

U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement

Summary of the Final

Fall Creek Falls, Tennessee Petition Evaluation Document/ Environmental Impact Statement

February 2000

The Office of Surface Mining's Knoxville Field Office (KFO) has prepared this Petition Evaluation Document/Environmental Impact Statement (PED/EIS) as required by §522(d) of the Surface Mining Control and Reclamation Act of 1977 (SMCRA) [30 U. S. C. 1272(d)] and in accordance with §102(2)(C) of the National Environmental Policy Act of 1969 (NEPA) [42 U. S. C. 4332(2)(C)]. This PED/EIS presents KFO's evaluation of Fall Creek Falls Lands Unsuitable for Mining Petition filed with this office in 1995. It includes an assessment of the potential coal resources of the petition area, the supply and demand for the coal resources of the petition area, the potential impacts of the designation action to the human environment and the economy, and alternative actions available to the Director if the Director decides to deny the Petition in whole or in part. The PED/EIS consists of two volumes as follows. Volume I contains ten chapters, each of which is summarized in the following pages. Volume II contains appendices to Volume I: Appendix A (additional environmental data that the Knoxville Field Office (KFO) collected to support the analyses of the petition allegations); Appendix B (petition without exhibits); Appendix C (letters commenting on the content, conclusions, and procedural issues of the draft PED/EIS; and Appendix D (transcript of the June 18, 1998 public hearing and written versions of oral statements made at the public hearing).

CHAPTER I. PURPOSE AND NEED FOR PROCESSING THE FALL CREEK FALLS LUM PETITION

A. BACKGROUND

On July 14, 1995, 49 citizens, Save Our Cumberland Mountains (SOCM), and Tennessee Citizens for Wilderness Planning (TCWP) petitioned KFO to designate the watershed and viewshed of Fall Creek Falls State Park and Natural Area in Van Buren and Bledsoe Counties, Tennessee, as unsuitable for surface coal mining operations. The petition area consists of the Fall Creek Falls State Park and the five watersheds outside the Park (Cane Creek, Falls Creek, Meadow Creek, Dry Fork and Piney Creek). The petitioners allege that the entire petition area should be designated as unsuitable for mining because: (1) reclamation is not technologically and economically feasible; (2) mining the area would affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific, or esthetic values; (3) mining the area would affect renewable resource lands in which the operations could result in a substantial loss or reduction in long-range productivity of water supply or of food or fiber products; (4) mining would affect natural hazard lands in which such operations could substantially endanger life and property; and (5) mining the area would be incompatible with existing State or local land use plans or programs. OSM accepted the petition for processing on October 5, 1995. The petition, as accepted, is an 80-page document and is reproduced without exhibits in Volume II, Appendix B. Recently the State of Tennessee added 1200 acres to the Fall Creek Falls State Park, 890 of which are outside the petition area. This final PED/EIS is considering only those lands included in the petition that was accepted for processing on October 5, 1995.

The petitioners have requested designation of the petition area including Fall Creek Falls State Park and Natural Area (hereinafter referred to as the Fall Creek Falls State Park or the Park) and five neighboring watersheds in southeast Tennessee, as unsuitable for surface coal mining

operations. The petitioners allege that mining in the petition area would adversely affect water quality, and would damage the Park and other natural resources of the petition area. The petitioners also allege other impacts that were not limited to the petition area as follows:

- " Skyline Coal Company has had numerous problems mining the Sewanee coal seam [chapter IV, section C.5.a.(1)];
- " There are examples of acid/toxic drainage outside the petition area that have been caused by mining the Sewanee seam [chapter IV, section C.5.a.(1)];
- " OSM has made a commitment to prevent water pollution problems [chapter IV, section C.5.a.(2)];
- " Regulations state that acid and toxic drainage must be avoided [chapter IV, section C.5.a.(2)];
- " OSM has expressed the importance of preventing acid/toxic drainage [chapter IV, section C.5.a.(2)]; and
- " There is no fool proof method of preventing acid mine drainage (AMD) [chapter IV, section C.5.a.(2)].

KFO considers the petitioners proposed action to designate the entire petition area as unsuitable for surface coal mining operations a major Federal action since the potential exists that implementation of the proposed action would prohibit surface coal mining operations from occurring within the petition area (including the Park) and, therefore, preclude the extraction of the resource until such time that the designation decision is terminated in accordance with §522(c) of SMCRA. A notice of intent to prepare a draft PED/EIS, including a request for public participation in determining the scope of the issues to be addressed, was published in the November 3, 1995, Federal Register (60 F.R. 55815) and in local newspapers. It was also mailed to all persons with an identifiable ownership interest in the petition area and interested local, State and Federal agencies. A scoping meeting was held on December 5, 1995, at Fall Creek Falls State Park with approximately 180 people in attendance.

By the close of the scoping comment period, January 26, 1996, KFO had received 49 scoping comment letters. In addition to scoping comments, KFO received numerous letters on the Fall Creek Falls petition from the general public and various organizations. All comments contained in the public record for the petition and the proposed PED/EIS were used in determining the scope of this document.

KFO and the Environmental Protection Agency announced the availability of the draft PED/EIS and requested public comments in the May 1, 1998, Federal Registers (63 F.R. 24192) and (63 F.R. 24176), respectively. The availability of the draft PED/EIS was also advertised in local and major newspapers in the geographical area of the Fall Creek Falls State Park. Notice of the June 18, 1998, public hearing was also made in these notices and newspaper advertisements. The initial public comment period on the draft extended from May 1 to July 30, 1998. Two additional public comment periods were announced from August 21, 1998, to September 16, 1998, and from January 29, 1999, to April 29, 1999.

Approximately 350 persons attended the June 18, 1998, public hearing and 45 individuals

presented oral statements. During the three comment periods, a total of 606 letters were received by KFO commenting on the draft PED/EIS. All comments received during the public comment periods were considered by KFO in the preparation of this final PED/EIS. Responses to the summarized public comments are in chapter VIII. Those letters that commented on the content, conclusions and procedural issues of the draft PED/EIS and the transcript of the public hearing are reproduced in volume II, appendices C and D, respectively. See chapter VIII for an explanation relative to the letters that were not reproduced.

Three companies objected to the designation of the petition area as unsuitable for surface coal mining operations and filed a petition to intervene in the Fall Creek Falls petition process. Skyline Coal Company (Skyline) filed an intervening petition with KFO on January 26, 1996, and Cane Tennessee, Inc., (Cane) and Colten, Inc., (Colten) filed an intervening petition with KFO on August 21, 1997. The companies have stated that they have made very large capital investments in their mining facilities and their investment bases are dependent upon realization of the low-sulfur compliance coal reserve base within the petition area. Should the petition area be designated as unsuitable for mining, the companies allege they would suffer injury in fact and a compensable taking of their properties. Skyline is in the process of closing operations in Tennessee.

Regulations pertinent to the Tennessee Federal Program are found at 30 CFR 942. Regulation references in this final PED/EIS appear as follows. Any Tennessee Federal Program regulation sections that are different from the Federal Regulations at 30 CFR 700 to end appear as 30 CFR 942 with their complete text. If the Tennessee Federal Program reference is identical to the Federal regulation reference at 30 CFR 700 to end, the 942 has been omitted from the citation.

KFO has maintained a public record on the Fall Creek Falls petition evaluation and environmental impact analysis process. Included in this record are data and studies generated by KFO for this document, the petition and supporting exhibits, all public comments, the petition and the draft PED/EIS, and other petition- and EIS-related documents. The record may be reviewed by the public and copies of any portion may be obtained for a reasonable fee at the KFO address given on the cover sheet.

B. PURPOSE AND NEED

The purpose of processing the petition and preparing this PED/EIS is to present KFO's evaluation of the merits of the petitioners' allegations and determine whether the petition area is, entirely or partially, worthy of being designated as unsuitable for surface coal mining operations based on the criteria in §522(a)(2) and (3) of SMCRA. KFO considered the petitioners' proposed action to designate the entire petition area as unsuitable for surface coal mining operations a major Federal action for purposes of NEPA since the potential exists that implementation of the proposed action would prohibit surface coal mining operations from occurring within the petition area including the Fall Creek Falls State Park and, therefore, preclude the extraction of the resource until such time that the designation decision is terminated in accordance with §522(c) of SMCRA.

The petitioners have fulfilled the minimum requirements of the Tennessee Federal Program in filing the petition to designate the subject lands as unsuitable for surface coal mining operations. Therefore, the Secretary of the Interior is required to make a decision to grant or deny the Fall Creek Falls petition.

C. SCOPE OF THE EVALUATION

The scope of the evaluation focused specifically on the five unsuitability criteria specified in §522 of SMCRA as follows: The State Regulatory Authority, (in this case, the Office of Surface Mining) shall designate an area unsuitable for all or certain types of surface coal mining operations if it determines that reclamation to the requirements of SMCRA is not technologically and economically feasible. OSM may designate an area unsuitable for surface coal mining operations if such operations will: (1) be incompatible with existing State or local land use plans or programs; (2) affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific, and esthetic values and natural systems; (3) affect renewable resource lands in which such operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products; or (4) affect natural hazard lands in which such operations could substantially endanger life or property, such lands to include areas subject to frequent flooding and areas of unstable geology. The five primary allegations in the Fall Creek Falls petition mirror the five unsuitability criteria.

CHAPTER II. ENVIRONMENTAL RESOURCES IN THE PETITION AREA

A. SURFACE-WATER HYDROLOGY

The petition area is located in Van Buren and Bledsoe Counties, Tennessee, and covers approximately 85,588 acres. The petition area includes the Park and the entire watershed and viewshed of Fall Creek Falls State Park. The petition area is in a rural setting, sparsely populated, and predominantly undeveloped, except for the Park.

KFO's evaluation of the surface-water hydrology in the petition area outside the Park shows that Cane Creek watershed maintains the best overall water quality of the five subwatersheds. Water quality is relatively consistent throughout the year with little change in overall water chemistry or water type as a result of seasonal flow. Falls Creek and Meadow Creek watersheds are essentially unaffected by surface coal mining operations and the water quality is comparable to that of Cane Creek watershed. No previous mining-related disturbances could be identified in the Falls Creek watershed while the Meadow Creek watershed has had minimal disturbance. Seasonal water quality data was not available for these streams; however, because of the lack of development and relatively undisturbed nature of these watersheds, it would be expected that seasonal water quality should fall within the range of other unmined watersheds which were sampled during the petition evaluation process.

Piney Creek and Dry Fork are both heavily affected by previous mining activities and show significant changes throughout the seasons, based on the amount of water available for dilution

of acid mine drainage. Because of the larger watershed sizes sampled at Piney Creek, some recovery in the overall water chemistry was noted, even during low-flow seasons of the year. However, Dry Fork remains impacted throughout the entire watershed during low flow. Water chemistry in both streams improves with increases in flow. Sediment loading during the petition evaluation process seemed to be most significant in the Cane Creek watershed, although extensive land-use changes were occurring throughout the petition area outside the Park which may account for the substantial changes in the sediment loads.

B. GROUND-WATER HYDROLOGY

Ground water in the petition area is generally present in quantities suitable for most domestic purposes. However, two public water supplies in the petition area are the primary sources of water for domestic and commercial uses. Ground water in the petition area occurs primarily along bedding planes and in secondary openings along fractures in the bedrock materials. Some ground water is expected in the alluvial/colluvial material of the gorge along with the solution openings in the carbonate rocks which comprise the valley walls and floor of the Cane Creek and Dry Fork gorge. Yields from area wells are estimated to range from 5 to 300 gallons/minute although the average user should expect yields less than 20 gallons/minute. Although suitable for most domestic uses, iron and pH values are often outside the recognized criteria for drinking water supplies.

C. STREAM BIOLOGY

The results of the biological stream survey and water quality sampling conducted in Cane Creek, Piney Creek and Dry Fork watersheds indicated that the upper stream reaches of the Cane Creek, Piney Creek, and Dry Fork watersheds have degraded conditions from multiple land uses such as agriculture, silviculture, and coal mining. The lower reaches of the watersheds showed improved conditions for both water quality and aquatic flora and fauna because of (1) the decreasing effects from multiple land uses in the vicinity of the sampling stations and (2) the effects of dilution on upstream water quality.

The assessment, through the use of biological metrics, of the aquatic communities sampled in the lower reaches of Cane Creek and Dry Fork showed the communities to be slightly impaired; whereas, the assessment of the aquatic communities sampled in the lower reach of Piney Creek showed the macroinvertebrate community to be moderately impaired. The aquatic biology and water quality data collected from the headwaters that were affected by surface coal mining operations showed impairment of the stream use classification for fish and stream biota. In contrast, stream reaches of unmined watersheds documented higher water quality and stable biota communities.

D. LAND USE AND SOCIOECONOMICS

The primary land uses within the petition area are recreation (the Park), silviculture (petition area outside the Park), and agriculture (petition area outside the Park). The primary land use in the petition area outside the Park is silviculture, with approximately 65,937 acres (77 percent) of the

area covered in both managed and unmanaged forest. Agriculture is the second largest land use, with approximately 18,678 acres (22 percent) of the area used as pasture/grassland or cropland. Agricultural lands are distributed throughout the petition area. Residential and commercial developments constitute a small percentage of the total acreage in the petition area outside the Park.

The Park consists of three distinct areas: developed areas, a wildlife management area, and a Class II Natural Area. These areas are managed under a multiple land use concept in accordance with the Park's Strategic Management Plan (SMP). The SMP specifically identifies goals and objectives for managing the various areas and provides a systematic approach to determine the future direction of the Park. The intent of the SMP is to carry out the mission of the Park which is to preserve and protect the existing natural, cultural, and scenic features and to provide the visitors with well managed and maintained stay use and day use facilities.

The Park is situated almost entirely in Van Buren County, Tennessee, although its southeastern perimeter extends into Bledsoe County. Because commercial and industrial businesses have historically been slow to develop in the region, Fall Creek Falls State Park plays a significant role in the local economy. The Park contributes a substantial amount in tax revenue, an estimated \$182,250 in local taxes during fiscal year 1996-97. This amount accounted for an estimated 40 percent of the total revenue base for Van Buren County during this period. During fiscal year 1996-97, the Park was nearly 92 percent self-supporting. The operating budget for the Park during this period was \$4.5 million. The total revenue per Park visitor was \$3.04, with the State of Tennessee's appropriation of tax dollars being \$0.17 per visitor. The stay use visitors generate a significant portion (85 percent) of the Park's revenues.

E. RECREATIONAL RESOURCES

Recreational activities in the petition area outside the Park are restricted because the area consists of private land holdings. Activities are limited to hunting, fishing, camping, swimming, and four-wheeling by local residents living in the area. Fall Creek Falls State Park is the only developed recreational resource in the petition area and provides various recreational and educational programs to the public.

