0061

United States Department of Agriculture | Forest Service | Intermountain Region | 324 25th Street Ogden, UT 84401-2310

Reply to: 2820

Date: October 22, 1993

Mr. James M. Parker
Utah State Director
Bureau of Land Management
P.O. Box 45155
Salt Lake City, UT 84145-0155

Dear Jim:

Enclosed for your approval and signature is the combined Bureau of Land Management/Forest Service Finding of No Significant Impact and Decision Notice (FONSI/DN), etc., for the Federal Coal Lease Application UTU-68082, (Crandall Canyon Tract). The Office of Surface Mining Reclamation and Enforcement (OSMRE) participated as a cooperating agency. This lease application was made by Genwal Coal Company. The Environmantal Assessment (EA) for the subject lease application is also enclosed.

The enclosed FONSI/DN has been signed by the Forest Service and constitutes the Forest Service's consent to lease the proposed tract subject to the special coal lease stipulations included in Appendix B of the above referenced EA.

Two copies of the FONSI/DN, signed by the Forest Service, are provided for your signature. Once you sign them, please return one of the copies with original signatures to the Regional Forester's Office for our records. We will forward a copy of the document to the involved National Forest.

Sent 10/28/93

In accordance with Secretary of Agriculture Appeal Regulations at 36 CFR 217, this decision is subject to appeal within 45 days of the date of publication of this Decision Notice. If we receive a timely appeal, we will notify you immediately.

Sincerely,

for GRAY F. REYNOLDS
Regional Forester

Enclosures

cc:
Manti-LaSal NF

UTAH STATE OFFICE
RECORDS MANAGEMENT

INT	OFFICE	INIT	DATE
	SD		
	ASD		
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	ACTION		COMMENT
	INFORMATION		COORDINATE
	CIRCULATE		APPROVAL

COMBINED BUREAU OF LAND MANAGEMENT/FOREST SERVICE
FINDING OF NO SIGNIFICANT IMPACT/DECISION NOTICE/RATIONALE

GENWAL COAL COMPANY LEASE APPLICATION UTU-68082
CRANDALL CANYON TRACT

USDA FOREST SERVICE, INTERMOUNTAIN REGION
MANTI-LA SAL NATIONAL FOREST
FERRON AND PRICE RANGER DISTRICTS

USDI BUREAU OF LAND MANAGEMENT, MOAB DISTRICT
UTAH STATE OFFICE

EMERY COUNTY, UTAH

An Environmental Assessment (EA) which discusses the effects of leasing the Crandall Canyon Tract (Lease Application UTU-68082) was prepared jointly by the Forest Service and Bureau of Land Management. The Office of Surface Mining Reclamation and Enforcement participated as a cooperating agency. The decisions recorded in this document are based on the environmental analyses documented in the Environmental Assessment for the tract; the Final Environmental Impact Statement, Manti-La Sal National Forest (Forest Plan FEIS), 1986; and Final Environmental Impact Statement for the San Rafael Proposed Resource Management Plan, 1989. The Environmental Assessment for Coal Lease Application UTU-68082, Crandall Canyon Tract is available through the Forest Supervisor's Office of the Manti-La Sal National Forest in Price, Utah and the Bureau of Land Management, Utah State Office in Salt Lake City, Utah.

Genwal Coal Company applied to the Bureau of Land Management for leasing of 1,974.39 acres under the Lease-on-Application process contained in Federal Regulations 43 CFR 3425 to extend the life of their existing Crandall Canyon Mine. In response to the application an interagency team delineated the Crandall Canyon Tract to be considered for leasing. The delineated tract encompasses 3,384.02 acres of Federal coal on lands administered by the Manti-La Sal National Forest. It lies directly adjacent (west, north and east) to the approved permit area for Genwal Coal Company's Crandall Canyon Mine. The tract would be accessed from underground workings in the adjacent mine. The Bureau of Land Management in consultation with Genwal Coal Company has determined that new surface facilities would not be required to efficiently and economically mine coal from the tract using underground mining methods.

The tract area evaluated for leasing includes the northernmost portion of a previous coal lease application area submitted by Mining and Energy Resources, Inc. (MERI). The evaluated tract was delineated to provide for potential future delineation of a competitive tract to the south, including most of the area included in MERI's application.

The proposed action is subject to the following authorities: Mineral Leasing Act of 1920 as amended; Federal Coal Leasing Amendments Act of 1976 (FCLAA), as amended; Multiple-Use Sustained Yield Act of 1960; National Forest Management Act of 1976 (NFMA); National Environmental Policy Act of 1969 (NEPA); and Federal Regulations 43 CFR 3400. Development of the lease, which is a separate permitting action, would be subject to these actions and the following: Federal

Land Policy and Management Act of 1976 (FLPMA); Surface Mining Control and Reclamation Act of 1977 (SMCRA); Federal Regulations 30 CFR 700 to End (SMCRA Regulations), and the State of Utah Coal Mining and Reclamation Regulatory Program.

The BLM lease decision and Forest Service consent decision are to offer the tract for leasing as discussed under Alternative C described in the EA prepared for the tract. The tract to be offered for leasing under this alternative is described as follows:

T. 15 S., R. 6 E., SLM, Utah	
Section 25: S1/2;	320.00 acres
Section 26: S1/2;	320.00 acres
Section 35: Lots 1-4, N1/2, N1/2S1/2;	639.80 acres
T. 15 S., R. 7 E., SLM, Utah	
Section 30: Lots 7-12, SE1/4;	362.47 acres
Section 31: Lots 1-12, NE1/4, N1/2SE1/4, SW1/4SE1/4;	685.72 acres
T. 16 S., R. 6 E., SLM, Utah	
Section 1: Lots 1-12, SW1/4;	528.48 acres
T. 16 S., R. 7 E., SLM, Utah	
Section 6: Lots 2-4, SW1/4NE1/4.	123.02 acres
TOTAL	2,979.49 ACRES

This alternative would involve offering that portion of the delineated tract for lease which lies east of the Joes Valley Fault with the inclusion of 20 Forest Service Special Stipulations, including the Stipulation for Lands of the National Forest System Under Jurisdiction of the Department of Agriculture, in addition to standard lease terms (BLM Lease Form 3400-12). The Forest Service Special Stipulations are attached. That portion of the delineated tract which lies west of the Joes Valley Fault would not be included due to the absence of ground water data and the complexity of the ground water system that limits our ability to predict mining related impacts to the hydrology of the Upper Joes Valley area. Leasing and mining induced subsidence in that portion of the delineated tract which lies within the Candland Mountain SPR (Semiprimitive Recreation) Management Unit would be allowed as provided in the Forest Plan because underground mining would not conflict with providing a quality semiprimitive recreation opportunity. Alternative C best meets the management objectives of the Forest Service as outlined in the Forest Plan and the needs of the general public. It would make additional Federal coal reserves available for competitive leasing, provide an opportunity to extend the life of the Crandall Canyon Mine, and would be consistent with Forest Service management goals and prescriptions for the area. The EA for the tract and the Proposed Finding of No Significant Impact (PFONSI) were released for a 30 day comment period on September 14, 1993. The PFONSI identified Alternative C as the Forest Service preferred alternative. No comments were received.

The only revision of the EA released with the PFONSI is the addition of information in regard to the classification of the South Fork of Horse Creek that drains the northern portion of the tract (Chapter III - Affected Environment, C. Geology and Hydrology, Hydrology. Page 13). A third year of data on flow of streams in tract area became available since release of the PFONSI. Using this data, it has been determined that the South Fork of Horse Creek exhibits characteristics of a perennial stream. It contained measurable flow in October for two of the three years that it has been monitored. The stream was not flowing in October of 1992 which was the last year of an extended drought. It was, however, flowing in October of 1991 (partially due to heavy precipitation in September) and was flowing in October of 1993.

We have determined that the proposal is not a major Federal action that would significantly affect the quality of the human environment; therefore, an Environmental Impact Statement is not needed. This determination was made based on the following considerations:

1. Management and public issues were identified during project scoping. Project scoping involved public notices of the proposal with a comment period as well as Interdisciplinary Team reviews and meetings. The preferred alternative would adequately address all issues identified through project scoping, and provides for protection of resources and mitigation of impacts consistent with the Forest Plan.

2. The unsuitability criteria for coal mining contained in Federal Regulations 43 CFR 3461 were addressed in the Forest Plan, Forest Plan FEIS, and EA for the tract. No areas within the tract were determined to be unsuitable for mining based on the criteria.

3. The potential adverse effects of the proposal can be effectively mitigated by the included special lease stipulations and implementation of the SMCRA Regulations (30 CFR 700 to End) and State of Utah Federal Coal Mining and Reclamation Regulatory Program.

4. The leasing action and anticipated lease development should have no significant adverse affect to cultural and paleontological resources, or floodplains.

5. There will be no adverse impacts to prime or unique rangelands, farmlands, or timberlands; alluvial valley floors; or wetlands.

6. There will be no adverse affects to listed or proposed Threatened, Endangered, and Sensitive plant or animal species. The Biological Evaluation that documents this conclusion and consultation with the U.S. Fish and Wildlife Service is included in the project file.

7. The preferred alternative is consistent with objectives and direction of the Manti-La Sal National Forest Land and Resource Plan, 1986 and the San Rafael Proposed Resource Management Plan, 1991. Cumulative impacts would be consistent with projected Forest Plan outputs and thresholds.

8. Coal mining has been a common and important element of the local economy and culture since the late 1800s. The impacts of underground mining have been observed and monitored for many years. No new or unique methods of mining are likely. The effects of the proposed activity are not likely to be highly controversial.

9. The activity is consistent with identified laws and regulations and would not adversely affect public health and safety.

Compliance with the terms and conditions of the lease and other administrative actions associated with the lease, in accordance with Federal Regulations 43 CFR 3400, are the responsibility of the Bureau of Land Management. The review, approval and enforcement of mining operations within the lease are the responsibility of the Department of Interior, Office of Surface Mining Reclamation and Enforcement under Federal Regulations 30 CFR 700 to End. As required under the Federal Coal Leasing Amendments Act of 1975 and the above regulations, future actions related to the lease which could affect surface resources require consultation and consent of the Forest Service.

The Bureau of Land Management leasing decision is subject to appeal to the Interior Board of Land Appeals. The Forest Service consent decision can be appealed pursuant to Secretary of Agriculture Regulations 36 CFR 217. A written notice of appeal must be filed with F. Dale Robertson, Chief, USDA Forest Service, Auditor's Building, 45 Northwest, P. O. Box 96090, Washington, D.C. 20090-6090 within 45 days of the date of publication of the decision in the Standard-Examiner Newspaper of Ogden, Utah, with a copy simultaneously sent to Gray F. Reynolds, USDA Forest Service, Intermountain Region, Federal Building, 324 25th Street, Ogden, Utah 84401. Any written notice of appeal of this decision must be fully consistent with 36 CFR 217.9, "Content of Notice of Appeal", including reasons for appeal.

The lease decision can be implemented following completion of the Bureau of Land Management and Forest Service appeal periods. The lease shall be offered under the procedures set forth for competitive coal lease sales in 43 CFR 3422.

Approved by: James M Parker Date: 10/24/93

JAMES M. PARKER, Utah State Director
USDI Bureau of Land Management

Consent by: for G R Browning Date: 10/22/93

Gray F. Reynolds, Regional Forester
USDA Forest Service, Intermountain Region

SPECIAL STIPULATIONS

Federal Regulations 43 CFR 3400 pertaining to Coal Management make provisions for the Surface Management Agency, the surface of which is under the jurisdiction of any Federal agency other than the Department of Interior, to consent to leasing and to prescribe conditions to insure the use and protection of the lands. All or part of this lease contain lands the surface of which are managed by the United States Department of Agriculture, Forest Service - Manti-La Sal National Forest.

The following stipulations pertain to the Lessee responsibility for mining operations on the lease area and on adjacent areas as may be specifically designated on National Forest System lands.

Forest Service Stipulation #1.

Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the Lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the Lessee prior to disturbance shall immediately bring them to the attention of the appropriate authority. Paleontological remains of significant scientific interest do not include leaves, ferns or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the Lessee.

Forest Service Stipulation #2.

If there is reason to believe that Threatened or Endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area, the Lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports and carrying out mitigating measures shall be borne by the Lessee.

Forest Service Stipulation #3.

The Lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data are adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the interrelationship of the geology, topography, surface hydrology, vegetation and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

Forest Service Stipulation #4.

Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

Forest Service Stipulation #5.

The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of access roads, are factors which will determine the ultimate size of the surface area utilized for the mine. A site-specific environmental analysis will be prepared for each new mine site development and for major improvements to existing developments to examine alternatives and mitigate conflicts.

Forest Service Stipulation #6.

Consideration will be given to site selection to reduce adverse visual impacts. Where alternative sites are available, and each alternative is technically feasible, the alternative involving the least damage to the scenery and other resources shall be selected. Permanent structures and facilities will be designed, and screening techniques employed to reduce visual impacts and, where possible, achieve a final landscape compatible with the natural surroundings. The creation of unusual, objectionable, or unnatural landforms and vegetative landscape features will be avoided.

Forest Service Stipulation #7.

The Lessee shall be required to establish a monitoring system to locate, measure and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

Forest Service Stipulation #8.

The Lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities. On Forest Development Roads (FDR), Lessees may perform their share of road maintenance by a commensurate share agreement if a significant degree of traffic is generated that is not related to their activities.

Forest Service Stipulation #9.

Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The Lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

Forest Service Stipulation #10.

In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specific approved locations.

Forest Service Stipulation #11.

If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulations of the surface management agency.

Forest Service Stipulation #12.

The coal contained within, and authorized for mining under this lease shall be extracted only by underground mining methods.

Forest Service Stipulation #13.

Existing Forest Service owned or permitted surface improvements will need to be protected, restored, or replaced to provide for the continuance of current land uses.

