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## ENVIRONMENTAL ASSESSMENT

for Amendment and Revision to

Spring Creek Mine

(SMP 79012R)

Spring Creek Coal Company

Big Horn County, Montana

February 1992

Prepared by

Montana Department of State Lands

Coal and Uranium Bureau

and

U.S. Office of Surface Mining  
Reclamation and Enforcement

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## CHAPTER I - INTRODUCTION

### A. Proposed Action

Spring Creek Coal Company (SCCC) has applied to the Montana Department of State Lands (MDSL) and the Office of Surface Mining Reclamation and Enforcement (OSM) for a permit amendment for its Spring Creek Mine, permit 79012R, in Big Horn County, Montana (Figure 1). If the amendment were approved, SCCC would:

1. Add 1,487.5 acres to the permit area (Figure 2) for additional mining across the South Fork of Spring Creek, highwall reduction, borrow areas for backfilling and reclamation material, a pond upstream on the South Fork to protect the operation from runoff, and associated disturbance.
2. Reclaim lands within the amendment area to habitats similar to the pre-mining condition. Reclamation activities in the new mine area would also include reconstruction of the South Fork channel and an alluvial aquifer to restore the hydrologic function of the South Fork valley.
3. Revise the reclamation plan in the present permit area by changing the ~~post~~-mining topography and the extent and distribution of the revegetation communities.

The Commissioner of MDSL, OSM, and the Assistant Secretary of the Interior for Land and Minerals Management must approve, disapprove, or approve with stipulations, the amendment application. The Authorized Officer for the Bureau of Land Management (BLM) must decide if the maximum economic recovery of federal coal will be achieved.

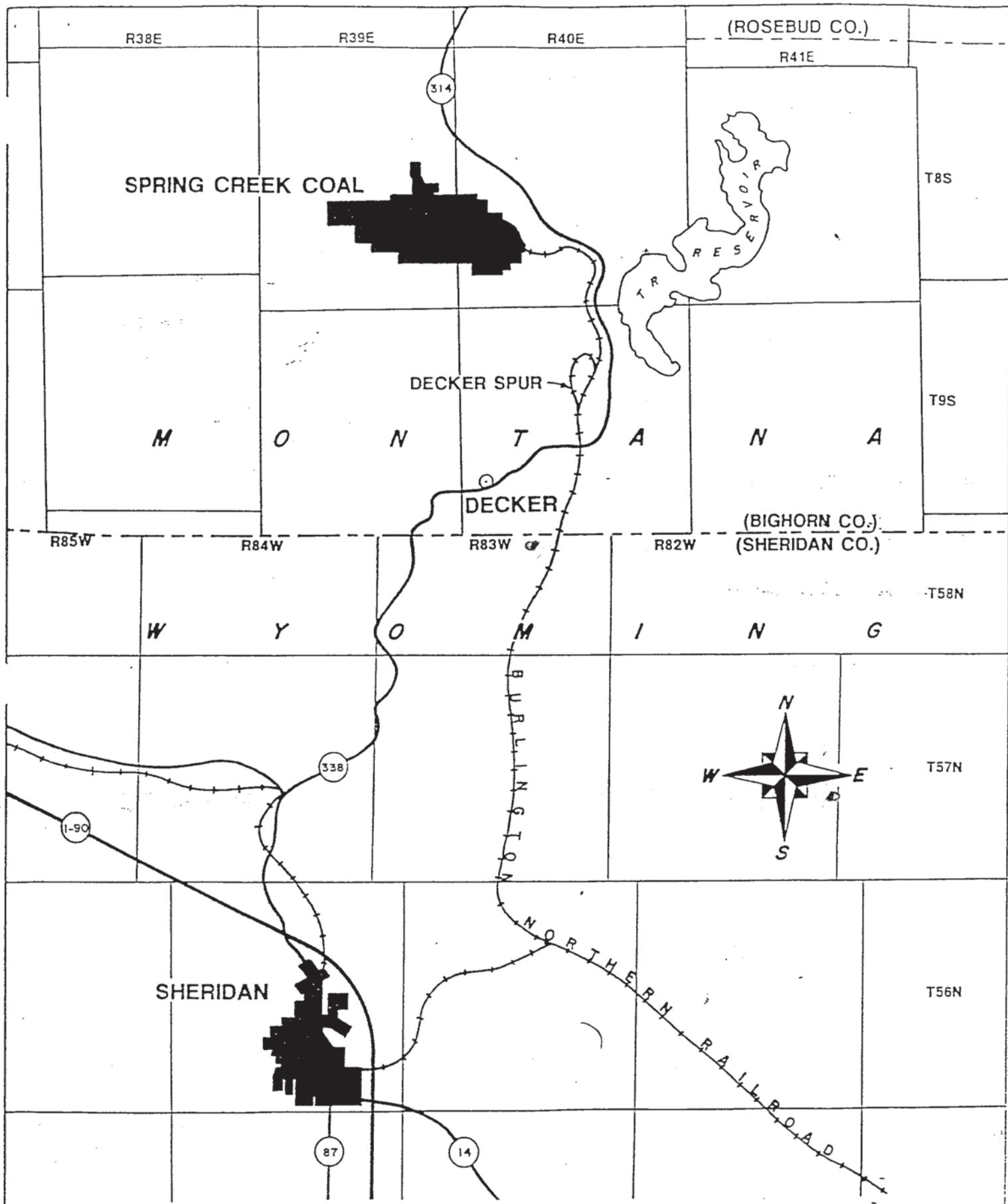
Certain parcels of the proposed amendment area south of the South Fork include lands that were designated by BLM in 1984 as unsuitable for mining because of the presence of critical mule deer and antelope winter range (criterion 15) and a golden eagle nest (criterion 11). This designation must be changed to suitable for mining, with stipulations as necessary, before disturbance of these parcels would be allowable. Such a change in designation must be approved by the BLM, the Montana Department of Fish, Wildlife and Parks (MDFWP), and the U.S. Fish and Wildlife Service.

