

C. ALTERNATIVES CONSIDERED

This section describes the two alternatives evaluated in this EA for the Kayenta Mine under Permit AZ-0001D. The alternatives are presented in comparative form, with the differences between each alternative providing the decision maker with a clear basis for choice between the options. Factors considered in evaluating whether alternatives were technically feasible or economically practical, and whether these would meet the need for renewal of the AZ-0001D permit included: legal requirements; environmental issues and concerns; design and/or engineering feasibility. The two alternatives addressed in this EA are as follows:

- Alternative 1 – approval by OSM to renew permit AZ-0001D for coal resource areas N-9, J-19, and J-21 for not more than five years (2010-2015) and the facilities necessary for mining and reclamation operations.
- Alternative 2 (No Action) – disapproval by OSM to renew permit AZ-0001D for coal resource areas N-9, J-19, and J-21 for not more than five years (2010-2015) and the facilities necessary for mining; however required reclamation operations will continue.

Other alternatives that did not achieve the purpose of and need for the project or were not practicable for mining operations were eliminated from detailed study. These are described in Section C.3.

C.1 ALTERNATIVE 1: APPROVE THE RENEWAL OF PERMIT AZ-0001D

Under this alternative, the OSM Western Region Director would approve the renewal permit AZ-0001D which would authorize continued mining in coal resource areas N-9, J-19, and J-21 of the Kayenta Mine permit area. The permit area for Kayenta Mine is approximately 44,073 acres², and Table C-1 describes the three coal resource areas, including total acres of each area and their mining and reclamation status through July 2010. The eight standard permit conditions from 30 CFR subpart 773.17, standard permit terms and specifications from previous renewed permits, and one existing Special Condition pertaining to the monitoring plan for the Mexican spotted owl will be incorporated into the approved permit. Federal regulations in 30 CFR 774.15 grant the existing permit holder a right of successive renewal, and provide that OSM must approve the renewal application unless it finds one or more of six enumerated criteria are met.

Existing facilities to be used for mining operations under the proposed renewal are summarized in the following sections, while Appendix A provides more details of the facilities, mining operations, and reclamation activities. The mine facilities outside the Kayenta Mine permit area have been separately authorized by OSM as part of the Initial Regulatory Program and are authorized for use in Kayenta

² Due to differences in the level of detail between datasets, discrepancies in acreage calculations can occur. The acreage calculations presented in the EA are rounded to the nearest acre and are approximate projections used for comparison of alternatives and analytic purposes only; they do not reflect exact measurements of on-the-ground resources.

mining operations in accordance with SMCRA regulations. This Environmental Assessment includes effects from the use of all mine facilities, within and outside the permit area to the extent such facilities are necessary to the mining operations that will be authorized by the proposed action. Table C-1 provides the status of N-9, J-19, and J-21 coal resource areas through the permit period. As of July 2010, active mining and reclamation was on 8,013 acres in the three coal resource areas, and 4,222 acres have been reclaimed. The estimate for mining disturbance between 2010 and 2015 is 1,159 acres with 1,692 acres reclaimed in the three coal resource areas.

Table C-1 Coal Resource Areas and Mining Status¹

Coal Resource Area	Total Acres²	July 2010 Mining and Reclamation Status	2010-2015 Estimated Disturbed and Reclamation Status	
N-9	1,891	Active mining and reclamation on 872 acres; 63 acres reclaimed; 1,019 acres to be mined and reclaimed in the future	2010	
			0 acres disturbed	0 acres reclaimed
			2011	
			45 acres disturbed	0 acres reclaimed
			2012	
			134 acres disturbed	3 acres reclaimed
			2013	
			126 acres disturbed	28 acres reclaimed
			2014	
			92 acres disturbed	165 acres reclaimed
J-19	3,886	Active mining and reclamation on 3,385 acres; 1,110 acres reclaimed; 502 acres to be mined and reclaimed in the future	2010	
			86 acres disturbed,	43 acres reclaimed
			2011	
			44 acres disturbed	104 acres reclaimed
			2012	
			50 acres disturbed	157 acres reclaimed
			2013	
			41 acres disturbed	207 acres reclaimed
			2014	
			49 acres disturbed	240 acres reclaimed
J-21	5,314	Active mining and reclamation on 3,756 acres; 3,049 acres reclaimed; 1,558 acres to be mined and reclaimed in the future	2010	
			45 acres disturbed	40 acres reclaimed
			2011	
			86 acres disturbed	24 acres reclaimed
			2012	
			156 acres disturbed	9 acres reclaimed
			2013	
			36 acres disturbed,	46 acres reclaimed
			2014	
			53 acres disturbed,	96 acres reclaimed
2015				
0 acres disturbed	95 acres reclaimed			

