively carrion eaters. They forage most of the day, sometimes up to 100 miles (161 km) per day looking for signs of food by watching other scavengers such as golden eagles, common ravens, and turkey vultures. They feed primarily on the carcasses of small- to mid-sized mammals such as domestic cattle, ground squirrels, rabbits, sheep, and deer.

5.5.6 Distribution and Population Status

Captive-reared California condors now occupy areas in California and Arizona. The FWS began reintroducing an experimental nonessential population in the Vermillion Cliffs in northern Arizona (Coconino County) and southern Utah in December 1996 and the Hurricane Cliffs on the Arizona Strip in December 1998. On March 25, 2001, the first egg laid by reintroduced condors was discovered in the Grand Canyon; however, the egg was broken and the nesting attempt failed. There were several other nest failures until November 2005, when the first wild-hatched chick fledged successfully in Arizona. Currently there are an estimated 60 condors in the wild in northern Arizona (AGFD 2005c).

5.6 NAVAJO SEDGE

5.6.1 Species' Description

The Navajo sedge (*Carex specuicola*) is perennial sedge 10 to 16 inches (25 to 40 cm) in height. Each plant has numerous stems growing from an underground rhizome with triangular pale green leaves 5 to 8 inches (12 to 20 cm) in length (FWS 1987b). Plants are monoecious with flowers occurring in two to four groups at the end of a stalk two to three times the length of the leaves, with the male flowers situated below the female flowers (FWS 1987b). Flowers are small and greenish-brown with scalelike parts (FWS 1987b).

Navajo sedge is one of approximately 490 species of the genus *Carex* found in the United States, with approximately 50 to 60 species found in Arizona (AGFD 2005e).

5.6.2 Species' Status—Past and Present

Navajo sedge was federally listed as threatened with critical habitat in 1985 (50 FR 19370). It is listed as highly safeguarded by the State of Arizona (AGFD 2005e). The species is a Navajo Nation Group 3 species, which are those species whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future.

Critical habitat for Navajo sedge was designated in 1985 for what was then the entire known occupied range of the plant (50 FR 19370). The total area is approximate 0.15 acres (0.06 ha) and the locations are on the Navajo Reservation in Coconino County, Arizona, approximately 20 miles (32.2 km) from the mining area.

5.6.3 Threats to Species' Survival

The two major threats to Navajo sedge are habitat loss caused by lowering of the water table from water development and trampling and grazing of plants at accessible sites by domestic livestock (FWS 1987b). This species is naturally rare due to its limited, specialized habitat, which increases its vulnerability to threats (FWS 1987b).

5.6.4 Habitat Requirements

Navajo sedge is found within Great Basin conifer woodlands in seeps and springs on Navajo Sandstone from approximately 4,600 to 7,200 feet (1,402 to 2,195 m) elevation (Brown and Lowe 1980; FWS 1987b; Roth 2001). The species grows on vertical cliffs and alcoves where springs and seeps are present (FWS 1987b).

5.6.5 Natural History

Navajo sedge sets fruit during spring and summer. The species mainly reproduces vegetatively from rhizomes, which form dense rhizomatous clumps making distinguishing individual plants difficult (AGFD 2005e; FWS 1987b).

5.6.6 Distribution and Population Status

The Navajo sedge is endemic to the Navajo Reservation and was previously known from limited areas along the Navajo Creek drainage. It has since been found in Coconino, Navajo, and Apache Counties in Arizona, and San Juan County in Utah (AGFD 2005e). Within Arizona the Navajo sedge is known from the Navajo Creek drainage in Coconino County east to the Tsegi Canyon watershed and from the east side of Shonto Wash in Navajo County south to Canyon de Chelly National Monument and Rock Point/Mexican Water in Apache County. Additionally, there is an occurrence on the Hopi Reservation. For the purpose of the analysis of effects in this BA, the distribution of Navajo sedge on the Hopi reservation is considered to be the area where Moenkopi Wash, Begashibito Wash, and Ha Ho No Geh Canyon overlap the unconfined portion of the N aquifer.

6.0 EFFECTS OF THE PROPOSED ACTION

The following sections describe the anticipated effects of various project components and activities associated with the proposed action on federally listed, proposed, candidate species, and designated critical habitat. The magnitude and nature of effects resulting from implementation of the proposed action are assessed for each of the species and critical habitat relative to existing conditions in terms of whether these effects are expected to appreciably reduce likelihood of species survival and recovery. Conclusions regarding the effects of the proposed action on these species, as well as a determination of effect (no effect; may affect, not likely to adversely affect; may affect, likely to adversely affect) is presented in the conclusions and determination section at the end of the analysis for each species.

Although not specifically required by ESA, the FWS encourages the formation of partnerships to conserve candidate species, since these species by definition may warrant future protection under the ESA. Since the contents of a BA are discretionary, the project proponents have chosen to include an assessment of the likely effects of the action and findings of effect for candidate species in the event these species become listed in the future.

The conclusions in this BA are based on the best scientific and commercial data available and are intended to assist the FWS in reaching a determination regarding the effects on species in the context of an informal consultation process, and finalized in a concurrence letter from FWS. A list of the species evaluated in this BA and a summary determination of effect are presented in Table 6-1.

Table 6-1 Summary Determination of Effect by Species

Species	Determination
Black-footed ferret	may affect, not likely to adversely affect
Southwestern willow flycatcher	may affect, not likely to adversely affect
Mexican spotted owl	may affect, not likely to adversely affect
Bald eagle	may affect, not likely to adversely affect
California condor	may affect, not likely to adversely affect
Navajo sedge	may affect, not likely to adversely affect
Navajo sedge critical habitat	may affect, not likely to adversely affect

No effect is the appropriate conclusion when it is determined that the proposed action will not affect listed species or critical habitat.

May affect, not likely to adversely affect is the appropriate conclusion when the effects on the species or critical habitat are expected to be beneficial, discountable, or insignificant. Beneficial effects have contemporaneous positive effects without any negative, insignificant, or discountable negative impacts on the species or habitat. Insignificant effects relate to the size of the impact, do not rise to the level of adverse effects, and should never reach the scale where take occurs. Discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person reviewing this program would (1) be unable to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect any effects that do occur to be discountable. A determination of "may affect, not likely to adversely affect" can only be reached when it is highly unlikely that a take would ever occur.

May affect, likely to adversely affect is the appropriate conclusion if any adverse effect on listed species or critical habitat may occur as a direct or indirect result of the proposed action. In the event the overall effect of the proposed action is beneficial to the listed species or critical habitat, but is also likely to cause some adverse effects, then the proposed action is "likely to adversely affect" the listed species or critical habitat. A "likely to adversely affect" determination by the FWS requires formal ESA Section 7 consultation. Determinations of "may affect, likely to adversely affect" can be reached when there is

uncertainty regarding the effects of project-related actions, but based on the best scientific and commercial data available some adverse effects, including take, also may occur (those possible effects are assumed to be more than insignificant or discountable).

6.1 BLACK-FOOTED FERRET

6.1.1 Direct and Indirect Effects

Potential direct and indirect effects on black-footed ferrets from activities associated with the proposed project are not expected to occur since there are no known extant populations of black-footed ferrets within the project area. The nearest population is a nonessential experimental population that was reintroduced into Aubrey Valley in an area designated as the AVEPA .

Peabody conducts annual surveys of prairie dog colonies to evaluate habitat suitability and potential for the presence of black-footed ferrets on the entire lease area and adjacent areas. This monitoring, conducted for more than 20 years, is reported annually to OSM. The results of these survey efforts indicate that the total acreage of the prairie dog colonies vary from year to year, sometimes significantly, as does the acreage within the varying number of individual colonies. As an example, in 2004 the total acreage was 266 acres (108 ha) for five separate colonies with the largest being 190 acres (77 ha). In 2005 it dropped to 148 acres (60 ha) total for five colonies with the largest at 125 acres (51 ha). In 2007 the total acreage for four colonies was approximately 112 acres (45 ha) (BIOME 2008). In the project area, colonies are small, highly fragmented, and do not meet the minimum FWS criteria of 200 acres (81 ha) for potential black-footed ferret habitat (BIOME 2008). Therefore, the proposed action is unlikely to have direct or indirect adverse impacts on the black-footed ferret.

6.1.2 Cumulative Effects

Federal activities potentially affecting the black-footed ferret would require separate consultation pursuant to Section 7 of the ESA and would not contribute to cumulative effects. Activities on State, private, and tribal lands that could potentially affect the black-footed ferret include disturbance from off-road vehicle use and direct impacts on prairie dog towns from livestock grazing; urban, water, highway/ roadway, and utility projects; agricultural development; and poisoning and shooting of prairie dogs. No other projects or activities that would contribute to cumulative effects have been identified. Furthermore, based on the lack of suitable habitat and extremely low likelihood of occurrence within the project area, the proposed project's incremental effect on this species likely would not be cumulatively considerable.

6.1.3 Conclusions and Determination

Due to the lack of suitable habitat, extremely low likelihood of occurrence within the project area, and the fact that prairie dog colonies within the project area are small and highly fragmented and do not meet the minimum FWS criteria of 200 acres (81 ha) for potential black-footed ferret habitat, the proposed action may affect, but is not likely to adversely affect the black-footed ferret. No critical habitat has been designated for this species; thus, none would be affected.

6.2 SOUTHWESTERN WILLOW FLYCATCHER

6.2.1 Direct and Indirect Effects

Southwestern willow flycatchers, as neotropical migrants, have high site fidelity to the location of breeding patches, returning to the same location to breed annually (FWS 2002). In Arizona, the southwestern willow flycatcher breeds locally along the Colorado River, the Alamo Lake area, at the headwaters of the Little Colorado and San Francisco Rivers, along the middle Verde River, at Roosevelt Lake, and along the middle Gila and the San Pedro Rivers. Breeding southwestern willow flycatchers do not currently occur in the project area, and site potential for this species is currently limited.

The southwestern willow flycatcher is a riparian obligate that breeds along rivers, streams, and other wetlands where a dense growth of willow, seepwillow, buttonbush, box elder, salt cedar, or other similarly structured riparian vegetation is present, often with a scattered overstory of cottonwood (Brown 1991; Hubbard 1987; Sogge et al. 1997; Unitt 1987; Whitfield 1990). This vegetation is often interspersed with small openings, open water, or sparse vegetation, creating a mosaic that is not uniformly dense. In most cases, slow-moving or still surface water or saturated soil is present at or near breeding sites during wet or normal precipitation years (Finch and Stoleson 2000; FWS 1995c).

Suitable foraging and resting habitat for this species exists within the project area along several small drainages near the Black Mesa mining operation, and at Moenkopi and Begashibito Washes. All these watercourses generally lack the elements necessary for suitable breeding habitat, including surface flows and saturated soils during breeding season as well as sufficient width. Willow flycatchers generally will not nest in areas where riparian vegetation is less than 33 feet (10 m) in width, although they may use these habitats for resting (FWS 2002). Riparian vegetation ranged from 10 to 20 feet (3 to 4 m) in width.