The Park is one of five state resort parks and is recognized throughout the southeast as a tourist destination because of its waterfalls, scenic qualities, and various recreational opportunities. During fiscal year 1996-97, approximately 1.2 million people visited the Park. The Park is considered a destination park and not a drive through park because it is relatively isolated from major state highways and interstates.

F. ESTHETICS

The visual characteristics of the landscape in the petition area outside the Park are influenced by the diversity of vegetative cover types and water forms, including deciduous, coniferous, and mixed forests, pastures/grasslands, croplands, timbered areas, small water bodies associated with agricultural land uses, and residential areas. This landscape does not provide views of

outstanding visual quality. Depending on the location from which an individual is viewing a specific portion of the petition area outside the Park, the quality of the view ranges from common to minimal. Common views are views where features contain variety in form, line, color and texture, or a combination thereof, but which tend to be common throughout the landscape being viewed and are not outstanding in visual quality. Minimal views are views where features have little change in form, line, color, or texture.

The visual characteristics within the Park consist of rolling terrain, natural rock bluffs, waterfalls, cascades, Fall Creek Falls lake, meandering streams flowing into the gorges, high use recreation and developed areas, and forest cover intermixed with open grassy areas. The scenic views of the waterfalls, cascades, and gorges qualify as distinctive. Distinctive areas are areas where features of land form, vegetative patterns, water forms and rock formations are of unusual or outstanding visual quality and are usually not common in the landscape being viewed. Views from the various trails throughout the Park may vary from distinctive to common but no assessment was made from areas along the trails. The scenery along the roads through the Park would be considered common. However, the scenery from the motor nature trail ranges from distinctive to common.

G. CULTURAL AND HISTORIC RESOURCES

The cultural resources within the petition area are based on the ecologic and esthetic resources of the Park which are the basis for the recreational, educational and religious and related activities in the Park. There are no identifiable cultural resources in the petition area outside the Park. The historic resources within the petition area are centered on the Trail of Tears which crosses through the southern portion of the petition area outside the Park. Actual segments of the trail are difficult to identify since the area has been subjected to considerable mining, logging, and farming activities over the intervening 160 years since the Trail of Tears experience. The State Archaeologist, in conjunction with the National Park Service (NPS), and assisted by local historians, continues to investigate possible alternative trail routes in order to refine knowledge of the Trail of Tears' route on the plateau.

H. THREATENED AND ENDANGERED SPECIES

A total of 28 rare, threatened, or endangered vertebrate and plant species have been recorded in the petition area. Of the 12 vertebrate species, 11 species have been identified in the Park, for a total of 21 occurrences; and 3 species have been identified in the petition area outside the Park for a total of 4 occurrences. Of the 16 plant species, 7 species have been identified in the Park for a total of 19 occurrences, and 10 species have been identified in the petition area outside the Park for a total of 13 occurrences.

CHAPTER III. EVALUATION OF COAL RESOURCES AND SUPPLY AND DEMAND FOR COAL

Chapter III evaluates the potential coal resources of the petition area, the supply and demand for coal, and the impact on the economy from designating the petition area as unsuitable for surface

coal mining operations. The petition area (outside the Park) has total recoverable surface reserves estimated to be 25.5 million tons, while total recoverable underground reserves are estimated to be 18.85 million tons. The estimated recoverable coal reserves in the Park are 1.96 million tons surface minable coal reserves and 3.36 million tons deep minable coal reserves. Coal mining in the petition area has been essentially non-existent since the late 70's and very early 80's. There has been no coal mining within the Park. As a result, predicting the future supply and demand for the petition area coal is difficult.

Coal within the petition area is expected to serve a variety of markets, with the majority of the coal being used by utility companies for steam production. However, some coal would be expected to be used as stoker coal for cement plants and direct heating purposes.

CHAPTER IV. ANALYSIS OF PETITION ALLEGATIONS

A. INTRODUCTION

Chapter IV presents: (1) the unsuitability criteria and the requirements for evaluating the petitioners' allegations; (2) a summary of the petitioners' allegations; (3) a summary of the intervenors' responses to each allegation; (4) an analysis of the petitioners' allegations; and (5) KFO's determination relative to each allegation.

As referenced above, three parties have formally intervened in the petition process: Skyline, Cane, and Colten. Skyline is the only intervenor that provided detailed responses to the petitioners' allegations; therefore, KFO has included a summary of Skyline's responses under each allegation.

B. UNSUITABILITY CRITERIA AND PETITION EVALUATION PROCESS

The intent of §522 of SMCRA is to provide a higher degree of protection to public and environmental values from surface coal mining operations where it is determined that the significance of these values could be compromised. Congress established criteria and procedures through which surface coal mining operations may be prohibited or limited where the significance of these values outweigh the temporary benefits derived from mining.

In responding to this petition for designation of lands as unsuitable for surface coal mining operations, KFO is acting consistent with the analysis of the definition of "surface coal mining operations" in the 1991 Memorandum Opinion of the Solicitor on Applicability of Section 522(e) of the Surface Mining Control and Reclamation Act to Subsidence, M-3671 (100 I.D. 85 (1993)) (the "M-Op"). KFO is also acting consistent with the final rule adopted on December 17, 1999, in which OSM adopted an interpretative rule on the same subject (Interpretative Rule Related to Subsidence Due to Underground Coal Mining, 64 FR 70838). The 1991 M-Op concluded that, with regard to underground mining, the most reasonable reading of section 701(28) of SMCRA is that "surface coal mining operations" means: surface activities in connection with a surface coal mine, and surface activities in connection with surface operations and surface impacts incident to an underground coal mine; and areas affected by such surface activities. The M-Op concluded

that subsidence is not a surface activity in connection with surface operations or impacts, and therefore is most properly considered not to be a surface coal mining operation subject to the prohibitions of §522(e). OSM's December 17, 1999, final rule is based on the interpretation set out in the 1991 M-Op. OSM expects to act consistent with the interpretation set out in the final rule in determining which aspects of an underground coal mine are prohibited under section 522 as surface coal mining operations including potential underground mining activities in the Park. This document also discusses any potential surface coal mining operations which might occur in the event that the State as the mineral owner of lands within the Fall Creek Falls State Park asserted valid existing rights (VER) in accordance with 30 CFR 761.11 or in the event portions of the Park boundaries are modified so that they are no longer part of the Fall Creek Falls State Park. The conveyance from the United States to Tennessee of the core area of the Park, required that the conveyed lands be used exclusively for public park, recreational, and conservation purposes. The United States retained a reversionary interest that could be exercised after notice and hearing, if the state failed to comply with this limitation for more than three years. The Department has never addressed whether allowing coal mining on the conveyed lands would violate the condition. Because it might be possible that some coal mining or some aspect of coal mining could be allowed, or that the mining could be completed in three years or less, this PED/EIS does address the Park lands.

Section 522 (a) (2) and (3) of SMCRA specifies five criteria (one mandatory and four discretionary) to be used in determining whether lands shall be or may be designated as unsuitable for all or certain types of surface coal mining operations as follows:

1. Mandatory Criterion

The state regulatory authority shall designate an area as unsuitable for all or certain types of surface coal mining operations if the state regulatory authority determines that reclamation pursuant to the requirements of the Act is not technologically and economically feasible.

2. Discretionary Criteria

A surface area may be designated unsuitable for certain types of surface coal mining operations if such operations will:

Be incompatible with existing State or local land use plans or programs.

Affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific, and esthetic values and natural systems.

Affect renewable resource lands in which such operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products, and such lands to include aquifers and aquifer recharge areas.

Affect natural hazard lands in which such operations could substantially endanger life and property, such lands to include areas subject to frequent flooding and areas of

unstable geology.

The petitioners presented numerous allegations of fact and sub-allegations of fact in support of the five primary allegations. The intervenors presented allegations in rebuttal to the petitioners five primary allegations, the allegations of fact, and the sub-allegations of fact. A summary of the petitioners and the intervenors allegations follows, along with KFO s determinations relative to each allegation. The allegations are presented in the order in which they appear in the petition.

C. ANALYSIS OF THE ALLEGATIONS

1. PRIMARY ALLEGATION NO. 1, FRAGILE LANDS

Primary Allegation No. 1 alleges that the petition area should be designated unsuitable for surface coal mining operations because mining the area would affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific, or esthetic values.

a. Summary of Petitioners and Intervenors Allegations

(1) The petitioners allege that mining within the petition area would affect the hydrologic balance of the watersheds which drain into the Fall Creek Falls State Park and affect the Park s unique hydrologic resources. They further allege that the primary reason the Park was set aside was because of its waters and water-formed features and that the watershed areas outside of the Park are critical to the existence of the Park. The petitioners also allege that streams, aquatic life and the falls are at risk when mining occurs in the Sewanee seam.

The intervenors allege that the petition area does not meet the regulatory definition of fragile lands and that the petition does not provide any supportive evidence that mining in accordance with SMCRA would significantly affect the alleged factors identified or cause any identified significant damage to these values.

(2) The petitioners allege that changes in water chemistry, changes in pH, increases in siltation, and changes in stream flow would result in significant damage to the wildlife which depend on the streams as habitat and/or sources of drinking water. The petitioners state that Cane Creek, which is the principal watercourse through Fall Creek Falls State Park, has been designated an environmentally sensitive stream by the Tennessee Department of Environment and Conservation (TDEC) and, therefore, the petition area qualifies as fragile lands.

The intervenors allege that the designation of a specified portion of Cane Creek as an environmentally sensitive stream by the State does not equate to the surrounding host landscape as fragile lands.

(3) The petitioners allege that the presence of endangered species qualifies the petition area as fragile lands.

The intervenors allege that the presence of threatened and endangered species in the petition area does not qualify the area as fragile lands.

4) The petitioners allege that Cane Creek, downstream of the Park boundary, is a stocked trout stream and cite a letter written by the Fish and Wildlife Service (FWS) stating that Cane Creek is considered the best stocked trout stream on the Cumberland Plateau. Further, the petitioners allege that untreated water discharging from surface coal mining operations would seriously degrade the water quality of Cane Creek and would be toxic to stream biota in the vicinity of the outfall and for an unknown distance downstream.

The intervenors allege that: (a) trout stocking activities occur approximately 13 miles downstream from the petition area proper, (b) historic water quality data collected from Cane Creek does not support the allegation of water degradation as stemming from past surface coal mining operations, and (c) advanced mining and reclamation technologies are being implemented to significantly minimize and/or prevent offsite damage to receiving streams. The intervenors also allege that trout stocking in Cane Creek below the Park does not qualify the petition area as fragile lands. The trout fishery is a minimum of 8 to 10 stream miles from minable coal reserves in the Piney Creek, Falls Creek and Cane Creek watersheds and 4 stream miles from minable reserves in the Dry Fork watershed.

(5) The petitioners allege that the presence of caves and cave-inhabiting species makes the petition area a fragile land. The petitioners further allege that mining-induced degradation of Cane Creek could also adversely affect the aquatic life in the caves located in the Cane Creek gorge as well as the Indiana bat, a Federally-listed endangered species, that inhabits caves in the area. The petitioners also allege that underground mining usually results in subsidence, either planned or unplanned, and that subsidence could alter the flow of the groundwater, resulting in the dewatering of streams and, consequently, diverting flows from the caves.

The intervenors allege that the presence of caves, cave-inhabiting species, and the occurrence of endangered cave species does not qualify the petition area as fragile lands.

(6) The petitioners allege that the presence of rare floral species in the petition area qualifies the area as fragile lands. The petitioners further allege that off-site effects of surface coal mining operations within the petition area could have a severe adverse impact on a number of rare floral species.

The intervenors allege that the presence of threatened and endangered species in the petition area does not qualify the area as fragile lands.

(7) The petitioners allege that surface coal mining operations would access areas that are

currently remote and thereby cause adverse effects to habitats and wildlife from foot and vehicle travel, pollution, and other factors relating to more human contact in the area. The petitioners also allege that surface coal mining operations in the Cane Creek watershed could have a direct and negative impact on the Tennessee Wildlife Resource Area's (TWRA's) long-term plans to use the area as turkey and otter habitat.

The intervenors allege that, for the most part, the entire petition area proper is already honey-combed with multiple access avenues and that access requirements stemming from any future mine development can utilize the majority of existing roads, power lines, water lines, etc., without causing any further significant disturbances to the area.

(8) The petitioners allege that esthetics are essential to the Park's land use plans and that surface coal mining operations outside the Park are incompatible with the Fall Creek Falls Strategic Management Plan. They allege that surface coal mining operations in the petition area would adversely alter the views from Park overlooks and adversely affect the visitor's experience.

The intervenors allege that the existing tree line, undulating topography, and the buffer zone around the Park itself provides a natural shield for the overlook areas referenced by the petitioners, and that surface coal mining operations in the petition area could not be seen from the natural overlooks in the Park.

(9) The petitioners allege that surface coal mining operations would have an adverse impact on historic lands (i.e., the Trail of Tears) in which such operations could result in significant damage to important historic lands. The petitioners also allege that there are burial mounds and cemeteries within the Park and the petition area that require the special protections of designation.

The intervenors allege that the presence of the Trail of Tears within the petition area does not qualify the area as fragile (historic) lands because: (1) the location of the Trail of Tears comprises an extremely small portion, less than three percent, of the petition area and is located in the southern portion of the area; and (2) the Trail of Tears does not meet the definition of fragile lands because a majority of the Trail parallels or overlies existing roadways in the petition area.

(10) The petitioners allege that Park visitors use various sections of Cane Creek for swimming and church baptisms and that mining impacts on water quantity and quality would adversely affect the cultural values of these areas.

The intervenors allege that Cane Creek water quality is expected to at least maintain status quo despite future mining initiatives.

(11) The petitioners allege that noise and dust would affect park visitation, local residents, and users of the Trail of Tears.

The intervenors allege that the petitioners' comments are not supported by fact and only reflect biased opinions in favor of selected individual beliefs.

(12) The petitioners allege that the Park is a fragile land as defined in 30 CFR 762.5 and the watersheds of the Park are the essence of the term fragile lands. Therefore, the petitioners assert that the entire petition area which makes up the watershed of the Park should be designated under the fragile criterion.

The intervenors allege that a designation of the entire watershed of the Park as fragile lands is not supported by fact.

(13) The petitioners allege that the petition area should be considered fragile land because it is underlain by the Sewanee coal seam and there is no fool proof method of preventing acid mine drainage from the Sewanee coal seam. They further allege that there are risks associated with mining the Sewanee coal seam. They allege that enforcement actions and the performance standards do not provide adequate protection for the petition area.