*critical wildlife*

### B. Background

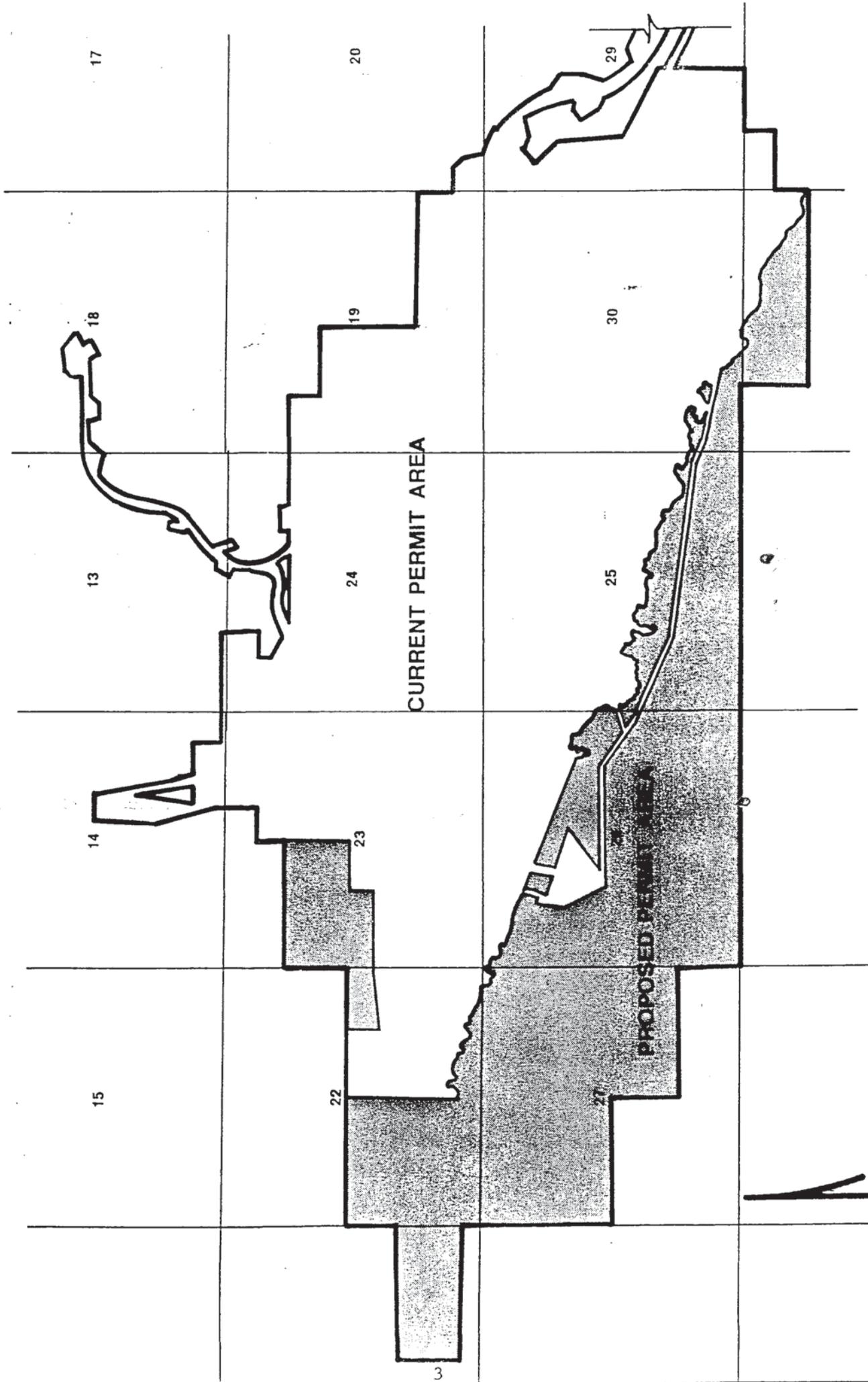
In 1979, SCCC was issued a permit to strip-mine coal in Big Horn County, Montana, about 8 miles north of the Montana — Wyoming border. The permit area occupies 3,305.6 acres in the Spring Creek Drainage in T8S, R39E, sections 13, 14, 22, 23, 24, 25, 26, 27, and 36; T8S, R40E, sections 18, 19, 20, 29, 30, 31, 32 and 34; T9S, R40E, sections 3, 10, 11, and 15. Disturbance eventually will occur on 2348.7 acres including mining, highwall reduction, facilities, roads, rail spur and loop and other associated disturbances; 1,297 acres of this will be actual mining disturbance. About 184 million tons of subbituminous coal will be removed from the Anderson-Dietz seam by 2002. The annual production is about 7 million tons.

Mining has been occurring in the area between the Spring Creek and South Fork channels. About 40 million more tons of recoverable coal lie under the South Fork and land to the south within that portion of the present SCCC lease area that the company is now proposing to add to the permit area.