Forest Service Stipulation #14.

In order to protect big-game wintering areas, elk calving and deer fawning areas, sagegrouse strutting areas, and other key wildlife habitat and/or activities, specific surface uses outside the mine development area may be curtailed during specified periods of the year.

Forest Service Stipulation #15.

Support facilities, structures, equipment, and similar developments will be removed from the lease area within two years after the final termination of use of such facilities. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages re-established, and the areas returned to a premining land use.

Forest Service Stipulation #16.

The Lessee, at the conclusion of the mining operation, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed or displaced corner monuments (section corners, 1/4 corners, etc.), their accessories and appendages (witness trees, bearing trees, etc.), or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the Lessee, by a professional land surveyor registered in the State of Utah, and to the standards and guidelines found in the Manual of Surveying Instructions, United States Department of the Interior.

Forest Service Stipulation #17.

The Lessees, at their expense, will be responsible to replace any surface water identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses.

Forest Service Stipulation #18.

STIPULATION FOR LANDS OF THE NATIONAL FOREST SYSTEM
UNDER JURISDICTION OF
THE DEPARTMENT OF AGRICULTURE

The licensee/permittee/lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter II, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of the Interior in the license/permit/lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of Interior, (2) uses of all existing improvements, such as Forest Development Roads, within and outside the area licensed, permitted or leased by the Secretary of Interior, and (3) use and occupancy of the NFS not authorized by a permit/operating plan approved by the Secretary of the Interior.

All matters related to this stipulation are to be addressed to:

Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501

Telephone No.: (801) 637-2817

who is the authorized representative of the Secretary of Agriculture.

_____
Signature of Licensee/Permittee/Lessee

Forest Service Stipulation #19.

The lessee/operator will be required to drill horizontally ahead of the advance of development workings to the west in the vicinity of the Joes Valley Fault zone to locate any faults and determine if they contain significant amounts of water. If significant water is encountered, the operator will be required to take appropriate measures, subject to approval of the Bureau of Land Management and Forest Service, to prevent diverting this water into the mine workings.

Forest Service Stipulation #20.

Except at specifically approved locations, mining that would cause subsidence will not be permitted within a zone along the Joes Valley Fault determined by projecting a 22 degree angle-of-draw (from vertical) eastward from the surface expression of the Joes Valley Fault, down to the top of the coal seam to be mined.

ENVIRONMENTAL ASSESSMENT

COAL LEASE APPLICATION UTU-68082, LBA NO. 9
CRANDALL CANYON TRACT

USDA, FOREST SERVICE, MANTI-LA SAL NATIONAL FOREST
USDI, BUREAU OF LAND MANAGEMENT, MOAB DISTRICT
EMERY COUNTY, UTAH

Responsible Officials:

Gray F. Reynolds, Regional Forester
Intermountain Region
USDA, Forest Service
324 25th Street
Ogden, Utah 84401

James M. Parker, State Director
Utah State Office
USDI, Bureau of Land Management
324 South State, Suite 301
Salt Lake City, Utah 84111-2303

Cooperating Agency:

USDI, Office of Surface Mining,
Reclamation, and Enforcement
Brooks Tower, 2nd Floor
1020 15th Street
Denver, Colorado 80202

For Further Information Contact:

George A. Morris, Forest Supervisor
Manti-La Sal National Forest
USDA, Forest Service
599 West Price River Drive
Price, Utah 84501
(801) 637-2817

Roger Zortman, District Manager
Moab District
USDI, Bureau of Land Management
P.O. Box 970
Moab, Utah 84532
(801) 259-6111

SEPTEMBER, 1993

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CHAPTER I - PURPOSE AND NEED

A. PROPOSED ACTION

On March 4, 1991, Genwal Coal Company filed Lease By Application (LBA) No. 9 with the Bureau of Land Management (BLM), Utah State Office, to lease Federal coal lands in the Crandall Canyon Tract, assigned serial number UTU-68082 (see Figure 1). This application involves Genwal securing additional, adjacent, coal reserves for their active Crandall Canyon Mine located about 24 air miles southwest of Price, Utah on the Price Ranger District of the Manti-La Sal National Forest. Genwal has indicated a need for the coal in their application: that will maintain their existing production level; allow the company to seek additional long-term and spot contract sales; that will allow the mine to achieve a more efficient production level; and provide recovery of coal deposits which, if not leased, would be bypassed.

On December 29, 1989, Mining and Energy Resources, Inc. (MERI) filed LBA No. 5 with the BLM, 480 acres of which was later overlapped by Genwal's application (see Figure 1). The BLM decided to delineate a single tract based on Genwal's application because of an immediate need for additional coal reserves at the Crandall Canyon Mine.

In 1990, Genwal was rapidly depleting the reserves in their two Federal coal leases, SL-062648 and U-54762, and needed to access reserves in their two State coal leases about 3/4 mile to the west (see Figure 2). In order to access these State coal reserves, they applied for and received from the Forest Service, an Underground Right-of-Way assigned serial number UTU-66838 on July 20, 1990 (see Figure 2). In mining these State reserves, Genwal discovered the need to subside adjacent, unleased Federal lands north of their State leases. They applied for and received a 50 acre Special Use Permit from the Forest Service on April 28, 1992 (see Figure 2).

The tract will be evaluated under the Lease-by-Application (LBA) process adopted by the Uinta-Southwestern Utah Coal Region (43 CFR 3425). The first step in the process was to complete tract delineation. Delineation was completed on August 10, 1992. The Tract Delineation Report is attached as Appendix A. The next step in the LBA process was to determine whether or not there was data available to meet Data Adequacy Standards established by the coal region. Standards were determined to be met for the majority of the tract on December 2, 1992. The next step in the process was to apply Unsuitability Criteria for Coal Mining that are contained in Federal Regulations at 43 CFR 3461 and conduct an environmental analysis of the proposed action (tract as delineated). This document has been prepared to satify analysis requirements and tiers to the Final Environmental Impact Statement, Manti-La Sal National Forest,1986 (Forest Plan FEIS), and the Final Environmental Impact Statement for the BLM's San Rafael Proposed Resource Management Plan, 1991.

B. PURPOSE AND NEED

The proposed action will conform to the overall guidance of the Forest Plan and FEIS and the Final Environmental Impact Statement for the BLM's San Rafael

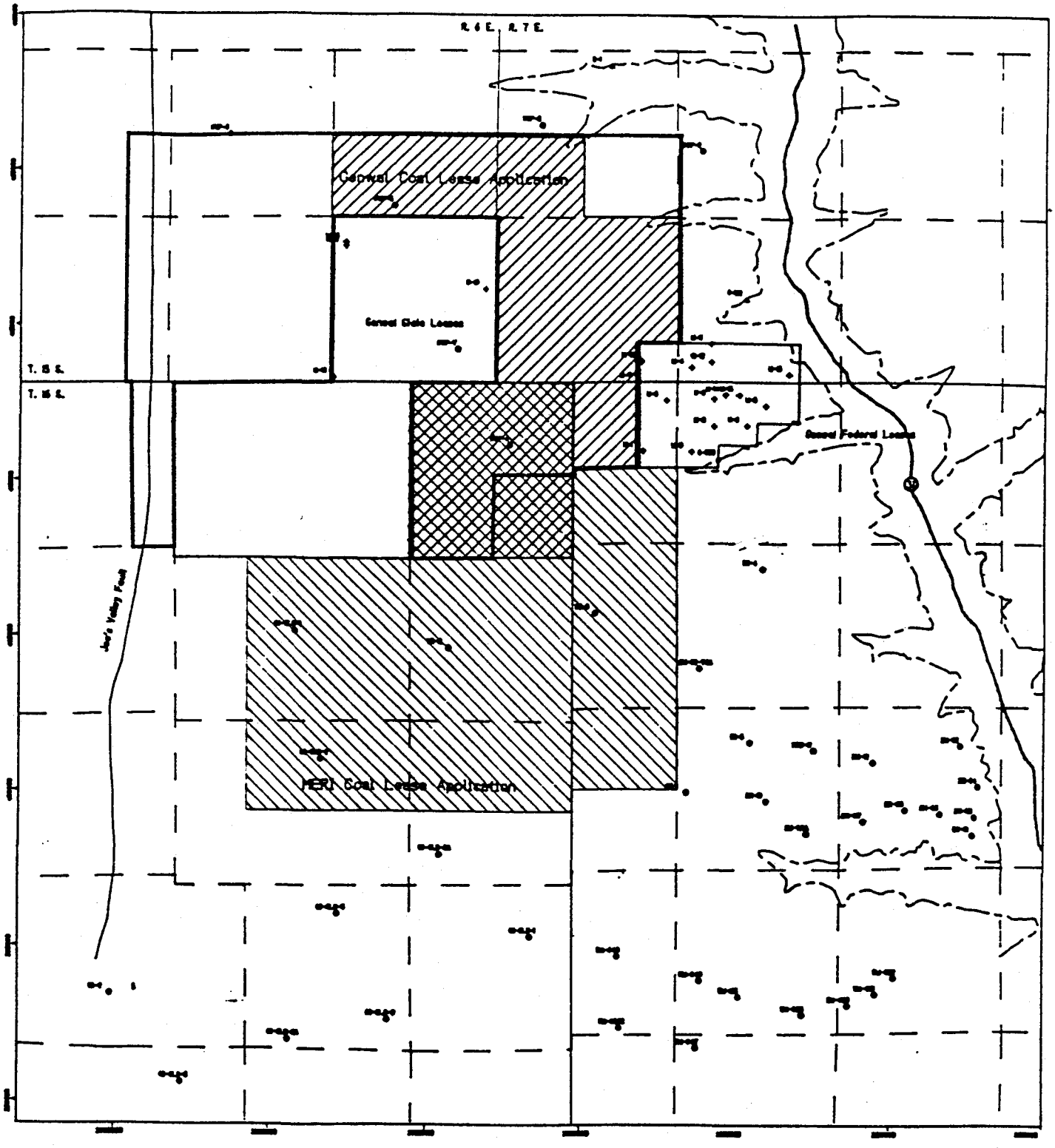


Figure 1: Coal Lease Applications, Crandall Canyon Area, Utah

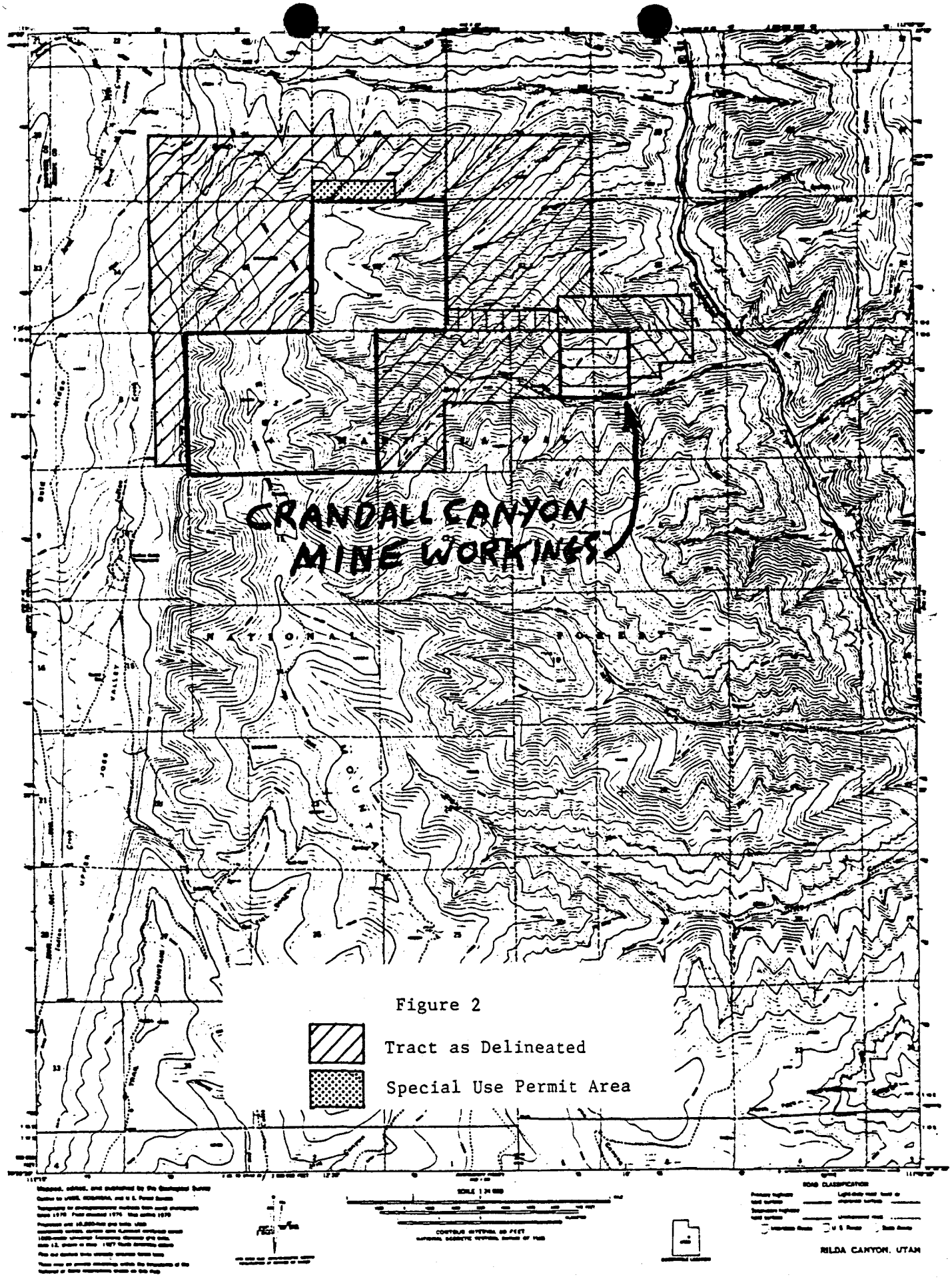


Figure 2

Tract as Delineated

Special Use Permit Area

Right-of-Way UTU-66838

State leases held by Genwal Coal Co.