Information regarding southwestern willow flycatchers in the Moenkopi Wash area on the Hopi Reservation is proprietary information of the Hopi Tribe. A site visit to portions of the Moenkopi Wash on Navajo Nation lands in 2005, however, indicated that suitable nesting habitat for southwestern willow flycatchers was absent. Vegetation in the wash, where present, was almost entirely dominated by narrow habitat "stringers" or small patches of salt cedar ranging from 6 to 12 feet (1.8 to 3.7 m) in height and ranging in width from 10 to 20 feet (3 to 6 m) that lacked the structural diversity, width, and elements necessary for suitable breeding habitat. While salt cedar in these areas would not likely be suitable for nesting, it could provide foraging and resting habitat for migrating flycatchers, or perhaps habitat for foraging flycatchers dispersing from other areas in nearby drainages. This notion is supported by a conversation with a Hopi biologist in March 2006, who indicated that during annual survey efforts for the species, there has been no documented use of the area for breeding or nesting activities. She further indicated that the Moenkopi Wash is used primarily as a migratory corridor, providing suitable foraging and resting habitat for migrating flycatchers (personal communication, D. Anderson, Hopi Tribe, March 2006).

Potential effects of the proposed action on southwestern willow flycatchers from construction activities at the mine site (if present) would likely be in the form of direct disturbance of birds and disturbance or destruction of potentially suitable foraging and resting habitat. Direct disturbance of birds would include noise from heavy equipment and construction.

Three acres (1.2 ha) of salt cedar would be removed with continuation of the Black Mesa mining operation. Although these stands likely provide suitable foraging habitat for southwestern willow flycatchers (if present), the amount of salt cedar removed constitutes only a small fraction of the remaining habitat available in these areas. Therefore, potential direct effects on southwestern willow flycatchers from implementation of the proposed action would be limited to noise from heavy equipment and construction.

Patches of riparian habitat suitable for breeding are not present in the action area, and effects on riparian vegetation from implementation of the proposed project are expected to be insignificant. Therefore, the proposed action is unlikely to have an appreciable effect on the overall suitability of riparian habitat for the southwestern willow flycatcher. No critical habitat for the southwestern willow flycatcher occurs in the project area. As a result, no direct impacts on critical habitat would occur as a result of implementation of the proposed action.

6.2.2 Cumulative Effects

Cumulative effects include the effects of all past, present, and reasonably foreseeable future actions. Reasonably foreseeable actions include all State, local, tribal, and private actions that are reasonably certain to occur in the project area. Future Federal actions are excluded from consideration because they will come under review, as subject to the consultation requirements established in Section 7 of the ESA.

Non-Federal actions most likely to affect the southwestern willow flycatcher and its habitat in or near the project area are those that occur along portions of the Little Colorado River and a number of its tributaries extending from St. Johns downstream to near Cameron. Most of the land in the Little Colorado River Basin is privately owned.

Cumulative effects on the southwestern willow flycatcher have included the reduction, degradation, and elimination of riparian habitat, which has curtailed the range, distribution, and populations of this species. The loss and modification of habitat have occurred from a variety of actions, including water diversion and impoundment, channelization, urban and agricultural development, livestock grazing, off-road vehicle and other recreational use, and hydrological changes resulting from these and other land uses that have occurred in the Little Colorado River Basin. As the human population within the project area and the surrounding region increases, and the demand for water and recreational access increases, southwestern willow flycatcher populations on private, public, or presently inaccessible lands will be subject to increased impacts from human activities.

Perhaps one of the most significant future threats to the southwestern willow flycatcher is from impacts on riparian habitat due to groundwater pumpage from increased water demand within the region. Surface water diversions and groundwater pumping for agricultural, industrial, and municipal uses are major factors implicated in the deterioration and elimination of southwestern willow flycatcher habitat (Briggs 1996). Groundwater pumping in Arizona has been repeatedly demonstrated to result in depletion of surface flows, degradation and loss of riparian habitats, and local impacts and local extirpation of aquatic and riparian flora and fauna (Glennon and Maddock 1994; Hendrickson and Minckley 1984; Stromberg 1993; Tellman et al. 1997).

No critical habitat for the southwestern willow flycatcher occurs in the project area. The nearest critical habitat occurs approximately 140 miles (225 km) southwest of the Black Mesa Complex along an 32.5-mile-long (52.3-km-long) segment of the upper Verde River from the Town of Cottonwood downstream through the town of Camp Verde to Beasley Flat on the Prescott National Forest. Therefore, the project would not contribute to cumulative effects on critical habitat for this species.

6.2.3 Conclusions and Determination

There is no known occupied or currently suitable nesting habitat for southwestern willow flycatchers within the project area. While marginally suitable habitat for foraging and resting exists within the project area along several small drainages near the Black Mesa mining operation and at Moenkopi and Begashibito Washes, salt cedar in these areas would not likely be suitable for nesting. Disturbances of these habitats are unlikely to displace southwestern willow flycatchers from habitats that are key to their survival because (1) the action area is not known to be used during the breeding season, (2) a very small amount of potential habitat exists, and (3) a greater number, and extent, of areas of higher-quality habitats are available elsewhere, which were found to be essential to the conservation of the flycatcher (i.e., critical habitat was not designated in the action area).

No critical habitat for the southwestern willow flycatcher occurs within in the project area and none would be affected by project-related groundwater pumping. Based on these factors, it is concluded that

the proposed action may affect, but is not likely to adversely affect the southwestern willow flycatcher or designated critical habitat.

6.3 MEXICAN SPOTTED OWL

6.3.1 Direct and Indirect Effects

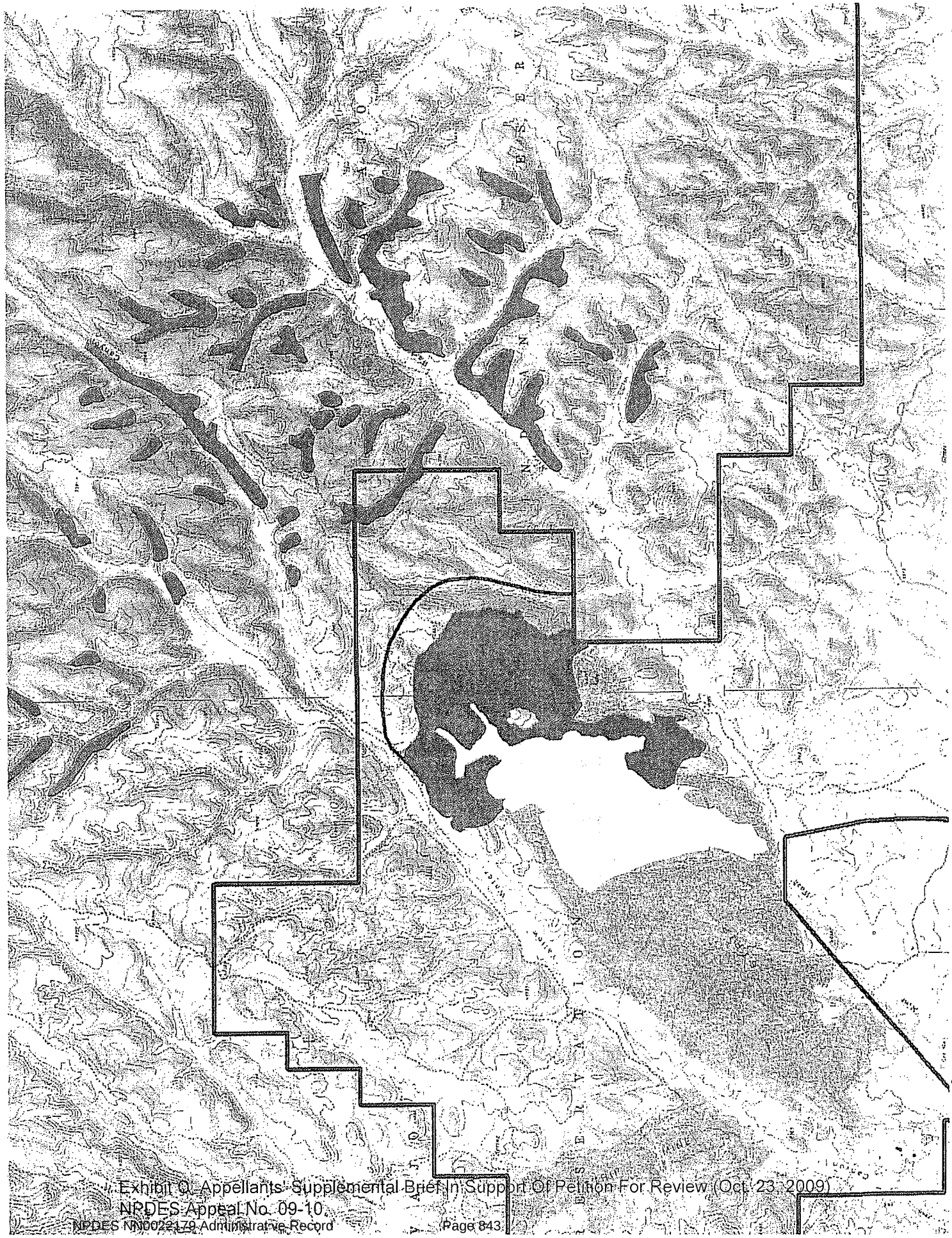
Mexican spotted owls have been monitored by Peabody since 1982 and were specifically addressed in an annual monitoring study from 1994 to 2000. The results of this effort, which are summarized in Section 5.3, indicate that historical mining-related disturbance in the N-11 mining area occurred from 1.9 to 4.5 miles (3.2 to 7.2 km) away from the 14 monitored nest and activity sites. Habitat disturbance unrelated to mining has already occurred near many of the sites from activities such as brush control, piñon/juniper chaining, and livestock pond construction (Peabody 2004). Under the proposed continuation of mining at the Kayenta mining operation, the closest mining would occur in the N-10 area about 3,750 feet (1,143 m) from the nearest PAC. All other PACs would be more than 6,336 feet (1,931 m) away from active mining operations. Proposed mining operations in relation to potential Mexican spotted owl habitat are shown in Figure 6-1.

Because mining would not occur in areas with mixed-conifer or pine/oak habitat, direct effects from the proposed action on protected or restricted Mexican spotted owl habitat would likely be in the form of effects on nocturnal foraging activities due to bright lights on draglines in the mine area and noise disturbance of birds. Based on the distance between PACs and suitable nesting habitat and areas of mining (draglines would be a minimum of 3,750 feet (1,143 m) from the nearest PAC) and the fact that foraging activities tend to be concentrated within and near PACs, it does not appear likely that owl foraging patterns would be significantly altered by currently planned mining. If areas of mining are altered and move closer to Mexican spotted owl habitat, then the potential for adverse effects would increase. Any change to the mining plan that moves operations closer to Mexican spotted owl PACs would require consultation with the FWS.

