

0001

file ACT/005/019

#2

United States
Department of
Agriculture

Forest
Service

Manti-LaSal
National Forest

599 West Price River Drive
Price, Utah 84501

Reply to: 2820

Date: December 31, 1987

Lowell Braxton
State of Utah Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RECEIVED
JAN 06 1988

DIVISION OF
OIL, GAS & MINING

Dear Lowell:

Enclosed are complete copies of the Forest Service Environmental Assessment (EA) and Finding of No Significant Impact/Decision Notice (FONSI/DN) which address Utah Power and Light Company's longwall mining under the escarpments in Miller and Newberry Canyons. This is a follow-up to our letter of December 23, 1987, which transmitted only a copy of the FONSI/DN to your office.

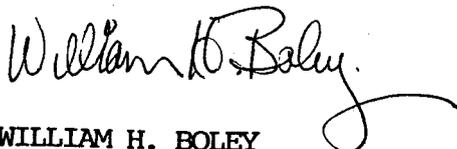
Alternative 3 (Modified Mine Plan), which was formulated and agreed to during our meeting on December 17, 1987, is the Forest Service approved alternative. Forest Service consent to the mining according to this alternative is subject to the mitigations identified on pages 7-9 of the EA. Utah Power and Light will need to incorporate provisions consistent with these mitigations into their Mining and Reclamation Plan.

The FONSI/DN and EA discuss using a 15° angle of draw as the basis for Alternative 3. Since the Division has determined that mining of the sixth and seventh east panels actually involved a 20° angle of draw, we have no objection to modification of this alternative accordingly.

Utah Power and Light Co. and the involved agencies will need to work closely together in a cooperative effort to provide for maximum recovery of the coal resource and the necessary coordination with other resources and resource uses.

If you have any questions, please contact the Forest Supervisor's Office in Price, Utah.

Sincerely,



WILLIAM H. BOLEY
Acting Forest Supervisor

Enclosure

DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT

UTAH POWER AND LIGHT
LONGWALL MINING UNDER THE ESCARPMENT
IN MILLER AND NEWBERRY CANYONS

Utah Power and Light Company has proposed to longwall mine under the escarpment in Newberry and Miller Canyons within their Wilberg/Cottonwood Mine Permit Area. Removal of coal by longwall mining as proposed is known to cause escarpment failure in the form of rock falls, topplings, and foundation failures. Similar mining activity has occurred in a portion of the north side of Newberry Canyon. The effects of the previous longwall mining in Newberry Canyon and the anticipated effect of continued use of longwall mining in Newberry and Miller Canyons have been assessed. The Forest Service Environmental Assessment which discusses the proposal and alternatives is available for review at the Forest Supervisor's Office in Price, Utah and the Ferron Ranger District Office in Ferron, Utah. In addition, a report prepared by Utah Power and Light Company entitled: "Assessment of Mining Related Impacts in Newberry Canyon, Cottonwood Coal Mine, Emery County, Utah, December, 1987" is available for review at the referenced Forest Service Offices and Utah Power and Light Company's Mining Division Office in Huntington, Utah.

It was determined by the Interdisciplinary Team that the proposed action (Alternative 2) is not consistent with the Land and Resource Management Plan of the Manti-LaSal National Forest, 1986.

Based on these findings it is my decision to approve Alternative 3 (Modified Mine Plan). Under this alternative the Forest Service will consent to approval of mine plans as modified to provide for protection of the Castlegate Sandstone outcrop from significant spalling. This alternative provides for mining under a portion of the escarpment and additional modifications of longwall mining in sequential panels as new data becomes available. This decision is consistent with the Migratory Bird Treaty Act, the Bald Eagle Protection Act, and the Endangered Species Act, Forest Service Manual 2670, and the Land and Resource Management Plan of the Manti-LaSal National Forest, 1986.

This 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: (a) there are no apparent adverse cumulative or secondary effects; (b) no known threatened or endangered species will be impacted; (c) floodplains will not be significantly affected; (d) there are no alluvial valley floors, prime or unique rangeland, timberland, farmland, known cultural or paleontological values, or wilderness that will be disturbed by this project; and (e) few public comments were received concerning this proposal. Notification of the proposal was published in the local newspaper, personal contacts were made, and a letter was sent to Forest planning contacts. Comments that were received provided no new issues or concerns.

This decision is subject to appeal under Secretary of Agriculture Regulation 36 CFR 211.18. A written notice of appeal must be filed with this office within 45 days from the date of decision.