Coal Resource Area	Total Acres ²	July 2010 Mining and Reclamation Status	2010-2015 Estimated Disturbed and Reclamation Status	
Totals	11,091 acres	8,013 acres active mining and reclamation 4,222 acres reclaimed 3,079 acres to be mined and reclaimed in the future	1,159 acres disturbed	1,692 acres reclaimed

SOURCE: Peabody Western Coal Company 2010a

NOTES: ¹ In addition to the coal resource areas, additional areas are used for support facilities necessary for mine and reclamation operations.

² Over the next five years, reclamation from previously permitted mining would also occur at N-06 (475 acres), N-11 Extension (420 acres), J-16 (33 acres), and N-10 (66 acres).

C.1.1 Support Facilities

Support facilities used for the Kayenta Mine operations under this alternative include water supply wells, transportation facilities, office and equipment facilities, utilities, coal handling facilities, explosive storage facilities, environmental monitoring sites, water control facilities, and topsoil stockpiles.

C.1.1.1 Navajo Aquifer Water Supply Wells

Kayenta Mine operations currently use about 1,236 af/yr from the N aquifer, which would continue to be pumped for the mining authorized under Alternative 1. This water is used for ongoing mining and reclamation operations, principally dust suppression as required by Federal regulations, and to provide water to local residents. The projected amount of water use from the N aquifer during the five-year period is 1,236 af/yr from eight wells. PWCC's existing leases with the tribes require N aquifer wells to be transferred to the tribes in operating condition for their use once PWCC successfully completes reclamation and relinquishes the leases unless the NDWR determines that the tribe does not need one or more of the wells. The PWCC leases and SMCRA permit specify the N aquifer wells monitoring and maintenance.

C.1.1.2 Roads

There are two types of transportation routes within the Kayenta Mine permit area: primary roads and ancillary roads. Primary and ancillary roads are designed, constructed, and maintained in accordance with regulations and performance standards set forth under 30 CFR 816.150 and 816.151. If necessary for future mine operations, regulatory approval will be obtained for mine-related roads crossing stream buffer zones prior to construction.

The primary roads on-site are used for mining operations such as heavy-duty vehicles to haul coal and other mine-support vehicles (including walking the draglines). Lighter-duty vehicles are used on ancillary roads to access environmental monitoring sites and remote mine facilities such as temporary or permanent water control facilities, water wells, and utility lines.

Existing primary roads will be used for Kayenta Mine operations in areas N-9, J-19, and J-21 through the permit period to transport coal to storage and processing sites within the PWCC lease area. Reclamation of the primary and ancillary roads will be completed as described in Appendix A.

C.1.1.3 Office and Equipment Facilities

Office and equipment facilities for the Kayenta Mine operations include mine buildings, offices, shops, bath houses, storage silos and cap magazines, coal storage and crushing areas, equipment storage areas, water diversions and culverts, sheds larger than 100 square feet constructed on permanent foundations, permanent and temporary fuel storage, and environmental monitoring sites.