Noise may arise from drilling and blasting, operating excavation equipment, on-site hauling of coal and overburden, handling and loading coal, and transporting coal from the active mining area. Noise-related disturbance from mining could affect nesting, roosting, and feeding activities of Mexican spotted owls.

Existing studies of noise indicate that the response of wildlife to noise disturbance is complex, being neither uniform nor consistent. Delaney et al. (1997) reviewed literature on the response of owls and other birds to noise and concluded the following: (1) raptors are more susceptible to disturbance-caused nest abandonment early in the nesting season, (2) birds generally flush in response to disturbance when distances to the source are less than approximately 200 feet (61 m) and when sound levels are in excess of 95 A-weighted decibels (dBA), and (3) the tendency to flush from a nest declines with experience or habituation to the noise, although the alert response (i.e., head movements or agitated behavior) cannot be completely eliminated by habituation.

Animal responses to noise disturbance reported in the literature have been either physiological or behavioral in nature (Leonard 2002). Physiological effects may include temporary or permanent hearing-threshold shifts, masking of auditory signals, increased respiration and heart rate, and increased corticosteroid levels. Behavioral responses include animals becoming alert and turning toward the sound source, fleeing from the sound source, changes in activity patterns (e.g., interrupted feeding), nest abandonment, or changes in habitat use. If the changes are sufficiently severe, the health and survival of an individual animal may be reduced. If a large number of animals are affected, then local population declines could result.


RED RIVER
VALLEY

Injury or disturbance thresholds associated with different noise levels have recently been established by FWS (2003) for murrelets (*Brachyramphus* spp.) and spotted owls. They estimated the sound-only injury threshold for murrelets and owls at approximately 92 dBA at nest sites. This level does not change. Disturbance thresholds were estimated at 70 dBA, and detectability thresholds were estimated at 44 dBA (FWS 2003).

Elevated ambient daytime noise from mining operations and periodic noise spikes from blasting activities in the N-10 area during the Mexican spotted owl's breeding season could result in decreased Mexican spotted owl utilization within an undetermined number of acres of the western portion of the nearest PAC. The magnitude of impacts would depend on the specific type of mining activity, the noise level generated by various types of mining equipment, the distance between the activity and individual owls, and whether local barriers and topography provide shielding effects. Topographic screening between the area of disturbance and the birds' location creates a noise buffer, and could assist in the reduction of noise disturbance (Knight and Cole 1995).

The sound levels of typical construction equipment range from approximately 65 dBA to 95 dBA at 50 feet (15 m) from the source, with an average level of 89 dBA at 50 feet (15 m) during the noisiest activities (U.S. Environmental Protection Agency 1971). Noise from localized heavy equipment (point sources) usually decreases by 7.5 decibels with each doubling of distance from source to receptor. Earth-moving activities would not extend beyond the boundary of the maximum disturbance limit of the mine and would occur more than 2,640 feet (800 m) from the nearest PAC; sound levels at that distance would be reduced to less than 56 dBA (Table 6-2), which is below the reported disturbance threshold of 70 dBA for the spotted owl (FWS 2003).

Table 6-2 Estimated Noise Levels Associated with Blasting Activities.

Distance Attenuation	
Distance to Receptor (feet)	**Sound Level at Receptor (A-weighted decibels)**
50	94
100	88
200	82
400	75
600	71
800	69
1,000	66
1,500	62
2,000	59
2,500	56
3,000	53
4,000	49
5,280	45

SOURCE: California State Water Resources Control Board 2002

Blasting activities used to excavate material during mining would result in a temporary increase in blast-induced ground vibration and air-overpressure/noise levels, which would vary according to a number of factors including the type of explosive material and method of detonation, the amount of explosive material used, the type of rock and earth material blasted, and the depth the charge is placed in the ground. While these factors may vary from site to site, the typical sound level for blasting measured at 50 feet (15 m) from the source is 94 dBA (Hoover and Keith 1996). Table 6-2 shows estimated blasting noise levels in the vicinity of an active blasting site. Blasting would be limited to the active mine area,

which is located approximately 3,750 feet (1,143 m) from the nearest PAC. All other PACs would be more than 6,336 feet (1,931 m) away from active mining operations. As indicated in Table 6-2, areas within approximately 4,000 feet (1,219 m) of a blasting site (such as is the case for the nearest PAC) are expected to be exposed to maximum noise levels of around 50 dBA, above the existing background sound level of approximately 40 dBA, which is below the reported disturbance threshold of 70 dBA for the spotted owl (FWS 2003).

Noise levels associated with mining in the N-10 area adjacent to the nearest PAC would likely be louder than levels to which Mexican spotted owls are already habituated, but are anticipated to be reduced due to the buffering effect that trees and topography provide in this setting. Sound travels upwards, especially in a canyon, but here it is expected to be somewhat attenuated by the heavily forested lands just above the active mining area and across the top of Black Mesa, especially in the upper elevations and densely forested areas that best support Mexican spotted owl roost and/or nest sites.

The influences of vegetation, topography, and atmospheric conditions as noise reduction factors can vary greatly and are often impossible to quantify. Therefore, these factors are generally not taken into account in environmental noise analysis, which generally results in predicted noise levels that are higher than actual noise levels. For example, a break in the line of sight between a noise source and receptor can result in a 5 dBA reduction. Dense vegetation can reduce noise levels by 5 dBA for every 100 feet (33 m) of vegetation, up to a maximum reduction of 10 dBA (United States Department of Transportation 1995). Atmospheric conditions can also affect the rate of sound attenuation. Sound travels farther during periods of higher humidity and also in colder temperatures (FWS 2003). Wind can reduce noise levels by as much as 20 to 30 dBA at long distances (United States Department of Transportation 1995).

The magnitude of mining-related noise impacts on the Mexican spotted owl are not expected to reach adverse levels due to the distance of proposed mining activities from the nearest PAC, and noise levels are expected to be below the disturbance threshold for spotted owls. Mining activities would occur more than 2,640 feet (800 m) from the nearest PAC, where sound levels from mining activities are expected to be less than 56 dBA, which is below the reported disturbance threshold of 70 dBA for the spotted owl (FWS 2003).

The proposed action would have no effect on designated critical habitat. The nearest critical habitat is located approximately 80 miles (129 km) from the Black Mesa Complex north of Tusayan and in the vicinity of the San Francisco Peaks and other mountains in the vicinity of Flagstaff and Williams, and in the Grand Canyon.

6.3.2 Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur. Future Federal actions are not considered because they would require a separate consultation under Section 7 of the ESA.

Approximately 90 percent of the Mexican spotted owl nests known to exist in the United States in the early 1990s were on Federal lands administered by the Forest Service (FWS 1995c). Most of the nests on non-Forest Service lands are on tribal lands under the control of the San Carlos Indian Tribe, Navajo Nation, White Mountain Apache Tribe, Mescalero Apache Tribe, and Jicarilla Apache Tribe (FWS 2005b). Each tribal government has developed management or conservation plans for Mexican spotted owl, which the FWS considers "wholly beneficial" (FWS 2005b). A summary of management of Mexican spotted owls by the Navajo Nation is provided in Section 6.3.3.

The primary threats addressed in the recovery plan are catastrophic wildfires and even-age silviculture. Other threats include grazing, recreation, and other land uses. Inappropriate grazing can affect the

Mexican spotted owl by adverse alteration of food and cover for prey species, and adverse alteration of riparian and oak communities. Recreation can result in direct disturbance from human activity and alteration of habitat. No specific projects or activities that would contribute to cumulative impacts on Mexican spotted owls on Black Mesa have been identified.

6.3.3 Conservation Measures

The N-10 mining area is located near the northeastern part of the Kayenta mining operation, within 1 mile (1.6 km) of mixed-conifer forest in Coal Mine Wash. As part of the conditions specified in the permit, Peabody is required to monitor Mexican spotted owls at the N-10 mining area and within a 2-mile (3.2 km) buffer, beginning two years prior to scheduled disturbance and continuing three years after the end of the disturbance (Peabody 2004). Monitoring will use nocturnal surveys in the mine area and 2-mile (3.2-km) buffer zone and diurnal surveys at known nests. Surveys will follow standard FWS protocol and will be the same as previously used for the N-11 area.

The Navajo Nation has developed a Navajo Mexican Spotted Owl Management Plan that generally follows the recommendations of the Federal recovery plan. It includes (1) mandatory preconstruction owl surveys using standard protocol, (2) Federal Section 7 consultations for proposed projects, (3) establishment of 600-acre (243-ha) primary activity centers around each recent and historic nest, and (4) the tribal project-approval process, requiring that all non-Federal activities avoid taking owls (FWS 2005b). NNHP (2005) requires avoidance of habitat alteration within a 100-acre (40-ha) core area around each nest, and limitations on activities and season of action within the remainder of the 600-acre (243-ha) primary activity center, in accordance with the recovery plan (FWS 1995c). No activity is allowed within 0.25 mile (0.40 km) of known nest/roost sites from March 1 to August 1, or within 0.25 mile (0.40 km) of a primary activity center if the nest/roost location is unknown.

6.3.4 Conclusions and Determination

Because mining would not occur in areas with mixed-conifer or pine/oak habitat, direct effects would be limited to effects to nocturnal foraging activities due to bright lights on draglines in the mine area and noise disturbance of birds. No ground-disturbing activities would occur in protected or restricted Mexican spotted owl habitat. Under the proposed continuation of mining at the Kayenta mining operation, the closest mining would occur in the N-10 area about 3,750 feet (1,143 m) from the nearest PAC. All other PACs would be more than 6,336 feet (1,931 m) away from active mining operations. Due to the distance of mining activities from the nearest PAC, the decibel level from mining-related noise in the nearest PAC would be less than 50 dBA, which is below the disturbance threshold of 70 dBA for the spotted owl (FWS 2003). Based on these factors, and the implementation of conservation measures, which would require monitoring of owls in the N-10 area, it is concluded that the proposed action may affect, but is not likely to adversely affect the Mexican spotted owl or designated critical habitat.

6.4 BALD EAGLE

6.4.1 Direct and Indirect Effects

Nearly all breeding areas for bald eagles in Arizona are in the central part of the state along the Salt and Verde Rivers (two are in the east-central mountains). There are no known bald eagle nests on or near the project area. A majority of the bald eagles wintering in Arizona are winter migrants. During the winter, bald eagles migrating from the north follow the freeze line south to find more available prey. Large numbers are common at lakes and rivers along the Mogollon Rim and east throughout the White Mountains.

Few trees large enough to be used for winter roosting exist on the project area. Therefore, the occurrence of bald eagles within the project area would probably be limited to occasional winter scavenging forays.

Piñon/juniper and grassland habitats with low, sparse cover may provide foraging habitat for bald eagles that occasionally and irregularly visit the project area and surrounding region during migration and winter. Mine operation activities have the potential to displace eagles from these areas during migration. However, disturbances of bald eagles when they are migrating and hunting probably would not displace them from habitats that are key to their survival, since other equally suitable habitats are available elsewhere.