GENERAL LOCATION MAP

FIG. 1



Spring Creek Coal Co.  
**PROPOSED EXPANDED PERMIT AREA**

SCALE: 1" = 0.5 MILE

FIG. 2

### C. Related Environmental Documents

The final Environmental Statement (ES) for the Spring Creek Mine was published in 1979 by the US Geological Survey (USGS) and MDSL. The original mine plan reviewed in the ES called for mining a larger area, including the area in the proposed amendment, than that finally permitted. The original plan was revised, as the Central Field Mine Plan alternative, to avoid areas along the drainages that met the geomorphic definition of alluvial valley floors, and in response to an MDSL deficiency letter and new regulations promulgated at the time. The Central Field Mine Plan is described on pages VIII-17 through VIII-62 of the ES. The ES also discusses the affected environment of the larger area, and the environmental consequences expected if the original plan had been permitted.

\* The BLM has prepared a separate environmental assessment (EA) which analyzes the impacts of revoking the unsuitability designation (BLM 1991).

## CHAPTER II - ALTERNATIVES UNDER ANALYSIS

### A. Alternative A — Disapprove

Disapproval of the amendment application is equivalent to the "no-action" alternative which must be considered under the rules and regulations implementing the National Environmental Policy Act and the Montana Environmental Policy Act (40 CFR parts 1500-1508 and ARM 26.2.628 et seq., respectively).

Under this alternative, SCCC would continue to mine coal under its existing permit (SCCC 1980 and 1985) until the permitted coal reserves (184 million tons) have been removed in about the year 2010. Concurrently with the mining activity, mined-out pits would be backfilled, and disturbed areas would be recontoured, resoiled, and revegetated in accordance with the approved reclamation plan contained in the existing permit. Reclamation would continue after mining ends until all disturbed areas have been reclaimed, and final bond release has been made. Administratively, this could be as early as the year 2025.

The selection of this alternative would not prevent SCCC from applying again in the future, nor would it necessarily keep MDSL and OSM from approving a future application.

### B. Alternative B — Approve With Stipulations

Selection of this alternative would allow expansion of the permit area by 1,487.5 acres to a total of 4,793.1 acres. All of the coal underlying the proposed amendment area is federally owned. Surface ownership of this area consists of 120 acres of federally owned land and 1367.5 acres of private land.

Mining would progress through the bed of the South Fork into the slopes on the south side of the valley. A dam would be built on the South Fork upstream of the mine to form a containment pond to protect the mine operation from runoff. Mining and associated disturbance would occur on 702.0 acres of the amendment area, increasing the total permitted disturbance to 3046.5 acres. About 40 million tons of coal would be removed from the amendment area for a mine-wide total of about 224 million tons. Life of the mine would be extended to approximately the year 2016.

Concurrently with mining activity, mined-out pits would be backfilled, and disturbed areas would be recontoured, resoiled, and revegetated in accordance with an approved reclamation plan contained in the amended permit, conditioned by stipulations (Chapter VI), if the amendment application were approved. The final pit would be backfilled by utilizing materials from the slopes and bluffs on the south side of the valley. The channel of the South Fork would be reconstructed, using selectively handled materials, to restore hydrologic function within the floodplain. Reclamation would continue after mining ends until all disturbed areas have been reclaimed and final bond release has been made. This could be as early as the year 2031.

The amendment application also contains proposed changes to the reclamation plan of the current permit area. This would involve overall changes in the post-mining topography as a result of mining and material balance experience gained by SCCC since the mine was initially permitted and because of the effects of proposed mining of the amendment area on the total material balance. The details of the revised post-mining topography reflect the need for a landscape that provides for the establishment of the post-mine vegetative communities and wildlife habitats.

## CHAPTER III - AFFECTED ENVIRONMENT

### A. Overview

The amendment area consists of a broad, flat-to-rolling valley bottom along the South Fork and the rising ground and bluffs of clinker, sandstone, and shale to the south. Elevations along the creek range from about 3,575 feet to about 3,900 feet over a distance of about 4 miles within the permit boundary. The bluffs to the south average about 300 feet higher. The overburden is 35 to 250 feet thick and consists of weakly to moderately consolidated, interbedded sandstones, siltstones, and claystones.

### B. Hydrology

#### 1. Surface Water

The Spring Creek mine amendment area is located within the South Fork Spring Creek drainage, about 3 miles northwest of its junction with the mainstem of Spring Creek. The South Fork has a drainage area of ~13.8 mi.<sup>2</sup> above the mainstem junction; the mainstem drains ~23.0 mi.<sup>2</sup> to the north. In total, the Spring Creek drainage includes ~37.2 mi.<sup>2</sup>, including ~.4 mi.<sup>2</sup> between the mainstem/South Fork junction and the Tongue River reservoir, a mile below.

Discharge records for most of the 1980's suggest that streams in the amendment area are ephemeral although precipitation for this decade was well below normal (see MDSL 1989). More persistent flow (apparently intermittent) was recorded in early (and some recent) data from monitoring sites in the South Fork (e.g. RS-3: 1976-77, 1986; RS-7 1979-80, 1982; RS-5: 1975, 1977-79); annual runoff volumes recorded at these sites have ranged from 0 to 500 acre-feet. The South Fork alluvial spring and "perennial" flow reach discussed (but not specified) in the ES have not been evident in recent monitoring, but may have occurred in the reach below Burt's pond (PS-13) where water levels in the alluvium were highest during wetter years.

Five stockponds (constructed in the 1940's) occur along the South Fork within the proposed amendment area. One of these ponds was breached or otherwise rendered non-functional probably well before the mine existed. Two other ponds were breached during the late 1970's; these two were repaired in the early 1980's by SCCC.

In 1981, MDSL determined that a portion of the South Fork of Spring Creek was an insignificant alluvial valley floor (AVF) as defined in the Montana coal program regulations (ARM 26.4.325). On the basis of an evaluation of the AVF status of the South Fork and more recent data, SCCC petitioned MDSL to reverse the 1981 AVF decision. MDSL reevaluated that decision in association with the new data; the original decision was upheld (MDSL, 1989).