C.1.1.4 Water Control Facilities

Sedimentation ponds, temporary and permanent impoundments, and Mine Safety and Health Administration sized impoundment structures are elements of the Kayenta Mine sediment and water control plan. Sediment ponds used to control runoff and sediment from disturbed areas will be constructed consistent with regulations and performance standards set forth under 30 CFR 816.46, 816.47, 816.56, and other applicable regulations. All surface drainage from most disturbed areas pass through either a temporary sedimentation pond or a siltation structure before leaving the Kayenta Mine permit area. Surface drainage from areas that are exempt from regulations (e.g., diversion ditches, roads or areas not disturbed by the operator) use sediment controls other than temporary sediment ponds. Temporary sediment ponds will be reclaimed when no longer needed to treat surface runoff from disturbed areas. As of 2010, 156 sedimentation structures exist within the areas leased by PWCC. Under this alternative, an additional 10 temporary sedimentation control ponds would be constructed during the five-year permit renewal period.

Water sources from pre-SMCRA impoundments, post-SMCRA impoundments, and existing or proposed sediment control ponds would be used to provide water for wildlife and livestock. Within the Kayenta Mine permit area, 19 permanent impoundment structures are available for post-mining wildlife and livestock use. Under this alternative, one additional impoundment would be constructed and proposed as permanent in the J-19 coal resource area, and 31 existing or proposed temporary sediment control structures would be converted to permanent impoundments including nine Mine Safety and Health Administration structures (see Map D-3) upon approval by OSM.

There are 11 existing impounding structures at the Kayenta Mine Complex that meet the size criteria set forth under 30 CFR 77.216(a). The primary purpose of these nine proposed permanent and two temporary structures, except for the Kayenta Mine freshwater pond, is to control sediment from disturbed areas. The purpose of the Kayenta Mine freshwater pond is to hold groundwater pumped from N aquifer wells for use during dust suppression activities.

C.1.2 Topsoil Stockpiles

Where prompt replacement of topsoil recovered in advance of mining disturbances is not feasible, topsoil will be stockpiled throughout the mine areas in accordance with regulations and performance standards set forth under 30 CFR 780.12(b)5 and 816.22(c) until needed for reclamation and revegetation activities. The dimensions, slopes, and volumes of topsoil stockpiles would vary depending upon the total salvage volumes, configuration of the stockpile location, and proximity to primary and ancillary roads within the Kayenta Mine permit area.

C.2 ALTERNATIVE 2: DISAPPROVE THE RENEWAL OF PERMIT AZ-0001D [NO ACTION]

Under this alternative, OSM would not approve the renewal of permit AZ-0001D for surface coal mining and reclamation in coal resource areas N-9, J-19, and J-21 as described above under Alternative 1, if one or more of the criteria enumerated in 30 CFR 774.15 exist. Due to the limited discretion under the statutory mandate for renewals, OSM cannot select this alternative unless a finding can be made that one or more of the six criteria in 30 CFR 774.15 is met. OSM's selection of Alternative 2, disapproval of the Kayenta Mine permit renewal would mean ongoing mining operations would cease after the renewal application was denied. Facility removal and reclamation activities would proceed within the three coal resource areas according to the provisions in the current Kayenta Mine closure plan and SMCRA regulations. Reclamation activities would continue in the surrounding areas throughout Kayenta Mine. Reclamation activities within the Kayenta Mine permit area would require approximately 500 af/yr from the water supply wells described in Alternative 1. The number of employees at the Kayenta Mine would be approximately 175 full time employees through 2012 and the coal royalties paid to the Navajo Nation and Hopi Tribe would cease. Water royalty payments to the tribes would continue at a reduced rate until reclamation was complete and the reclaimed lands are returned to the Tribes. The total estimated payments to the tribes is \$1.2M to the Navajo Nation and \$0.7M to the Hopi Tribe. Property taxes would continue to be paid to Navajo County, but at a reduced rate and sales taxes paid to the State of Arizona would cease.