The intervenors contend that the Sewanee seam in and of itself is not toxic and that new reclamation techniques assure that water quality problems will be minimized or eliminated.

b. KFO's Summary Determination for Primary Allegation of Fact 1

In summary, KFO has determined that the record before it demonstrates that there are fragile lands in the Park and in the petition area outside the Park and that surface coal mining operations in the Park or in certain petition area lands outside the Park would affect those fragile lands in which such operations could result in significant damage to important esthetic values, cultural values, and natural systems.

" **FRAGILE LANDS IN THE PARK.** KFO has determined that the Park is a fragile land with respect to its natural resources, its ecologic resources, its cultural values and its esthetic resources.

Natural Systems. The Park is fragile land because it includes important natural systems, especially the waters and unique water-formed features of as Fall Creek Falls, Falls Creek Lake, Cane Creek Falls, Cane Creek Cascades, and Piney Creek Falls. The record demonstrates that water quantity and quality of the streams that drain into the Park are essential to the Park, including its natural systems. The record demonstrates that the natural systems of the Park depend upon high water quality and that the water quality of streams which drain into the Park can significantly affect those systems. The record demonstrates that surface coal mining operations in the Park and in the petition area outside the Park, even in compliance with SMCRA (see routine mining scenarios and violations scenarios in chapter V of this document), could potentially increase mineralization of area streams during low-flow periods of the year. In Cane Creek, during critical low-

flow periods, an increase between 400 to 500 percent could be anticipated for both sulfates and total dissolved solids. Likewise, iron and manganese could be increased by between 800 and 1000 percent during such flow conditions. Surface coal mining operations in the other watersheds of the Park also showed increases in mineralization during low-flow seasonal conditions but not as significant as that of Cane Creek. Under the abandonment scenarios in chapter V of this document, water quality would be degraded at the point where the mining operation discharged into the stream. Impacts on waters in the Park would be more significant from mining operations in the Park than from mining operations in the petition area some distance outside the Park. Under these scenarios, water quality could be degraded by low pH, and high concentrations of dissolved metals which could precipitate on the substrate of the streams resulting in yellow or red/brown staining of the stream bottoms and the unique water-formed features of the Park. Dry Fork would also be degraded under the abandonment scenario, but would not adversely affect the Park because Dry Fork does not enter the Park during low-flow conditions. The record demonstrates that surface coal mining operations within the Park and the petition area outside the Park could generally have a positive influence on the water quantity in the area streams under low-flow conditions. This results from the increased storage and recharge capacity of unconsolidated mine spoils which will subsequently sustain the creek flow. However, in Falls Creek, abandoned open pits resulting from surface coal mining operations could contain surface-water runoff normally anticipated to drain to sediment control structures and be discharged to the receiving stream. Such a condition could result in a reduction in the available water supply for Falls Creek Lake from this eastern tributary. As a result, the impact resulting from abandonment and complete containment of surface-water runoff in the mine pits would be a 10 percent reduction in overall stream flow to the lake. With respect to surface coal mining operations in Piney Creek under an abandonment scenario, significant amounts of iron and manganese would be discharged from the site in the form of acid/toxic drainage into Piney Creek. However, because of the distance of these operations from the Park boundaries, levels of iron and manganese would dissipate prior to entering Fall Creek Falls State Park.

Ecologic Resources. The record demonstrates the Park is fragile land because it is a valuable habitat for threatened and endangered (T&E) species of plants, wildlife, and cave species. The record also demonstrates that these species and their habitats are important ecologic resources of the Park and part of the natural system of the Park. The record further demonstrates that these species and their habitats in the Park, with the exception of caves and cave species, could be significantly damaged by surface coal mining operations in the Park or in the petition area outside the Park. Potential impacts of impaired water quality and quantity on dependent T&E species within the Park would vary depending on the mining scenario considered. Impacts to T&E species under the routine mining scenario would be negligible to minor depending on the stream's mineral concentrations, the flow rate, and the particular sensitivities of the stream biota. Under the violations scenario the impacts could be minor to significant,

depending on the severity of the violation and the duration of the violation until treatment was initiated. If the problem involved an acid/toxic discharge into the creek, the impacts on the species could be significant. Once treatment started, the mineral concentration and the total dissolved solids (TDS) would increase, enhancing the potential for impacts to stream biota. Like the routine mining scenario, the impacts to stream biota in the violations scenario would be dependent on their particular sensitivities to the mineral concentrations and the TDS. Under the abandonment scenario, significantly elevated levels of total dissolved solids as well as AMD and the precipitants frequently associated with it, could have moderate to significant, long-term, adverse impacts extending for an undetermined distance downstream in Fall Creek Falls State Park from the surface coal mining operation location, adversely impacting and potentially destroying the T&E species and their habitats. Chapter V.B.2 discusses in detail the likelihood of these impacts under the various mining scenarios.

Cultural Values. The record demonstrates that the Park is fragile land because of its natural systems and esthetic resources which provide cultural (recreation, education and religious) activities for Park visitors. The record further demonstrates that these are important cultural activities, particularly the recreational activities which are the primary land use of the Park. Surface coal mining operations in the petition area outside the Park could have significant impact on the cultural activities inside the Park in an abandonment scenario (as described in chapter V where the operator abandons the site with no mitigation of impacts to water quality). In that event, the recreation activities of the Park which were directly or indirectly dependent on the water or water-formed features of the Park could be impacted, depending on the intensity and the duration of the impact. If surface coal mining operations occurred in the Park, they could potentially have short term significant impacts on the Park's cultural resources even though they remained in compliance with SMCRA. Those impacts could consist of changes in surface and ground-water chemistry from elevated levels of total dissolved solids and increased stream sedimentation from construction of drainage control structures and roads, increased fugitive dust, and noise from blasting and the use of heavy equipment. While these would be short-term, life-of-mine duration (5 to 10 years), they could affect the Park's ability to sustain the same quality of cultural experience as long as there were mining or reclamation activities on the site. It could likewise affect adjacent areas where the mining operation was visible to the users of the area. An abandoned surface mine could also have significant and severe impacts on the Park's water quality, impacting those cultural activities that are dependent on the water and water-formed features of the Park.

Esthetic Resources. The record demonstrates that the Park is fragile land because it has a number of esthetic resources of high scenic value such as Fall Creek Falls, Falls Creek Lake, Cane Creek Falls, Cane Creek Cascades, Cane Creek Gorge, and Falls Creek. These esthetic resources are dependent on the water quality and water quantity of Cane Creek, Meadow Creek, Falls Creek, and,

to a lesser degree, Piney Creek in order to maintain their unique qualities as important scenic features of the Park. The record demonstrates that there is a possibility that mining in the Park and the petition area outside the Park would affect the water systems of the Park which depend on the hydrologic balance of the watersheds draining into Fall Creek Falls State Park to maintain their scenic beauty. Therefore, any mining within the Park or within the above watersheds could significantly impact these esthetic resources.

Environmental Corridor. The record demonstrates that the Park is fragile land because it contains esthetic resources (based on the ecologic resources) which form an environmental corridor along Cane Creek that contain a concentration of ecologic and esthetic features as referenced in the definition of fragile lands in 30 CFR 762.5. Cane Creek flowing through the Park contains numerous ecologic and esthetic features such as an unusually high water quality, numerous occurrences of threatened and endangered species, Cane Creek Falls and Cascades, and other significant esthetic qualities. The record further demonstrates that this environmental corridor could receive minimal to moderate impacts by surface coal mining operations in the Park or within the Cane Creek, Meadow Creek, and Falls Creek watersheds outside the Park under a routine mining scenario or under a mining with violations scenario. In an abandonment scenario, adverse impacts to water quality and quantity in the above watersheds could cause significant damage to the ecologic and esthetic features found within the Cane Creek corridor. The record does not demonstrate that there are any environmental corridors with a concentration of ecologic and esthetic features in the petition area outside the Park. This is at least, in part, due to the fact that the environmental quality of the petition area outside the Park has already been adversely affected by a variety of human activities, including agriculture, silviculture, surface mining, and residential and commercial development. As previously referenced, under any of the mining scenarios it is likely that there would be no adverse impacts on the Park from surface coal mining operations in the headwaters of the Piney Creek watershed because of the distance of those recoverable coal resources from the Park boundaries.

" **FRAGILE LANDS IN THE PETITION AREA OUTSIDE THE PARK.** KFO has determined that some portions of the petition area outside the Park are fragile because of the existence of rare floral threatened and endangered species in the Piney Creek watershed, and because the quantity and quality of waters in Cane Creek, Meadow Creek, Falls Creek, and lower reaches of Piney Creek form important natural systems because they are water sources for the unique waters and water-formed features of the Park.

Rare Floral Species. There are a few occurrences of rare floral species in the Piney Creek watershed in three locations. Three occurrences are in areas where there are no known recoverable coal resources. Ten occurrences are in two locations of known recoverable coal reserves.

The record demonstrates that the areas of these occurrences in locations of known recoverable coal reserves outside the Park are fragile land. However, KFO has determined that the record does not justify designation of these areas under the fragile lands criterion. Protective measures are included in SMCRA for threatened and endangered species. 30 CFR 780.16 and 784.21 require anyone seeking a permit for surface coal mining operations to identify any listed or proposed threatened and endangered species or species requiring special protection under State or Federal law and indicate how they will minimize adverse impacts, enhance the identified resources where practicable, and comply with the Endangered Species Act. Surface coal mining operations in either of the two locations of the rare floral species in the headwaters area of Piney Creek (chapter II, figure II-12), would require implementation of SMCRA-required protective measures such as buffer zones around locations of the species and implementation of requirements of the Endangered Species Act. These measures should be sufficient to prevent significant impacts on the identified rare floral species. Surface coal mining operations could potentially result in minor to moderate damage to individual specimens in these two locations under a violation scenario or an abandonment scenario, but KFO has determined that, overall, it is unlikely that any significant damage to the species could result from surface coal mining operations. Therefore, the level of risk does not justify designation for these areas under this discretionary criterion.

Caves and Cave Species. The record demonstrates that the caves and cave species are an important ecologic resource in the Dry Fork watershed. Two cave species are located in the upper Dry Fork Gorge of the Dry Fork watershed. However, because of the distance of these caves from the areas of major coal resources, KFO has determined there is little likelihood that the activities of surface coal mining operations such as blasting and clearing vegetative cover would have a significant adverse impact on the caves or habitat of cave species such as the Indiana bat either in the Park or in the petition area outside the Park. Also, water quality and quantity changes from surface coal mining operations in the coal resource areas of the petition area would have little effect in the cave and karst areas of the Park or of the petition area outside the Park, because of the beneficial chemical changes that take place within a short distance of the water entering into the cave system. Therefore, ground water coming from surface coal mining operations would not result in significant damage to the caves or the cave-inhabiting species. Thus, the record demonstrates that the areas with caves are not fragile lands. Further, KFO has determined that caves and cave systems are common throughout the Cumberland Plateau and that streams draining through these caves are a part of the normal hydrologic setting for this region.

Natural Systems. The record before KFO demonstrates that there are important natural systems present in the petition area outside the Park. These natural systems are the waters of Cane Creek, Falls Creek, Meadow Creek, and the lower reaches of Piney Creek. These natural systems are important because they provide the water quality and quantity necessary to sustain the unique water and

water-formed features present in the Park. The record before KFO does not demonstrate that there are any water-formed features in the petition area outside the Park which could be considered important natural systems, such as Fall Creek Falls, Cane Creek Falls, Cane Creek Cascades, and Piney Creek Falls, etc. However, as indicated above in the discussion of natural systems and fragile lands within the Park, the record demonstrates that both the quantity and quality of the waters of Cane Creek, Falls Creek, Meadow Creek, and the lower reaches of Piney Creek contribute significantly to the esthetic and recreational values and natural systems within the Park, and that these Park values and systems could be significantly damaged by surface coal mining operations within the petition area. Therefore, KFO has determined that the watersheds of these natural water systems in the petition area outside the Park are fragile lands. The record further demonstrates that the waters of the Dry Fork watershed are not an important natural system because they do not serve as a water source for any important unique surface waters or water-formed features in the Park or in the petition area outside the Park. Dry Fork does not enter the surface waters of the Park during the critical low-flow conditions when water quality impacts would be most significant. During higher flow conditions when Dry Fork does enter the Park, it is far downstream of the identified fragile important water-formed features in the Park.

Cultural Values. The record before KFO does not demonstrate that there are cultural values (recreational, religious, educational) that make the petition area outside the Park a fragile land. The petition area outside the Park has undergone significant development for agriculture and silviculture land uses and, to a lesser degree, for residential and commercial land uses. There are no organized recreational land uses in the petition area outside the Park. Most of the recreational activities identified in areas outside the Park are hunting, fishing, four-wheeling, etc., activities that are common in rural areas throughout the Cumberland Plateau. As for educational and religious activities in the petition area outside the Park, the record before KFO included only one submersion baptism approximately nineteen years ago. Although these recreational, educational, and religious activities may be valuable to those living in and near the petition area, the record does not demonstrate that these cultural activities are unique to these areas, that they have uncommon importance in the region, or that they are due to high environmental quality. Thus, the cultural activities identified in the petition area outside the Park do not meet the designation criteria for fragile or historic lands.

Esthetic Values. The record before KFO does not demonstrate that there are important esthetic values in the petition area outside the Park. The views in the petition area outside the Park are common and do not possess the important scenic values that are common to the Park from its overlooks. Nor does the petition area outside the Park have scenic attractions such as the many water falls, gorges, and cascades that are reoccurring features of the Park.

Other Values and Systems. The petitioners made other allegations with respect to fragile lands for which the record before KFO did not justify determinations under that criterion as follows. The record does not justify a determination that the Park or the petition area outside the Park is a fragile land because of the existence of the Cane Creek trout fishery outside the petition boundaries. The record shows that the Cane Creek trout fishery is located north of the petition area, approximately ten miles from any known recoverable coal reserves and that impacts from surface coal mining operations in the petition area would be unlikely. Concerning the existence of terrestrial wildlife, turkeys and otters, in the petition area outside the Park, the record demonstrates that the TWRA's wild turkey stocking program is very successful within the Park and has expanded to areas immediately outside the Park to the point that TWRA has no plans for continuing its stocking program. Turkey stocking is primarily for hunting, with hunts usually set during the spring season. Turkeys are known to use the open reclaimed areas of active mining operations. Due to their mobility, it is unlikely that surface coal mining operations in the Park or in the petition area outside the Park would have an adverse impact on the turkey population. Concerning the otter, there have been no occurrences of the otter in the Park or in the petition area outside the Park. It is assumed that because of their mobility, they would seek other habitats (as has been the pattern with other mobile species) if their habitat was disrupted by surface coal mining operations.