Federal Coal Lease SL-062648

Federal Coal Lease U-54762

Proposed Resource Management Plan. This Environmental Assessment tiers to the decisions of both EISs which are available for review at the Price Ranger District and Manti-La Sal National Forest offices and the BLM's San Rafael Resource Area and the Moab District offices, respectively.

The purposes of the proposal are to maintain Genwal's existing production levels for an extended length of time so that additional long-term contracts can be procured and to recover coal deposits that would be bypassed if not leased.

Pursuant to the National Environmental Policy Act of 1969, a need exists for a decision to be made relative to the proposed action. The Regional Forester, Intermountain Regional, USDA, Forest Service (FS), and the Utah State Director of the BLM are the officials responsible to decide whether or not to offer the tract for competitive leasing. They may decide to deny the application or conditionally approve one of the action alternatives described in Chapter II. The decision will be based on the environmental analysis presented in this jointly-prepared (BLM/FS) document, but will be displayed in a separate decision document following completion of the final EA. If the application is approved and the tract is leased to Genwal, the Underground Right-of-Way and the Special Use Permit to subside, mentioned in the Introduction, will no longer be needed and they will be cancelled.

C. SCOPE OF THE ANALYSIS

In determining the scope of action, the alternatives, and the impacts to consider in this Environmental Assessment (EA), the Interdisciplinary Team (IDT) applied the principles of the regulations implementing the National Environmental Policy Act (NEPA), 40 CFR 1508.25.

The scope of this analysis includes two types of actions, two types of alternatives, and three types of impacts. They include actions which may be:

> ***Connected Actions.*** *These actions are closely related and therefore should be discussed in the same disclosure document. Actions are connected if they: automatically trigger other actions which may require environmental impact statements (EIS'S); cannot or will not proceed unless other actions are taken previously or simultaneously; or, are interdependent parts of a larger action and depend on the larger action for justification.*
>
> *The proposed action includes those activities necessary to fulfill the identified purpose and need, as well as all connected actions as identified in the alternatives described in Chapter II. Actions necessary to meet the purpose and need include a decision selecting an action alternative and lease issuance to Genwal. Connected actions as defined above include mitigation measures described in the alternatives. We are not aware of any other connected actions.*
>
> ***Cumulative Actions.*** *These actions, when viewed with other proposed actions, have cumulative impacts and should therefore be discussed in the same document. The scope of the analysis includes past, present, and reasonably foreseeable future actions, which may be cumulative in nature, and also includes cumulative actions occurring or proposed on other lands.*

Similar Actions. *These actions, when viewed with other reasonably foreseeable or proposed actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.*

Two types of alternatives were considered in the analysis, including a no action and other reasonable action alternatives. Site-specific mitigation measures are discussed in Chapter II.

Three types of impacts are considered in the analysis, including those which are direct, indirect, and cumulative, pursuant to 40 CFR 1508.7 and 40 CFR 1508.8. These impacts are described below and are discussed in Chapter IV.

Direct effects *are caused by the action and occur at the same time and place.*

Direct effects on all resources were analyzed for all proposed actions and connected actions described in the alternatives, Chapter II.

Indirect effects *are caused by the proposed action and are later in time or farther removed in distance, but are still reasonably foreseeable.*

Indirect effects on all resources were analyzed for the proposed actions and connected actions described in the alternatives, Chapter II. Direct and indirect effects are considered equally in the analysis and are not specifically identified or disclosed separately.

Each aspect of a resource can be affected by activities occurring within a period of time or area of influence. This area of influence, or area of potential ***cumulative effect****, is different for each resource. Chapter II describes the spatial and temporal scope of the cumulative effects area. The effects of all past, present, and reasonably foreseeable future actions occurring within these areas were considered. Past, present, and reasonably foreseeable future actions occurring on all ownerships are considered in the effects analysis in Chapter IV.*

D. AUTHORIZING ACTIONS

This coal lease application was submitted and will be processed and evaluated under the following actions: Mineral Leasing Act of 1920, as amended; National Environmental Policy Act of 1969 (NEPA); Multiple-Use Sustained Yield Act of 1960; Federal Land Policy and Management Act (FLPMA) of 1976; National Forest Management Act (NFMA) of 1976; Federal Coal Leasing Amendments Act of 1976, as amended; and Federal Regulations at 43 CFR 3400. Permitting of mining operations within the tract, if leased, would be processed and evaluated under the following actions: Surface Mining Control and Reclamation Act (SMCRA) of 1977 and Federal Regulations at 30 CFR 700. The office of Surface Mining, Reclamation, and Enforcement (OSM) has responsibility for permitting mines which involve Federal coal. Therefore, they have been identified as a cooperating agency. A more detailed description of the role of OSM in the regulation of coal mining activities is presented in Appendix D.

CHAPTER II - PROPOSED ACTION AND ALTERNATIVES

A. INTRODUCTION

This chapter is the heart of the document as it summarizes the EA. This chapter presents the issues, the alternatives considered, and a summary of the impacts of the alternatives. Five alternatives were developed by the ID Team: a No Action alternative (A) and four action alternatives (B, C, D, E) (see Figure 3).

B. MANAGEMENT HISTORY OF PROJECT AREA

The character of the area is derived from the influence of past wildfires, timber harvest, wildlife and livestock grazing, mining, and recreation.

Forest Plan Management Units within the project area include: RNG (Range Forage Production), TBR (Wood Fiber Production and Utilization), RPN (Riparian), WPE (Watershed Protection and Improvement), MMA (Leasable Minerals Area), and SPR (Semiprimitive Recreation). The requirements for each management unit, as defined in the Forest Plan, consist of a prescription summary and a set of management requirements. The prescription summary identifies the primary management emphasis. All prescriptions allow for multiple-use with the application of management requirements for non-emphasis activities.

The project area falls within the Crandall Ridge Sheep and Goat (S&G), Crandall Canyon S&G, and Trail Mountain Cattle and Horse (C&H) Allotments. The area has been grazed by livestock for well over a century.

Coal exploration and leasing have occured in the area over the past 50 years while oil and gas leasing, exploration and development have occured since the early '50s. Genwal acquired the coal leases and began development in the early '80s. Numerous environmental analyses have been prepared for these activities over the years.

The ID Team has reviewed these environmental analyses for relevancy to the proposed action. It was decided to conduct a new analysis based on the need for updated information to make a sound resource decision.

C. PUBLIC PARTICIPATION

Integral to the environmental process is project scoping, which involves the solicitation of comments from Federal, State and local agencies and interested organizations and individuals to assure that the most accurate and current environmental information and public issues are incorporated into planning and decision-making. The proposal was included in an "Environmental Status Report" that was mailed to over 100 addressees on August 30, 1993. This report described the projects being planned on the Manti-La Sal National Forest, an overview of each project, and the contact person serving as the Interdisciplinary Team Leader.

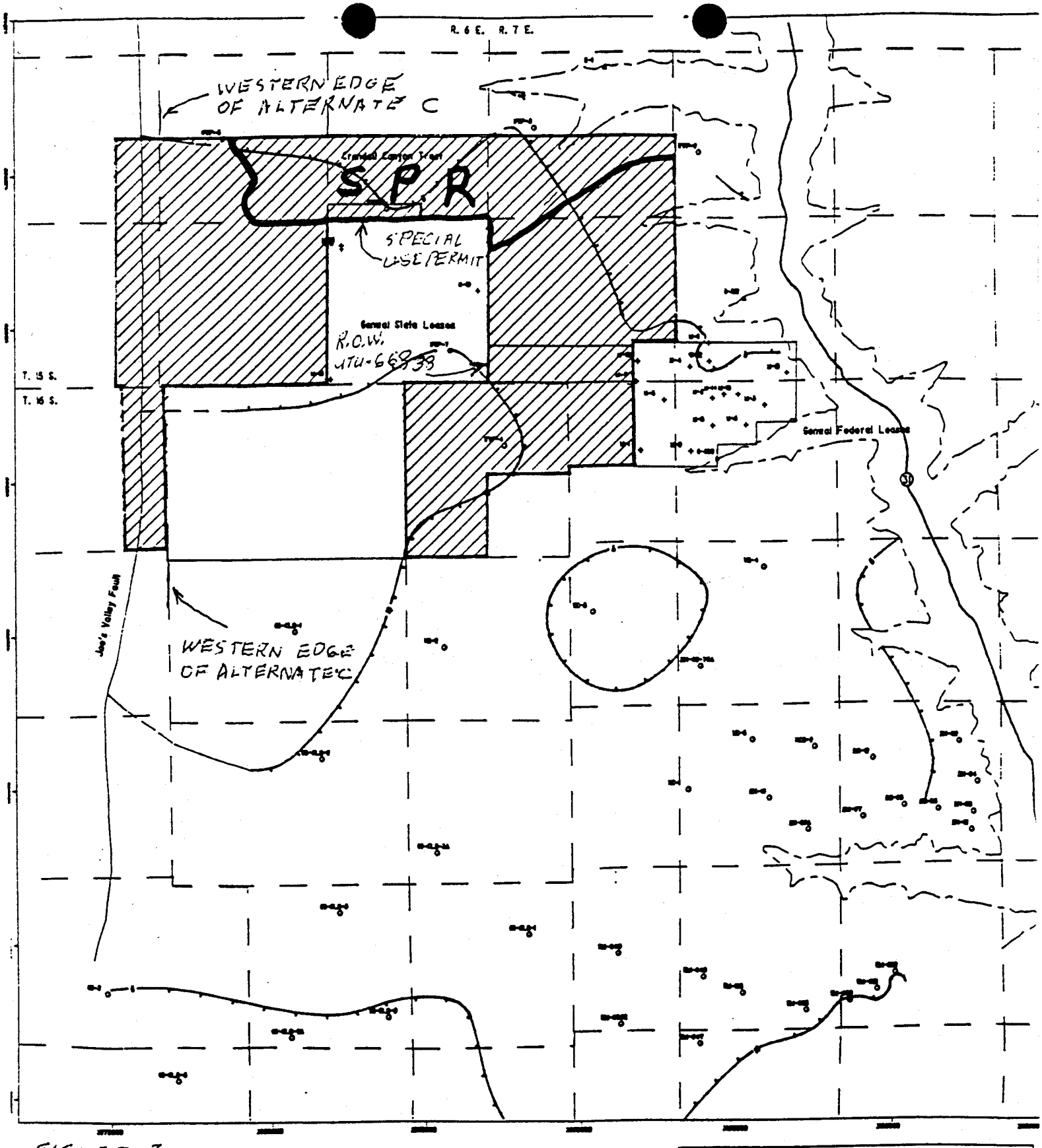


FIGURE 3

Lease by Application No. 9, Crandall Canyon Tract

Scoping for this project was initiated March 23, 1993 and finalized on June 21, 1993. Comments were solicited from 48 entities which are listed in Chapter V. Responses were received from: The Utah Division of Wildlife Resources, Emery Water Conservancy District, Utah Wilderness Association, and Neilsen & Senior, Attorneys and Counselors. An Interdisciplinary Team (ID Team) of BLM and FS resource specialists analyzed the proposed action using the public responses to develop the issues.

D. ISSUES

The four responses received during the public scoping process, along with issues developed by the BLM, FS, and Genwal, were used by the ID Team in determining the following issues relative to the proposed action. The content of the comments was analyzed for the identification and/or verification of environmental issues. One issue was raised that was categorized as resolved through normal mitigation practices.

Socioeconomics

If the tract is not leased, the Federal coal reserves would not be recovered and the mine would probably close within the next 4 years. This would result in the loss of of the existing 100 mining company jobs, an unknown number of mining-industry support jobs, coal royalties, and an estimated 25 million tons of recoverable Federal coal.

* *The socioeconomics issue will be measured in tons of available coal, royalty to Federal, State, and local governments, and projected mine life in comparing alternatives.*

Land Stability

Mining-induced subsidence could cause surface cracking and aggravate existing unstable slopes within the tract.

* *Measurement would recognize whether or not land stability would be affected in comparing alternatives.*

Ground and Surface Water

Mine workings in the proposed tract could encounter additional ground water that could be discharged into Crandall Creek. The Crandall Canyon

Mine has a discharge permit, but to date, has not discharged water into Crandall Creek.

This could result in diverting ground water to the surface that would otherwise remain perched or flow underground to discharge as seeps and springs west of the tract (due to the dip of the rock strata) in the Joes Valley drainage.

Discharge of mine water into Crandall Creek would increase flow and could alter water quality if mine contamination were present.

Mining induced subsidence could alter the ground and surface water systems.

The flow of some springs could change and new springs could emerge.

Subsidence of perennial drainages could alter stream morphology with full extraction mining. Sediment could be added to the drainages due to stream channel alteration and flow could be diverted underground if surface cracks develop in the drainage channels.

A notable reduction of surface flow into Indian Creek could result in loss of wetland areas and related riparian vegetation.

There could be an infringement on existing water rights.

The increased potential for traffic-related accidents in Crandall and Huntington Canyons could increase the possibility of spills of polluting materials, such as coal, diesel fuel, gasoline, etc.

* *Alternatives would be compared by describing the estimated overall potential effects in changes to stream morphology, sediment load, and flow.*

Recreation

The northern portion of the delineated lease tract includes approximately 600 acres of the Candland Mountain Semiprimitive, Recreation Area (SPR). Mining under this area would cause subsidence and could alter the flow of springs and stream reaches in the South Fork of Horse Canyon.