George C. Morris
George Morris
Forest Supervisor
Manti-LaSal National Forest

Date 12/18/87

ENVIRONMENTAL ASSESSMENT

FOR

UTAH POWER AND LIGHT COMPANY
LONGWALL MINING UNDER THE ESCARPMENT
IN MILLER AND NEWBERRY CANYONS

USDA FOREST SERVICE, MANTI-LASAL NATIONAL FOREST

Responsible Official:

George Morris
Forest Supervisor
599 W. Price River Drive
Price, Utah 84501
801-637-2817

For Further Information Contact:

John Niebergall
District Ranger
Ferron Ranger District
P.O. Box 310
Ferron, Utah 84523
801-384-2372

Prepared by: Mark R. Chatterton and
Carter Reed

Table of Contents

I.	Introduction	1
	A. Purpose and Need	1
	B. Authorizing Actions	3
	C. Background	3
	D. Issues and Concerns	6
	E. Opportunities	6
	F. Negative Declaration	6
II.	Alternatives	7
	A. Alternative 1 - Protect the Escarpment (No Action)	7
	B. Alternative 2 - Consent to Escarpment Failure (UP&L Proposal)	7
	C. Alternative 3 - Consent to Modified Mine Plan	7
III.	Description of Existing Environment - Affected Environment	9
	A. Topography, Geology, and Mining	9
	B. Vegetation	11
	C. Migratory Birds	14
	D. Public Safety	18
	E. Watershed	19
IV.	Management Direction	20
V.	Environmental Consequences - Environmental Impacts	22
	A. Alternative 1 - Protect the Escarpment (No Action)	22
	B. Alternative 2 - Consent to Escarpment Failure (UP&L Proposal)	23
	C. Alternative 3 - Consent to Modified Mine Plan	28
VI.	Cumulative Affects	29
VII.	Personal and Public Involvement	32
	A. Interdisciplinary Team	32
	B. Other Agencies Consulted	32
	C. Public Contacts	32
	D. Intensity of Public Interest	32
VIII.	References Cited	33
IX.	Appendix	34

I. INTRODUCTION

A. Purpose and Need

Utah Power and Light Company (UP&L) has proposed to mine portions of Miller and Newberry Canyons, in their Wilberg/Cottonwood Mine Permit Area, which lie directly adjacent to or under the steep canyon slopes or escarpments of the Wasatch Plateau (map 1 and 2). This proposal is within Federal Coal Lease (FCL) U-47978 and consists of using the longwall mining technique which involves the total extraction of coal along longwall panels.