The record does not demonstrate that the Park or the petition area outside the Park is a fragile land because of the fact that Cane Creek has been designated as an environmentally sensitive stream by the State of Tennessee; the existence of undesignated remnants of the Trail of Tears; or the existence of any undetermined Native American burial mounds and archaeological sites. Nor does the record demonstrate that there are historic lands in the Park or in the petition area outside the Park in which surface coal mining operations could result in significant damage to important resources. The record also does not demonstrate that there are important scientific values in the Park or in the petition area which could be significantly damaged by surface coal mining operations.

Risk. The record demonstrates that there are risks associated with surface coal mining operations in the Park and in the petition area outside the Park. When evaluating the risk of a surface coal mining operation in the Park or in the petition area outside the Park, KFO considered the probability that surface coal mining operations will cause damage and the impacts that could result. KFO reviewed the record and determined that there are a number of uncertainties in evaluating the impacts of surface coal mining operations in such a large area.

" **Location of acid- and toxic-forming materials.** The occurrence of potentially acid- and toxic-forming material associated with the coal seams of the petition area is generally uncertain, nonuniform and discontinuous throughout the petition area. Thus, KFO could not predict with certainty the locations of such materials, or the levels of risks to the Park resources

under the designation criteria.

- " **Long-term success of AMD predictive and preventive techniques.** Prediction of post-mining water quality and prevention of AMD from acid-forming materials are evolving methodologies. Beginning in 1992, KFO enhanced baseline data requirements, to improve identification and prediction for acid- and toxic-forming materials. Since then, KFO has issued nine permits in the southern coal fields. Of those permits, seven have acid or toxic drainage or seeps, which are being controlled on site. Some of the sites may result in long-term water pollution. KFO is now evaluating the sites as potential long-term producers of water pollution. Thus, uncertainties exist even with those more recent permits where enhanced prediction and prevention techniques were used; and additional time with these methodologies is needed to verify long-term efficacy in the petition area.
- " **Water quality impacts of non-acid or non-toxic materials.** Some water quality alterations can result from surface coal mining operations in parts of the petition area that do not have acid or toxic materials. Alterations can include significant increases in alkalinity, total dissolved solids, pH, resuspension of iron from previously weathered overburdens or spoils, and generation of manganese. These alterations are associated with large-scale disruptions of strata interacting with ground and surface waters. Available information is not sufficient to predict whether any particular alterations could kill, injure, or impair biota in the areas of discharges, nor how far downstream the impacts would be.
- " **Recoverable coal reserve locations.** There is a paucity of drill hole data for this area. Thus, KFO was unable to determine if all coal reserves had been identified, and cannot calculate with certainty the level of risk to resources under the designation criterion.
- " **Operator Error.** The success of a TMHP is contingent on several factors including: (1) adequate sampling of the overburden, (2) proper analysis of the overburden materials, (3) design for specifically handling the acid- or toxic-material, and (4) effective implementation of the TMHP. At any point in the operation, operator error can occur and potentially result in the formation of AMD and impact the water resources of the receiving stream.

KFO has also determined that there are also inherent risks or impacts associated with surface coal mining operations. These risks or impacts include alterations to the topography of the mined area, temporary changes in land use, removal of timber and wildlife habitat within the mining area, alteration of the soil and geologic profile, elevated levels of total dissolved solids in the water, periodic increases in fugitive dust, increased

sedimentation of streams, alteration of existing esthetic values, and noise.

The record demonstrates, as indicated in the above analysis of this allegation that surface coal mining operations in the Park and in the watersheds of Cane, Meadow, Falls, and the lower reaches of Piney Creek pose a risk of causing significant damage to the identified fragile resources of the Park and the petition area outside the Park. Although some risks may have low probabilities of occurring, if they did occur the impacts on the Park and the waters of the petition area outside the Park which are the primary sources of water for the unique and fragile water-formed features of the Park (Cane, Meadow, and Falls Creeks, and the lower reaches of Piney Creek), could be significant and long term.

The record demonstrates that the Park is fragile land because of the existence of its important natural systems, its ecologic resources (threatened and endangered species and their habitats), its cultural values and its esthetic values. The record also demonstrates that surface coal mining operations in the Park or in portions of the petition area outside the Park will affect these fragile lands in which the operations could result in significant damage to these important natural systems, cultural values and esthetic values.

2. PRIMARY ALLEGATION 2, RENEWABLE RESOURCE LANDS

Primary Allegation No. 2 alleges that the petition area should be designated unsuitable for surface coal mining operations because mining the area would affect renewable resource lands in which the operations could result in a substantial loss or reduction in long-range productivity of water supply or of food or fiber products.

a. Summary of Petitioners and Intervenors Allegations

(1) The petitioners allege that ground water in the petition area is unpredictable and that the inconsistent quality and quantity of ground water is a natural hazard.

The intervenors allege that conducting surface coal mining operations in the petition area will not result in a substantial loss or reduction in long-range productivity of water supply. The intervenors also state that the ground-water resources in the petition area are predictable and manageable. The intervenors state that a site-specific determination must be made on current information.

(2) The petitioners allege that pollution from surface coal mining operations could make Cane Creek unpotable to hikers because contaminants entering the stream from surface coal mining operations would result in unacceptable degradation making it potentially unusable as a drinking water supply.

The intervenors allege that the petitioners have not provided documentation which suggests or demonstrates that surface coal mining operations will result in a substantial loss or reduction of long-range productivity of a water supply. The intervenors also allege that historical water quality from Cane Creek, based on USGS records, shows that

water quality has not been affected in the watershed despite significant previous surface coal mining operations.

(3) The petitioners allege that the petition area is used for hunting, fishing, and farming, all of which could be adversely affected by changes in water quality or quantity due to surface coal mining operations. Petitioners also assert that the area is also used by local residents for the gathering of berries, seeds for horticultural projects, etc., which could be adversely affected by surface coal mining operations.

The intervenors allege that surface coal mining operations in the petition area will not result in a substantial loss or reduction in long-range productivity of food or fiber products.

b. KFO s Summary Determination for Allegation of Fact 2

The record demonstrates that there are renewable resource lands in the petition area outside the Park. The record also demonstrates that these renewable resource lands produce food and fiber products. KFO s analysis showed that there have been adverse impacts to water quality in Dry Fork and in Piney Creek as a result of pre-SMCRA mining activities. However, the fiber producing businesses (silviculture), which are the largest industries in the petition area, do not appear to have been affected by any mining impacts on the quality or quantity of the water as demonstrated by the statements from the silviculture industry. Although agriculture is the second largest industry in the petition area outside the Park, the record does not demonstrate that agriculture has been affected in the past by the water quality or quantity from pre-SMCRA (unregulated) mining that occurred throughout the petition area. Nor does the record show that there is any prime farmland in the petition area. Both of these industries rely on precipitation as a water source for their industries, rather than ground or surface water in the petition area. Therefore, the waters of the petition area do not contribute to the long-range productivity of food or fiber. Concerning water supply and ground water as a renewable resource, the record demonstrates that ground water is not a significant renewable resource in the Park or in the petition area outside the Park which contributes significantly to the long-range productivity of water supply. There are two public water supplies in the petition area which provide water sources for industrial and domestic uses. These public utilities are supplied by ground and surface water from sources outside the petition area and do not rely on the waters of the petition area for their reservoirs. The record further demonstrates that there are a few well users in the petition area outside the Park and no well users in the Park. The majority of the residents in the petition area use public utility water.

The record demonstrates that waters of Cane Creek in the Park are occasionally used by campers and hikers. The record also supports a determination that surface coal mining operations could affect these waters. However, the record does not demonstrate that the occasional and incidental use of these waters in the Park by campers or hikers or the incidental use of well water in the petition area outside the Park qualifies any part of the petition area as renewable resource lands, because the record does not demonstrate that the area contributes significantly to long-range productivity of the water supply. Therefore, neither the Park nor the petition area outside the

Park meet the requirements for this designation criterion.

3. PRIMARY ALLEGATION 3, NATURAL HAZARD LANDS

a. Summary of Petitioners and Intervenors Allegation of Fact 3

Primary Allegation No. 3 alleges that the area should be designated unsuitable for surface coal mining operations because mining would affect natural hazard lands in which such operations could substantially endanger life and property.

The petitioners allege that mining can increase flooding. They allege that a greater than 100-year flood has occurred at Cane Creek in the petition area and that construction activities changed the flood-flow characteristics. They also allege that these events demonstrate that the petition area is prone to flooding, and that mining would increase the danger to life, property, and the environment. They further allege that the adverse effects of surface coal mining operations include increased flooding as a result of the filling of stream channels and flood plains by sediment.

The intervenors allege that flooding is not a significant issue in the petition area. Skyline references the flood hazard mapping of Van Buren County prepared by HUD. Skyline emphasizes that HUD mapping does not show flood hazard along streams where surface mining would most likely occur in the petition area.

b. KFO s Summary Determination for Allegation of Fact 3

KFO has determined that the flood prone areas in the Cane Creek watershed are natural hazard lands. KFO has also determined that surface coal mining operations could affect natural hazard lands because surface coal mining operations could cause a five percent increase in previously identified flood discharges. However, the record before KFO does not support a determination that surface coal mining operations could substantially endanger life and property from flooding because (1) no structures would be substantially endangered by flooding in Cane Creek during a 100-year event as a result of surface coal mining operations, (2) all structures in the other watersheds are located significant distances from the respective creeks, and (3) the record does not indicate any other respects in which life or property could be substantially endangered by flooding because of surface coal mining operations.

4. PRIMARY ALLEGATION 4, INCOMPATIBILITY WITH EXISTING STATE OR LOCAL LAND USE PLANS OR PROGRAMS

Primary Allegation No. 4 alleges that the petition area should be designated unsuitable for surface coal mining operations because mining the area would be incompatible with existing State or local land use plans or programs.

a. Summary of Petitioners and Intervenors Allegation of Fact 4

(1) The petitioners allege that the petition area forms the watershed of the Park. State regulations provide for the establishment of buffer areas to protect Natural Resource Areas, including Natural Areas. The Strategic Management Plan for the Park indicates that state plans include the purchase of land both upstream and downstream of the Park to provide adequate protection of park resources and to give defensible boundaries. Allowing mining in the watershed would directly undercut the ability of the State to create or maintain a buffer area or to make decisions about appropriate activities or land for park protection.

The intervenors allege that SMCRA requirements, including the 300 foot buffer zone [under §522(e)(5)] around the Park, provide adequate protection to the special features in the Park. The intervenors further state that under the Park's original land acquisition agreement, sufficient land acreage was incorporated to provide a natural, built-in buffering capacity for its scenic landscape and waterfalls. The intervenors conclude that the combined acreage of the Park's natural buffer and the 300 foot buffer zone prohibition to mining around the Park's entire boundary is sufficient to ensure protection of its natural resources. Therefore, mining in the watershed would not directly undercut the State's ability to create or maintain a buffer area.

(2) The Petitioners allege that coal truck traffic would affect tourist traffic to the Park.

The intervenors allege that: This statement is not correct. Again, the comment merely reflects a typical opinion of the petitioners only. No proof is provided in this document which shows that coal trucks cause damage to the roads and thus constitute a conflict with land use plans. To the contrary, coal haulage offers an opportunity for jobs which undoubtedly fit into the land use plan. Further, taxes collected by both the local, state, and federal governments provide important money resources to help maintain the road systems in the land use plans of the petition area.

(3) The Petitioners allege that mining would affect the Trail of Tears National Historic Trail.

The intervenors allege that the presence of the Trail of Tears within the petition area does not qualify the area as fragile lands because: (1) the location of the Trail of Tears comprises an extremely small portion, less than three percent of the petition area, and is located in the southern portion of the area; and (2) the Trail of Tears does not meet the definition of fragile land because a majority of the Trail parallels or overlies existing roadways in the petition area.

(4) The petitioners allege that the Park is a prime tourist area in the State of Tennessee. Over \$8 million was spent on the Park in the late 1960's and early 1970's to construct extensive facilities for use by Park visitors, to make Fall Creek Falls a resort park.

The intervenors allege that the petitioners' allegation that mining in the area could damage the Park's attractiveness and economic viability is merely an opinion and is not

supported by facts and, therefore, does not support the allegation that mining is incompatible with existing State or local land use plans or programs.

(5) The Petitioners allege that feature-length films have been made in and out of the petition area and mining would cause this industry not to return. The intervenors made no response to this allegation.

b. KFO s Summary Determination for Allegation of Fact 4

KFO has determined that the record before it demonstrates that temporary use of the land by surface coal mining operations could not coexist with or be integrated into existing State or local land use plans or programs because: (1) the existing land use plans and programs do not call for surface coal mining operations in the Park; (2) the impacts of fugitive dust and noise from surface coal mine operations on the recreational values of the Park could not be integrated into the existing Park land use of recreation; (3) the visual impacts of surface coal mining operations in the Park or in the petition area outside the Park could have a negative impact on Park visitation and use for film making, thus affecting State revenue and the economic viability of the Park and the surrounding area; and (4) the natural systems, ecologic resources, cultural resources and esthetic values of the Park could be moderately to significantly impacted by surface coal mining operations in the Park and in the petition area outside the Park as described in the mining scenarios in chapter V. These impacts would be in direct conflict with the stated mission of Fall Creek Falls State Park - - To preserve the Park and Natural Area s unique resources - - most importantly its water and water-formed features - - for future generations. This mission is the basis for the Park s current land use plans and programs. In order to enhance these programs, the State has invested significant amounts of State funds in the Park to preserve its natural resources and to make it more attractive to Park visitors. In turn, the Park has generated revenue for the State and the surrounding counties because of its high visitation rates and its attractiveness as a feature film location.

KFO has determined that the record does not support the following allegations of the petitioners with respect to this criterion: (1) mining of the area would undercut the ability of the State to maintain a buffer zone around the Park. [The State has been successful in acquiring additional lands around the Park to enhance its protection of the Park resources. It has also been successful in preserving the natural resources of the Park although the petition area outside the Park has been significantly affected by various land uses such as agriculture, silviculture and, to a limited degree, by mining. There has been no mining in the petition area outside the Park since 1984.] (2) Coal trucks damaging roads is inconsistent with land use plans. [KFO has determined that there is sufficient road maintenance provided at the State and local level to address additional impacts to roads by coal trucks.] (3) Mining near the Trail of Tears is inconsistent with land use plans. [KFO has determined that since there are no identifiable segments of the Trail of Tears in the Park or in the petition area outside the Park, mining near the Trail of Tears would not be inconsistent with local land use plans or programs.]

5. PRIMARY ALLEGATION 5, RECLAMATION NOT TECHNOLOGICALLY AND ECONOMICALLY FEASIBLE

Primary Allegation No. 5 alleges the petition area must be designated unsuitable for surface coal mining operations because reclamation is not technologically and economically feasible.

a. Summary of Petitioners and Intervenors Allegations of Facts

(1) The petitioners allege that reclamation associated with mining in the petition area is not technologically and economically feasible because the Sewanee coal seam consistently leads to acid and toxic drainage despite the efforts of OSM and the most diligent mining companies to avoid such degradation.