The Utah Wilderness Association objects to surface disturbing actions, including subsidence or water flow interruption within the SPR unit.

Higher coal-mining related traffic volumes maintained for an additional 19 years in Crandall and Huntington Canyons would continue the potential for conflicts with recreation activities and traffic.

* *This issue would be measured by comparing effects to visual quality obectives (VQO) in the Candland Mountain Semi-primitive Recreation Area (SPR) and displaying duration of effects to recreation by mine-related traffic.*

Transportation

Depending on demand, coal production at the Crandall Canyon Mine could currently increase from 1.2 million tons per year (1992) to 1.5 million tons with an attendant increase in mine-related traffic (coal hauling and mine business traffic) in Crandall Canyon (Forest Development Road 50248) and Huntington Canyon (State Highway 31) before the tract were ever leased. Traffic on this highway is reaching maximum design capacities. With current reserves and production rate of 1.3 million tons per year, this traffic volume would last for 4 years. If the tract were leased, the traffic volume would last an additional 19 years.

This additional 19 years of traffic volume would increase the potential for traffic-related accidents.

If another mine were to be opened in Crandall Canyon, then the traffic volume in Crandall Canyon and Huntington Canyon would exceed design capabilities.

* *Comparison of alternatives would be measured by displaying the duration of mine-related traffic effects on recreation.*

Wildlife

Alteration of the flow or morphology of perennial drainages could decrease habitat quality for macroinvertebrate species and trout (including spawning habitat).

Alteration of the flow of springs could alter watering opportunities for terrestrial wildlife species.

* *This issue would be measured by comparing the potential level of effects on wildlife.*

Resolved Issue - Other Minerals

The proposed tract encompasses lands leased for oil and gas that have a high potential for the occurrence and development of natural gas. Coal mining could conflict with oil and gas exploration and production.

Conflicts between oil and gas leasing and coal leasing will be resolved through standard lease stipulations. The BLM will retain ultimate authority for resolving conflicts between oil and gas and coal operations.

E. DEVELOPEMENT OF ALTERNATIVES

In developing the alternatives, the ID Team considered the issues identified during public scoping while addressing the objectives of the proposed leasing action. These alternatives present the Deciding Officers with a reasonable range of alternatives from which to choose. No alternatives were developed that were eliminated from further consideration.

F. DESCRIPTION OF ALTERNATIVES

ALTERNATIVE A - No Action:

Under this alternative the tract would not be offered for lease.

ALTERNATIVE B - Offer the Tract for Lease as Delineated Subject to Management Requirements:

Under this alternative the tract would be offered for competitive lease as delineated subject to the BLM's standard lease terms and Forest Service Special Coal Lease Stipulations including the Department of Agriculture

Stipulation contained in Appendix B of the Forest Plan.

ALTERNATIVE C - Offer the Tract for Lease Excluding the Western Strip:

This alternative would be the same as Alternative B except that the approximate 400 acre area west of Sections 26, 35, T15S, R6E, and Section 2, T16S, R6E would be excluded from the tract. Full support mining would be allowed up to the tract boundary. Second mining would be limited using a 22 degree angle of draw from the coal seam to the Joes Valley Fault which is also the approximate location of the section line. The boundary adjustment and second mining restriction would be needed to protect sensitive geo-hydrologic resources including a wetland in Upper Joes Valley. The second mining restriction could be waved if geo-hydrologic information can be provided that shows that the hydrologic balance could be maintained and that these sensitive geo-hydrologic resources could be adequately protected.

ALTERNATIVE D - Offer the Tract for Lease Excluding the SPR Area:

This alternative would be the same as Alternative B except that the 600 acre area in the Candland Mountain SPR in Sections 25 and 26, T15S, R6E, and Sections 30 and 31, T15S, R7E would be excluded from the tract. Second mining would be limited using a 22 degree angle of draw from the coal seam to the section line, thereby allowing no subsidence to occur within the SPR.

ALTERNATIVE E - Offer the Tract for Lease excluding the Western Strip and the SPR Area:

This alternative would combine Alternatives C and D for the same reasons mentioned above. The western strip and the SPR would both be excluded from the tract.

G. SUMMARY COMPARISON OF ALTERNATIVES

A detailed analysis of the environmental consequences or impacts is provided in Chapter IV. The following table is intended to be a summary for use in comparing alternatives on a relative basis.

TABLE II - 1
COMPARISON OF ALTERNATIVES BY ISSUES

ISSUES * Indicators	ALTERNATIVE A NO ACTION	ALTERNATIVE B PROPOSED ACTION	ALTERNATIVE C PROPOSED ACTION Minus Western Strip	ALTERNATIVE D PROPOSED ACTION Minus SPR	ALTERNATIVE E PROPOSED ACTION Minus Western Strip & SPR
SOCIO-ECONOMICS OF MINING					
* Tons of Coal	Up to 25 Million not available	Up to 25 Million recovered	Estimated 23.2 Million recovered	Estimated 22.9 Millions recovered	Estimated 21.3 Million recovered
* Estimated Royalty to Governments	No benefit	44.0 Million realized	41.2 Million realized	40.3 Million realized	37.5 Million realized
* Estimated Mine Life	4 years	23 years	22 years	21 years	20 years
LAND STABILITY	No effect	Some effect	Some effect	Some effect	Some effect
EFFECT OF SUBSIDENCE ON HYDROLOGUY	No effect	High potential effect overall	Low potential effect overall	High potential effect overall	Low potential effect overall
RECREATION AND TRANSPORTATION					
* SPR VQR	No effect	Low potential effect	No effect	Low potential effect	No effect
* Recreation and Traffic Effects	Last for 4 years	Last for 23 years	Last for 22 years	Last for 21 years	Last for 20 years
WILDLIFE					
* Aquatic	No effect	High potential effects	Moderate potential effects	High potential effects	Moderate potential effects
* Terrestrial	No effect	Moderate potential effect	Low potential effect	Moderate potential effect	Low potential effect

CHAPTER III - AFFECTED ENVIRONMENT

A. INTRODUCTION

This chapter describes the environmental components of the area that would affect and would be affected by any of the action alternatives, if implemented. The resource components include the natural and human conditions that could change under the implementation of an action alternative or that could aid the reader to better understand the alternatives.

B. SOCIOECONOMICS AND MINING

Socioeconomics

The area of influence for the subject coal lease application, located near the company's Crandall Canyon Mine, is generally confined to the Emery County area. The tract is located in the vicinity of Huntington Canyon about 18 miles northwest of Huntington, Utah.

The Crandall Canyon Mine has produced coal since 1984 and has gone from a relatively small mine with 300,000 tons production in 1990 to an anticipated 1.3 million tons in 1993. Nevada Power purchased the operation in 1989 and subsequently sold half interest to Intermountain Power Association. The mine and related facilites employ about 100 workers, primarily from Emery County. Coal is hauled to loadouts at Mohrland, Wildcat siding, or to a loadout in the Wellington area which provide jobs for an additional 30 truck drivers and an unknown number of other supporting jobs to the industry.

Emery County's estimated 1992 population was 10,200. The County's population peaked in 1983 at 12,700 after which it declined steadily until 1991 where it has now leveled off. This is a significant 20% decline over an 8 year period, returning to population levels experienced in the mid 1970's. Outmigration took place throughout the declining period.

Nonagriculture employment in the county in 1991 totaled 3,437. This is a significant 2,453 jobs or 42% loss than the peak year of 1982. Considering 1991 data, the major industry employment categories in Emery County were:

Government.....845 (24.6%)
Trans.,Communic.,Public Utilities.....788 (22.9%)
Mining.....755 (22%)
Trades.....441 (12.8)
Services.....281 (8.2%)

Outside of government employment including local, State, and Federal, the dominance of the mining industry in the county, which is primarily coal mining, is evident. Coal mining, handling, transportation, and generation of electricity from coal-fired facilities likely provides over 40% of the County's jobs. This dominance is even more apparent when you look at the personal income and earnings in the county (1989 data) in order of importance:

Mining.....$47,103,000 (37.1%)
Transport, Public Utilities.....$35,717,000 (28.1%)
Government.....$13,956,000 (11%)
Construction.....$11,722,000 (9.2%)
Services.....$8,315,000 (6.5%)

Mining, which is primarily coal mining, along with related industries including coal-fired electric power generation, contributes an estimated 60% of earnings in Emery County. Population projections for the county by the Utah Office of Planning and Budget show a very modest increase of less than 5% by the year 2000.

A major factor influencing Emery County is changes in employment for the Utah coal mining industry. Total state coal-mining employment peaked in 1982 at 4,296. Within one year, the number employed fell to 2,707 (a 37% reduction). Moderate decline continued throughout the 80's and early 90's. In 1992 Utah coal mining employment was estimated at 2,216 which is a significant 48% reduction from the 1982 peak.

Emery county has an estimated 35% of Utah's coal mining employment. It is notable that in recent years, Utah's coal production has had significant growth (1983 - 11,829,000 tons, 1992 - 21,015,000 tons), while production was achieved with a significant reduction in direct employment. During this period the productivity of Utah coal mines was increased significantly through cost controls and other efficiency factors, including installation of longwall mining equipment which has greatly reduced labor requirements. Mine modernization in the last 10 years has enabled many of Utah's mines to remain competitive in the market place. Utah's total coal production peaked in 1990 at 22 million tons and declined modestly to over 21 million tons in 1992, a decrease of about 5 percent. Future production is expected to have modest growth with continuing closing of less efficient operations and growth by the more productive mining operations.

Mining and Subsidence

Operations in the Crandall Canyon Mine are conducted by using the room and pillar method. Development entries are driven to create a panel, then rooms are driven to the panel's far end. Retreat, or second mining, then commences whereby the pillars are partially recovered, extracting up to 70% of the coal volume. As most of the northern end of East Mountain is leased for oil and gas, the BLM will retain ultimate authority for resolving any conflicts between coal and oil and gas operations through enforcement of standard lease stipulations.

Subsidence is usually coincident with mining and is transmitted rapidly from the underground workings to the surface. Once begun, subsidence will follow the direction of mining and the majority will occur within 6 to 12 months after mining is complete. The total subsided area will include the surface area above the extracted coal and an additional surrounding area determined by an angle of draw. Final subsidence contours for the tract and the adjacent State land will resemble a broad irregularly shaped trough.

The extent and magnitude of subsidence is dependent on the physical properties of the overburden, coal bed depth, extracted coal bed height and width, seam

dip, geologic discontinuities, mining rate, and multiple-seam mining. The following subsidence parameters have been observed in the Huntington Canyon area: 1) a 20 to 30 degree angle of draw, 2) maximum subsidence ranging from 3 to 6 feet, and 3) maximum subsidence occuring within 800 feet from the edge of the subsidence trough. Other more general parameters are: 1) subsidence impacts for overburden above the Castlegate Sandstone are expected to be less and delayed because of this sandstone's stronger and more rigid characteristics, and 2) subsidence impacts are less with more overburden. Pursuant to their approved mining permit, Genwal is, and has been, conducting subsidence monitoring within their Federal and State leases including the Right-of Way and the Special Use Permit to subside unleased Federal lands in the SPR.

C. GEOLOGY AND HYDROLOGY

Topography and Geology

The north end of East Mountain is an elongated ridge that trends north-south. The ridgeline lies along the western portion of the tract and reaches an elevation of 10,730 feet. Western slopes of East Mountain, with minor drainages, rise over 1,000 feet above Upper Joes Valley and Indian Creek; towards the northwestern portions of the tract, the slopes rise above Scad Valley and Scad Valley Creek. Eastern slopes of East Mountain within the tract are cut by 3 major drainages which flow eastward into Huntington Creek. These 3 drainages include the south fork of Horse Canyon, Blind Canyon, and Crandall Canyon respectively from north to south.

The stratigraphic units exposed on the tract consist of the following, in descending order: North Horn Formation (shales with subordinate sandstone, conglomerate, and limestone), Price River Formation (sandstone interbedded with shale and conglomerate), Castlegate Sandstone, Blackhawk Formation (siltstone and sandstone interbedded with shale), and Starpoint Sandstone. The North Horn Formation forms the top and upper slopes of East Mountain and the bedrock surface in Upper Joes Valley. The Price River Formation forms intermediate slopes around the perimeter of East Mountain. The cliff-forming Castlegate Sandstone forms the major cliffs along the western slope of East Mountain and rims of the major drainages. The coal-bearing Blackhawk Formation forms the slopes of the major drainages. In the lower sections of the major drainages, the cliff-forming Starpoint Sandstone and slope-forming Mancos Shale are exposed.

Coal beds of economic interest in this area occur at the base of the Blackhawk Formation. However, drilling information indicates that only the Hiawatha bed (lowest seam) is minable within the tract. The Hiawatha bed is currently being mined by the applicant at the Crandall Canyon Mine. Overburden on the Hiawatha bed is zero in the major drainages and reaches over 2,000 feet under East Mountain. Along the western boundary of the tract (Joes Valley Fault) the overburden ranges from about 500 feet to over 2,000 feet.

The structure of the area is relatively simple with the rock layers and coal beds dipping about 3 degrees to the southeast. The western boundary of the tract is defined by the Joes Valley Fault. The Joes Valley Fault is a major structural feature with displacement in excess of 2,000 feet. Consequently,

there are no minable coal reserves to the west of this fault. There is no indication of additional faulting within the tract east of the Joes Valley Fault. There is some question as to the fault's location as mapped by the U.S. Geological Survey. Photointerpretation of aerial photography by the BLM places the fault location approximately 1/8 mile to the east, coincident with the section line (see Figure 4).

Upper Joes Valley lies between East Mountain which rises approximately 1,500 feet to the east and Bald Ridge which rises less than 500 feet to the west. Indian Creek occupies the valley bottom.