C.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Federal agencies are required by NEPA to explore and objectively evaluate reasonably feasible alternatives that meet the project's purpose and need, and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). NEPA limits the range of reasonable alternatives to those that fall within the agency's statutory mandate and those that at least partially serve the agency's objective. During the development of this EA, several potential alternatives were considered by OSM. These alternatives were developed considering public comments received during review of the permit renewal application, but were eliminated because they do not meet the purpose and need or were not technically and economically practical and feasible (43 CFR 46.420(b)). NEPA does not require agencies to analyze the environmental consequences of alternatives that it has in good faith rejected as too remote, speculative, impractical, or ineffective. Descriptions of these alternatives and the reasons why they were eliminated from detailed study are provided in the following sections.

C.3.1 Renewal of Permit with Additional Special Conditions

In addition to the permit conditions described in Section C.1.1, OSM considered incorporating additional conditions to the permit renewal. OSM's authority for denying a request for renewal is limited under 30 CFR 774.15, and thus any conditions to the renewal must be warranted as necessary to ensure compliance with the six criteria listed at 30 CFR 774.15(c) (see Section A). OSM has determined that PWCC has submitted a complete application for renewal, and after agency review of the Permit Application Package (PAP) and consideration of prior public comments, OSM has not identified any additional conditions that would be warranted under the six statutory criteria. Moreover, based on the analysis of the environmental effects of the proposed action in this EA, OSM has not identified any conditions that would be necessary to reduce or eliminate any significant effects of the proposed action. The alternative was dismissed from further consideration because no conditions within OSM's statutory authority are warranted and such conditions would be ineffective in ensuring compliance with the statutory renewal criteria or reducing significant impacts.

C.3.2 Use of the Dakota Aquifer

PWCC evaluated the feasibility of using the Dakota aquifer (D aquifer) (GeoTrans, Inc. 2001), including whether 500 af/yr could be pumped from the D aquifer from five wells. The modeling results indicated pumping from five wells at 62 gallons per minute would result in well interference within 2 to 3 years and the wellfield cannot sustain 500 ac-ft/yr. In addition, the leases with the Tribes require PWCC to provide potable water to local residents. However, the quality of water from the D aquifer makes it unsuitable for potable uses due to elevated total dissolved solids (TDS) (Truini and Longworth 2003). The use of water from the D aquifer would require the construction of a separate water delivery system to provide water for potable uses in accordance with the lease and for mining operations. Also, construction of the separate water system and use of the D aquifer will require a revision to the mining permit, which is beyond the statutory authority of OSM in considering a permit renewal application. Based on aspects of economic practicality the construction of a separate water system this alternative is not economically practical and fails to meet the OSM's purpose and need.

C.3.3 Alternative Mining Methods

OSM and PWCC evaluated using different methods to mine coal from areas N-9, J-19, and J-21. OSM and PWCC considered recovering coal reserves in the Kayenta Mine permit area by use of underground recovery methods. PWCC and OSM reviewed the technical feasibility and economic practicality aspects and determined that regional geology and anticipated surface cover within the project area would not facilitate this mining method. Three considerations preclude underground mining:

- The main coal seams in the Wepo formation are variable in thickness and tend to split into discontinuous seams (Nations, Swift and Haven 2000). Underground mining is not technically feasible in areas where coal resources are located with variable and discontinuous seams.

- Typically, underground mining operations occurring in areas with the coal resource in splitting seams requires operators to wash the coal if it is diluted with other materials such as partings and overburden. PWCC does not currently have a coal washing operation and has not proposed one for development as part of the permit renewal which results in this alternative not being economically feasible.

PWCC would have to refit existing or proposed operations to facilitate underground mining. PWCC would not be able to recover the same maximum economic recovery of coal reserves identified in the project area due to the nature of underground mining, where pillars would need to remain in place permanently. Furthermore, longwall mining is risky in shallow overburden situations due to the tendency to cave, crushing the support pillars surrounding the longwall panel. Collapse of overburden would create a very hazardous working situation for underground miners, and cause damage to, or even loss of, mining equipment. For these reasons, this alternative is not technically feasible or economically practical (43 CFR 46.420(b)).