#### 2. Groundwater

Well hydrographs from the 1980's for the South Fork of Spring Creek indicate a major source of recharge to the alluvial aquifer from stockponds. The unconfined aquifer receives additional recharge by infiltration of rain and snowmelt from ephemeral tributaries to the South Fork of Spring Creek. The South Fork of Spring Creek was determined an insignificant alluvial valley floor pursuant to state regulations.

Mean annual discharge through the alluvium is approximately 94 acre-feet/yr. Water primarily flows through clayey and silty gravel at the base of the alluvium. The maximum rate of leakage at the base of the alluvium into the overburden is 15 acre-ft/yr. This water eventually recharges the Anderson-Dietz coal. East of the present permit boundary, alluvial water discharges downgradient to underlying permeable clinker.

Drawdown water level measurements from 1985 through 1989 of the Anderson-Dietz coal in wells close to the pits approximate ( $\leq 3.1$  feet) predictions determined by Spring Creek Coal Company. Wells further away exhibited less drawdown than predicted in 1985. This may indicate preferential flow paths or a greater amount of recharge from Pearson Creek to the south than previously thought.

Water quality in the alluvial aquifer is below irrigation standards but acceptable for stock watering. The mean conductivity of 122 samples is 2708 umhos/cm. Water quality in the alluvial aquifer deteriorates downgradient.

### C. Vegetation

Vegetation on the amendment area is dominated by big sagebrush and grass. Closed and open stands of ponderosa pine and Rocky Mountain juniper are also present. Detailed descriptions and maps of the vegetation types, and a complete list of species reported from the amendment area, are found in the amendment application (SCCC 1990). Table 1 lists vegetation types and their acreages.

Table 1. Vegetation Types of the South Fork Amendment and Acreages

Type	Disturbed	Proposed Undisturbed	Total
Artemesia cana	26.3	21.1	47.4
Artemesia tridentata/Agropyron spicatum	155.1	291.6	446.7
Artemesia tridentata/Agropyron smithii	257.3	96.3	353.6
Agropyron smithii	19.0	22.4	41.4
Grass-Halfshrub-Forb	62.8	72.6	135.4
Pine-Juniper open	90.7	119.5	210.2
Pine-Juniper closed	21.0	40.8	61.8
Rhus trilobata	0.3	2.0	2.3
Drainage bottom	11.0	26.4	37.4
Shallow shaley	53.8	55.6	109.4
Planted	2.5	34.5	37.0
Revegetated	0.5	2.7	3.2
Pond	<u>1.7</u>	<u>0.0</u>	<u>1.7</u>
Total	702.0	785.5	1,487.5

There are no federally listed threatened or endangered plant species known from the area. However, one species observed, Astragalus barrii Barneby, is listed by the Montana Natural Heritage Program as a species of concern in the state (MNHP 1991b). It is considered to be imperiled in Montana, because of its association with Fort Union formation coal fields, and very rare throughout its range.

### D. Wetlands

The vegetation baseline information provided by SCCC (1990) was reviewed and a recent

brief field examination was conducted by MDSL to ascertain whether the stockponds (1.7 acres total; Table 1 above) discussed in Section B of this chapter could be considered wetlands. These efforts indicated the predominant vegetation includes forbs such as fanweed, kittentails, curleydock, cocklebur, tumbling mustard, and Canada thistle (noxious); perennial grasses such as foxtail barley and wheatgrasses (including tall, crested, western, and slender); and annual grasses (Japanese brome and cheatgrass). Some minor components observed in the recent field visit included basin wildrye, a perennial bunchgrass and boxelder, a mesic-site tree. The plant species composition of the ponds varies yearly due to changes in the moisture regimes of the ponds from year to year.

Water volumes in these ponds reflect ephemeral surface runoff in the South Fork which occurs in response to snowmelt and seasonal precipitation. The ponds are therefore seasonal in nature. Three of these ponds were dry by midsummer of 1991 (1991 revisions to vegetation baseline information; SCCC 1990) and the recent field visit indicated the ponds were dry except for one (different from the wet pond in midsummer) that had ice in the bottom.

As a result of these observations, MDSL and OSM do not believe that these ponds constitute wetlands.

#### E. Wildlife

Wildlife habitat types roughly correspond to vegetation types. More than 150 species of amphibians, reptiles, birds, and mammals have been reported from the amendment area and its vicinity. Complete species lists are found in the amendment application (SCCC 1990).

The bluffs along the south edge of the proposed amendment area are dominated by ponderosa pine, Rocky Mountain juniper, sagebrush/grasslands, grass/half shrub/forb and shallow shaley vegetation types. This area provides winter range for mule deer and sage grouse, nesting and perching sites for raptors, and habitat for numerous songbirds and small mammals. This is part of an area of about 880 acres designated by the BLM to be unsuitable for mining due to the presence of critical mule deer and antelope winter range and of a golden eagle nest (BLM 1991) This issue is further discussed in Section G below.

The bald eagle, peregrine falcon and black-footed ferret are the only endangered species that could potentially occur in the region within which the Spring Creek Mine is located. Bald eagles concentrate their activities near the Tongue River Reservoir but have been sighted within the study area (the permit area plus a two mile buffer around it). Two bald eagle nests have been documented during wildlife surveys; however, these nests are more closely associated with the Tongue River Reservoir and are outside the wildlife study area.