The intervenors allege that the Sewanee coal seam in and of itself is not toxic. They contend that the coal seam and its related overburden has variable acid-producing potential and that potential does not automatically equate to toxicity. They further contend that such materials only become acid-producing under prolonged exposure to atmospheric oxidizing conditions and other processes. They further allege that mining at the Skyline Coal Company site has demonstrated that the Sewanee seam and its overburden materials can be handled properly to avoid or significantly minimize the production of undesired acid conditions. They also contend that the violation history provided by the petitioners misrepresents the facts and is often inaccurate.

(2) The petitioners allege that the methods used by the coal industry and OSM do not accurately predict acid or toxic mine drainage, and that there is no foolproof method for handling acid-forming materials. Therefore, the petitioners allege that any mining in the watershed would place the streams in the Park at risk of acid mine drainage and would conflict with OSM regulations and objectives to prevent such occurrences.

The intervenors allege that reclamation associated with the mining of the Sewanee coal seam is technologically and economically feasible as demonstrated by the current operations at its Big Brush Creek Mine. Skyline states that the company is being successful in mining the Sewanee coal seam without creating toxic mine drainage as alleged by the petitioners. The lack of an adequate technological understanding of the geochemical make-up of the overburden associated with the Sewanee coal seam and the subsequent deficit of technological know-how in the proper handling of the spoil material had led to past mining operations causing undesirable acid mine drainage. Such is not the case however with more recent technological break-throughs and experiences gained in working with the coal seam. With improved acid-base accounting techniques that take into account siderite-masking, the acid-producing potential of the overburden can be properly characterized in advance of mining. Skyline asserts that, with an accurate acid-base bank, the combination of mining and reclamation technologies can be and are being implemented by Skyline at its Big Brush Creek Mine to avoid and/or significantly minimize the generation of acidic conditions. Skyline further states that the company is successfully mining and reclaiming the disturbed areas economically and at a profit.

(3) The petitioners allege that reclamation is not technologically and economically

feasible within the petition area because even fully regulated mining results in unavoidable impacts.

The intervenors allege that the environmental protection performance standards can and will provide the necessary protection for the Park and the petition area.

b. KFO's Summary Determination of Allegation of Fact 5

KFO has determined that the record before it does not demonstrate that reclamation is technologically and economically infeasible under the Act and the regulations as is required under the mandatory criterion. The record does not clearly demonstrate that reclamation is technologically or economically infeasible because of the presence of the Sewanee coal seam in the petition area. Although the Sewanee coal seam may contain acid- and toxic-forming materials, this does not support a determination that reclamation of those surface coal mining operations involving coal extraction from the Sewanee seam is infeasible. Predictive and preventive techniques are evolving and improving. However, current predictive and preventive techniques may not be able to demonstrate with absolute certainty that an area will not produce acid or toxic discharges or that the area will be successfully reclaimed, because some water quality alterations could result from surface coal mining operations despite current predictive techniques and from surface coal mining operations that do not have acid or toxic materials. Such water quality alterations are associated with large-scale disruptions of geologic strata interacting with ground and surface water moving through and over them. Thus, current predictive and preventive techniques may not demonstrate with absolute certainty that an area will not produce acid or toxic discharges or that the area will be successfully reclaimed.

KFO reviewed the record relative to the history of mining in the southern coal fields where the Sewanee seam dominates. KFO found that the record shows that the majority of permits issued in this area have been successfully reclaimed. This does not support a conclusion that reclamation in the southern coal fields is economically and technologically infeasible. Only 8 permits out of 205 permits issued since 1977 when SMCRA was enacted are confirmed AMD producers. However, uncertainties exist with some of the more recent permits where enhanced prediction and prevention techniques were used. Several more years of experience will be required to determine the overall success of the newer methodologies for AMD prediction and prevention that were incorporated into these permits because a judgement concerning the success or failure of these more enhanced techniques cannot be made until these sites are in reclamation. These sites are in the early reclamation stages with several more years to go before an accurate assessment may be made with respect to the long-term success of these methodologies.

The record before KFO does not clearly demonstrate that reclamation is technologically or economically infeasible, as required for designation under the mandatory criterion. Nonetheless, the record does clearly demonstrate that surface coal mining operations would pose an unacceptable risk to the fragile lands of the Park, and that such risks are incompatible with Park land use plans and programs. Because the adverse impacts could be significant, the risk to the Park is unacceptable. While the record does not support designation under the mandatory criterion, designation is appropriate under these discretionary criteria.

D. SUMMARY DETERMINATION CONCERNING DESIGNATION

The record before KFO demonstrates that surface coal mining operations in parts of the petition area would pose an unacceptable risk to the fragile lands of the Park and that such risks are incompatible with Park land use plans and programs. Because the adverse impacts could be significant, the risk to the Park is unacceptable. Therefore, KFO has determined that the record before it demonstrates that designation of parts of the petition area is appropriate under these discretionary criteria.

CHAPTER V. IMPACTS OF ALTERNATIVE ACTIONS

Chapter V presents KFO's evaluation of the impacts of the proposed action and alternative actions identified by KFO.

A. PROPOSED ACTION: GRANT THE PETITION AND DESIGNATE THE ENTIRE PETITION AREA AS UNSUITABLE FOR ALL SURFACE COAL MINING OPERATIONS

Under the proposed action, the Director would: (1) grant the petition, in whole, based on a finding that reclamation is not technologically and economically feasible pursuant to §522(a)(2) of SMCRA and 30 CFR 762.11(a); and/or (2) exercise discretion pursuant to a finding that surface coal mining operations would be incompatible with State and local land use plans pursuant to §522(a)(3)(A) of SMCRA and 30 CFR 762.11(b)(1); or affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific or esthetic values, and natural systems pursuant to §522(a)(3)(B) of SMCRA and 30 CFR 762.11; or affect renewable resource lands in which the operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products pursuant to §522(a)(3)(C) of SMCRA and 30 CFR 726.11(b)(3); or affect natural hazard lands in which the operations could substantially endanger life and property, such lands to include areas subject to frequent flooding and areas of unstable geology pursuant to §522(a)(3)(D) of SMCRA and 30 CFR 762.11(b)(4).

Implementation of the proposed action, granting the petition, would preclude any surface coal mining operations from being conducted within the petition area, both now and in the future, unless the lands unsuitable designation was terminated by OSM upon receipt and evaluation of a petition to terminate the designation. Consequently, there would be no impacts on the environmental resources within the petition area as a result of implementing the proposed action.

The extraction of approximately 44.35 million tons of recoverable coal on the Morgan Springs, Lantana, Sewanee, and Richland coal seams in the petition area outside the Park would be precluded if the petition were granted. This designation would prevent surface disturbance on approximately 12,994 acres of land in the petition area outside the Park which would be subject to surface coal mining operations impacts. This designation would also preclude the extraction of 5.32 million tons of coal from the Park. The preclusion of extracting the recoverable coal resources would not be irreversible because action on a future petition could reverse this

decision, as stated above. However, the recoverable resources would be unavailable for mining during the period between designation under this proposed action and a decision based on a future petition to terminate such a designation. There are existing procedures in 30 CFR 764.13(c) for termination. A mineral owner, a landowner, or other interested party would have the option of providing information to KFO that justifies termination of the designation decision. Termination of the designation decision is discussed in more detail in a later section of the summary.

The impact of the proposed action to grant the petition on employment is anticipated to be minor because Skyline, the largest surface coal mining employer, is in the processing of closing its operations. Skyline is the only company which has indicated that it has future plans for mining the petition area but those plans are uncertain at this time with the closure of its current operations. Complete designation of the petition area could potentially result in the loss of unrealized tax revenue for Van Buren and Bledsoe Counties on 49.67 million tons of recoverable coal.

B. ALTERNATIVE NO. 1: NOT DESIGNATE ANY OF THE PETITION AREA AS UNSUITABLE FOR SURFACE COAL MINING OPERATIONS

1. Introduction

Under this alternative action, the Director would deny the petition, in whole, based on a finding that the record does not demonstrate that reclamation is not technologically and economically infeasible pursuant to §522(a)(2) of SMCRA; or that surface coal mining operations would: not be incompatible with State and local land use plans pursuant to §522(a)(3)(A) of SMCRA and 30 CFR 762.11(b)(1); or affect fragile or historic lands in which such operations could result in significant damage to important historic, cultural, scientific or esthetic values, and natural systems pursuant to §522(a)(3)(B) of SMCRA and 30 CFR 762.11; or affect renewable resource lands in which the operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products pursuant to §522(a)(3)(C) of SMCRA and 30 CFR 726.11(b)(3); or affect natural hazard lands in which the operations could substantially endanger life and property, such lands to include areas subject to frequent flooding and areas of unstable geology pursuant to §522(a)(3)(D) of SMCRA and 30 CFR 762.11(b)(4).

Selection of this alternative would not constitute approval of surface coal mining operations within the petition area, including the Park. A decision to approve or deny a permit application would be made after an applicant had submitted the required information, pursuant to SMCRA and the Federal Program for Tennessee (30 CFR 942), and KFO makes the required written findings pursuant to 30 CFR 773.15(c). Also, the permit application would be reviewed to determine any impacts to the environmental resources within the Fall Creek Falls State Park. In addition to reviewing an application for compliance with SMCRA and the Federal Program for Tennessee, KFO would conduct an environmental review in accordance with NEPA. The review would consider site specific information submitted by the operator and previous environmental analyses for the area, as well as comments from the public and private sectors. Conditions to mitigate any identified impacts would be included as part of the permit approval.

Furthermore, if KFO determined that, as a result of a technical evaluation of a permit application, the proposed operation would adversely affect Fall Creek Fall State Park, KFO would be required, pursuant to §522(e)(3) of SMCRA and 30 CFR 761.12(f), to request approval from affected agencies. In the event that KFO did determine an adverse effect would occur to the Park from a proposed surface coal mining operation, KFO would request approval by the Tennessee Department of Environment and Conservation (TDEC).

In addition, a permit applicant applying for a SMCRA permit would be required to apply for a NPDES permit from the Tennessee Division of Water Pollution Control (WPC) if a point-source discharge is anticipated. If WPC were to deny issuance of the NPDES permit, then KFO would suspend processing of this SMCRA permit in accordance with the terms of the 1985 Memorandum of Understanding between OSM and the State of Tennessee concerning the processing of SMCRA and NPDES permits.

2. Hypothetical Mining Scenarios

To more fully analyze the potential impacts associated with Alternative No. 1 (deny the petition in whole and do not designate any of the petition area, including the Park, as unsuitable for mining), KFO developed hypothetical mining scenarios that assumed high intensity development of coal resources in the Fall Creek Falls petition area including the Park. To develop the mining scenarios, KFO reviewed data on the past mining activity in the area; geology from exposed coal seams; the coal reserve base; and current and potential mining activity in the southern Tennessee coalfield and in Bledsoe and Van Buren Counties, Tennessee. This review enabled KFO to hypothesize the mining operations that might be expected to occur in the Fall Creek Falls petition area in the future if the Director selected Alternative Action No. 1.

Environmental impacts that could result, if mining under these hypothetical scenarios were to occur, were evaluated using three mining scenarios.

- " **Routine Mining Scenario** assumed that all activities associated with surface coal mining operations would be conducted in a manner consistent with Tennessee Federal Program Regulations at 30 CFR 942, utilizing contemporary mining practices and no violations occur.
- " **Violations Scenario** assumed that risks associated with mining activities do exist, and that unanticipated circumstances such as an ineffective toxic material handling plan, can occur as a result of operator errors in prediction, planning and/or implementation. Therefore, potential impacts, if such unanticipated operator circumstances were to occur, were also analyzed. This scenario also assumed that, in accordance with contemporary mining practices, the violations were addressed in a timely manner through revisions to the mining operations and/or reclamation plan. Violations occur because there are errors or unanticipated circumstances.
- " **Abandonment Scenario** assumed a worst case in which the circumstances of

the violations scenario occur, but the impacts were intensified because the mine site was abandoned with no effort to mitigate any adverse effects. The unanticipated circumstances eventually resulted in the failure of the operation and the production of long term acid mine drainage leaving the site. The performance bond for the surface coal mining operation had not been upgraded to address the long term acid mine drainage.

3. Hypothetical Mining Scenarios for the Five Watersheds and for the Park

Minable reserve data was used to project hypothetical mining scenarios for the Park and for each of the different watersheds within the petition area outside the Park under each of the scenarios referenced above. These hypothetical assumptions were based on known coal reserve locations and available information on important physical characteristics within the petition area that would serve to facilitate the removal of the recoverable coal resources. The mining assumptions were as follows:

- " **Dry Fork** The most significant coal reserves within the Dry Fork watershed are located on the Richland seam in the headwaters area of the watershed (figures III-6 and III-7). Since much of the surface minable reserves in this area have been previously mined, the site selected included 70 acres of abandoned mine land (remining land) on the Sewanee coal seam within a 400 acre surface mine. The majority of recoverable coal reserves were surface reserves. Therefore, a surface mining assumption was selected for the Dry Fork watershed. The assumption of several hundred acres was used to assess the impacts that could occur if large areas were being mined.
- " **Piney Creek** KFO assumed a 550 acre surface mine on the Sewanee coal seam in the headwaters area of the watershed. As most of this area contains pre-SMCRA abandoned mine sites, remining of 100 acres of abandoned mine land was included within the 550 acre surface mine.
- " **Cane Creek** KFO used an underground mining scenario since underground mining reserves have the largest minable unit of coal available in the watershed.
- " **Falls Creek** The only block of minable coal within this watershed is on the Richland seam. This coal is a surface minable reserve of approximately 300 acres in the headwaters area of the eastern fork of Falls Creek.
- " **Meadow Creek** There are two areas of surface minable coal resources within this watershed. The largest, approximately 250 acres on the Sewanee seam in the headwaters of the watershed, was chosen.
- " **The Park** There are two areas of mineable coal resources in the Park, a block of underground coal resources adjacent to the Cane and Meadow Creek watershed boundaries and a block of surface mineable resources along the boundary of the

Cane Creek watershed. In the event that the State of Tennessee asserted valid existing rights (VER) to the minerals located within the park boundaries or the boundaries of the Park were modified so that a third party had access to these resources, those minerals would involve recoverable underground coal resources located along the park borders of the Cane Creek watershed and, to a limited extent, along the Meadow Creek watershed and surface mineable coal resources along the park borders of the Cane Creek watershed.