6.4.2 Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BA. Future Federal actions that are unrelated to the proposed action are not considered in this BA because they require separate consultation pursuant to Section 7 of the ESA. While the Arizona State Land Department has no broad management practices directed toward listed species, it often considers the needs of listed species in specific projects through coordination with the FWS and AGFD. Actions occurring on private lands also may contribute to cumulative impacts, but to a far lesser degree.

Bald eagles may be adversely affected by future State, local, or private actions such as urbanization, water development, and highway/roadway and utility projects that result in the loss or degradation of winter roosting and foraging habitat on nearby State and private land. However, the effects of these actions are expected to minimally affect the species, given the infrequent occurrence of the species in the project area, the marginal suitability of desertscrub and grassland habitats for bald eagles, and the widespread availability of other equally suitable habitats that are available.

6.4.3 Conclusions and Determination

There are no known bald eagle nests on or near the project area. A majority of the bald eagles wintering in Arizona are winter migrants. Since few trees large enough to be used for winter roosting exist in the project area, the occurrence of bald eagles would probably be limited to occasional winter hunting and scavenging forays. Disturbances to bald eagles when they are migrating and hunting are unlikely to displace them from habitats that are key to their survival since other equally suitable habitats are available.

Based on these factors and the infrequent occurrence of the species in the project area, it is concluded that the proposed action may affect, but is not likely to adversely affect the bald eagle. No critical habitat has been designated for this species; thus, none would be affected.

6.5 CALIFORNIA CONDOR

6.5.1 Direct and Indirect Effects

All the project facilities are within the designated nonessential experimental population area for reintroduction of California condor in northern Arizona. The designated area extends from U.S. Highway 191 on the east to U.S. Highway 93 on the west, and south to Interstate 40, and is intended to accommodate movements of condors and to include canyon country that provides suitable habitat. As of November 2005, there were 60 condors in the northern Arizona population (Grand Canyon National Park 2005). Condor nesting to date has occurred at Vermillion Cliffs and in the Grand Canyon.

Condors have been documented to fly up to 150 miles (241 km) in a day (Meretsky and Snyder 1992). Foraging flights by breeding pairs in southern California in the 1980s ranged from 44 to 112 miles (71 to 180 km), while nonbreeding birds foraged over greater distances. Foraging condors may occur occasionally over the mine. The Kayenta and Black Mesa mining operations are about 70 miles (113 km)

from the Vermillion Cliffs, but they are in a region consisting mostly of woodland and there are no records of occurrence of this species.

Foraging condors are unlikely to land near mining activities. While some newly released birds exhibit behavior that includes approaching humans and even allowing themselves to be touched, the condors are monitored, and birds with inappropriate behaviors are taken out of the wild (Cade et al. 2004).

Condors could potentially be attracted to road kill along access roads. Because project-related activities are expected to slightly increase commercial and public traffic levels on public highways within the project area, there is an increased potential for vehicular collisions with California condors (if present) along these existing highways. However, due to scarcity of large carrion, this population generally receives supplemental feeding, which occurs within a few miles of their release points at the Vermillion Cliffs area or within the Grand Canyon, and tends to keep the birds confined to these areas. Due to these factors and low likelihood of occurrence within the project area, vehicular collisions with California condors are anticipated to be highly unlikely.

6.5.2 Cumulative Effects

Changes in historic land use patterns in many areas of the condor's historic range have caused habitat degradation and fragmentation and are major factors in the decline of this species. This project will not disturb individual birds, nor will it modify or affect nesting, roosting, or feeding habitat; therefore, this project will not contribute to cumulative effects on this species or its habitat.

6.5.3 Conservation Measures

The following conservation measures are recommended by FWS to minimize the likelihood of proposed project-related impacts on the California condor:

- If nonnesting condors occur within 1 mile of a blasting area, postpone blasting until the condors leave or are hazed by permitted personnel.
- If a condor occurs at the mine site, cease construction until the condor leaves on its own or until techniques are employed by permitted personnel which results in it leaving the area.
- Instruct construction workers and supervisors to avoid interaction with condors and to immediately contact the appropriate land management agency (Navajo Nation Natural Heritage Program Zoologist at (928) 871-7070) or Peregrine Fund personnel at (928) 606-5155 or (928) 355-2270 if condors occur at the mine site.

6.5.4 Conclusions and Determination

California condors are highly mobile birds, able to travel over 100 miles (161 km) in a single day, and use home ranges of well over 1 million acres (404,686 ha). Because of their mobility, and the fact that they are not closely tied to one small habitat area, effects from implementation of the proposed project are anticipated to be negligible to nonexistent. Based on these factors, the low likelihood of occurrence of the species in the project area, and implementation of recommended conservation measures, it is concluded that the proposed action may affect, but is not likely to adversely affect the California condor. No critical habitat has been designated for this species in Arizona; thus, none would be affected.

6.6 NAVAJO SEDGE

6.6.1 Direct and Indirect Effects

The Navajo sedge has a very limited distribution, and there is no known habitat for the species in any of the areas that would be disturbed during mining activities. The potential effects on the species from the proposed action would be from drawdown of the N aquifer due to pumping, which could potentially affect habitat by decreasing water flow in seeps and springs. Effects on the species from decreased flow in springs and seeps could include decreases in plant vigor and survivorship. Additionally, habitat for the species may be affected by changes in the seasonal variability in flows, which decreases the integrity of hanging gardens, in turn decreasing suitable habitat for the species.

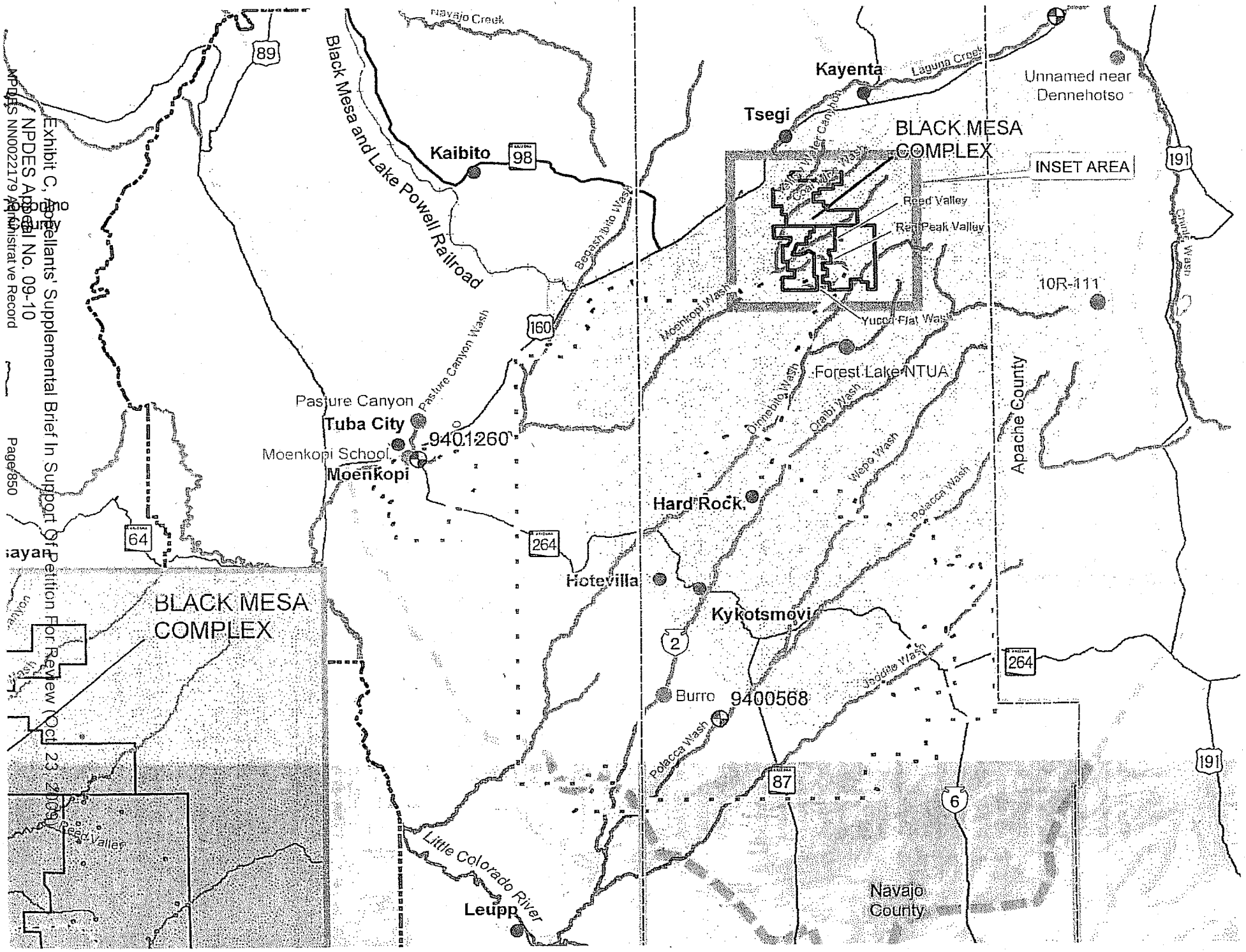
Until December 2005, when mining ceased at the Black Mesa Mine, the N aquifer was the primary source of water for the coal-slurry pipeline. The N aquifer can be characterized as a sandstone aquifer of low transmissivity that is confined beneath the leasehold, the central portion of the Navajo Reservation, and the northeast portion of the Hopi Reservation. The confined and unconfined areas of the N aquifer are shown on Figure 6-2. The Peabody well field is in the confined portion of the aquifer. The aquifer is unconfined in the area of Moenkopi and Tuba City, where several springs occur. Additional springs and seeps occur to the north and northwest of the Black Mesa Mine.

The N aquifer is a large aquifer system (refer to Figure 6-2); water in storage is estimated to be 166 million acre-feet (205 billion m^3) (Arizona Department of Water Resources 1989; Eychaner 1983). Recharge from precipitation is estimated to be approximately 13,000 af/yr (16 million m^3/yr) for the N aquifer or approximately 0.008 percent of the water in storage (Eychaner 1983; Hart et al. 2002). Because the annual recharge is small compared to the volume of water in storage, aquifer water levels do not fluctuate significantly in response to typical wet and dry cycles of precipitation. Recharge of this system generally occurs in the north-central part of the aquifer, north and west of Kayenta, where aquifer units are exposed at the land surface and precipitation is relatively high.

The N aquifer includes the Navajo Formation, the Kayenta Formation, and the Lukachukai member of the Wingate Formation. The N aquifer consists of 4 million acres (1,618,743 ha) within the Little Colorado River system. The aquifer is composed of fine-grained sandstone alternating with siltstone and ranges in thickness from a few feet to 1,300 feet (396 m) thick (Farrar 1979). The average thickness of the aquifer is approximately 400 feet (122 m) (Eychaner 1983), and the storage coefficient is estimated to average 0.10, with a range of 0.00022 to 0.008 for the confined areas and 0.10 to 0.15 for the unconfined areas.