One sighting of a peregrine falcon was recorded during the baseline study (9/76) in a tree in riparian habitat along the Tongue River. This sighting was made on the southeastern edge of the study area, approximately two miles from the permit area boundary. No other sightings have been recorded.

Two prairie dog towns have been mapped in the southern portion of the study area; one in the SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec.34, T8S, R39E and the other in the SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec.31, T8S, R40E; both are 3/4 to one mile from any proposed disturbance. No sightings of black-footed ferrets have been documented for either of these locations.

Several animals listed by Montana Natural Heritage Program (MNHP) as species of special concern in the state (MNHP 1991a) were reported in the amendment application (SCCC 1990). Table 2 lists these species and their ranks.

Table 2. Animal Species of Special Concern Recorded in Spring Creek Mine's Wildlife Study Area  
State Rank/Global Rank<sup>1</sup>

Reptiles:	
Snapping turtle ( <u>Chelydra serpentina</u> )	S3/G5
Spiny softshell ( <u>Apalone spinifera</u> )	S3/G5
Birds:	
Common loon ( <u>Gavia immer</u> )	S3/G5
American white pelican ( <u>Pelecanus erythrorhynchos</u> )	S2/G3
Long-billed curlew ( <u>Numenius americanus</u> )	S4/G5
Bald eagle ( <u>Haliaeetus leucocephalus</u> )	S3/G3
Ferruginous hawk ( <u>Buteo regalis</u> )	S3/G4
Peregrine falcon ( <u>Falco peregrinus</u> )	S1/G3
Swainson's hawk ( <u>Buteo swainsoni</u> )	S4/G4
Eastern bluebird ( <u>Sialia sialis</u> )	S3/G5
Mammals:	
Townsend's big-eared bat ( <u>Plecotus townsendii</u> )	S2/G4

<sup>1</sup> 1=critically imperiled; 2=imperiled; 3=very rare; 4=apparently secure; 5=demonstrably secure

#### F. Cultural Resources

Five cultural resource sites have been located on or near the proposed amendment area (SCCC 1990): three campsites, one lithic scatter, and one rock art site. All five sites are eligible for listing on the National Register of Historic Places. Full data recovery has been achieved on all sites.

#### G. Federal Land Use Plans

SCCC petitioned the BLM early in 1991 to start a process of changing the designation of certain lands within the proposed amendment area from unsuitable for mining to suitable, with stipulations as necessary (see Chapter I). This process has involved (a) the development of a mitigation plan for disturbance of those lands designated as critical mule deer and antelope winter range, (b) consultation with the USFWS on the golden eagle nest, and (c) the preparation of an EA by the BLM (1991) on the proposed redesignation.

SCCC requested that 228 acres of a total of 880 acres that have been designated as unsuitable for mining since 1984 be redesignated as suitable. Only 20 acres of this request would be directly disturbed by coal extraction as proposed in the amendment application. Remaining disturbance would consist of highwall reduction, roads, a soil stockpile, and drainage control (BLM 1991).

SCCC documented that the golden eagle nest was destroyed naturally in 1981 and that no further nesting attempts at this site by golden eagles has occurred since that time. The USFWS was consulted and agreed that the unsuitability designation under criterion 11 for the nest site may be withdrawn (BLM 1991).

The BLM applied unsuitability criterion 15 for critical mule deer and antelope winter range to lands in the amendment area on the basis of studies during the winter of 1976-77 (BLM 1991). SCCC, in consultation with the MDFWP and the BLM, has developed a mitigation plan in an attempt to change the unsuitability designation. This plan involves the implementation of a rest-rotation grazing system and the establishment of a controlled hunter access program on lands adjacent to the mine that are owned and/or controlled by SCCC. These programs will be expanded to the lands disturbed by mining after mining and reclamation are complete and approval of MDSL and OSM is granted. The objective of this mitigation plan is to maintain and improve big-game wildlife habitat on the affected lands. Additionally, SCCC must also develop a plan that addresses the reclamation of appropriate habitat in the proposed amendment area heretofore designated as unsuitable for mining. This entire mitigation package has been approved by the MDFWP (letter of January 7, 1992 from Richard Ellis, MDFWP to Sandy Sacher, BLM). Formal BLM approval of the proposed change in designation of the affected lands is expected shortly.

## CHAPTER IV - ENVIRONMENTAL CONSEQUENCES

This chapter examines the effects of the alternatives on the affected environment.

### A. Alternative A - Disapprove

Under this alternative, currently permitted mining and reclamation would continue. Disturbance would stop on the north side of the South Fork and not proceed into the proposed amendment area. The 702.0 acres of additional disturbance proposed in the application would not occur. About 40 million tons of recoverable coal would be left and may not be economically recoverable in the future.

The impacts to soils and overburden, hydrology, vegetation, wildlife, and cultural resources described under Alternative B would not occur.

### B. Alternative B - Approve With Stipulations

#### 1. Amendment Area

##### a. Hydrology

##### (1) Surface Water

The proposed amendment would include mining-related disturbance and reclamation of approximately 8400 feet of the South Fork Spring Creek channel, and of a shorter reach (~1200 feet) for the proposed South Fork flood control impoundment upstream of mining. Proposed mining disturbance through the South Fork channel and into the steep slopes to the south would add approximately 700 acres of surface disturbance (including highwall reduction) to the existing mine plan. Pit disturbance would account for ~340 acres of the above disturbance, with the additional amount resulting from highwall reduction to the south, and an ~130 acre borrow area extending across steep slopes and drainages southeast of proposed mining. In addition, revisions to the approved reclamation plan would affect most of the current mine permit area within the mainstem and South Fork drainages, as a result of this proposed amendment. Spring Creek will be required to reevaluate the overburden mass balance and to explore reclamation alternatives that could reduce surface disturbance (see Chapter VI - Stipulations).