Either block of coal reserves could also be easily accessed through surface activities in the petition area outside the Park in connection with underground mining operations in the Park. Even though certain areas of the Park are protected by §522(e) of (SMCRA) from surface coal mining operations, the State of Tennessee might theoretically allow mining which involved only underground activities in the Park and limited all surface activities to the area outside the Park in accordance with the final OSM rule adopted on December 17, 1999, in which OSM adopted an Interpretive Rule Related to Subsidence Due to Underground Coal Mining, 64 FR 70838.

4. KFO s Determinations of Impacts

KFO s analyses of the petition area, utilizing the three hypothetical mining scenarios in each of the five watersheds, enabled it to make determinations relative to the applicability of the designation criteria if mining were allowed in the respective watersheds as follows.

a. Dry Fork Watershed Summary of Analysis of Designation Criteria Under the Mining Scenarios

KFO has determined that surface coal mining operations in the Dry Creek watershed would not affect the fragile lands of the Park in which the operations could result in significant damage to the Park s important esthetic values and natural systems. Nor would mining in Dry Fork watershed be incompatible with the Park s existing land use plans and programs. It would not affect renewable resource lands in which the operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products. It would not affect natural hazard lands in which the operations could substantially endanger life and property, such lands to include areas subject to frequent flooding and areas of unstable geology. Nor would reclamation be technologically and economically infeasible under the Act or the regulations. Dry Fork subsidizes underground during low flow periods prior to entering the Park and resurfaces in Cane Creek, north of the Park, and outside the petition area. Therefore, surface coal mining operations in Dry Fork watershed would not affect Park surface resources.

b. Piney Creek Watershed Summary of Analysis of Designation Criteria Under the Mining Scenarios

KFO has determined that surface coal mining operations in the Piney Creek watershed would not affect fragile or historic lands in the Park or in the petition area outside the Park in which the

operations could result in significant damage to important esthetic values or natural systems except under an abandonment scenario. In that scenario the acid/toxic discharge could potentially destroy the habitat of threatened and endangered species in the Park and in the petition area (depending on the duration and the intensity of the impact), and damage esthetic values by coating the stream bottoms and unique water-formed features of the Park with red-brown iron flocculent.

Surface coal mining operations would not affect renewable resource lands in which the operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products. There are lands in the Piney Creek watershed which produce food and fiber. However, these lands do not rely on the water quality or water quantity of Piney Creek for their water supply. Precipitation events are the source of water for these renewable resource lands. Nor does the record demonstrate that the ground water or water supplies of Piney Creek are used for long-range productivity of water supply. Water users, not only in this watershed, but throughout the petition area, rely on public water supplies for commercial and domestic uses. Therefore, the record does not demonstrate that surface coal mining operations could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products, even under an abandonment scenario.

Surface coal mining operations would not be incompatible with existing State or local land use plans or programs because of the distance of any recoverable coal reserves and surface coal mining operations from the Park entrances or the Park viewsheds.

Surface coal mining operations would not affect natural hazard lands in which the operations could substantially endanger life and property, including areas subject to frequent flooding and areas of unstable geology, because any structures that could potentially be affected by flooding are located at a substantially higher elevation than the Piney Creek flood plain.

Nor would reclamation be technologically and economically infeasible under the Act or regulations. Further, Piney Creek watershed is already significantly impacted by AMD from pre-SMCRA mining, and mining in the upper reaches of the Piney Creek watershed, utilizing the enhanced prediction and prevention methods for AMD, could potentially benefit the water quality of this watershed.

**c. Cane, Meadow and Falls Creek Watersheds Summary of Analysis of Designation
Criteria Under the Mining Scenarios**

KFO has determined that surface coal mining operations in the Cane, Meadow and Fall Creek watersheds could affect fragile lands in which the operations could result in significant damage to important esthetic values, ecologic systems, cultural values and/or natural systems under an abandonment scenario. Surface coal mining operations in each of these watersheds could potentially impact the esthetic values and natural systems of the Park, as well as be incompatible with existing Park plans and programs. The record demonstrates that the water quantity of these streams is essential to the esthetic and cultural values of the Park. The water quality of these streams is also essential to the continued existence of the unique natural systems and ecologic

resources associated with the stream biota and the threatened and endangered species of the Park. These three watersheds bordering the Park provide the primary water sources for features such as the Park's falls, cascade and gorges. High water quality of these entering streams is essential to the health and existence of stream-dependent biological communities. The ecological resources, cultural and esthetic values, and natural systems associated with these streams contribute significantly to the Park's popularity as a tourist attraction. Surface coal mining operations could potentially have an adverse impact on stream ecology including T&E species, recreational stream uses, scenic qualities of the stream, and visitation of the areas associated with the stream. Further, mining in close proximity to the road and the Park at the south entrance could affect Park visitation because it could be visible to visitors, the majority of whom enter and leave the Park at the south entrance. It could also affect visitation because of noise and fugitive dust from blasting and heavy equipment, increased truck traffic from coal haulage, and impacts on scenic values. This could affect the economic self-sufficiency of the Park and the local economy.

KFO has also determined that the record demonstrates that there are renewable resource lands within these watersheds. The record demonstrates that these renewable resource lands produce food and fiber products. The record does not demonstrate that the area contributes significantly to long-range productivity of water supply. Further, the record does not demonstrate that surface coal mining operations in the petition area could result in a substantial loss or reduction of long-range productivity of water supply or of food or fiber products as a result of impacts on water quality or quantity. KFO's analysis shows that only in the abandonment (worst case) scenario in one watershed, Cane Creek, is there a potential for significant dewatering of the creek. This would occur primarily during periods of low flow, with stream recovery of flow during mean and high flow and precipitation events. Thus even in this abandonment scenario, there would be no substantial long-range impact on water quality or quantity.

KFO has also determined that the flood prone areas in the Cane Creek watershed are natural hazard lands. KFO has determined that surface coal mining operations could affect natural hazard lands, because surface coal mining operations could cause a five percent increase in previously identified flood discharge rates. However, KFO has determined that the record before it does not demonstrate that surface coal mining operations could substantially endanger life and property from flooding, because (1) no structures would be substantially endangered by flooding in Cane Creek during a 100-year event as a result of surface coal mining operations, (2) all structures in the other watersheds are located significant distances from the respective creeks, and (3) the record does not indicate any other respect in which life or property on natural hazard lands could be substantially endangered by flooding because of surface coal mining operations.

KFO has further determined that the record does not clearly demonstrate that reclamation would be technologically or economically infeasible under the Act or regulations as is required under the mandatory criterion. A discussion relative to this determination is found in earlier sections of the Summary.

C. ALTERNATIVE NO. 2 DENY THE PETITION IN WHOLE, REQUIRE AN EIS ON AN INDIVIDUAL PERMIT ACTION BECAUSE OF THE SIGNIFICANCE OF THE INDIVIDUAL PERMIT ACTION

Selection of alternative action No. 2, deny the petition and require an EIS on an individual permit action, parallels alternative action No.1 described above, except that under this alternative an EIS would be required for all surface coal mining operations proposed to be conducted in the petition area.

As stated under alternative action No. 1, if WPC determined that permanent degradation of the waters of Cane Creek within the Park were to occur from the discharge of waste waters from a proposed mining operation, WPC would not issue the NPDES permit and KFO would not proceed with the SMCRA permit review of the surface coal mining operation without the required approval of a point-source discharge. If the EIS identified an adverse effect to Fall Creek Falls State Park, OSM, as stated above, would formally request approval or disapproval of the permitting action from TDEC.

D. ALTERNATIVE NO. 3 GRANT THE PETITION IN PART AND DESIGNATE PORTIONS OF THE PETITION AREA AS UNSUITABLE FOR ALL OR CERTAIN TYPES OF SURFACE COAL MINING OPERATIONS

This alternative action, which would involve designation of selected resources, entails three sub-alternative actions as follows:

- 3.a prohibit certain types of surface coal mining operations or
- 3.b prohibit or limit surface coal mining operations with respect to specific coal seams; or
- 3.c prohibit surface coal mining operations in selected watersheds.

1. Alternative 3a: Grant the Petition in Part and Designate Portions of the Petition Area as Unsuitable for Certain Types of Surface Coal Mining Operations

Selection of alternative action No. 3a, which prohibits or limits surface coal mining and/or surface activities in connection with underground coal mining within the petition area, could prohibit (a) all surface coal mining operations on those portions of the petition area where acid-forming materials were identified, or (b) prohibit certain types of surface coal mining operations within the petition area based on the mining method.

a. Prohibit Mining in Acid-Forming Materials

Under this subalternative, the Director would prohibit surface coal mining operations for all portions of the petition area where the geochemistry information identified acid-forming materials requiring the special handling and disposal of such materials. The risk of encountering identified acid-forming materials associated with mining and subsequent environmental impacts would be virtually eliminated. However, the overburden sampling program would not necessarily guarantee the identification of all acid-forming materials within the proposed permit area. If selected, this option could be applied to all seams in the petition area and would be applicable to surface coal mining operations, including surface activities in connection with underground mining operations. However, all seams in the Park and in the petition area outside

the Park have acid-forming materials. The occurrence of these materials is non-uniform, discontinuous and uncertain. Therefore, it would be difficult to single out specific seams, or portions thereof, for designation as unsuitable for mining because of the uncertainties of the locations of toxic-forming materials.

This alternative would also prohibit remining and reclamation of previously mined areas where there are known occurrences of acid-forming materials, unless an exemption is made to allow for remining. The remining of previously mined areas, particularly in the Piney Creek and Dry Fork watersheds, would have the potential to improve water quality and, therefore, would have a beneficial effect on other environmental resources.

The recoverable resource base, which would be affected by this option, cannot be determined because the distribution of acid-forming material throughout the petition area is unknown.

b. Prohibit Mining Based on Mining Method

Under this subalternative the Director could prohibit mining by one mining method but allow the other. Thus the Director could preclude surface mining activities but allow surface activities in connection with underground mining operations. If surface mining activities were prohibited under this alternative, approximately 12,994 acres of land would not be disturbed and the potential for associated environmental impacts limited. Prohibiting surface mining activities in the petition area would mean that approximately 27.45 million tons of coal would not be extracted until such time as a positive decision was made in response to a petition to terminate the designation decision. Underground mining could be allowed on the Lantana, Sewanee, and Richland coal seams with an estimated 22.22 million tons of coal being recovered. Under this option surface disturbance associated with underground mining operations would be considerably less as compared to surface coal mining activities and would minimize the exposure of acid-forming materials located within the overburden. It would likewise minimize the disruption of area aquifers which may be removed and replaced during surface mining activities. However, with this type of mining, there is a potential risk of a continuous discharge to receiving streams as a result of gravity drainage or pumpage from the underground workings. This could have a minor to major impact on receiving streams during low-flow conditions when the stream will have minimal water available to dilute such effluent discharge.

By the same token, the Director could preclude surface activities in connection with underground mining activities but allow surface mining activities. This would prevent any surface disturbance associated with underground mine development within the petition area and discharges of underground mine waste water into the receiving streams. Prohibiting surface activities in connection with underground mining operations would mean that approximately 22.22 million tons of coal, primarily in the Cane Creek watershed, could not be directly accessed from within the petition area. Mine waste water from pumped or gravity-fed discharges associated with underground mines could constitute the majority of the water in area streams during low-flow conditions. Under this option, allowing surface mining activities could result in the remining of areas where the water quality could be significantly improved. This could return previously mined lands to a productive use.

2. Alternative 3b: Designate Selected Coal Resources Within the Petition Area as Unsuitable for Certain Types of Surface Coal Mining Operations

Selection of alternative action No. 3b, designate specific coal seams within the petition area as unsuitable for all types of surface coal mining operations, could preclude surface coal mining operations from being conducted on the Morgan Springs, Lantana, Sewanee, or Richland coal seams. The petitioners' allegations focused primarily on mining the Sewanee coal seam. If the Sewanee coal seam were designated as unsuitable for all types of surface coal mining operations, up to 24 million tons of coal would not be extracted until such time as a positive decision was made in response to a petition to terminate the designation decision. Of this 24 million tons, approximately 13.17 million tons are considered as underground resources, much of which (approximately 90 percent) may not be accessible unless some surface entry is available within the petition area. Also, if surface coal mining operations were prohibited on this seam, approximately 7,419 acres of land would not be disturbed and the potential for impacts would be correspondingly limited. Surface coal mining operations could be allowed on the Morgan Springs, Lantana, and Richland coal seams with an estimated 24.6 million tons of coal being recovered and the potential to disturb approximately 6,892 acres. Although the Sewanee seam is well known for its acid-producing qualities, all seams in the Park and in the petition area outside the Park may have toxic materials which are potentially capable of producing acid mine drainage. The effectiveness of the toxic material handling plan determines the potential for a site to produce acid mine drainage. Therefore, prohibiting mining on the Sewanee seam would not necessarily preclude the possibility of surface coal mining operations generating acid mine drainage from other seams.

3. Alternative 3c: Designate Specific Watersheds as Unsuitable for all Types of Surface Coal Mining Operations Preferred Alternative

Selection of alternative action No. 3c, designate specific watersheds within the petition area as unsuitable for mining, could preclude surface coal mining operations from being conducted in the Park and in the petition area outside the Park based on the impacts and cumulative risk of impacts on protected environmental resources in the Park from surface coal mining operations in those areas.

In determining whether the Park and one watershed or combination of watersheds should be designated as unsuitable for mining, KFO evaluated the significant resources within and outside the Park, based on the criteria in §522(a)(2) and (3). The significant resources considered in the evaluation of this alternative were: (1) water quality, (2) water quantity, (3) ecology, including T&E species, (4) cultural resources (including recreation), (5) esthetics, (6) environmental corridors, (7) tourism, and (8) food and fiber. Other resources which were evaluated but determined not to be significantly impacted included (1) topography, (2) geology, (3) soils, (4) vegetation, (5) terrestrial wildlife, (6) climate, (7) historic resources, (8) wetlands, (9) wild and scenic rivers, (10) natural hazard lands, including flood plains, and (11) climate.

KFO determined that the record before it did not demonstrate that under the mandatory criterion, the petition area is unsuitable for surface coal mining operations because reclamation is not

technologically and economically feasible [SMCRA §522(a)(2)]. KFO also determined that the record before it did not demonstrate that surface coal mining operations would affect renewable resource lands in which such operations could result in substantial loss or reduction of long-range productivity [SMCRA §522 (a)(3)(C)], or that surface coal mining operations would affect natural hazard lands in which such operations could substantially endanger life and property [SMCRA §522(a)(3)(D)]. However, KFO determined that the record clearly demonstrated that surface coal mining operations would pose an unacceptable risk to the fragile lands of the Park and the petition area outside the Park, in which such operations could result in significant damage to important cultural values, esthetic values and natural systems [SMCRA §522(a)(3)(B)], and that such risks are incompatible with the state land use plans and programs for the Park (SMCRA §522(a)(3)(A). Chapter IV discusses in detail the information KFO analyzed with respect to its determinations on the allegations made by the petitioners. The analyses in chapter IV were also used by KFO in its determinations with respect to the two designation criteria referenced above that the record tends to support. KFO also used these analyses, along with the analyses of the mining scenarios in chapter V of this document, in its determination that mining should be prohibited in the Park and in the following watersheds of the petition area: Cane, Meadow and Falls. Further, KFO determined that mining should be prohibited in Piney Creek watershed except in those headwaters areas where remaining the recoverable coal resources would not further degrade the impaired water quality resulting from pre-SMCRA mining in which impacts from previous mining would be mitigated.