Some N-aquifer groundwater flows to the northeast, where it discharges into Laguna Creek, to the northwest where it discharges into Navajo Creek, and to the southwest where it discharges into Moenkopi Wash. All three streams have perennial reaches of varying lengths supported by discharge from the N aquifer. The N aquifer also discharges to springs along the aquifer boundary (Arizona Department of Water Resources 1989) (Figure 6-2).

Under the proposed action, recent past average annual use (2000 through 2004) of the N aquifer (4,400 af/yr) would be reduced to an average rate of about 1,236 af/yr (1,524,584 m^3/yr) over the life of the mining operations. Therefore, even though pumping of the N aquifer may continue, water levels in the area of the well field may rise due to a decrease in the pumping compared to previous years. Peabody-related pumping would consist of 1,236 af/yr (1,524,584 m^3/yr) on average from 2008 through 2025 for mine-related and public use; an average of 505 af/yr (622,918 m^3/yr) for mine reclamation and domestic use from 2026 through 2028; and an average of 444 af/yr (547,666 m^3/yr) for domestic and maintenance uses from 2029 through 2038.


Navajo Creek
89
Black Mesa and Lake Powell Railroad
Kaibito
98
Begashibito Wash
160
Pasture Canyon Wash
Pasture Canyon
Tuba City
9401260
Moenkopi School
Moenkopi
64
264
Hotevilla
Hard Rock
Kykotsmovi
2
Burro
9400568
Polacca Wash
Little Colorado River
Leupp
87
6
191
Kayenta
Laguna Creek
Unnamed near Dennehotso
Tsegi
Tsegi Water Canyon
BLACK MESA COMPLEX
INSET AREA
Reed Valley
Red Peak Valley
Yucca Flat Wash
Moenkopi Wash
10R-111
Forest Lake NTUA
Dinnebito Wash
Oraibi Wash
Wepo Wash
Apache County
Navajo County
Exhibit C, Appellants' Supplemental Brief In Support Of Petition For Review (Oct. 23, 2009)
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The United States Geological Survey (USGS) has been monitoring N-aquifer spring flow from four springs (Moenkopi School, Pasture Canyon Spring, Burro Spring, and an unnamed spring near Dinnehotso) for a minimum of 10 years (some springs have been monitored for much longer but not always at the same location). The closest USGS-monitored spring (the unnamed spring near Dinnehotso) is more than 35 miles (56 km) from the Black Mesa Complex. The USGS concludes that "for the consistent periods of record at all four springs, the discharges have fluctuated but long-term trends are not apparent" (USGS 2005). It appears that pumping to date has not measurably reduced the monitored N-aquifer spring flow. However, modeling of N-aquifer groundwater discharge suggests that, as future non-project-related groundwater pumping in proximity to some of these springs increases, flows from springs could be impacted (GeoTrans, Inc. [GeoTrans] 2006).

There are other N-aquifer springs that are not monitored, and past changes to these springs, if any, are unknown. Numerical models of the N aquifer are not designed to simulate discharge from individual springs (Brown and Eychaner 1988; GeoTrans 1999). However, the GeoTrans model does simulate groundwater discharge to Begashibito Wash approximately 25 miles (40 km) west of the leasehold. Cow Springs, located at the southwestern extent of Begashibito Wash, is an area of groundwater discharge as expressed by seeps and small springs. Cow Springs is the closest modeled area of seeps and springs to the mine and would therefore experience the greatest impact due to project pumping. The model predicts changes in groundwater discharge into Begashibito Wash/Cow Springs combined.

Model-predicted groundwater-discharge diminution due to Peabody's pumping is given in Table 6-3. Under the minimum pumpage scenario, the 2025 Peabody-related diminution in Begashibito Wash/Cow Springs is predicted to be 13.7 af/yr (16,899 m^3/yr). This is 0.63 percent of the estimated 2005 discharge of 2,169 af/yr (2,675,422 m^3/yr), or a negligible impact.

Table 6-3 Projected Groundwater Diminution to Black Mesa (N Aquifer) Streams, in Acre-Feet per Year

Pumping	2005		2025		Change Due to Pumping			Percent Peabody
	All	Non-Peabody	All	Non-Peabody	All	Non-Peabody	Peabody	
Streams/Springs								
Chinle Wash	498.8	498.8	498.8	498.8	0.1	0.1	0.0	0.00
Laguna Creek	2,434.5	2,443.2	2,381.1	2,390.4	53.4	52.8	0.6	0.02
Pasture Canyon	389.4	389.4	330.5	330.5	58.9	58.9	0.0	0.000
Moenkopi Wash	4,283.3	4,302.7	4,274.7	4,299.5	8.6	3.2	5.4	0.13
Dinnebito Wash	515.0	515.3	514.1	514.9	0.9	0.4	0.5	0.09
Oraibi Wash	455.5	455.9	452.3	453.6	3.1	2.3	0.8	0.17
Polacca Wash	431.1	432.1	422.3	424.2	8.8	7.9	0.9	0.22
Jaidito Wash	2,015.1	2,018.2	1,999.2	2,007.8	15.8	10.3	5.5	0.27
Begashibito Wash/ Cow Springs	2,169.1	2,177.3	2,153.4	2,175.3	15.7	2.0	13.7	0.63

SOURCE: GeoTrans, Inc. 2006

The potential distribution of Navajo sedge on the Hopi Reservation is approximately the same distance from the leasehold and pumping area as Begashibito Wash/Cow Springs; therefore, the type and magnitude of effects on springs in the area would be expected to be similar to those for modeled for Begashibito Wash/Cow Springs.

Another population of Navajo sedge is known to occur near Tsegi, approximately 6 miles (9.6 km) north-northwest of the northern end of the well field; however, Peabody's well-field pumping should have little or no measurable impact on the N-aquifer water source that supplies this population. Even though the

Tsegi population of Navajo sedge is geographically closer to the Peabody well field than the Begashibito Wash/Cow Springs population, it is hydrologically isolated from the impacts of Peabody's well-field pumping by two major geological structures, a fault and the crest of a large monocline. Those structures serve as barriers between Tsegi and areas to the north and northwest of the N-aquifer pumping area, which is situated in the relatively flat-lying rocks that underlie the Black Mesa basin to the south and southeast. Tsegi is located just on the unconfined side of the boundary between the confined and unconfined portions of the N aquifer; from the fault and the crest of the monocline, which pass near Tsegi, the rock units dip steeply to the south-southeast toward the Black Mesa Complex. The exposed N-aquifer rocks south of Tsegi, which feed the seeps and springs needed to sustain the Navajo sedge population, would not be susceptible to significantly reduced discharges from springs due to the N-aquifer pumping associated with the proposed action.

Monitoring results and hydrologic models support this conclusion. The N-aquifer well at Tsegi (8T-522) indicated a drop of only 2.9 feet (0.9 m) from the baseline period through 2005 (Truini and Macy 2006), and GeoTrans (2006) predicted the drawdown in the N aquifer at Tsegi to be substantially less than 10 feet (3 m) from all sources through 2025. GeoTrans (2005) predicted Peabody-related drawdown in the N aquifer at Tsegi to be approximately 0.4 ft (0.1 m) assuming an average use of 1,236 af/yr, which is the projected pumping rate by Peabody.

6.6.2 Cumulative Effects

Cumulative effects include "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 CFR Part 402.02). Future Federal actions are excluded from consideration because they would come under review, as subject to the consultation requirements established in Section 7 of the ESA.

The cumulative effects on Navajo sedge in the area include non-project-related pumping of the N aquifer for human and livestock use as well as impacts from livestock grazing and trampling of the species. The non-Peabody-related diminution of flows at Begashibito Wash/Cow Springs from pumping of the N aquifer is predicted to be 2.0 af/yr (2,467 m^3/yr) (GeoTrans 2006). This is 0.09 percent of the estimated 2005 discharge of 2,169 af/yr (2,675,422 m^3/yr). Non-Peabody related pumping was based on recent water use growth rates and historic population growth rates and is expected to increase annually at a rate of 2.7 percent (GeoTrans 1999).

Livestock grazing in Navajo sedge habitat has been shown to lead to the direct loss of plants (FWS 1987b). Approximately 80 percent of Navajo sedge populations are accessible to livestock (Roth 2004), which, given the open grazing on the Navajo Indian Reservation, could lead to impacts on the species. The level of impacts on the species from grazing would depend on the intensity and duration of grazing activities.

Changes in the global climate may impact water supply for the Navajo sedge if it results in droughts of increased severity or length. The precise timing, nature, and magnitude of climate-change impacts at a specific location are not certain. A general model to evaluate global climate change from a single CO_2 emission source has not been developed. Currently, circulation models take into account the global carbon cycle, the oceans, atmospheric circulation patterns, cloud cover, and other parameters to evaluate the global climate. Due to the uncertainties in Earth's carbon cycle and the uncertainties in the range of climate predictions in terms of future control technologies, political policies, new regulations, and business markets; quantifying impacts on a regional or global basis based on the addition of a few CO_2 emission sources would be highly speculative.

The effects of climatic changes will be smoothed by the storage in the system and the addition of climatic signals that are not in phase. Long-term changes in climate would be expected to affect the amount of water available to support the Navajo sedge, but data do not exist to allow the development of quantitative predictions.

6.6.3 Conclusions and Determinations

The project area does not include known Navajo sedge populations or habitat; however, as project-related pumping of the N aquifer may potentially decrease flows in seeps and springs by less than 1 percent of the total flow in the worst-case scenario, it is concluded that the proposed action may affect, but is not likely to adversely affect the Navajo sedge.

Navajo sedge critical habitat was designated in 1985, as described in Section 5.7.2 (50 FR 19370) and is approximately 20 miles (32.2 km) northwest of the Black Mesa Complex along Navajo Creek in the unconfined portion of the N aquifer. Modeled impacts on N-aquifer levels at Tsegi Canyon are expected to be 0.4 ft (0.1 m) assuming an average use of 1,236 af/yr (GeoTrans 2005). Tsegi Canyon is nearer to the Black Mesa Complex than the Navajo sedge designated critical habitat, and impacts on critical habitat are expected to be lower than those modeled for Tsegi Canyon. Changes in N-aquifer levels in the unconfined area are influenced to a much greater degree by precipitation levels and localized pumping than by Peabody-related pumping, which occurs within the confined portion of the aquifer. Given the distance of designated critical habitat from the Black Mesa Complex, modeled changes in aquifer levels of less than 0.4 ft (0.1 m), and the overriding influence of precipitation and localized non-Peabody related pumping in the unconfined portion of the N aquifer; the proposed project may affect, but is not likely to adversely affect critical habitat.