During proposed mining and reclamation of the South Fork channel, ephemeral runoff from the upper portion of the South Fork drainage (~6.9 mi.<sup>2</sup>) would be intercepted by the proposed South Fork flood control reservoir. Long-term storage in the 230 acre-foot reservoir is to be limited to ~10 acre-feet, to maintain flood control during operations. Water in excess of this volume would be discharged to the South Fork pit (for temporary holding). This water would then be pumped, as necessary, into the mine's three water storage ponds, three traps and Sediment Pond 1 for mine use (e.g., dust control). Excess South Fork runoff would be discharged to the mainstem Spring Creek from Sediment Pond 1. This water handling scheme could result in additional storage of up to ~150 acre-feet of South Fork runoff.

Reclamation proposed for the disturbed reach of the South Fork channel includes replacement of the irregular, incised active channel and floodplain complex with a small meandering trapezoidal channel (10-year, 24-hour peak flow) within a larger trapezoidal channel with a regular meander

(100-year, 24-hour floodplain).

Four intact stockponds and one breached stockpond in the amendment area would be removed by mining and related activities. The four intact ponds may have value as surface seasonal water sources for livestock and wildlife. Also, these ponds have apparently been sources of alluvial aquifer recharge in the South Fork. In the amendment application, SCCC has committed to evaluate, in consultation with MDSL, replacement of these features within one year of issuance of a permit for the amendment proposal. (The reader is referred to Chapter III, Section D. and this chapter under 1.c. regarding wetlands for additional discussion of the ponds.)

## (2) Groundwater

The proposed reclamation plan involves reconstruction of the alluvial aquifer by placing 0.31-0.63 inch crushed and screened gravel into a disturbance-long trough 197 feet wide and 4 feet deep. Within the 10-year channel, the top of the gravel would underlie 4 feet of suitable root material. The characteristics for the proposed reclaimed alluvial aquifer and the existing alluvial aquifer are listed in Table 3.

Table 3. Existing and proposed (reconstructed) alluvial aquifer characteristics for South Fork of Spring Creek.

Aquifer	Conductivity (mean in gpd <sup>2</sup> /ft <sup>2</sup> )	Transmissivity (gpd <sup>2</sup> /ft)	Specific Yield (%)	Cross-sectional area (ft <sup>2</sup> )	Porosity (%)
Existing	1700	28000	7	≈ 2250	45
Proposed	10000	40000	15-30	749	32

\* gallons/day

Recharge enhancement would occur through the construction of shallow gouges in the 10-year channel. Evaluating replacement of mined stock ponds or an acceptable alternative promoting aquifer recharge to pre-mine levels is a component of the reclamation plan. Saturation of the reconstructed aquifer would require 6-8 years.

The proposed reconstructed alluvial aquifer would be capable of transmitting the estimated pre-mine discharges. However, the effects of transmitting the annual discharge of groundwater through a smaller cross-sectional area with a much higher hydraulic conductivity are difficult to predict (Table 3). Average groundwater velocity would be greater by a factor of four in the reconstructed aquifer than in the existing alluvial aquifer. The reconstructed aquifer would yield more water than the native aquifer, but the total amount of water in storage would be less in the reclaimed aquifer than the existing aquifer.

Proposed construction of a 3-foot thick compacted layer of clay beneath the replaced gravel aquifer would likely inhibit vertical leakage ( $\leq 15$  acre-ft/yr) to the underlying spoil, similar to pre-mine bedrock conditions. Monitoring wells in the alluvial and Anderson-Dietz aquifers removed by mining would be replaced with monitoring wells in the reconstructed aquifer.

Enlargement of the present operation would locally increase the existing cone of depression in the Anderson-Dietz coal aquifer. This short-term effect would be greatest to the south where the coal has not been faulted or removed by burning and where the West Pit (Pit 1) will intercept thicker saturated areas. The predicted 10-foot drawdown isopleth extending south  $\approx 3500$  feet from the West

Pit and the East Pit (Pit 2) through the year 1995 may under-predict potential drawdown (SCCC, 1990). The current 10-foot drawdown isopleth is  $\approx$ 5100 feet south of the West Pit and  $\approx$ 6250 feet south of the East Pit (SCCC, 1991). No known existing water supplies would be affected by drawdown in the Anderson-Dietz coal aquifer.

Degradation of water quality in the alluvial aquifer would occur during initial saturation of the screened gravel. Leaching of salts from the clinker gravel would likely increase the total amount of sulfates and total dissolved solids in the alluvial water above current levels. Following transmittal of initial pore volumes through the reclaimed aquifer, water quality should improve.

An alluvial spring in the South Fork of Spring Creek, approximately two miles downgradient of the mine and a few hundred feet upgradient from the junction of the main fork of Spring Creek with the South Fork, appears to be a local phenomenon, receiving recharge from the adjacent area. The enhanced ephemeral spring provides water for stock and wildlife during the spring. Mining impacts to the spring from the South Fork amendment proposal would be remote.

#### b. Vegetation

Predominantly native species would be used to establish vegetative cover and production following the redistribution of soils. The basic communities would be shrub/grasslands and pine-juniper stands. Table 4 lists the vegetation types to be established and their acreages. Maps showing the locations of the types on the reclaimed landscape are found in the amendment application (SCCC 1990).