Upper Joes Valley is in the northern end of the Joes Valley Graben. The Joes Valley Fault forms the eastern boundary of the graben. The west bounding fault of the graben lies west of Bald Ridge. Many other faults have been mapped within the graben to the south demonstrating that the graben is within a fault zone.

Upper Joes Valley contains a thick layer of alluvium and colluvium. A lobe of colluvium extends into the valley having apparently emanated from the two largest canyons directly below the main peak of East Mountain. This lobe forms a bench a few tens of feet above Indian Creek. The North Horn Formation probably underlies the colluvial/alluvial material of the valley.

Further south, a narrow ridge of small boulders within fine grained material forms a low ridge running down the middle of the valley east of Indian Creek within the NE 1/4 of Section 3. Its origin is suspected to be either the surface expression of a fault or a moraine. The ridge does not continue any further south than the NE 1/4 of Section 3. However, a group of springs that lie along the east side of this low ridge in the NE 1/4 of Section 3 continues southward for another mile into the NE 1/4 of Section 10. This spring alignment and alignment of the ridge parallel to the Joes Valley fault favor a fault origin for the ridge.

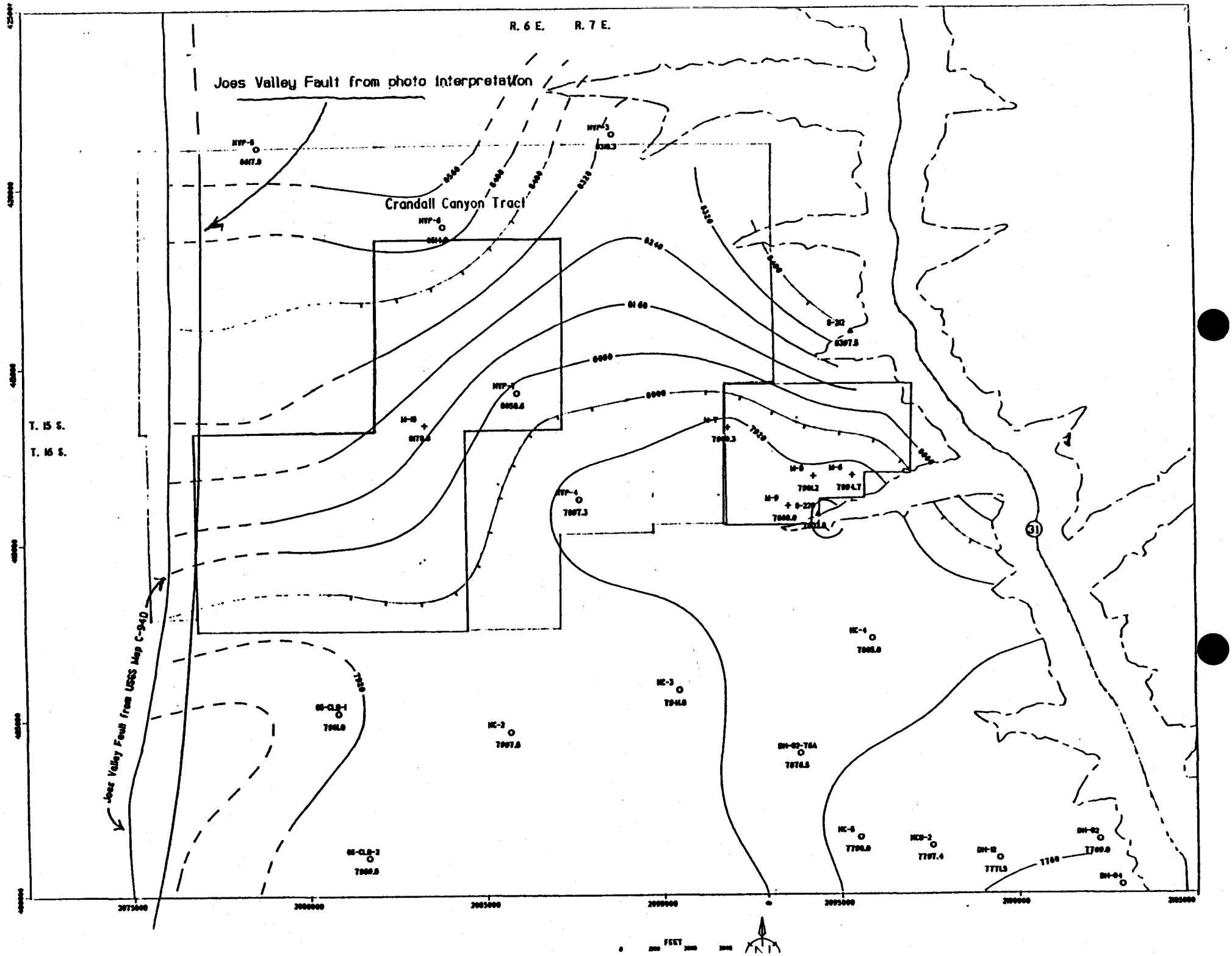
The mid slope of East Mountain displays extensive land instability characterized by failure of the colluvium. More severely disrupted terrain suggests that deeper slumps may also have occurred. Springs on the face of East Mountain may be contributing to the instability.

Hydrology

Drainages within the tract include portions of Crandall Creek, Blind Canyon Creek, the South Fork of Horse Creek, and Indian Creek. Crandall Creek, Blind Canyon Creek, and Horse Creek drain the east slope of East Mountain and flow to the east into Huntington Creek. Several small tributaries of Indian Creek drain the west slope of East Mountain within the tract. Huntington Creek flows to the south and is tributary to the San Rafael River. Indian Creek flows to the south into Lowry Water and then into Joes Valley Reservoir. Joes Valley Reservoir drains into Cottonwood Creek which is also tributary to the San Rafael River. The San Rafael River is tributary to the Colorado River.

Water in Huntington and Indian Creeks is used for culinary, agricultural, industrial, and cold water fish purposes.

Crandall Creek is perennial within the tract. Blind Canyon Creek and the two


R. 6 E.
R. 7 E.
Joes Valley Fault from photo interpretation
Crandall Canyon Tract
T. 15 S.
T. 16 S.
Joes Valley Fault from USGS Map C-94D
31
FEET

main tributaries to Indian Creek flow continuously during high precipitation cycles but have been known to cease flowing during dry cycles. It is not known if water continues to flow through alluvial materials in the channels during wet years but this is suspected.

Indian Creek becomes perennial in the SE 1/4 of Section 34, T.15 S., R.6 E., which is a short distance downstream from the tract. Most of the flow appears to come from the canyons of East Mountain both as surface flow directly into Indian Creek and as spring flow from the toe of alluvial/colluvial materials that line the valley floor just above Indian Creek. Springs on the west side of the valley, along the foot of Bald Ridge, also contribute to the flow. Indian Creek progressively increases in volume as it picks up water from various springs and stream sources.

Streams flow westward from each of the two main canyons below the peak of East Mountain in Section 35, T.15 S., R.6 E., SLM. Flow from the northernmost of these continues across the valley fill to Indian Creek. In the next canyon south, a stream flows across the Castlegate Sandstone cliffs, creating a 20 foot waterfall. During high flows, the water flows into the valley. During low flows, it disappears into the colluvial/alluvial materials.

Springs have been inventoried throughout the tract. Ground water recharge is from precipitation along East Mountain. Water which enters the ground water regime through permeable rock layers and fractures in the bedrock flows down-dip to the southeast. It flows through permeable rock layers or aquifers where it is perched by underlying rock layers with less permeability. It continues to flow laterally until it encounters other fractures that allow it to migrate deeper underground into other aquifers, or flows to the surface as springs and seeps. The Joes Valley Fault and sympathetic faults within the Joes Valley Graben could also function as conduits for ground water flow vertically and laterally through the tract. Some water becomes trapped and is stored underground where aquifers are discontinuous. It is common for underground mining in the area to encounter sandstone channels that drain water rapidly into the mine then cease flowing as mining advances beyond the channel. The only regional aquifer known in the lease area is the Starpoint-Blackhawk Regional aquifer. Within the tract, exploration drilling has shown the potentiometric surface of this aquifer to be within the Starpoint Standstone below the Hiawatha coal seam. The only location where the potentiometric surface has been mapped at the same elevation as the top of the Hiawatha seam is at the southeast corner of the tract.

Precipitation and runoff which penetrates only the unconsolidated soil, colluvium, and highly fractured and weathered bedrock flows along the topographic slope until it encounters fractures and can enter the ground water regime, or emerges along the slope as springs and seeps. This type of emergence flow occurs along the west slope of East Mountain. Springs occur high on the ridge on the west slope within the North Horn and Price River formations and within colluvial/alluvial deposits along the floor of Upper Joes Valley.

The greatest concentration of springs lies in a north-south line within a wet meadow between Indian Creek and the road on the east side of Upper Joes Valley in Section 34, T.15 S., R.6 E. and Section 3, T.16 S., R.6 E. These springs emerge from the toe of the colluvial/alluvial materials at the mouths of the

canyons below the main peak of East Mountain. The sources for the springs in Section 34 appear to be primarily from the streams flowing down the west side of East Mountain. It is likely that the North Horn Formation underlying the surface materials perches the water creating the wet meadow and springs. Water flowing through the Joes Valley Fault and other sympathetic faults within the graben could also be contributing to the flow.

The presence of springs continues to the south, along the east side of a low linear ridge and beyond, where the ridge descends into an open meadow. The alignment of these springs, along the ridge and beyond, suggests that the springs in the southern part of the meadow may be related to faulting.

The low ridge and colluvial/alluvial lobe north of the low ridge appear to act as barriers to ground water flow across the valley. Spring waters emerging east of the low ridge drain south to a point where the ridge ends. The water then runs westward into Indian Creek. Flow is sufficiently restrained by the natural barriers to support a wet meadow and riparian vegetation. The wet meadow is a wetland and riparian area.

Water in the surface drainages within the tract is of good quality. Dissolved solids concentrations rarely exceed 500 milligrams per liter. The concentration of total dissolved solids rapidly increases near the mouth of Huntington Canyon where the saline Mancos Shale is continuously exposed to the flowing stream. The predominant dissolved chemical constituents in the surface drainages are calcium, magnesium, and bicarbonate.

Water quality of springs is also good with dissolved constituents typical of the rock formations from which they discharge. Total dissolved solid concentrations range from 50 to 750 milligrams per liter. The predominant dissolved chemical constituents are calcium and bicarbonate.

D. RECREATION AND VISUAL QUALITY

Recreation use in this area is primarily restricted to big game hunting during the autumn hunting seasons and occasional use by hikers during the summer months. The northern portion of the delineated lease tract includes approximately 600 acres of the Candland Mountain Semiprimitive, nonmotorized, Recreation Area (SPR). The eastern portion and roughly one half of the western portion of the tract have been designated in the Forest Plan as semi-primitive, motorized. The remaining area included in this potential lease is roaded, natural appearing.

At its southern boundary the SPR is more heavily vegetated with aspen and conifer stands than the adjacent state lands which contain an old burn that has not regenerated yet. In addition to the solitude afforded by the absence of mechanical sounds from the valleys below, the SPR has significant visual value. Remaining lands outside of the SPR also considered for lease are not as visually sensitive yet offer recreational opportunities to the public.

The visual quality objective (VQO) for the SPR area is retention. Under retention, activities may only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes should not be evident, and all retention activities should be accomplished either during the

operation or immediately after. In other words, management activities should be subordinate to the characteristic landscape and should be subtly integrated into the landscape so as to attract little attention. The 50 acre Special Use Permit (mentioned in Chapter I) area within the SPR was subsided last year by Genwal mining coal in the adjacent State lease to the south. The Forest Landscape Architect inspected the area from the air and on the ground this past Spring and determined no effect to VQOs for the SPR.

A narrow portion of the lease tract to the west of the Joes Valley Fault has a VQO designation of partial retention. Under partial retention, surface-disturbing activities should remain visually subordinate to the landscape. Activities may also repeat form, line, color, or texture; but changes in qualities of size, amount, intensity, direction, pattern, etc., should remain visually subordinate to the landscape. The VQO of partial retention should be accomplished as soon as possible after a surface-disturbing activity occurs or within a minimum of the first year. To paraphrase: partial retention VQOs will allow activities such as mining to occur, provided that reclamation, etc. restores disturbed areas to a natural appearing condition.

The remainder of tract lands involved are to be managed as modification. Under the modification visual quality objective, management activities may visually dominate the original characteristic landscape. However, activities of vegetative and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that their visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities such as structures and roads must remain visually subordinate to the proposed composition. Reduction in form, line, color, and texture should be accomplished in the first year or at a minimum should meet existing regional guidelines. More simply put, this broad objective allows for most forms of development similar to mining activities, however a reasonable attempt should be made to fit within the context of the natural surroundings.

E. TRANSPORTATION AND RECREATION

The section of Highway 31 between the east Forest boundary and Crandall Canyon was constructed on its present alignment and subgrade width in 1960. The asphalt wearing surface was placed in the mid-70's. The constructed template has a 30 foot subgrade in order to provide two, 12 foot traffic lanes. Based on the road template and alignment, the service volume that the highway could carry was 246 vehicles per hour with the original design condition of 35% truck traffic. The designed hourly volume was 15%, or 75 vehicles per hour, with a designed speed of 45 miles per hour. In 1991 the percentage of truck traffic was estimated at 25%, so the service volume that the highway could carry was 293 vehicles per day. The peak hourly volume during shift change at the Crandall Canyon Mine is about 81 vehicles per hour which is near the designed volume of 75 vehicles per hour and below the service volume of 293 vehicles per day. Without a change in the general traffic volume on the road, the coal production would have to exceed 4.9 million tons a year before the service level would exceed threshold limits.