Under this alternative, the Director would designate Cane Creek, Falls Creek, and Meadow Creek watersheds and the Park as unsuitable for all types of surface coal mining operations including surface activities in connection with underground mining operations. The Director would also designate the Piney Creek watershed, in part, as unsuitable for all types of surface coal mining operations, including surface activities in connection with underground mining operations; provided that mining may be permitted, on a case-by-case basis, in the headwaters of the watershed, if a portion of the proposed surface coal mining operation includes areas previously disturbed by mining and the permit applicant can demonstrate that water quality in the receiving stream(s) will not be degraded and that impacts from previous mining will be mitigated as a result of the surface coal mining operation. The Director would not designate any of the Dry Fork watershed as unsuitable for surface coal mining operations, based upon KFO's determination that this watershed does not meet the criteria set forth in 30 CFR 762.11 for designating lands as unsuitable for mining.

Implementation of this alternative would preclude any surface coal mining operations from being conducted within the Park, the Meadow Creek, Falls Creek and Cane Creek watersheds and the Piney Creek watershed except in the headwaters where remaining could potentially mitigate the impacts of pre-SMCRA mining on this portion of the watershed. Consequently, with this alternative there would be no impacts on the environmental resources of the Park from surface coal mining operations in the Park, the Cane Creek, Meadow Creek and Falls Creek watersheds and the lower reaches of the Piney Creek watershed.

Concerning the Piney Creek watershed, KFO reviewed the following resources in determining the extent of impacts if remaining were allowed in the headwaters of this watershed.

" Water Quality and Quantity

The Piney Creek watershed is the third largest watershed in the petition area and contributes approximately 34 percent of the water that drains into the Park. However, it enters into the lower third of the Park, where there are limited cultural/recreational and scenic resources associated with Piney Creek, and it contributes a minor to moderate amount of water to the total water resources of the Park. The water quality data presented in chapter II, section A.2.b, shows that the Piney Creek watershed has been significantly impacted from historical mining. Specifically, the water quality in the headwaters of Piney Creek has been significantly impacted from AMD discharging from pre- and post-SMCRA surface mines and has impacted the stream s ecosystem for a considerable distance downstream, as shown by the tabulated water quality and biological data in chapter II, sections A and C, respectively. Even though the water quality improves in the lower reaches of Piney Creek as it enters the Park, it is not comparable to the water quality in Cane, Falls, and Meadow Creeks as these streams enter the Park. The only unique water-formed feature that is dependent on Piney Creek for its water quantity and quality is Piney Creek Falls. These falls are unimpaired by impacts from pre-SMCRA mining in the headwaters of Piney Creek.

" Stream Ecology and T&E Species

As referenced above, the water quality of Piney Creek improves in its lower reaches where it enters the Park. Therefore, Piney Creek does not have an adverse impact on the stream ecology and the few T&E species directly affected by Piney Creek once it enters the Park. Piney Creek flows into Cane Creek in the gorge downstream of the majority of the ecological resources of the Park.

" Scenic and Cultural/Recreational Resources and Tourism

From where Piney Creek enters the Park to Piney Falls the stream provides recreational opportunities (swimming) for the visitors using group camp No. 2. There are also hiking and bike trails that cross the stream. Also, at the point where the stream flows into the gorge, Piney Falls is considered to have distinctive scenic qualities and is frequently visited. Piney Falls is located on the motor nature trail, a popular trail which accounts for frequent visitation to the falls.

If surface coal mining operations were conducted in the headwaters of the Piney Creek watershed which resulted in water quality impacts, particularly AMD (as described in the abandonment scenario in chapter V of this document), on environmental resources both within the Park and in the petition area outside the Park would be affected to some degree. The abandonment scenario could result in a reduction in the water available to Piney Creek in the immediate vicinity of the mining operation during precipitation and storm events but should not have any significant effect in the Park. Water quality in Piney Creek could be significantly degraded during low-flow conditions periods of the year if the site was abandoned and acid/toxic drainage was released. Aquatic biota in the areas immediately downstream from the surface coal mining operation could

be moderately to significantly impacted. Even though surface mining operations could result in degraded stream conditions in the Piney Creek watershed outside the Park, the adverse impacts would not affect the Park because the degraded stream conditions would dissipate before they reached the Park boundaries. Therefore, there would be minimal impacts on Park water quality as a result of a re-mining failure.

KFO has determined that the re-mining of abandoned mine lands in the headwaters of this watershed has the potential to improve water quality and therefore, have a beneficial effect on resources both within and outside the Park. Currently, Piney Creek proper and other headwater tributaries flow through pre-SMCRA mine pits and are impacted by AMD and by increased concentrations of TDS which result in mineralization to the waters of the receiving stream. The re-mining effort could reclaim the pre-SMCRA mine pits and reconstruct Piney Creek proper and the other headwater streams, including riparian habitat. Also, the previously mined and unreclaimed land would be returned to a productive use.

Concerning Dry Fork watershed, KFO's review of the record demonstrated that Dry Fork watershed has no impact on the fragile lands of the Park or the Park's land use plans or programs. Dry Fork subsides underground during low flow periods prior to entering the Park and resurfaces in Cane Creek, north of the Park and outside the petition area. Any mining that would potentially occur in the Dry Fork watershed would be in the remote portions of the petition areas, several miles from the Park boundaries. Therefore, surface coal mining operations in Dry Fork watershed would not affect Park surface resources. Nor would mining in Dry Fork impact ground-water resources or the caves and cave inhabiting species of this watershed. The record demonstrates the ground water in this watershed is not utilized extensively for domestic use. The residents of this area use the public water supply for this resource. Concerning the caves and cave species, the record demonstrates that the ground water, once it enters the substrate of the cave systems, undergoes a chemically induced change which enhances the water quality before it enters the caves and cave habitat. Therefore, the record before KFO does not demonstrate that there would be impacts to ground-water resources from surface coal mining operations in the Dry Fork watershed.

The recoverable resource base which would be affected by this alternative is as follows. The majority of all surface recoverable coal resources occur in the Piney and Dry Fork watersheds while the majority of the underground recoverable coal resources occur in the Cane Creek watershed with minimal amounts in the Falls Creek and Meadow Creek watersheds. The recoverable resources in the Dry Fork and Piney Creek watersheds total 18.41 million tons, 6.58 million in Dry Fork and 11.83 in Piney Creek. The majority of the recoverable coal resources in Piney Creek, approximately 8,000,000 tons, would be recoverable through re-mining in the headwaters of this watershed. The remaining 3.83 million tons would be precluded from extraction. The recoverable coal reserves in the Cane, Meadow, and Falls Creek watersheds total 31.26 million tons: 26.62 million tons in Cane Creek, 1.44 million tons in Falls Creek, and 3.2 million tons in Meadow Creek. All these reserves would be precluded from mining under this alternative with the exception of 0.65 million tons of Morgan Springs coal which could possibly be recovered by underground mining activities located outside the petition area. Of this 31.26 million tons, approximately 5.32 million tons are in the Park. KFO recognizes that it is unlikely

that the Park reserves would ever be mined by the State or by a third party (assuming the boundaries of the Park were modified to delete some of the current Park lands). However, all these reserves could potentially be precluded from extraction under this alternative. Under this alternative, approximately 69 percent or 34.4 million tons of the total recoverable coal reserves in the petition area would be unrecoverable.

The loss of the projected annual coal production within the petition area would have minor impacts on regional or national coal markets. With respect to the impacts on the local market, the only operation which has a direct or indirect effect on the local economy of the petition area is in the process of closing its mining operations. Therefore, there would be no impacts on the local economy as a result of this alternative.

E. ALTERNATIVE NO. 4

KFO has determined that the no action alternative is not reasonable because the petitioners have fulfilled the requirements of the Tennessee Federal program and have filed a complete petition to designate the subject lands as unsuitable for surface coal mining operations. Therefore, this alternative will not be analyzed further.

F. TERMINATION OF DESIGNATION

Designation of lands as unsuitable for surface coal mining operations does not permanently preclude mining in the petition area. If the preferred alternative to designate selected watersheds within the petition area is selected, landowners, mineral right owners and other interested parties may request that a designation be terminated in whole or be terminated for specific portions of the area in accordance with 30 CFR 764.13(c). The allegations and supporting evidence in the petition to terminate must provide information that refutes those bases for designation of the area. The petition area is large and many of the conclusions reached by KFO are general to a large area and may not specifically apply to a smaller area that could potentially be the subject of a termination petition. KFO does not have the geochemistry information for small segments of the petition area which could be readily available to a landowner, a mineral rights owner, or other interested party. KFO believes that these individuals are in the best position for providing site specific information that could substantiate a termination of designation decision. In the event that a petition to terminate was submitted, KFO would provide appropriate NEPA compliance on a case-by-case basis, either through the development of an EIS or an environmental assessment (EA), along with a PED to evaluate the petition to terminate.

G. OTHER ENVIRONMENTAL EFFECTS

1. Inherent Program Effects

Should mining occur in the Park or the petition area outside the Park, KFO's inspection and enforcement (I&E) program would be responsible for inspection of surface coal mining operations in the petition area to determine if they were in compliance with SMCRA. If an operation was determined to be in violation of SMCRA requirements, the operator would be

required to abate the problem. However, because of the inspection cycle set out in the regulations, 30 to 90 days may pass between the noncompliance event and its discovery and abatement under KFO's program. The impacts of noncompliance with the Federal regulatory program during this period of nonabatement could result in minor to moderate short term effects. In some cases involving acid/toxic discharges, there could be major short term impacts until the problem was abated.

If a permittee failed to abate the problem and forfeited the reclamation bond, administrative and judicial processes could potentially delay reclamation procedures for several months. Impacts resulting from the delay in instituting reclamation procedures could be similar to, although less severe than, those disturbances resulting from unregulated mining in the past, as described in OSM-EIS-1. On the basis of KFO's experience, the number of bond forfeitures have been low (approximately three percent of all permits issued) under the Federal Program for Tennessee. To the extent that an area cannot be reclaimed adequately with existing bond levels, the resulting impacts have been analyzed in detail in OSM-EIS-18, Comprehensive Impacts of Permit Decisions under Tennessee Federal Program.

2. Irreversible and Irrecoverable Commitment of Resources

A resource is committed irreversibly when the current and/or potential productivity of that resource is lost and, once lost, can never be regained. A resource is committed irretrievably when the current and/or potential productivity of that resource is lost for the life of the mine, but can be regained at some future time. Should surface coal mining operations occur in the petition area, resources would be both irreversibly and irretrievably lost. Irreversibly lost resources include: loss of geologic strata and any visually striking geologic features of the surface topography; and loss of individual animals as well as the species composition in mined areas. Irretrievably lost resources include: loss or limitation in use of a surface- or ground-water supply; and forestry, recreation, and fish and wildlife habitat land uses.

State and Federal statutes require that there can be no net loss of wetlands; therefore, they must be replaced. Historic properties, in some cases, can be physically moved and salvaged and thus preserved.

3. Inherent Adverse Effects

Should surface coal mining operations occur in the Park or in the petition area outside the Park, inherent changes to the environment could occur such as; alterations to the mined area topography, changes in land use, removal of vegetation / wildlife habitat within the mining area, alteration of soil and geologic structure, elevated levels of total dissolved solids in surface and ground water, periodic increases in fugitive dust in the localized area of the mining operation, increased sedimentation from construction of drainage control structures and roads, impacts to esthetic qualities, and noise generated from blasting and the use of heavy equipment. In addition to these inherent adverse effects, there is the possibility of a surface coal mining operation failure in the petition area, resulting in the discharge of acid mine drainage (AMD) into the waters of the Park. SMCRA provides significant environmental protection through permitting requirements

and performance standards to mitigate and/or eliminate most of the impacts listed above.

KFO's inability to determine if all coal resources had been identified in the petition area has affected KFO's ability to state with certainty the level of inherent adverse effects to the Park resources. These uncertainties alone may pose an unacceptable risk to the important natural systems, cultural, ecologic, and esthetic values of the Park.

4. The Relationship between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

If a surface coal mining operation was approved, long-term impacts to post-mining topography would be minimal. Mine sites within the petition area could be returned to their pre-mining productivity, but there could be a long-term loss of species diversity. During mining the hydrologic balance would be disturbed. Most of the impacts, however, would be short-term. The immediate impact on ground-water resources would be dependent on the type and intensity of mining within the petition area. Backfilled spoil materials could actually store and transmit major volumes of ground water. However, actual quality of such water is unknown, but would include increased sulfates, alkalinity, and various metal components. The primary impact on ground water associated with underground mining could be resource diminution resulting from subsidence of aquifers and piracy of ground water. Regulations require that any person who conducts surface mining activities that result in adverse impacts to water supplies must replace those water supplies. Mining and hauling operations could dramatically degrade the visual resources of the permit area during the short-term. During active operations, mining-related noise could have a major impact on the solitude of the areas immediately adjacent to the mine site and near the haul roads. All noise impacts would be short-term as they would cease upon completion of mining. Short term or long term economic impacts associated with mining would not be major.

5. Cumulative Impacts to the Fall Creek Falls State Park and Natural Area

NEPA regulations at 40 CFR 1508.25(a)(2) require that cumulative actions be considered in an environmental impact statement. Cumulative impacts are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Given below is KFO's evaluation of the cumulative impacts of mining in the Park and in the petition area outside the Park. This evaluation of cumulative impacts, based upon hypothetical mining scenarios, would be similar to the impacts described in the Comprehensive Impacts of Permit Decisions under the Tennessee Federal Program, OSM-EIS-18.

- " Topographic Impacts - the topography could be altered slightly creating minor cumulative effects.
- " Surface-Water Hydrology - This cumulative hydrologic impact assessment considers all existing and anticipated mining operations and addresses potential hydrologic impacts both within the petition area watersheds outside the Park and

in the Park in accordance with the requirements of 30 CFR 780.21(g).