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APPENDIX A

CONSULTATION AGREEMENT

CONSULTATION AGREEMENT

BETWEEN

OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT,
U.S. FISH AND WILDLIFE SERVICE,
BUREAU OF INDIAN AFFAIRS,
BUREAU OF LAND MANAGEMENT,
U.S. FOREST SERVICE, AND
U.S. ENVIRONMENTAL PROTECTION AGENCY

FOR THE

BLACK MESA PROJECT BIOLOGICAL ASSESSMENT

A. Purpose and Need

This Consultation Agreement (Agreement) is entered into by the U.S. Fish and Wildlife Service (FWS) and other Federal agencies with authority and actions to perform on the Black Mesa Project to ensure appropriate internal management in conducting Section 7 consultation under the Endangered Species Act of 1973, as amended. The action agencies are the Office of Surface Mining Reclamation and Enforcement (OSM), the lead agency for the consultation; Bureau of Indian Affairs (BIA); Bureau of Land Management (BLM); U.S. Forest Service (Forest Service), and U.S. Environmental Protection Agency (USEPA). All of the agencies listed above are collectively referred to as Consultation Participants.

Consistent with Department of the Interior Secretarial Order 3206, the Hopi Tribe and Navajo Nation plan to participate in the consultation process through the lead agency and BIA.

The Project Applicants requiring formal authorization from one or more of the Federal agencies, listed above, as a prerequisite to implementing the Black Mesa Project are Peabody Western Coal Company (Peabody), Black Mesa Pipeline, Inc. (BMPI), Salt River Project and future co-owners of the Mohave Generating Station, and the Hopi Tribe and Navajo Nation. The Project Applicants will participate in the consultation process through the lead agency (50 C.F.R. §§402.13 and 402.14(g)(5)).

This Agreement addresses consultation and coordination on all species listed as threatened, endangered, or proposed for listing, and designated or proposed critical habitat potentially affected by the Black Mesa Project. The Agreement also considers effects on, and management of, candidate species.

The Black Mesa Project includes four proposed components: (1) Peabody proposes several revisions to the life-of-mine plans for the Kayenta and Black Mesa Mines, (2) operation of the coal-slurry preparation plant by BMPI; (3) BMPI proposes to reconstruct the coal-slurry pipeline that transports coal from the Black Mesa Mine to the Mohave Generating Station, and (4) Salt River Project, for itself and future Mohave Generating Station co-owners, and the Hopi Tribe and Navajo Nation propose to construct a water-supply system (i.e., well field and water-conveyance pipeline) that would supply water to the mines and coal slurry pipeline and potentially supply water to local tribal communities.

The magnitude of the Black Mesa Project, associated issues, and number of agencies cooperating and/or participating in the preparation of the Black Mesa Project biological assessment (BA) and their interest in producing a sound environmental outcome warrants an agreement to clarify expectations,

commitments, and findings and to establish communication protocols for and among the Consultation Participants.

Through this Agreement, the six Federal agencies and five Project Applicants (including the two American Indian tribes) agree to assign members to an interagency Biological Resources Subcommittee to conduct this consultation as well as assist in preparation of the BA. A list of the Consultation Participants and representatives of the tribes and Project Applicants and their contact information is provided as Attachment A.

B. Consultation History

Informal consultation for the project began with the submittal of a letter to FWS from the project environmental consultant, URS, on behalf of OSM on May 5, 2005. During the months of May, June, and July, representatives of FWS, URS, and Bureau of Reclamation (Reclamation), coordinated via electronic mail and teleconferences. On June 24, 2005, an informal coordination meeting of representatives of URS and Reclamation, on behalf of OSM, and FWS was held in Phoenix, Arizona to discuss the concept of the multi-agency consultation and process, and to discuss convening a Biological Resources Subcommittee for the Black Mesa Project. On July 26, 2005, the initial meeting of the Biological Resources Subcommittee was conducted to discuss the status of the project and biological resource studies, initiate coordination with the Consultation Participants, and discuss the content of this Consultation Agreement.

C. Agency Authorities and Actions

The Black Mesa Project is a major Federal action requiring the completion of an environmental impact statement and that will include consultation with the FWS. The several Federal agencies, in concert with the tribal governments and Project Applicants, are involved and will be responsible for making decisions on certain components of the project.

Life-of-Mine Revision for Kayenta and Black Mesa Coal Mines

Actions by Federal agencies regarding the Peabody's life-of-mine revision include:

- OSM approval, conditional approval, or disapproval of Peabody's life-of-mine revision;
- BIA and tribal approval of a right-of-way to Peabody for a transportation corridor;
- BLM approval of changes to Peabody's mining plan;
- USACE approval of modification of Peabody's Clean Water Act (CWA) Section 404 permit and USEPA CWA Section 401 water-quality certification; and
- USEPA approval of modifications of Peabody's National Pollutant Discharge Elimination System (NPDES) permit.

Coal-Slurry Preparation Plant

Actions by Federal agencies regarding the BMPI coal-slurry preparation plant permit application include:

- OSM approval or disapproval of BMPI's preparation-plant permit application.

Coal-Slurry Pipeline

Actions by Federal agencies and tribal authorities regarding reconstruction of BMPI's coal-slurry pipeline include:

- BIA and tribal approval(s) of rights-of-way, leases, and permits for BMPI's coal-slurry pipeline;
- USACE CWA Section 404 permit(s);
- USACE River and Harbors Act Section 10 permit (Colorado River crossing);
- USEPA, tribal lands and state (Arizona and Nevada) CWA Section 401 water-quality certification;
- BLM amendment of the existing grant for right-of-way:
- Forest Service amendment of the existing special use permit.

C-Aquifer Water-Supply System

Actions by Federal agencies and tribal authorities regarding the C-aquifer water-supply system include:

- BIA and tribal approval(s) of rights-of-way, leases, and permits for the pipeline and associated facilities;
- BIA and tribal approval of well leases and drilling permits;
- USACE CWA Section 404 permit(s);
- USEPA (tribal lands) CWA Section 401 water-quality certification; and
- BIA actions associated with tribal approvals of the use of tribal water.

D. Consultation Action

This Agreement concerns early and ongoing coordination for conducting the consultation process, in compliance with Section 7 of the Endangered Species Act, in the preparation of the Black Mesa Project BA. This early and ongoing coordination encourages the Consultation Participants to proactively collaborate in planning and developing solutions to help facilitate and expedite the consultation process.

OSM will provide a draft BA for FWS to review. Attachment B contains the proposed schedule for the review and completion of the BA process, including dates when comments are due for each document within the process.

Formal consultation would commence only when a complete written request, in accordance with 50 C.F.R. §402.14(c), is received by the FWS. The request will include relevant reports including the draft EIS for the Black Mesa Project, the final BA, and any other relevant project information about the affected listed species or critical habitat, including but not limited to the results of studies and surveys, conservation measures to minimize or compensate for project effects, and plans to monitor effects and the effectiveness of conservation measures.

E. Operations

URS, a third-party environmental consultant, will serve as a non-Federal representative assisting in the consultation process through the lead agency.

The Consultation Participants mutually agree to:

- Assign a primary contact (refer to Appendix A) and appropriate support staff with adequate authority to carry out the terms and intent of this agreement specific to each agency's authorities and actions required for the Black Mesa Project (refer to Item C of this Agreement). If there are any changes in personnel, the name and contact information for a new point-of-contact will be provided immediately to OSM, who will distribute the information to all Consultation, Tribal, and Project Participants immediately.
- Acknowledge the responsibility of each action agency to identify and address all direct, indirect, and cumulative effects including those effects related to interrelated and interdependent actions.
- Coordinate as partners to identify and develop conservation measures for incorporation into the project design to eliminate, minimize, or compensate for adverse impacts, as appropriate.
- Provide data to the lead agency for effects analysis.
- Coordinate determinations of effect recognizing ultimate responsibility for any given determination resting with the jurisdictional agency.
- Coordinate in the identification of related conservation measures, reasonable and prudent measures, or reasonable and prudent alternatives that rest with the agency responsible for the decision/action.
- Provide data to the FWS for development of reasonable and prudent measures and/or alternatives and conservation recommendations, if needed.
- Participate in milestone meetings, consultation meetings, and conference calls, as needed.
- Coordinate during the writing of the BA to ensure all elements of the BA (e.g., analysis of effects, conservation measures, etc.) are fully documented. Coordination can involve, but is not limited to, informal one-on-one discussions; conference calls, if multiple participants are involved; and provision of preliminary draft sections of the BA to appropriate participants for complicated topics and/or analysis.
- Review and provide written comments to OSM on all draft documents (e.g., draft BA, draft biological opinion [BO]) within a period of 20 calendar days.
- Early notification, if any problems may arise that would affect the content of the documents or schedule.
- Amend the Agreement only through acceptance by all of the Consultation Participants.
- Cooperate in establishing mutually agreeable schedule adjustments if changes to the schedule (Attachment B) are required.
- If a BO is necessary, extend the consultation period by the amount of time needed to review the draft BO if comments require further discussion and/or major revisions to the BO.
- Terminate the Agreement 60 calendar days from receipt of written notice by any one of the Consultation Participants.

- Acknowledge that this Agreement is only to improve the internal management of this consultation by the Consultation Participants and is not intended to and does not create any right or benefit, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.
- Acknowledge that nothing in this Agreement shall be construed as obligating any of the Consultation Participants or project applicants to the expenditure of funds, or for the future payment of money, in excess of appropriations authorized by law.
- If coordination expectations are not met and an impasse is reached regarding any aspect of the consultation process, Agreement, or with any of the documents, all involved parties will use Issue Resolution Teams as identified in item number (3) on page 5 of the Long-Term Strategy for Streamlining Consultations under the Endangered Species Act in Arizona and New Mexico (November 1999). Elevations of issues to Issue Resolution Teams will follow the three tiers: field unit, state or regional unit, and respective offices in Washington D.C. The first-level resolution team should be established at the first administrative level above the level of the impasse. If a second-level resolution team is needed, a state or regional team should be requested. If a third-level resolution team is needed, a team at the Washington D.C. level should be requested.

<u>As lead consulting agency, OSM agrees to:</u>

- Lead and facilitate the consultation process with FWS, in cooperation with the other Consultation Participants, under the terms of this Agreement recognizing OSM's authority and actions are limited to decisions associated with the life-of-mine and coal-slurry preparation plant permits, and that Consultation Participants may have separate authorities and actions that are dependent on this Agreement.
- Develop and maintain the OSM administrative record for the consultation process.
- Provide project information (e.g., maps, copies of data and/or information) to the Consultation Participants to be able to make informed contributions to the process.
- Convene and conduct meetings or conference calls, as needed.
- Convene the Consultation Participants to remedy concerns and/or issues soon after discovery of concerns and/or issues that pertain to the Consultation Participants.
- Prepare draft and final documents in coordination with the other Consultation Participants.
- Provide an electronic and paper copy of the draft BA to the designated representative of each Consultation Participant, tribe, and Project Applicant for review. (In the absence of electronic mail, BIA representatives will receive both a paper copy and an electronic copy saved to disc via overnight mail.)
- Provide 20 calendar days for review of the draft BA by the Consultation Participants, Tribes, and Project Applicants.
- Revise the draft BA, incorporating comments received from the reviewers as deemed appropriate by OSM, and prepare the final BA for submittal to FWS.
- Provide an electronic and paper copy of the final BA to the designated representative of each Consultation Participant, tribe, and Project Applicant. (In the absence of electronic mail, representatives will receive both a paper copy and an electronic copy saved to disc via overnight mail).