The Crandall Canyon Forest Development Road #50248 was reconstructed between 1981 and 1982 to its present subgrade and alignment for access to the Crandall

Canyon Mine. It was designed to safely accommodate projected mining and public traffic. The subgrade width was 31 feet. The roadway had a temporary road surface of crushed aggregate placed in 1985 and was asphalt-surfaced in 1991. The present traffic lanes are under 12 foot in width. The road has an average grade of 7% over it's 1.45 mile length to the mine with a design speed of 20 miles per hour. Based on the road template, road alignment, and composition of coal mining traffic (22% heavy trucks) the road should have a service volume of 107 vehicles per hour. In 1992 the Crandall Canyon mine produced 1,178,000 tons of coal. Peak hourly traffic for this volume of coal is estimated at 66 vehicles per hour. The present roadway configuration and coal traffic composition would allow production of coal at 1,874,000 tons per year before the service volume of the road would be exceeded.

Recreation Visitor Days (RVDs) in this area are estimated at 108,000 annually. Mine-related traffic may be heard and/or seen by those camping, fishing, picnicing, hiking, or sight-seeing from vehicles. Subsequently, some visitors may elect to limit their stay or go elsewhere to pursue recreation activities.

F. WILDLIFE

Aquatic

The affected environment for aquatic wildlife within the project area includes the Crandall Canyon, Blind Canyon, Horse Creek, and Indian Creek drainages; although waters further downstream in Huntington Creek and Lowry Water, outside the project area, could be affected. Fisheries values for aquatic wildlife include the fish, their prey, and their habitat.

The major aquatic habitat within the tract is Crandall Canyon. Crandall Creek is perennial for at least the lower 2.5 miles as documented in a riparian inventory conducted on July 21, 1992. Game and nongame (forage) fish are known to occur in the lower 2,000 feet of the creek but a partial fish barrier limits fish movement upstream. There may be some resident fish species present in large pools near the tract. Crandall does contribute invertebrate food items and surface flow to Huntington Creek, an important fishery in the region.

Terrestrial

The Crandall Canyon tract is inhabited by a variety of terrestrial wildlife species. Bear, cougar, deer, elk, birds, reptiles and amphibians are supported by habitats within the area. The area is used as spring and summer forage by deer and elk. Big game species may also use this area for calving, fawning, and cover. Raptors known to occur within the area include red-tail hawks, golden eagles, sharp-shinned hawks, and a number of owl species. Evidence of active and inactive raptor nesting sites have been found. Other terrestrial organisms present include rodents, lagomorphs, upland ground birds, songbirds, coyotes, bobcats, and woodpeckers.

Listed Threatened, Endangered, and Sensitive species that may occur in the area are Bald eagles, Northern Goshawk, Peregrine Falcon, and Northern Three-toed Woodpecker. Bald eagles may occasionally pass through the area during their winter migration. Northern Goshawk and Northern Three-toed Woodpecker are listed as sensitive species that may occur in the project area.

Inventories of the Goshawk and Three-toed Woodpecker were completed in the spring of 1993. No other threatened, endangered or sensitive species have been observed in the area. A biological assessment/evaluation has been completed and is included in Appendix C along with U.S. Fish and Wildlife Service's concurrence.

Riparian zones associated with perennial springs and streams have been identified within the project area. These provide important habitat for water dependant terrestrial species as well as provide necessary habitat requirements for aquatic species. Perennial streams and springs also provide sources of water for other wildlife species found in the area.

CHAPTER IV - ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION

This chapter includes the analytical and scientific basis for comparison of the alternatives, including the proposed action (40 CFR 1502.16). Measures to mitigate adverse environmental impacts (40 CFR 1502.16 (h)) through compliance with Forest Plan standards (36 CFR 219.13) is emphasized. It also summarizes monitoring programs required by NEPA (40 CFR 1502.2 (c)) and (36 CFR 219.5 (K).

The Forest Plan and Forest Plan FEIS disclosed direct, indirect, and cumulative environmental impacts of coal leasing, exploration, and development. In Chapter III the Plan presents standards designed to mitigate them. This chapter incorporates Chapter IV, Environmental Consequences, of the Forest Plan FEIS by reference (40 CFR 1502.21), summarizes relevant sections, and points out any significant differences between Forest-wide impacts and those specific to this proposal and alternatives.

MITIGATION

Over the past 10 years, public understanding of forest management issues and the impacts of various management activities has increased dramatically. In recent years, public, agency, and organizational concerns have been focused less on identification of specific, significant impacts than on the application and effectiveness of mitigation measures.

As defined by 40 CFR 1508.20, mitigation includes:

- ***Avoiding the impact** altogether by not taking a certain action or parts of an action.*
- ***Minimizing impacts** by limiting the degree or magnitude of the action and its implementation.*
- ***Rectifying the impact** by repairing, rehabilitating, or restoring the affected environment.*

* *Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.*

* *Compensating for the impact by replacing or providing substitute resources or environments.*

Forest Plan standards employ the above measures. Thus, this chapter is a site-specific tie between effects identified in Chapter IV of the Forest Plan FEIS and Forest Plan standards for mitigating those effects. Mitigations in the form of Special Stipulations from Appendix B of the Forest Plan are included in Appendix B of this EA.

MONITORING

NFMA requires that Forest Plan implementation be monitored (36 CFR 219.11 (d)). This is done on a sample basis. The results may demonstrate needed changes in management direction (36 CFR 219.12 (k)). Forest-wide and site specific monitoring elements are listed in Table IV-1 on pages IV-3 to IV-13 of the Forest Plan. Included are three types of monitoring:

* ***Implementation monitoring*** *is used to determine if goals, objectives, standards, and management practices are implemented as detailed in the Plan and the project specifications;*

* ***Effectiveness monitoring*** *is used to determine if management practices as designed and executed are effective in meeting Forest Plan standards, goals, and objectives;*

* ***Validation monitoring*** *is used to determine whether the data, assumptions, and coefficients used in the development of the plan are correct.*

Forest-wide monitoring of the application and effectiveness of mitigation measures will be briefly summarized in this chapter. Additional mitigation specified in this EA will be monitored for effectiveness either continuously or when specific measures are completed.

In conclusion, Forest Plan standards mitigate direct, indirect, and cumulative impacts identified in the Forest Plan EIS. Also, the Forest Plan and project monitoring program measures the effectiveness of that mitigation.

The following sections provide a description of the consequences, or potential impacts, to the environment of implementing each alternative. It is the scientific and analytic basis for comparison of alternatives summarized in Table II-1 in Chapter II. It also describes the consequences of implementing each alternative in terms of the issues.

B. SOCIOECONOMICS AND MINING

ALTERNATIVE A

The No Action Alternative would involve not leasing any coal reserves within the delineated tract. If this alternative were to be implemented, the estimated 25 million tons of Federal coal would probably be irretrievably lost, as the reserves are not feasibly accessible except from the Crandall Canyon workings. Developing new access or reopening existing workings to access coal in the tract after the Crandall Canyon Mine is closed may not be economical and

could involve considerable safety hazards. The estimated 44 million dollars in royalty that would benefit Federal, State, and local governments would not be realized and mine life would not be extended for 19 years. Mine life for the Crandall Canyon Mine would last for about 4 years at the current production rate and with current leased reserves.

ALTERNATIVE B

The tract under application is adjacent to the Crandall Canyon Mine. Although the tract would be leased competitively, the applicant is the only logical lessor of the tract. If leased, it can be developed easily without any further surface development by the applicant through their existing operation.

The Crandall Canyon Mine has had increasing production in recent years and is expected to reach 1.3 million tons in 1993 with their continuous miner/continuous haulage system. The maximum capacity as designed is 1.5 million tons. The existing mine permit area has only 4 more years of reserves at the present rate of production. The present employment level has been about 100 including miners and all surface and office personnel. With full extraction, the delineated tract would provide an estimated 25 million tons of recoverable coal which would add 19 years to their reserve base at present production rates. At existing prices, this production would generate $44 million of royalty which would benefit Federal, State, and local governments.

In summary, the leasing and development of the subject Federal coal tract is not expected to have a notably increased socioeconomic impact on Emery County. Facilities are in place and mining is occuring at the anticipated production rate. With leasing and continued efficient production, an estimated 130 jobs in mining and hauling the coal are projected to continue for an additional 19 years, for a total of 23 years.

ALTERNATIVE C

Under this alternative, the reduced acreage would reduce recoverable reserves by 1.6 million tons to 23.4 million tons which would add an additional 18 years of production at the present and projected level. Royalty realized that would benefit Federal, State, and local governments would be $ 41.2 million. This reduction in reserves is not expected to alter the socioeconomic impacts as the same level of production and jobs are anticipated. The mine life would be reduced by about one year, for a total of 22 years, and the estimated 1.6 million tons of Federal coal and $2.8 million in royalty would be lost forever.

ALTERNATIVE D

Under this alternative, the reduced acreage would reduce recoverable reserves by 2.1 million tons to 22.9 million tons or about 17 years of additional production at the present and projected level. Royalty realized would be $40.3 million. This reduction in reserves is not expected to alter the socioeconomic impacts as the same level of production and jobs are anticipated. The mine life would be reduced by about two years for a total of 21 years and the estimated 2.1 million tons of Federal coal with $3.7 million in royalty would likely be lost from economically feasible production.

ALTERNATIVE E

Under this alternative, the reduced acreage would reduce recoverable reserves by 3.7 million tons to 21.3 million tons adding about 16 years of production at the present and projected level for a total of 20 years. This reduction in reserves is not expected to alter the socioeconomic impacts as the same level of production and jobs are anticipated. Royalty realized would be $37.5 million. The mine life would be reduced by about three years and an estimated 3.7 million tons of coal with $6.5 million in royalty would likely be lost from economically feasible production.

C. TOPOGRAPHY/SUBSIDENCE

ALTERNATIVE A

The tract would not be leased and no mining would occur so there would be no new subsidence in the tract area. A special-use permit was issued to Genwal Coal Company in 1992 authorizing subsidence of 50 acres of the tract in the Candland Mountain Semiprimitive Recreation Area along the north line of Section 36 (State Lease ML-21569). Less than 1 foot of subsidence occurred in this tract caused by mining to the State lease boundary. No disruption of surface resources was observed earlier this year by the Forest Landscape Architect.

ALTERNATIVE B

Underground coal extraction up to the Joes Valley Fault is anticipated to extend the edge of the subsidence trough approximately 200 to 600 feet west of the Joes Valley Fault into Upper Joes Valley and Scad Valley. It is likely that the Joes Valley Fault would affect the anticipated angle-of-draw and reduce the westward extent of the trough. There is potential that subsidence would be focused along the fault forming an abrupt limit to the subsided area rather than a gradual trough. In either case, subsidence is not expected to reach Indian Creek.

Surface cracks are most likely to occur at the edge of the subsidence trough. Along the Joes Valley Fault to the north where the overburden is about 500 feet, there is a moderate to high potential for surface cracks. As the overburden along the fault increases to 1,000 feet toward the south, the potential for surface cracks would become minimal. The potential for surface cracks would increase along the Joes Valley Fault trend, if the fault acts as a barrier to the development of an even subsidence trough, focusing subsidence along the surface expression of the fault. Any surface cracks that develop west of the Joes Falley Fault should not be conducive to the migration of water due to the high clay content of the surficial North Horn Formation.

If exceptions to lease stipulations that prevent subsidence of perennial drainages are approved under the mine plan, a moderate to high potential for surface cracks to develop exists in lower stretches of major drainages where overburden is less than 500 feet. Surface cracks are likely to form along the slopes and could cross a stream channel at the edge of the subsidence trough. Surface cracks along the slopes of drainages are expected to have the capacity to heal due to expanding clays in the Blackhawk Formation and natural processes such as creep and deposition of the material carried during surface runoff.

A surface crack across a stream channel is expected to have the capacity to heal by filling the alluvium carried by the stream. Also, a stream is unlikely to be diverted underground by a surface crack because the claystones and siltstones of the Blackhawk Formation have a low permeability and the higher permeability sandstones are lenticular and pinch-out in short distances. Although a surface crack across a stream channel could connect with a fracture system which intercepts the underground mine workings, the fractures in a fine material are not expected to provide an open conduit for the migration of water. The greatest potential for a surface crack to connect with the mine workings and divert a stream underground would occur in an area with less than a couple hundred feet of overburden with a predominant sandstone (such as a sandstone channel) above the minable coal. However, no areas meeting these criteria have been identified within this tract.

Subsidence of stream channels could change the morphology of the drainage but the nature and extent of impacts is not known at this time. The stream gradients would be affected in the transition zone between the area of maximum subsidence (3 to 6 feet) and the edge of the subsidence trough (800 feet). In the expected transition zone for the lower stretches of the major drainages, the existing stream gradients of 80 feet (Crandall and Blind Canyons) to 120 feet (South Fork of Horse Creek) in 800 feet would be lowered by 3 to 6 feet in 800 feet. A possible impact of this change in stream gradient would be a reduction in the stream velocity.

In compliance with lease stipulations, subsidence of perennial streams would not be approved unless the study of impacts of subsiding Blind Canyon Creek on State Lease ML-21569 and other areas confirms that there would be no disruption of flow and substantial increases in sediment.

ALTERNATIVE C

The impacts would be the same as discussed for Alternative B except that the extent of mining that could cause subsidence would be limited along the Joes Valley Fault calculated by a 22 degree angle-of-draw from the fault. This would prevent the potential for focusing subsidence along the surface expression of the fault, the area west of the fault, and decrease the potential for surface cracks along the fault and to the west into Upper Joes Valley.

ALTERNATIVE D

The impacts would be the same as discussed for Alternative B except that the amount of potential subsidence in the Candland Mountain Semiprimitive Recreation Area would be reduced to less than one foot and the potential for cracks in this area would be substantially reduced.