The recent South Fork Amendment area vegetation baseline inventory identified two types that have no proposed post-mining revegetation equivalent. These are the grass/half shrub/forb (GHF) and shallow shaley types. The location and the forb component of these types indicate that they potentially provide important spring and early summer dietary requirements for mule deer, antelope, and grouse. Therefore, the Department would require, in the form of a stipulation if the application is approved, the development of a plan to replace these types by a post-mining type designated as GHF/SS (see Chapter VI.). This plan would also include the development of measures to reestablish Astragalus barrii Barneby in appropriate locations.

Table 4. Proposed Reclamation Vegetation Types for the South Fork Amendment and Acreages

Artemisia cana/Drainage bottom	29.5
Rhus trilobata type	20.0
Sage/Grassland	526.2
Pine-Juniper type	92.4
Pine-Juniper planting	31.3
Rhus planting	1.6
Artemisia tridentata concentration	1.0
GHF/SS	*
Total	702.0
Shrub mosaic seedings **	64.8

\* The acreage value for this type is not available until the stipulation associated with the reclamation of the GHF/SS type is addressed (see Chapter VI). The delineation of an average figure for this type will necessitate a reduction, accordingly, in the sage/grassland type.

\*\* These will be placed in patches on 10% of the Artemisia cana/drainage bottom, sage/grassland,

and pine-juniper types.

Species diversity would be reduced into the long term since revegetation standards are based on the few very common/dominant species and not the total pre-mine species complement. Over an extended period of time, invasion of plants from undisturbed areas and successional processes could improve species diversity and the variety of vegetation types.

In view of the specific ecological requirements of ponderosa pine, Rocky Mountain juniper and some select shrub species, it is possible that these species will be lost as self-sustaining/regenerating populations on disturbed portions of the mine area for an undetermined period of time. To enhance the probability of establishment, survivorship and regeneration of these species within a reasonable time period, the use of intensive reclamation strategies will be required. Currently proposed strategies include: selective soils handling, planting of seedlings and seed derived from locally adapted and genetically diverse sources and recontouring to diversify the topography and create macro- and micro-habitats tailored to specific species requirements. Additional management strategies that may be considered include, but are not limited to: protection from predation, regulation of understory competition and mycorrhizae inoculation of individual seedling plantings.

Without information to the contrary at this time, it is assumed that some portions of the riparian communities below the limit of mining in the South Fork would be adversely affected when water flow is disrupted. Decreases in vegetation productivity and elimination of deciduous trees and shrubs would occur. The integrity of riparian communities could be restored if alluvial groundwater supplies and surface water flows develop appropriately following reclamation. The company would be required by stipulation, if the application is approved, to monitor for and remedy any detectable problems requiring mitigation that occur to species downstream from the mining operation (see Chapter VI).

c. Wetlands

There will be no impacts on wetlands in the proposed amendment area, because no wetlands have been identified.

d. Wildlife

The steep, rugged topography along the southern edge of the permit area would be disturbed under the current mine plan. Critical mule deer winter range and sage grouse winter concentration areas would be disturbed. The proposed reclamation plan has been designed to approximate this steep and varied topography. In the short term, the reclaimed landscape and vegetative composition would be much simplified compared to the pre-mine condition. The reduced structural diversity of the reclaimed vegetation types would reduce the wildlife species diversity. As the woody species mature, succession advances, and natural weathering processes create microhabitats, the pre-mine utility of the site to wildlife should be reestablished. If the application is approved, SCCC would be required by stipulation to investigate the possibility of incorporating bluff extensions into the reclamation plan as a means of reducing the amount of disturbance to native land and further enhancing the wildlife habitat potential (see Chapter VI).

There would be no impact to endangered wildlife species. Any bald eagle activity is concentrated near the Tongue River Reservoir, well outside the permit area. A single sighting of a peregrine falcon in 1976 suggests that this species would not be affected by mining. The presence of

black-footed ferrets has not been recorded at either of the two prairie dog towns located south of the permit area.

Most of the Species of Special Concern (Table 2) are associated with the Tongue River Reservoir or are not considered rare or imperiled in Montana and would not be affected adversely by the proposed amendment. The ferruginous hawk is ranked as very rare in the state but, like the peregrine falcon, has only been sighted once (5/76) during wildlife surveys over the years, and therefore should not be affected by the proposed amendment. The eastern bluebird (ranked very rare in the state) is an infrequent visitor which would find suitable habitat in adjacent areas. One individual female of Townsend's big-eared bat (ranked as imperiled in the state) was collected during baseline studies (1976). No specific surveys have been conducted for this species since that time. Rock outcrops in the proposed amendment area could serve as roosting habitat, either night roosts for both sexes or day roosts for male bats. Roosting sites are not as critical to this species as maternity sites, and although disturbance in this area would likely cause relocation of roosting sites, any existing population would probably not be jeopardized (personal communication with Tom Lemke, MDFWP, January 23, 1992).

#### e. Cultural Resources

The three campsites and the lithic scatter would be destroyed by mining. The effect of the loss of these sites could be primarily the loss of their scientific research potential. The detailed testing performed already has resulted in the recovery of the data from each site, effectively mitigating the impact of mine-related disturbance.

The rock art site would not be disturbed directly, but indirect disturbance by blasting is possible. Although complete recordation of this site has occurred, the site should be monitored during mining for any indirect adverse effects. A stipulation to this effect would be added to a permit, if granted for the amendment (see Chapter VI).

To achieve final concurrence with state and federal regulations, SCCC would be required by stipulation to complete and submit final mitigation reports on the above sites within a reasonable time period. In addition, the protection and mitigation, as necessary, of any heretofore undiscovered cultural or historic resources that are found during the course of the proposed mining and reclamation operations would be required of SCCC (see Chapter VI).