- If a BO is necessary, distribute the FWS draft BO to the designated representative of each Consultation Participant, Tribe, and Project Applicant for review and comment.
- Compile comments on the draft BO and submit to FWS within 25 days of receiving the draft BO from FWS. Provide the compiled comments to the designated representative of each Consultation Participant, tribe, and project applicant for review and discussion.
- Identify and communicate all time commitments (Attachment B). If the schedule for OSM's provision of documents and other information has not been met and changes are required, changes to deadlines will not be finalized without mutual agreement with the Consultation Participants on the deadline changes needed, except as provided by statute, guidance, or pursuant to this Agreement.

FWS agrees to:

- Recognize the authorities and actions of each of the Consultation Participants for certain components of the project (refer to Item C above), including interdependent and interrelated actions.
- Use expertise regarding listed species to assist the Consultation Participants in identifying conservation opportunities and conservation measures in preparation of the BA.
- Provide comments to the lead agency on the draft BA within 20 days of receipt from the lead agency.
- If a BO is necessary, provide final BO to the lead agency within 135 calendar days of receipt of the final BA from the lead agency, with exceptions as described at 50 C.F.R. §402.14(e) and (g)(5) and in this Agreement.
- Develop and maintain the FWS administrative record for the consultation process.

It is anticipated that the Tribes and Project Applicants agree to:

- Coordinate their involvement in the consultation process through the lead agency.
- Participate in meetings and conference calls as requested by the lead agency.
- Provide expertise and information regarding listed species to assist the Consultation Participants and staff the Biological Resources Subcommittee.
- Review and provide written comments on all draft documents (e.g., draft BA, draft BO) to the lead agency within a period of 20 days.
- Coordinate as partners to identify and develop conservation measures and recommendations to eliminate, minimize, or compensate for adverse impacts, as appropriate.

It is anticipated the State agencies agree to:

- Coordinate their involvement through the lead agency.
- Participate in meetings and conference calls as requested by the lead agency.
- Provide expertise and information regarding listed species to assist the Consultation Participants and staff the Biological Resources Subcommittee.

- Review and provide written comments on all draft documents (e.g., draft BA, draft BO) to the lead agency within a period of 20 days.
- Coordinate to identify and develop conservation measures and recommendations to eliminate, minimize, or compensate for adverse impacts, as appropriate."

F. **Term**

This Agreement shall take effect upon the date of the last signature, and shall remain in effect for five (5) years, or upon completion of the Endangered Species Act Section 7 process, whichever comes first.

G. **Approved**

Chief, Program Support Division
Office of Surface Mining Reclamation
and Enforcement

11/3/05
Date

Field Supervisor
Arizona Ecological Services Field Office
U.S. Fish and Wildlife Service

10/3/06
Date

Director
Bureau of Indian Affairs

11-17-05
Date

Field Manager,
Kingman Field Office
Bureau of Land Management

11/22/2005
Date

Forest Supervisor.
Kaibab National Forest
Forest Service

11/14/05
Date

Director, Communities and Ecosystems Division
Region IX
U.S. Environmental Protection Agency

11/21/05
Date

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re: NPDES Permit Renewal Peabody Black Mesa NPDES Permit No. NN0022179: Black Mesa Complex	)	NPDES Appeal No. 09-10

NOTICE OF WITHDRAWAL OF PERMIT

Under the authority of 40 C.F.R. section 124.19(d), Region 9 of the Environmental Protection Agency ("Region 9") hereby withdraws the National Pollutant Discharge Elimination System ("NPDES") permit on appeal in this matter. Pursuant to 40 C.F.R. section 124.19(d), a Regional Administrator may withdraw a NPDES permit at any time prior to the issuance of a decision by the Board granting or denying review. The Region may then prepare a new draft permit. The Board has not yet issued a decision granting or denying review in this matter and thus, the Region is choosing to exercise its authority to withdraw the permit. By issuing this Notice, the Region does not intend to waive any argument or defense concerning the issues raised in the pending appeal.

This Notice, which Region 9 is serving on all parties to this matter, provides the necessary notice to the Board and interested parties of the withdrawal of the permit on appeal. In accordance with 40 C.F.R. sections 124.6 and 124.19(d), Region 9 will prepare a new fact sheet for the new draft permit and will provide notice and opportunity for public comment. Region 9 also intends to hold public hearings on Navajo and Hopi land.

The EPA Region 9 Water Division Director is authorized to issue this withdrawal pursuant to Delegation No. R9 1250.40 from the Regional Administrator. This delegation re-delegates authority to the Director of the Water Division to implement the procedures for issuance of a NPDES permit under the regulations at 40 C.F.R. § 122.1. The final permit decision was signed by the Region 9 Water Division Director in accordance with this delegation of authority, which applies equally to the decision to withdraw a NDPES permit.

Dated: 30 November 2009

Alexis Strauss
Director, Water Division
EPA Region IX
75 Hawthorne St., WTR-1
San Francisco, CA 94105
Phone: (415) 972-3572
Fax: (415) 947-3549

CERTIFICATE OF SERVICE

I hereby certify that a copy of the Notice of Withdrawal was served on the following persons by U.S. Mail and electronic mail:

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Dated: 12-1-09

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BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re:	)	
	)	
Peabody Western Coal Company	)	
Black Mesa Complex	)	NPDES Appeal No. 09-10
	)	
Permit No. NN0022179	)	
	)	

ORDER DISMISSING PETITION FOR REVIEW WITH PREJUDICE

On August 5, 2009, U.S. Environmental Protection Agency Region 9 ("Region") issued to Peabody Western Coal Company ("Peabody") a National Pollutant Discharge Elimination System ("NPDES") permit renewal, number NN0022179 ("Permit"), for Peabody's Black Mesa Complex facility. On September 9, 2009, the Black Mesa Water Coalition, Diné C.A.R.E., To Nizhoni Ani, C-Aquifer for Diné, and Center for Biological Diversity ("Petitioners") filed a petition for review as well as a motion for an extension of time to submit a brief in support of the petition. After the Board granted a 45-day extension, Petitioners filed a supplemental brief on October 23, 2009, requesting that the Board remand the permit to the Region with instructions to address several alleged deficiencies.

Pursuant to its authority under 40 C.F.R. section 124.19(d) to withdraw a permit prior to the Board rendering a decision to grant or deny review, the Region filed a notice withdrawing the Permit on December 1, 2009. The Region stated that in addition to preparing a new draft permit under 40 C.F.R. section 124.6, it will also prepare a new fact sheet, provide appropriate notice and opportunity for public comment, and that it intends to hold public hearings on Navajo and Hopi lands.

Upon consideration, the Board hereby dismisses the above-captioned matter with prejudice. Section 124.19(d) states that "[t]he new draft permit shall proceed through the same process of public comment and opportunity for a public hearing as would apply to any other draft permit subject to this part." This dismissal is not a determination on the merits of any arguments raised in the petition, and thus does not preclude Petitioners from raising those arguments in its public comments submitted to the Region regarding the forthcoming draft permit.

So ordered.

ENVIRONMENTAL APPEALS BOARD

Dated: December 3, 2009

By: Anna L. Wolgast
Anna L. Wolgast
Environmental Appeals Judge

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing Order Dismissing Petitions for Review with Prejudice in the matter of Peabody Black Mesa, NPDES Appeal No. 09-10, were sent to the following persons in the manner indicated:

Facsimile and EPA Pouch Mail

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Dated: DEC 3 2009

Annette Duncan
Secretary

AP Story: EPA withdraws discharge permit for Ariz. coal mine

Margot PerezSullivan to DavidW Smith, John Tinger, robyn stuber, Erica Maharg 12/04/2009 03:10 PM

Cc: Julie Anderson

This message has been replied to.

Hi Folks, The AP story ran widely - Duragno Herald, AZ Daily Star, AZ Republic, St. Louis Post Dispatch, St. Louis Business Journal, Las Vegas Sun, Charleston Gazette, Mohave Valley News, AZ Daily Sun along with a host of television and radio stations including KOLD (CBS affiliate Tucson), KVIG (ABC affiliate in New Mex. Tex. and Juarez), KSWT (CBS affiliate in the Yuma area), KGUN (ABC affiliate in Tucson), KWES 9 (NBC affiliate in New Mexico), KTAR (radio in AZ). Here is the text from the article.

EPA withdraws discharge permit for Ariz. mine

by Felicia Fonseca
Associated Press Writer
Article Last Updated; Friday, December 04, 2009 12:49AM

FLAGSTAFF, Ariz. - The U.S. Environmental Protection Agency has withdrawn a water discharge permit for a controversial coal-mining operation in northern Arizona pending public hearings.

The EPA's decision about the permit for Peabody Energy's Black Mesa mine complex comes after an appeal by environmentalists who contend the discharge of heavy metal and pollutants threatens water sources that nearby Navajo and Hopi communities depend on for drinking, farming and ranching.

Dave Smith, water permits manager in the EPA's San Francisco office, said Thursday the agency believes the permit is solid but wanted to provide an opportunity for additional public comment.

"Our job is to focus on the Clean Water Act piece of this right now and whether the water discharges have significant affects, and to make sure they are adequately controlled," he said.

Peabody spokeswoman Beth Sutton called the environmentalists' claims frivolous and said the company has a record of compliance with the Clean Water Act. The mining will continue in a "business-as-usual fashion," and Peabody will maintain best practices to assure good water quality, she said.

The mining complex that includes the Black Mesa and Kayenta mines sits on nearly 65,000 acres Peabody leases from the Navajo and Hopi tribes and has been in operation since the 1970s. Coal from the Kayenta mine supplies the Navajo Generating Station near Page. The Black Mesa mine supplied the Mohave Generating Station in Laughlin, Nev., until the power plant was shuttered in 2005.

Water discharge that includes storm water and runoff from mining, coal preparation and reclamation areas is held in more than 230 ponds at the mining complex. About 33 have leaks, and the EPA has said some of those don't meet water-quality standards, need additional monitoring or need removal.

The EPA said many of the ponds are internal and used for treatment and storage. About 111 ultimately discharge to the Little Colorado River system through a series of washes and tributaries.

Peabody's five-year water discharge permit went into effect Oct. 1. With the withdrawal, the EPA said Peabody can continue operating on a previous permit that expired in 2006 but has been administratively extended.

Stephen Etsitty, executive director of the Navajo Nation EPA, said the new permit contained improvements over the last, including new regulatory requirements for reclamation areas and revisions to monitoring plans. He added that the Navajo EPA's monitoring of discharge in the mine area hasn't raised any red flags.

"We're pretty confident that what's contained in the permit is going to withstand any additional review," he said. "We're just hopeful that this doesn't drag out the process of putting a necessary permit in place."

Environmentalists commended the EPA for reconsidering the permit and said the action would force Peabody to comply with the Clean Water Act. It also will give the EPA a chance to remedy what they say has been environmental injustice.