ALTERNATIVE E

The impacts would be the same as discussed for Alternative B except that the potential for focusing subsidence along the Joes Valley Fault, subsidence of the area west of the fault and the potential for cracks in this area would be precluded. In addition, the amount of potential subsidence in the Candland Mountain Semiprimitive Recreation Area would be reduced to less than one foot and the potential for cracks in this area would be substantially reduced.

D. GEOLOGY AND HYDROLOGY

Geology

ALTERNATIVE A

No effect

ALL ACTION ALTERNATIVES

The west slope of East Mountain has been disrupted by landslides. Most appear to be failures of colluvial materials. Others may be deeper slump features. Mining induced subsidence along the outcrop may trigger additional landslides, especially during wet periods.

Mitigation - The potential for mining induced slope failure should be evaluated prior to mining. Recovery mining should be avoided during extremely wet periods.

Hydrology

ALTERNATIVE A

No effect. Subsidence in the tract due to the angle-of-draw extension caused by mining in adjacent areas has not caused impacts to hydrology within the tract area.

ALTERNATIVES B AND D

Subsidence would fracture the rock layers overlying the extracted coal seam. The flow of ground water could be altered causing some changes to the flow of springs in and directly adjacent to the lease tract area. Some springs could decrease or increase in flow. It is also possible that some springs could dry up while new springs could be created. Monitoring of springs at the Crandall Canyon Mine and other mines on the Wasatch Plateau has shown that this is very unlikely considering the amount of overburden over most of the tract area, formations that contain considerable amounts of clay that expands when wet, and the self healing nature of fractures. Ground water generally flows down-dip to the southeast toward Huntington Canyon. Ground water would continue to flow in this direction even if perched aquifers are fractured.

Water originating on the west slope of East Mountain flows into Upper Joes Valley where it sustains springs, streams, and a wet meadow. Subsidence caused by coal mining could induce some fracturing of the overlying strata and surface. These fractures could intercept water resources before they reach Upper Joes Valley. Shallow fractures are likely to heal and only temporarily divert water. Deep seated fractures are more likely to permanently divert water from reaching Upper Joes Valley. This could happen if subsidence effects were focused along the Joes Valley Fault. If mining were to occur westward all the way to the fault line, normal subsidence curves could not be used to predict subsidence effects because the west end of the curve would be cut-off by the fault. Assuming minimal compression against the fault, friction between the fault blocks and rubbilization of the overburden would be the limiting

factors in the amount of subsidence that could occur. If subsidence were to be focused along the fault, the amount of subsidence could be nearly equivalent to the extraction height of the coal seam. If this were to occur, ponding along the fault line is likely to occur. If the character of the fault becomes open due to subsidence, surface waters could be diverted into the fault and away from the wetland they support in Upper Joes Valley.

Mine workings could encounter water stored in perched aquifers and divert it into the mine. To date, the mine has not encountered water volumes sufficient for meeting the needs of mining or to require discharge of water into Crandall Creek. Exploration drilling has demonstrated that the potentiometric surface of the Starpoint-Blackhawk Regional Aquifer lies below the Hiawatha seam except for the extreme southeastern corner of the tract. It is unlikely that mining would produce water volumes sufficient to cause dewatering of the aquifer and require discharge of mine water to Crandall Canyon unless mine workings are driven directly into the Joes Valley Fault.

If the Joes Valley Fault acts as an aquiclude and conduit for ground water flow, as suspected, driving of mine workings into the fault area could encounter large amounts of ground water. This water would be diverted into the mine and discharged into Crandall Creek, increasing the flow and altering the water quality in Crandall and Huntington Creeks. This could potentially also decrease the amount of water presently flowing into Indian Creek. There is no way to predict the potential for this to occur or the amount of water that could be encountered by mining into the fault. This impact would be avoided by requiring the lessee to drill laterally ahead of mine workings toward the fault zone to test for the presence of water. If flowing water is encountered, the mine operator would be required to leave an adequate barrier or construct seals to prevent diverting the water into the mine and the associated impacts.

Lease stipulations require specific approval to subside any perennial drainages within the tract. Subsidence of perennial drainages on or directly adjacent to the tract could be considered if the study being conducted at the headwaters of Blind Canyon Creek (subsidence of the headwaters of Blind Canyon Creek on State Lease ML-21569) determines that mining under a perennial drainage would not cause adverse or unmitigable changes in flow, stream morphology, erosion/sediment production, or fish habitat.

Lease stipulations and the mining regulations require monitoring of ground water, surface drainages, and springs sufficient to detect impacts caused by mining. They also require implementation of measures needed to mitigate impacts detected by monitoring that result in material damages to resources or water uses.

Since it is anticipated that these alternatives could cause changes to the hydrologic system and flow of perennial drainages that could adversely affect existing water uses (including aquatic habitat) and water rights within and downstream of the tract, the level of potential impact is considered high.

ALTERNATIVES C AND E

The impacts under this alternative would be the same as discussed above for Alternatives B and D, except that the potential for disrupting flow in the springs and drainages west of the Joes Valley Fault, including Indian Creek,

would be prevented. This would be accomplished by not leasing the area west of the Joes Valley Fault and limiting the extent of second mining by the 22 degree angle-of-draw from the fault. In addition, the operator would be required to drill ahead of mine workings to test the volume of water in the Joes Valley Fault zone and to make adjustments in the mine plan to prevent encountering large amounts of ground water.

Some surface cracks could occur on the west slope of East Mountain but the cracks would be shallow and would heal rapidly. They could intercept surface water resources before they reach Upper Joes Valley on a temporary, short-term basis with little, if any, impact to surface water flow. It is possible, but unlikely, that surface cracks would occur along the northern portion of the tract within the Candland Mountain SPR. Subsidence in the SPR authorized by the 1991 special use permit did not induce surface cracks or cause impacts to surface water.

Lease stipulations and the mining regulations require monitoring of ground water, surface drainages, and springs sufficient to detect impacts caused by mining. They also require implementation of measures needed to mitigate impacts detected by monitoring that result in material damages to resources or water uses.

Since it is not anticipated that these alternatives would cause changes to the hydrologic system and flow/quality of perennial drainages that would adversely affect existing water uses (including aquatic habitat) and water rights within or downstream of the tract, the level of potential impact is considered minimal or low.

E. SPR AND VISUAL RESOURCES

ALTERNATIVES A, D and E

No effect to visual resources in the SPR.

ALTERNATIVES B and C

There would be possible subsidence in the SPR due to underground mining. Because of the amount of overburden, method of coal extraction employed, and type and amount of vegetative cover present, the possibility of visible subsidence in the SPR is minimal. Upon visiting the site immediately adjacent to the SPR where mining has occurred on State lands, no subsidence could be seen. This adjacent area possesses little vegetative cover due to a past fire and possible visual impacts caused by subsidence would have been readily apparent.

If subsidence actually did take place in the SPR in a manner similar to that which has been confirmed to occur in another area near the Crandall Canyon mining facility, one could be fully confident it would not be visually evident (given identical soils and geology), and these alternatives would have a low potential to affect visual quality objectives (VQO). At this location below the mining facility, the amount of overburden is less than in the SPR and consequently the potential for subsidence and its subsequent visual evidence at the surface is greater. In addition this lower elevation slope has little

vegetative cover and any slides or fissures at the surface would be easily noticed. Subsidence which has occured under this relatively barren slope is not visually apparent in any way. The majority of the SPR land involved is much more densely vegetated, particularly with conifer.

It may be expected with a high amount of confidence that any subsidence which does occur will not be visually evident in the more thickly overburdened and densely vegetated portion of the tract. Accordingly, it is anticipated that the visual quality objective of retention will be maintained in the SPR.

F. TRANSPORTATION

At the production rate of 1.5 million tons per year the service volume of Highway 31 will not be exceeded and the service level will not decrease. Highways users will experience decreased speeds during mine shift changes, especially near the intersection of the Crandall Canyon Road. Travelers will also experience the nuisance of coal debris from coal haulage vehicles until existing covered-load laws are enforced by local and state law enforcement officers. The peak traffic volume will be 120 vehicles per hour. The dispersed recreational user will notice the increase in traffic during peak periods.

At the production rate of 1.5 million tons per year the traffic volume of the Crandall Canyon Road would approach 530 vehicles per day with a peak hourly volume of 86 vehicles . The peak service volume allowable without unstable or forced-flow is estimated at 96 vehicles per hour. The primary use of this road would remain coal haulage until the reserves were depleted. The road would still provide access for range and dispersed recreation use from the trailhead. The lower speeds associated with use of this road are generally considered acceptable for short local access roads.

Visitors using recreation sites in the vicinity of Crandall and lower Huntington Canyons are impacted either audibly or visually by mine traffic.

ALTERNATIVE A

No additional effects would occur above and beyond the 4 years duration expected under existing conditions.

ALTERNATIVE B

Above effects would continue for an additional 19 years.

ALTERNATIVE C

Above effects would continue for an additional 18 years.

ALTERNATIVE D

Above effects would continue for an additional 17 years.

ALTERNATIVE E

Above effects would continue for an additional 16 years.

G. WILDLIFE

ALTERNATIVE A

If the "no action" alternative is selected, the aquatic and terrestrial wildlife habitat and populations should not change from present conditions provided that other conditions remain constant (i.e., management direction, other unrelated improvement projects, climatic conditions). No additional effect to wildlife is expected if this alternative is selected.

ALTERNATIVES B AND D

If one of these alternatives is selected, there will be subsidence. Associated with subsidence is the possibility of water loss due to fracturing of the soil/rock layers. Lease stipulations require that the lessee/operator replace water identified for protection in the event that water loss occurs as a result of mining. The possibility of water loss is associated largely with the springs within the areas to be subsided. Any reduction of water from springs could reduce the amount of water that enters the streams located beneath them.

The area of greatest concern in regard to water loss is the watershed of Indian Creek which has numerous springs that feed associated wetlands that eventually drain into Indian Creek. This area also has numerous faults which adds to the complexity of the effects of subsidence and could amplify the impacts upon the spring/water resources. Indian Creek supports a Brook trout fishery which is largely dependent on its spring water sources for flow. It is doubtful that any fish production change within Indian Creek would be noted in Joes Valley Reservoir downstream, however macroinvertebrate populations could be affected which could reduce the numbers of invertebrates drifting downstream towards Joes Valley Reservoir which could influence the fisheries present. If water is diverted away from Upper Joes Valley, water-dependant terrestrial and aquatic wildlife species associated with wetland/riparian areas would be affected.

Some springs that supply flow to Crandall Creek, Blind Canyon Creek, and the South Fork of Horse Creek could be affected. It is however, expected that any changes in flow would be minimal due to the healing potential of cracks and lithologic layers that perch permeable aquifers. Some changes in sediment production could result from subsidence. An increase in sediment production could impact the very popular trout fishery in Huntington Creek by reducing available spawning habitat.

The Northern Goshawk and Northern Three-toed woodpecker (and their habitat) are the most likely listed Sensitive species to exist within and adjacent to the tract. If the Three-toed woodpecker occurs in the area, impacts due to subsidence would be minimal. Water is a critical component of goshawk habitat. Diversion of water induced by subsidence could adversely impact goshawk habitat.

A Biological Evaluation/Assessment was completed for the project, has been reviewed by the U.S. Fish and Wildlife Service (Appendix C). The Biological Evaluation/Assessment determined that there would be no effect to listed or proposed Threatened and Endangered species or their habitat.

Due to the potential for affecting water flow in the wetland areas and the Indian Creek drainage in Upper Joes Valley, potential impacts to aquatic wildlife species are considered to be high. Potential impacts to terrestrial species are considered to be moderate due to the potential for changes in springs and flow to the wetland/riparian areas in Upper Joes Valley.

ALTERNATIVES C AND E

These alternatives would be the same as Alternatives B and D except that the 400 acre western strip would be excluded from the tract and second mining would be restricted to prevent focusing subsidence along the Joes Valley Fault. Mining would be allowed in some areas that supply water to Upper Joes Valley but loss of flow to Upper Joes Valley and Indian Creek is not expected. Subsidence could result in some changes in sediment production.

Potential impacts to aquatic wildlife would be moderate due to potential changes to sediment production in Huntington Creek from subsidence. Potential impacts to terrestrial wildlife would be considered low because impacts to the wetland/riparian area in Upper Joes Valley would be minimized or prevented.

H. SHORT-TERM USE OF MAN'S ENVIRONMENT VS. LONG-TERM PRODUCTIVITY

ALTERNATIVE A

There would be no impacts to the productivity of Forest resources other than coal because the tract would not be leased. This alternative would not have potential to extend the life of the existing Crandall Canyon Mine or provide the associated socioeconomic benefits.

ALTERNATIVES B AND D

The life of the Crandall Canyon Mine and the associated socioeconomic benefits would be extended within the short-term; 19 years for Alternative B, and 17 years for Alternative D. The productivity of environmental resources would be affected as discussed for the individual resource categories.

ALTERNATIVES C AND E

The life of the Crandall Canyon Mine and the associated socioeconomic benefits would be extended within the short-term; 18 years for Altarnative C, and 16 years for Alternative E. The productivity of environmental resources would be affected as discussed for the individual resource categories.

I. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

ALTERNATIVE A

Under this alternative the tract would not be offered for lease. There would be no irreversible or irretrievable commitments of environmental resources.

For the purposes of this analysis, it is assumed that the proposed tract, or portion thereof, would not be evaluated or offered for leasing again in the

foreseeable future. In this case, the coal would be bypassed. Selection of this alternative would, therefore, involve an irretrievable commitment of the coal reserves and associated socioeconomic benefits. It is not possible to determine whether or not the coal would be recovered at some time in the future. Once the Crandall Canyon Mine is closed and abandoned, the potential to safely and economically mine the reserves in the tract would be substantially reduced, if not precluded.