- " Surface-Water Quantity - The overall cumulative hydrologic impacts on surface-water quantity within the petition area outside the Park and in the Park would be minor. KFO's analysis indicates that the changes in flood-flow characteristics would be minimal. It is anticipated that impacts would be relatively localized and would not result in a significant stream flow alteration or affect the surface water availability in the watershed.
- " Surface-Water Quality - The overall cumulative hydrologic impacts on surface-water quality within the petition area watersheds outside the Park and in the Park would range from water quality improvements as a result of re-mining of the abandoned mine lands in the Piney Creek and Dry Fork watersheds to moderate water quality impacts based on the contemporaneous mining which would result in increases in total dissolved solids concentrations, potentially impacting the stream biota in the Cane Creek, Meadow Creek and Falls Creek watersheds, depending on the sensitivities of the biota to mineral concentrations in the water. However, this would be a short-term, life-of-mine impact.
- " Ground-Water Hydrology - Although under the hypothetical mining scenarios in chapter V of this document, little or no cumulative impacts on ground-water users is anticipated, localized impacts to individual well users could result. However, in the event that the ground-water quality and quantity are impacted, there are two public water supplies available within the petition area which most of the residents of the petition area utilize. In addition, because of the distances between identified coal resources and potentially affected aquifers, no impacts to alluvial or karst aquifers of Cane Creek or Dry Fork are anticipated.
- " Forest and Wildlife Resource Impacts - Under the hypothetical mining scenarios discussed in chapter V, the cumulative impacts to the forest resources, including vegetative diversity and wildlife habitat could be minor. Under the routine mining and violation scenarios, elevated levels of total dissolved solids in streams could have a minor cumulative impact on the aquatic biology and users of the water in the Park. Under the abandonment scenario, the impacts could be long-term, depending on the intensity and the duration of the discharges from the site.
- " Socioeconomic Impacts - Mining in this area would not subject the infrastructure to stress or cause large employment impacts. Tax revenue to Bledsoe and Van Buren Counties could be affected should mining reduce visitation to the Park. This impact could potentially be decreased by taxes from surface coal mining operations in the petition area and employment from those operations.
- " Environmental Justice - No members of the affected community who are minority, low-income, or Native American would be disproportionately impacted

in relation to the larger community.

- " Esthetic Resources - Local residents and Park visitors could experience adverse esthetic impacts. These cumulative visual, noise and dust impacts would range from minor to major depending on the proximity of the surface coal mining operation to residential and park visitation areas.

CHAPTER VI. RATIONALE FOR THE PREFERRED ALTERNATIVE DESIGNATE SELECTED WATERSHEDS WITHIN THE PETITION AREA AS UNSUITABLE FOR CERTAIN TYPES OF SURFACE COAL MINING OPERATIONS

A. DESIGNATION OF SURFACE AREAS

Under this alternative, the Director would designate Cane Creek, Falls Creek, and Meadow Creek watersheds and that portion of the Park located within the petition area as unsuitable for all types of surface coal mining operations including surface activities in connection with underground mining operations. The Director would also designate the Piney Creek watershed, in part, as unsuitable for all types of surface coal mining operations, including surface activities in connection with underground mining operations; provided that mining could be permitted on a case-by-case basis in the headwaters of the watershed, if a portion of the proposed surface coal mining operation included areas previously disturbed by mining and the permit applicant demonstrated that water quality in the receiving stream(s) will not be degraded and that impacts from previous mining will be mitigated as a result of the surface coal mining operation. The Director would not designate any of the Dry Fork watershed as unsuitable for surface coal mining operations, based upon KFO's determination that this watershed does not meet any of the criteria set forth in 30 CFR 762.11 for designating lands as unsuitable for surface coal mining operations.

B. EVALUATION OF RISK OF DAMAGE TO RESOURCES IN THE PETITION AREA

KFO's evaluation of the five watersheds and the Park focused on significant resources within and outside the Park, based on the criteria in §522(a)(2) and (3) for designating the Park and any one watershed or combination of watersheds as unsuitable for surface coal mining operations. The significant resources considered in the evaluation of this alternative are: (1) water quality, (2) water quantity, (3) ecology, including T&E species, (4) cultural resources (including recreation), (5) esthetics, (6) environmental corridors, and (7) tourism. Other resources which were evaluated but determined not to be significantly impacted included (1) topography, (2) geology, (3) soils, (4) vegetation, (5) terrestrial wildlife, (6) climate, (7) historic resources, (8) wetlands, (9) wild and scenic rivers, (10) natural hazard lands, including flood plains, and (11) climate. Prohibiting surface coal mining operations in one watershed or a combination of watersheds would be based on the criteria in §522(a)(2) and (3). This preferred alternative is based on the: (1) risk of damage from surface coal mining operations which could affect the fragile resources within the Park and in the petition area outside the Park and (2) the incompatibility of surface coal mining operations in the petition area with existing State and local land use plans and programs as summarized below.

KFO also reviewed the record before it with respect to the level of risk to protected resources that surface coal mining operations in each of the five watersheds and the Park would pose individually and collectively. In evaluating the risk of damage from surface coal mining operations, KFO developed scenarios for each watershed that hypothesized impacts from different levels of effective AMD prediction and prevention. KFO developed three scenarios, which assumed the following types of impacts.

(1) **Impacts Associated with Routine Mining** - - SMCRA provides significant environmental protection, through permitting requirements and performance standards, to mitigate the impacts of surface coal mining operations. However, a surface coal mining operation in compliance with SMCRA may nonetheless have effects on the environment such as: changes in surface and ground-water chemistry from elevated levels of total dissolved solids and increased stream sedimentation from construction of drainage control structures and roads (including possible adverse effects on the benthic community, depending on species sensitivities); increased fugitive dust; noise from blasting and the use of heavy equipment; and impacts on esthetic qualities. These impacts are generally short-term and life-of-mine (5 to 10 years, depending on the size of the operation). However, some impacts, such as changes to water chemistry, can be long-term, depending on the duration and intensity of the operation and the dilution in the receiving stream.

(2) **Impacts Associated with Violations** - - A surface coal mining operation could have impacts resulting from errors such as improper maintenance of sediment structures, faulty implementation of the toxic material handling plan, and misidentification of acid- or toxic-forming materials during the permitting process. There is increased likelihood of error when an operator implements a complex toxic material handling plan. This could result in acid or toxic drainage even if the plan itself is adequate.

(3) **Impacts Associated with Abandonment** - - With respect to abandonment, the impacts on resources both within and outside the Park from an operation in Meadow, Falls, Cane and Piney Creek watersheds would be significant and long-term. Surface coal mining operations could potentially have an adverse impact on stream ecology including T&E species, recreational stream uses, scenic qualities of the Park's unique water features, and visitation of the areas associated with these features. Concerning surface coal mining operations in Piney Creek watershed, any adverse impacts to water quality and water dependent resources would dissipate by the time Piney Creek enters the Park because of the distance of any potential surface coal mining operations from the Park boundaries.

These scenarios reflect the risk of impacts that may result, in part, because of uncertainties in predicting and preventing AMD impacts. KFO reviewed all available information concerning the AMD impacts that may result from surface coal mining operations. However, there are significant uncertainties that are inherent in evaluating the impacts of surface coal mining operations - particularly in such a large petition area - 86,000 acres. These geological and technical uncertainties include:

- " **Location of acid- and toxic-forming materials.** The occurrence of potentially acid- and toxic-forming material associated with the coal seams of the petition area is generally uncertain, nonuniform and discontinuous throughout the petition area. Thus, KFO could not predict with certainty the locations of such materials, or the levels of risks to the Park resources under the designation criteria.
- " **Long-term success of AMD predictive and preventive techniques.** Prediction of post-mining water quality and prevention of AMD from acid-forming materials are evolving methodologies. Uncertainties exist even with those more recent permits where enhanced prediction techniques were used; and several more years of experience with these methodologies will be required to verify long-term efficacy in the petition area.
- " **Water quality alterations resulting from non-acid or non-toxic materials.** Some water quality alterations can result from surface coal mining operations in parts of the petition area that do not have acid or toxic materials. Alterations can include significant increases in alkalinity, total dissolved solids, pH, resuspension of iron from previously weathered overburdens or spoils, and generation of manganese. These alterations are associated with large-scale disruptions of strata interacting with ground and surface waters. Available information is not sufficient to predict whether any particular alterations could kill, injure, or impair biota in the areas of discharges, nor how far down stream the impacts would be.
- " **Recoverable coal reserve locations.** There is a paucity of drill hole data for this area. Thus KFO was unable to determine if all coal reserves had been identified, and cannot calculate with certainty the level of risk to Park resources under the designation criteria.
- " **Operator Error.** The success of a TMHP is contingent on several factors including: (1) adequate sampling of the overburden, (2) proper analysis of the overburden materials, (3) design for specifically handling the acid- or toxic-material, and (4) effective implementation of the TMHP. At any point in the above mentioned steps, operator error can occur and potentially result in the formation of AMD and impact the water resources of the receiving stream.

When evaluating the risk of damage to the Park from a surface coal mining operation, KFO considered the probability that the surface coal mining operation will cause damage and the impacts that could result. Thus, it is important that, although several of the impacts listed above have low probabilities of occurring, if they did occur the impacts on the Park would be significant and could be severe and the uncertainties increase the risk that OSM would not be able to predict and prevent significant impacts. Therefore, in light of the significance of potential impacts and the uncertainties that make it more difficult to predict and prevent those impacts, KFO concluded that the risk of damage from surface coal mining operations is significant as described.

As discussed in chapter IV of this document, KFO has determined that the record before it does not demonstrate that the petition area is unsuitable for surface coal mining operations under the mandatory criterion that reclamation is not technologically and economically feasible [SMCRA §522(a)(2)]. KFO also determined that the record before it did not demonstrate that surface coal mining operations would affect renewable resource lands [SMCRA §522 (a)(3)(C)], and that surface coal mining operations could affect natural hazard lands [SMCRA §522(a)(3)(D)]. However, KFO has determined that the record demonstrates that surface coal mining operations would pose an unacceptable risk to the fragile lands of the Park, in which such operations could result in significant damage to important esthetic and cultural values and natural systems [SMCRA §522(a)(3)(B)], and that such risks are incompatible with the State's land use plans and programs [SMCRA §522(a)(3)(A)]. Chapter IV discusses in detail the information KFO analyzed with respect to its determinations on the allegations made by the petitioners. The analyses in chapter IV were also used by KFO in its determinations.

C. KFO'S DETERMINATION FOR THE PREFERRED ALTERNATIVE

Based on the record, KFO made determinations relative to the risks to Park resources if surface coal mining operations were allowed in the five watersheds and the Park, as follows.

- " Cane, Meadow, and Falls Creek watersheds as well as the Park should be designated as unsuitable for mining based on the risks detailed in the abandonment scenarios in chapter V of this document. Surface coal mining operations in each of these watersheds could potentially impact the esthetic and cultural values and natural systems of the Park, as well as be incompatible with existing Park plans and programs. The record demonstrates that the water quantity of these streams is essential to the esthetic and recreational values of the Park. The water quality and quantity of Cane, Meadow, and Falls Creek are essential to the continued existence of the unique water and water-formed features of the Park, the natural values of the stream biota, the threatened and endangered species of the Park, and the esthetic values of the Park.

- " Piney Creek should receive partial designation as unsuitable for surface coal mining operations, including surface activities in connection with underground coal mining operations, except that surface mining operations would not be prohibited if some aspect of a proposed mining plan includes areas previously disturbed by pre-SMCRA mining. Applications for mining in the Piney Creek watershed would be evaluated on a case-by-case basis to determine if they meet the general requirements for remining permits. In evaluating the applicability of this proposed exception for remining, KFO would also consider such factors as maintenance and/or improvement of existing hydrologic conditions, restoration of conditions capable of supporting equal or better land uses, enhancement of fish and wildlife resources, and any other site specific factors which could further mitigate impacts from previous mining. The water quality in the headwater reaches of Piney Creek has been significantly impacted by Pre-SMCRA mining

where the majority of Pre-SMCRA mining is located. Designation with this exception would allow mining only in the upper reaches of the watershed, and would allow only those surface mines that remine previously mined areas in the Piney Creek watershed, thus minimizing any risk to Park resources. However, the Park should not be subject to the possibility of the impacts set out in the abandonment scenario in the lower reaches of Piney Creek, because the impacts of abandonment could potentially significantly damage the Park s natural systems and esthetic values, and be incompatible with the Park s plans and programs. The Piney Creek abandonment scenario in chapter V demonstrated that poor water quality discharges into the creek from such an operation in the headwaters would dissipate in the lower reaches of Piney Creek as it approached the Park boundaries. Therefore, there would be no impacts to the Park, even in the event of a remining failure in the headwaters of Piney Creek.

- " Dry Creek Watershed should not be designated as unsuitable for surface coal mining operations because mining in Dry Creek would not affect the fragile lands of the Park in which the operations could result in significant damage to the Park s important esthetic and cultural values and natural systems. Nor would mining in Dry Fork watershed be incompatible with the Park s existing land use plans and programs. Dry Fork subsides underground during low flow periods prior to entering the Park and resurfaces in Cane Creek, north of the Park, and outside the petition area. Therefore, Dry Fork watershed would not affect Park surface resources.

Designation of Cane Creek, Falls Creek, and Meadow Creek watersheds as unsuitable for all surface coal mining operations would ensure the prevention of the environmental and socioeconomic impacts described in chapters IV and V of this document. Designating Piney Creek as unsuitable for surface coal mining operations except for operations for which some aspect included areas disturbed by pre-SMCRA mining would potentially enhance the water quality of the streams in the Piney Creek watershed and improve current land uses of the watershed through the utilization of OSM remining policies and procedures.

D. CONCLUSION

When evaluating the risk of damage to the Park from surface coal mining operations, KFO considered the probability that surface coal mining operations would cause damage and the impacts that could result. Thus, it is important that, although several of the impacts in section B of this chapter have low probabilities of occurring, if they did occur the impacts on the Park would be significant and could be severe. KFO has determined that the record does not clearly demonstrate that reclamation is technologically or economically infeasible, as required for designation under the mandatory criterion. Nonetheless, the record does clearly demonstrate that surface coal mining operations would pose an unacceptable risk to the fragile lands of the park, and that such risks are incompatible with Park land use plans and programs. Because the adverse impacts could be significant, the risk to the park is unacceptable. Therefore, designation is appropriate under these discretionary criteria.

CHAPTER VII AND REMAINDER OF THE DOCUMENT

Chapter VII describes the public participation process; chapter VIII contains KFO's responses to public comments on the draft PED/EIS; chapter IX lists the individuals responsible for preparing this document; and chapter X lists the references cited. Volume II contains Appendix A (additional environmental data that KFO collected to support the analyses of the petition allegations); Appendix B (petition without exhibits); Appendix C (letters commenting on the content, conclusions, and procedural issues of the draft PED/EIS), and Appendix D (transcript of the public hearing and written versions of oral statements made at the public hearing).