"The tribal groups know the heavy metal and pollutants are affecting their livestock and ecological community," said Amy Atwood, an attorney with the Center for Biological Diversity. "We need to see EPA disclosing what those impacts are, where they are occurring, and in the process, find a better way to contain them."

The EPA initially denied a request to hold a public hearing on the permit. Smith said the agency reconsidered in light of the appeal and will hold two such hearings next year on the Hopi and Navajo reservations.

Smith doesn't anticipate the draft permit will change but said, "We are open-minded."

"We do not prejudge," he said. "That's why we have public hearings. If we need to adjust the permit, we will."

Thank you,

Margot Perez-Sullivan
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EPA withdraws permit for Peabody's impoundment pond discharges

By Tanya Lee
Tutuveni Freelance Reporter

The U.S. Environmental Protection Agency announced on Dec. 3 that it has withdrawn the National Pollutant Discharge Elimination System (NPDES) permit it issued in October for Peabody Coal's impoundment ponds on the Black Mesa Mine Complex. The EPA will reopen the comment period on the permit (for 30days, beginning at a date not yet specified) and will hold public hearings on Hopi and Navajo.

The move, said Vernon Masayesva, executive director of Black Mesa Trust, could indicate that all permitting for the Black Mesa and Kayenta mines on Hopi and Navajo lands will be brought into question. "EPA's decision to hold comments on a renewal of the water discharge permit is the first signal that the federal government is beginning to take its special legal obligations to Indian people more seriously," he said.

What an NPDES Permit Covers

The NPDES permit (NN0022179) is one of several permits related to water quality that Peabody is required to have in order to operate the mines. This permit applies only to some of the 230 impoundment ponds that Peabody has built on the leasehold. It affects only to those ponds from which water would be discharged into the waterways of the United States-in particular Moenkopi Wash and Dinnebito Wash. Of the 230 impoundment ponds, 111 meet this criterion. Internal impoundments that Peabody will not discharge into the waterways are not affected.

An NPDES permit addresses only impacts to surface water. It does not deal with impacts to the N-aquifer or any other groundwater.

EPA said the water quality for discharges from the impoundment ponds must meet standards for aquatic wildlife, livestock, and human contact, but not drinking. Previously, said EPA permit writer John Tinger, Peabody could not discharge water from the impoundments because the water did not meet standards for sediment. However, Hopi downstream users wanted the water. EPA issued new regulations for reclaimed areas in semi-arid and arid regions.

Permit Opposed

Peabody's NPDES permit expired on Feb. 1, 2006. EPA administratively extended the permit and Peabody has been operating under that extension. The permit just issued replaced the extended permit. This water permit is separate from the life-of-mine permit approved by the Office of Surface mining last December, although EPA was a cooperating agency for the preparation of the environmental impact statement that led to the life-of-mine permit.

At the end of October, Californians for Renewable Energy (CARE) and Vernon Masayesva sent EPA a notice of intent to sue for violations of the Clean Water Act. Separately, the Center for

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Biological Diversity, Sierra Club, Natural Resources Defense Council, Dine CARE, TO' Nizhoni Ani, and other organizations filed an appeal contesting the permit on the grounds that it allowed the discharge of toxic metals and other pollutants into Moencopi and Dinnebito Washes.

Hopi Tribal Government

The CARE/Masayesva notice of intent to sue focused on whether the permit was properly issued given the political situation Hopi at the time the permit was under consideration. The short version is this: EPA did not consult with the Hopi Tribal government-as is required by law-because there has not been a legally-constituted government on Hopi for almost a year.

Further, said CARE, the Hopi Tribe did not certify-again as is required by law-that the permit met its federally-approved water quality standards. CARE wrote: "An error by US EPA's is the failure to recognize the Hopi Tribe's approved water quality standards. In OSM's document of decision on page 17 of their Cumulative Hydrologic Impact Assessment of the Peabody Western Coal Company Black Mesa Complex, (Dec. 2008) the OSM states 'The Hopi Tribe received approval of water quality standards on July 8, 2008, from the US EPA, but the tribal council has yet to adopt the water quality standards.' This statement is incorrect because the US EPA cannot approve water quality standards for a state or tribe that have not been adopted. The US EPA Administrator would have to federally promulgate water quality standards for a state or tribe that had not acted."

The 401 water quality certification that EPA accepted was signed by Sharon Masek Lopez, Acting Director Hopi Tribe Water Resources Program on June 12, according to EPA.

The certification that EPA got from the tribe in order to issue the permit was "fraudulent," according to the CARE/Masayesva letter to EPA. The letter reads: "CARE and Vernon Masayesva allege US EPA knowingly conspired with PWCC to accept a fraudulent 401 certificate so as to avoid the more stringent discharge requirements as specified in the Hopi water quality standards (the 1997 version approved by Tribal Council). CARE and Vernon Masayesva intend to file a citizen suit pursuant to the Clean Water Act provisions for US EPA not adopting the Hopi Tribe's approved water quality standards, and for accepting a fraudulent 401 certification for the Hopi Tribe, when clearly there was no Chairman, or Vice-Chairman of the Hopi Tribe at the time it was provided before issuing NPDES Permit No. NN 0022179."

These issues could appear to be just technical matters. But Masayesva and CARE maintain they are much more-that they are indicative of a long-standing cooperation between Peabody and federal agencies such as OSM and EPA that allow mining to continue on Black Mesa without full consultation with or informed consent from the tribes.

Why It Matters

A fundamental question regarding this permit is, "What is in the impoundment ponds, and where will it end up?" While the 404 permit does not deal with groundwater at all, hydrologists know that surface water and groundwater intermix in their natural progression through the water cycle.

A fact sheet prepared by Peabody issued in August regarding the impoundments and the permit stated that the water to be discharged from the impoundments "includes runoff from active mine areas, coal preparation plant areas, and reclamation areas."

EPA stated also that 33 seeps have been identified associated with the 111 impoundments that would discharge water into the washes. The previous permit, wrote Peabody, "required that PWCC conduct a Seepage Monitoring and Management Plan. The permit required the PWCC design and conduct a study plan to determine the source of, and pollutants in, seepages below impoundments." Between 1999 and 2007, Peabody monitored between 7 and 16 seeps a year. Among the pollutants found were iron, selenium, nitrates, aluminum, chloride, sulfate, TDS, and cadmium.

Based on the results of

the monitoring. "EPA and PWCC established a prioritization to address seeps including 1) reclaim as many ponds as possible 2) eliminate monitoring requirements for seeps not causing problems 3) continue monitoring where data is inconclusive 4) establish a permanent fix for problem areas and 5) explore if regulatory variances may be applicable for certain non-bioaccumulative parameters. In addition, EPA will explore the feasibility of granting a water quality variance for aluminum, TDS and sulfate as appropriate if their presence is due to naturally occurring conditions and at levels not exceeding background concentrations."

No Worries?

All in all, it sounds like everything is under control. But is it? Michael Boyd, president of the board of directors of Californians for Renewable Energy, called the impoundments on Black Mesa "a toxic nightmare." The biggest challenge for the tribes in the future will be remedial costs for what Peabody has done over the last 35 years, he said. In his opinion, "That's why the government does not want any controversy over the water permit."

The dates, times, and locations of the public hearings on the permit will be announced in the Hopi Tutuveni and the Navajo Times, according to the EPA.

A New Beginning

Masayesva followed up on his thoughts about what this new comment period could mean in the longer term. He said, "Although the comment period will be limited in scope, it will give us an opportunity to bring up other issues directly related to the mining controversy, such as overdrafting and contamination of the Navajo aquifer.

"This action will have direct impact on the current BMP EIS Record-of-Decision litigation pending in before an administrative law judge. It will show the Secretary of Interior that the Black Mesa EIS is far from complete and Interior will have no choice but to overrule the OSM's Record-of-Decision to issue Peabody a Life-of-Mine permit for the Black Mesa Mine Complex."

http://www.indiancountrytoday.com/national/southwest/80427077.html

Pollution conflict triggers added tribal hearings

By Carol Berry, Today correspondent
Story Published: Jan 4, 2010
Story Updated: Dec 31, 2009

BLACK MESA, Ariz. – Opponents of increased coal mining on this massive site in northern Arizona were encouraged by the disclosure Dec. 3 that the Environmental Protection Agency has withdrawn a water permit and has ended, at least temporarily, concern about mining-related runoff into inadequate treatment ponds.

Black Mesa Water Coalition had appealed the water permit issued to Peabody Western Coal Co. on grounds that it violated the Clean Water Act, National Environmental Policy Act, and Endangered Species Act, and that it "failed to adequately analyze the environmental impacts of leaky waste ponds and failed to provide local residents with adequate opportunities for public participation," according to a press release.

The EPA's Southwest Regional office said by phone that the permit in question was a stormwater permit entering a routine five-year renewal period and was not flawed, but that the agency had decided to hold two additional public hearings on Navajo and Hopi tribal lands to accommodate further public comment.

The permit governs rain and snow runoff from mining areas that flows through washes into treatment ponds and "there is an issue with seeps" onto the surrounding land, an EPA spokesman said, asserting that the runoff does not contain toxic mine waste or other major pollutants.

Under an expanded permit issued a year ago by the Office of Surface Mining, Peabody could mine nearly 6,000 acres of remaining coal on Navajo and Hopi lands at Black Mesa, site of a massive strip mine that currently supplies the Navajo Generating Station near Page, Ariz.

The OSM permit extension, contested fiercely by opponents from various sectors, also involved water issues but is not directly related to the current controversy, according to EPA.

Opponents to the stormwater permit, however, disagree that it does not involve major pollutants and instead contend that it is polluting the region's natural water system, where "the Black Mesa Mine Complex has a history of controversy stemming from concerns about air and water pollution, impacts to local people, the drying of aquifers and springs and coal pollution's contribution to global warming," according to the

coalition press release.

Stormwater runoff and pond seeps "including selenium, nitrates, and other heavy metals and toxic pollutants from coal mining operations at the Black Mesa Complex are threatening washes, tributaries, groundwater and the drinking water for local communities but are not being regulated," it states.

"EPA is to be commended for doing the right thing in this instance and withdrawing the inadequate water permit for Black Mesa," said Wahleah Johns, co-chair of the Black Mesa Water Coalition. "Our community was shut out of the permitting process and our requests for public hearings on the permit denied. If a new permit is issued, the agency must ensure that impacted communities are meaningfully involved in environmental decision-making."

No dates have been set for the public hearings on Navajo and Hopi lands concerning the permit renewal, but scheduling is expected within the next couple of weeks, EPA said.

The organizations objecting to the National Pollutant Discharge Elimination System permit renewal includes the Coalition, To' Nizhoni Ani ("Beautiful Water Speaks,") Diné CARE, Diné Hataalii Association Inc., Diné Alliance, C-Aquifer for Diné, Natural Resources Defense Council, Center for Biological Diversity and Sierra Club. NPDES permits target point-source releases such as constructed pipes or ditches.