ALTERNATIVES B AND D

If the tract is leased under either of these alternatives, mining of the coal would take place. Since coal is not a renewable resource, extraction and use of coal reserves would constitute an irreversible commitment of the resource. The coal would not be available for use by future generations. In addition, the use of energy and other resources needed to extract the coal reserves would be an irretrievable and irreversible commitment of these resources.

The extraction of coal reserves would involve impacts to other resources as previously discussed under the individual resource categories. Subsidence and the related impacts to the hydrologic system would be irretrievable and irreversible. It would not be possible to reverse changes to the topography and hydrologic system once they occur. If subsidence were to be focused along the Joes Valley Fault and water is diverted from the Indian Creek drainage, this impact would probably be irreversible. Other impacts related to subsidence would, however, be irretrievable but not irreversible. For example, water needed in an area for wildlife and livestock could be replaced if a specific watering source is lost. A new spring could be developed, a water well could be drilled, or a stock pond could be constructed to provide an alternative watering source. Increases in sediment production and associated decreases in the quality of spawning habitat in Huntington Creek would be irretrievable but potentially not irreversible. Measures could be required and taken to improve watershed conditions and spawning habitat in the affected area or adjacent areas to mitigate the impact.

The impacts to recreation and transportation would be irretrievable but not irreversible, since they could be reversed by other actions.

ALTERNATIVES C AND E

The commitments of resources would be essentially the same as discussed above except that potential irreversible impacts to water flow and wildlife in Indian Creek would be minimized or prevented.

J. CUMULATIVE IMPACTS

It is not possible to detect and quantify all of the cumulative impacts because accurate records of man's activity throughout prehistoric and historic times are not available. This analysis is limited in scope to the Huntington Canyon and Indian Creek drainages from the proposed lease tract to the downstream reaches likely to be affected by the proposed leasing and potential mining. Since environmental resources within the ecosystems are inter-dependent, the discussion will not be broken down into individual resource categories. The socioeconomic and environmental resources will, however, be discussed

separately. Anticipated impacts after mitigation for each resource were discussed at the beginning of this chapter. Several of the issues discussed throughout the analysis were identified because of the cumulative effects of existing uses and management emphasis and the potential effects of the proposed coal leasing.

Future surface disturbing projects associated with coal leasing and mining as well as other resource uses and developments are inevitable, however, no such proposals are ripe for analysis at this time. The analysis of cumulative impacts was, therefore, limited to the proposed action and alternatives.

Socioeconomics

Coal mining was an important factor in the development of the local socioeconomic infrastructure and continues to be a dominant element in the local economy and lifestyle. Since approximately 85% of the coal mined in Utah is from the Wasatch Plateau Coal Field, the socioeconomic benefits of coal mining are also important Statewide, and to a lesser degree Nationwide.

The socioeconomic setting of the influence zone for the project was described in Chapter 3, Affected Environment. The setting described in Chapter 3 is the result of the existing cumulative level of coal mining and other activities that have occurred to date, including management of National Forest resources, agriculture, and industry.

The Uinta-Southwestern Utah Coal Region Round Two Final Environmental Impact Statement, 1983, predicted that Alternative Two (Preferred Alternative) would result in a steady increase in population through the year 2000 from the 1982 baseline population. An increase in population of 16,700 (total for Carbon, Emery, Sanpete, and Sevier Counties) was predicted by the year 2000. This was expected to result in considerable stress on the county infrastructures. In actuality, all or portions of only 6 of the 22 coal lease tracts analyzed under this alternative have been leased. The populations have decreased from the 1982-1983 peak due to the soft coal market and advances in mining technology. Improved methods and new technology have resulted in increased production with fewer miners (including support services).

ALTERNATIVE A

The life of the Crandall Canyon Mine would not be extended unless lands to the south of the existing permit area are offered and acquired by Genwal Coal Company. Closure of the mine in 1997 would decrease employment and the associated economic benefits. The bonus bid and coal royalties would not be generated. This impact would be more severe locally than Statewide or Nationally, but would be evident (See Chapter 4, Socioeconomics and Mining).

ALTERNATIVES B, C, D, and E

The mine life would be extended as discussed in Chapter 4, Socioeconomics and Mining. The bonus bid and coal royalties generated would be proportionate to the amount of reserves leased and mined under each of the alternatives. The overall economic benefits and differences in benefits between the four alternatives would be more important locally than Statewide of Nationally. The overall benefits would be evident Statewide and Nationally but the differences

between the four alternatives would be minimal at this broad level.

Environmental/Physical Resources

Huntington Canyon has been affected and continues to be affected by historic (abandoned) and active mining operations and related surface disturbance and subsidence. All of the surface facilities associated with abandoned mine workings in Huntington Canyon and it's tributaries have been reclaimed by the mine operators or by the Utah Division of Oil, Gas, and Mining under the Abandoned Mined Lands Program. Even though it is known that historic abandoned mining operations caused subsidence, there are no evident surface expressions of subsidence, such as cracks or troughs. Current mining operations include the Genwall Coal Company Crandall Canyon Mine, PacifiCorp Deer Creek Mine, and Co-Op Mining Company Trail Canyon (inactive, under reclamation) and Bear Canyon Mines located downstream of the proposed tract near the mouth of Huntington Canyon. Subsidence associated with these mines is being monitored as required by lease stipulations and the approved mining and reclamation plans. Trough subsidence on East Mountain associated with the PacifiCorp Mines has reached 13 feet centered over blocks of longwall panels involving two overlapping extracted coal seams. Due to the mountainous uneven terrain, subsidence troughs are usually not evident. The visual effects of subsidence have been limited to rockfalls along escarpments and surface cracks. Most cracks heal naturally within a few years. Other cracks require reclamation.

There is concern about the cumulative effects of traffic and dispersed recreation in Huntington Canyon along State Highway 31. A transportation analysis has shown that mining related traffic volumes will not be increased due to the proposed action but the duration would be extended with the associated increased mine life. At the present time mine traffic and recreation traffic have not exceeded maximum design capacity. Any increases in traffic volumes would increase the potential for accidents and decrease the quality of dispersed recreation in the canyon. It is anticipated that traffic will steadily increase over the years with the growth of recreation use and could, at some time during the life of the Crandall Canyon Mine, exceed design capabilities.

Ground and surface water quality is described in Chapter 3 under "Hydrology". The potential impacts of each of the alternatives are described in Chapter 4 under "Hydrology". It is certain that Man's activities in Indian Creek and Huntington Creek have affected flow and quality. Water is impounded in several reservoirs, is diverted for culinary, agricultural, and industrial use, and has been affected by construction or roads, grazing, recreation, and mining. Water quality usually meets or exceeds State water quality standards for the identified beneficial uses, including culinary, industrial, agricultural, recreation, and cold water fisheries. Occasional violations of standards for fecal coliform bacteria have been detected in Huntington Creek, probably caused by concentrated dispersed recreation. Total dissolved solids concentrations increase rapidly in Huntington Creek where flows encounter the saline Mancos Shale Formation and agricultural/industrial lands below the Forest boundary.

Water monitoring associated with the approved mining and reclamation plans for the Deer Creek, Trail Canyon, and Bear Canyon Mines shows that there have been some increases in water flow and decreases in water quality at or below the Forest boundary related to mine water discharge into Huntington Creek. Water

encountered in underground mine workings is treated and discharged into Huntington Creek under existing Utah Non-Point Pollution Discharge Permits. The Cumulative Hydrologic Impact Assessments for the mines have determined that there would not be any changes in the water balance due to mining. There is however, some unsubstantiated evidence that the Deer Creek Mine could be diverting water from the Cottonwood Creek drainage to the Huntington Canyon drainage. An investigation is being conducted by water users and the State of Utah. None of the proposed alternatives is expected to affect water resources in the Cottonwood Canyon drainage.

Huntington Creek and Indian Creek support trout fisheries. Increases in sediment and other substances due to the construction and maintenance of roads, grazing, fires, recreation, and mining have undoubtedly occurred. Mining induced subsidence could cause accelerated erosion and sediment production. Mine operators are, however, required to develop mitigations to assure that there are no net additions of sediment into water supplies. Sediment will continue to affect spawning habitat. The fisheries and spawning habitat in these drainages are of high quality and are expected to remain of high quality.

The Utah-Southwestern Utah Coal Region Round Two Final Environmental Impact Statement, 1983 analyzed the cumulative of several alternatives for coal leasing. Under Alternative 2 (Preferred Alternative), the impacts of leasing 22 coal lease tracts were analyzed. All or portions of only 6 of the tracts have been leased under the Lease-on-Application process for the purposes of extending the life of already existing mines. The Crandall Canyon tract was not analyzed under any of the alternatives, but it has been determined that the level of predicted cumulative impacts would be generally consistent with those predicted in the FEIS, but substantially less in terms of magnitude.

ALTERNATIVE A

No changes to the existing conditions are expected.

This alternative is consistent with Forest Plan management prescriptions for the area and Forest-wide goals for non-mineral resources. It could be considered to be inconsistent with Forest Plan management prescriptions that allow mineral activities, with appropriate mitigations, if the management prescriptions and goals for other resources can be met.

ALTERNATIVES B and D

The additional impacts associated with these alternatives could result in decreasing the flow of water in the wet meadow/riparian area and Indian Creek in Upper Joes Valley. Riparian habitat, spawning habitat, and water rights could be altered (See the discussion of impacts for individual resource categories). Terrestrial and aquatic species population levels and goals could be adversely affected by decreased water flow and increased erosion/sediment.

Conflicts between recreation, general transportation, and mining related traffic could increase with increasing recreation use of Huntington Canyon and State Highway 31.

Land stability could be affected along the west slope of East Mountain, triggering new landslides or aggravating existing landslides. This would

increase erosion and sediment production. Visual quality would be decreased but visual quality objectives would be met.

These alternatives would not be consistent with management prescriptions for the project area and Forest-wide goals in the Forest Plan or resource production levels or thresholds established in the Forest Plan and Forest Plan FEIS.

ALTERNATIVES C AND E

There would be minimal, if any, changes to water flow in Indian Creek or Huntington Creek. Some changes in spring flow could occur but these changes are expected to be localized. Detectable impacts to water rights are not expected. Subsidence could result in sediment production increases that could affect spawning habitat, however, the fisheries and spawning habitat should remain of high quality. Impacts to terrestrial wildlife habitat are not expected to impact populations or population goals.

Conflicts between recreation, general transportation, and mining related traffic could increase with increasing recreation use of Huntington Canyon and State Highway 31.

Subsidence along the west slope of East Mountain could trigger new isolated landslides or aggravate existing landslides. The potential for this to occur is low due to measures under this alternative that would reduce the magnitude of subsidence and prevent the potential for focusing subsidence along the Joes Valley Fault. Slight increases in erosion and sediment production could result. Visual quality objectives would be met.

Alternative C would be consistent with management prescriptions for the project area and Forest-wide goals in the Forest Plan and resource production levels or thresholds established in the Forest Plan and Forest Plan FEIS.

Alternative E would be consistent with the Forest Plan and Forest Plan FEIS, except for excluding the Candland Mountain SPR Management Unit from the lease. The analysis has determined that leasing and subsidence of the SPR would not conflict with Forest Plan management prescriptions for providing for a quality semiprimitive recreation experience.

CHAPTER V - PREPARERS AND PUBLIC INVOLVEMENT

A. LIST OF PREPARERS

The following individuals from the Manti-La Sal National and the BLM formulated the five alteranatives considered in this document in response to the issues and the expected environmental effects:

SPECIALIST	SPECIALTY	ID TEAM ROLE
Brent Barney	Engineering	Member, FS
Paul Burns	Fishery Biologist	Member, FS
Kevin Draper	Recreation/Visuals	Member, FS
Abe Elias	Mining Engineering	Member, BLM
Dale Harber	Minerals/Geology	Member, FS
Dennis Kelly	Hydrologist	Member, FS
Pete Kilbourne	Minerals/Geology	Consultant, FS
Dan Larsen	Soils Scientist	Consultant, FS
Stan McDonald	Cultural Resources	Consultant, FS
Max Nielson	Socioeconomics	Member, BLM
Walter Nowak	Minerals/Geology	Team Leader, FS
Tom Rasmussen	Minerals/Geology	Consultant, BLM
Steve Romero	TE&S/Wildlife	Member,FS
Bob Thompson	TE&S/Plants/Range	Consultant, FS

B. PUBLIC INVOLVEMENT

Public involvement is discussed in Chapter II, under Public Participation. This section lists the 48 agencies, groups and individuals consulted during the EA process:

Utah Division of Wildlife Resources	Utah Division of Water Rights
Emery County Commissioners	Emery Water Conservancy District
Southeastern Utah Association of Local Governments	Huntington - Cleveland Irrigation Company
Utah Wilderness Association	Soil Conservation Service
Slick Rock Council	Owen M. Peel
Charles Mckay	David Peel
J. D. Covert, Et Al	Wayne Poulsen
Division of State Lands and Forestry	Utah Department of Health
Utah Riparian Coalition	American Fisheries Society
Moab District Office, BLM	Utah State Office, BLM
Price Coal Office, BLM	Division of Oil, Gas and Mining
Genwal Coal Company	Office of Surface Mining
Cottonwood Irrigation Company	Nielsen & Senior, Attorneys
Energy West Mining Company	Mining and Energy Resources, Inc.
Southern Utah Wilderness Alliance	City of Castle Dale

City of Ferron	City of Orangeville
Emery County Economic Development	Trail Mountain Livestock Association
Utah Associated Municipal Water Systems	Senator Orrin Hatch's Office
Sportsmen for Quality Wildlife	East Carbon Wildlife Federation
Utah Department of Natural Resources	Bureau of Water Pollution Control
PacifiCorp Electric Operations	Maughan Guymon
Lee McElprang	Avra M. Smith
Meridian Oil, Inc.	Wade K. Jensen
Utah Department of Transportation	Carbon County Commissioners

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Appendix A - Tract Delineation Report