#### f. Federal Land Use Plans

The BLM (1991) has determined that the redesignation of 228 acres of lands south of the South Fork from unsuitable to suitable (with an approved mitigation plan) for mining or related disturbance and the subsequent disturbance and proper reclamation of these lands is not expected to have serious impacts upon mule deer or antelope populations.

### 2. Present Permit Area

The reclamation plan of the present permit area would change as a result of this proposed amendment. The initial amendment application involved a marked subduing of the post-mining topography from the presently approved plan. This was due to (a) a reassessment of material balance of the mine based upon a decade of mining experience, and (b) a redistribution of materials because of the proposed additional mining. Review of the proposed revised post-mining topography by MDSL indicated that considerably more diversification was necessary to provide for the establishment

needs of various vegetative communities and wildlife habitats.

The plan was subsequently changed by SCCC. The currently proposed plan exhibits considerably more drainage density than either the presently approved plan or the original proposed revision. This has resulted in a larger proposed quantity of the silver sage and drainage bottom revegetation types than currently approved. Also a more varied terrain and the inclusion of steeper slopes characterize the current proposal compared to the original proposal.

Other changes in the revegetation plan in the present permit area are also proposed. The pine/juniper type, big sagebrush concentration areas, and skunkbush sumac concentration areas would all increase appreciably in extent and/or distribution compared to the currently approved plan. This is due to better definition of the revegetation types and/or the need for increased acreage/distribution of them in relation to the proposed revised post-mining topography.

In contrast, the skunkbush sumac type and the pine/juniper type (concentrated) planting areas would be reduced considerably, the former by about 80%. This is due to a reevaluation of the actual occurrence of these types on the premining landscapes as they are now thought to exist or did exist before disturbance.

The sagebrush/grassland type would increase in extent as a net result of the changes described above. Finally, a new type, drainage species plantings (in select areas), is proposed; this type should enhance drainage bottoms for wildlife use.

The proposed new reclamation plan for the present permit area is not expected to have any adverse impacts additional to the presently approved plan. It is expected to provide for the establishment of vegetative communities and wildlife habitats in a more balanced and realistic way than the presently approved plan. In the case of the new drainage species planting type, wildlife habitat would be enhanced.

## CHAPTER V - CONCLUSIONS AND RECOMMENDATIONS

MDSL and OSM have determined that the proposed amendment, as stipulated, would have no additional significant impacts that have not already been addressed by the original ES. Therefore an EIS on this amendment is not necessary.

## CHAPTER VI - STIPULATIONS

26.4.313(3) and (4), 314(1), 631(1) and (2): Within one year of the approval date of this permit amendment, Spring Creek Coal Company must, in consultation with the Department, reevaluate the post-mining contour plan of the disturbed area to determine if viable alternatives are available for reducing the limits of proposed disturbance in the terrain south of the South Fork of Spring Creek. This reevaluation may include an examination of bluff extension feasibility and of alternatives for redistribution of spoils within any portion of the total operation.

The final recontour plan, as approved by the Department, must include a quantitative materials balance which indicates that the plan can be physically achieved. All applicable portions of the permit (maps, narrative, etc.) must be revised in accordance with the approved plan.

The final plan must also be consistent with the revegetation communities, in terms of their acreage and locations, required to be replaced on the disturbed area.

26.4.313(5), 711, 312(1)(a), 751(2)(e): Within 6 months of the approval date of this permit amendment, Spring Coal Company must, in consultation with the Department, develop a plan for establishment of a revegetation community (designated as GHF/SS) in the amendment area that will replace the pre-mining community types known as grass/half shrub/forb and shallow shaley. This plan should include, but not be limited to, development of microtopographic sites, specialized soil handling, the development of appropriate seed mixtures and planting strategies, and the development of plans for reestablishment of plants of limited occurrence, especially Astragalus barrii, Barneby.

82-4-231(1), MCA and ARM 26.4.711: Within 6 months of the approval date of this permit amendment, Spring Creek Coal Company must develop, in consultation with the Department, a plan for monitoring the plant species in the riparian community in the South Fork of Spring Creek downstream of the mining operation for the purpose of determining adverse effects, if any, that any species may sustain as a result of the interception of runoff by the mining operation. The plan must also include a strategy for mitigating or reversing these effects, as necessary, if they occur.

26.4.304(2), 1131: No later than December 31, 1992, Spring Creek Coal Company must submit final mitigation reports for the five cultural resource sites that are in or near the amendment area and that are eligible for listing on the National Register of Historic Places.

26.4.1131: If, in the course of mining, Spring Creek Coal Company encounters any previously unrecorded cultural or historic resource site(s), it must immediately contact MDSL, OSM, and SHPO and take appropriate action.

Spring Creek Coal Company must monitor the rock art site, 24BH-2529, on at least an annual basis to determine if this site is being affected indirectly by blasting activity adjacent to the site. The results of this monitoring must be reported to the Department annually or immediately if any damage becomes evident.

## CHAPTER VII - CONSULTATION AND COORDINATION

### A. Agencies Consulted

Montana Department of Fish, Wildlife and Parks  
Montana State Historic Preservation Office  
USDI Bureau of Land Management

### B. Preparers

#### MDSL

Greg Hallsten, Environmental Coordinator  
Neil Harrington, Permitting Supervisor  
Lynn Woome, Soils  
Tom Golnar, Surface Water Hydrology  
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Kyle Wendtland, Vegetation  
Shannon Heath, Wildlife  
Bob Bohman, Cultural Resources  
Claudia Furois, Word Processing Technician

#### OSM

Floyd McMullen, Environmental Project Manager

## CHAPTER VIII - REFERENCES

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