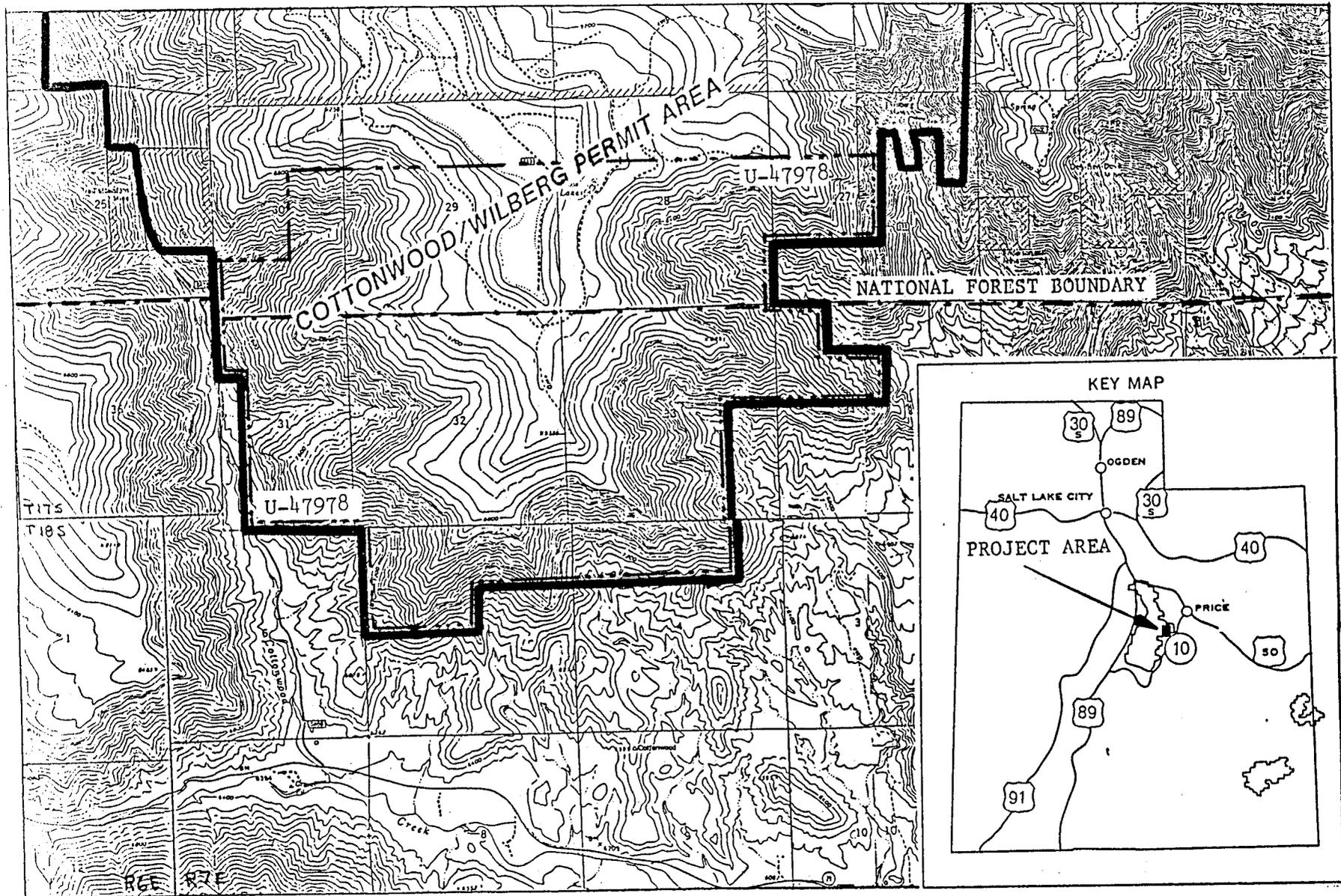
Total extraction of the coal seam or seams in longwall panels inevitably results in subsidence and fracturing of the overlying rock. Sometimes this fracturing can be seen at the surface in the form of cracks. It is also known that total extraction of the coal directly under or adjacent to a steep slope or escarpment, such as in Miller and Newberry Canyons, can cause accelerated erosion, failure of the escarpment, and fracturing of the plateau area above escarpments. The rate and magnitude of subsidence is dependent on many geological factors and the type and configuration of mining.

UP&L has already mined the sixth and seventh east panels under the escarpment in Newberry Canyon on an experimental basis. This proposal involves longwall mining of the ninth and tenth west panels in Miller Canyon in 1988 and 1989 and longwall mining of the eighth and ninth east panels in Newberry Canyon in 1989 and 1990. In addition, sometime between 1997 and 2001, UP&L plans to mine the remaining portion of Miller Canyon that is within National Forest System (NFS) lands (map 2). Starting in 1990, UP&L has also proposed to extend longwall mining under the escarpment to the south onto public lands administered by the Bureau of Land Management (BLM).

The intent of this analysis is to assess the impacts of escarpment failure as a result of UP&L's proposed longwall mining under the remaining portion of the escarpment in Newberry and Miller Canyons on NFS lands. The Forest Service decision to be made, is whether or not to consent to escarpment failure at specifically approved sites as outlined in Special Stipulation #15 of FCL U-47978. Forest Service authorities for this decision are contained in the following section. Thus, this analysis will assess the impacts of potential escarpment failure of approximately 7000 feet of escarpment proposed for longwall mining (map 2).

Since only short-term information is available regarding the magnitude and extent of escarpment failure, which can be expected from longwall mining under the escarpment (UP&L monitoring of sixth and seventh east panels), a reasonable worst case scenario will be assumed in assessing the effects of the proposed action. Using this scenario, it is postulated that the entire undermined escarpment length, including the additional area projected to the surface using a 15 degree angle of draw, could be affected by escarpment failure.

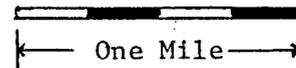
MAP 1



Source: 7.5 Minute Series USGS Topographic
Mahogany Point, Utah
Red Point, Utah



Scale: 1.5 inches per mile



Prepared by:
Mark R. Chatterton
12/7/87

B. Authorizing Actions

Mining operations are conducted under the authority of the following actions: the Mineral Leasing Act of February 25, 1920, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; the Surface Mining Control and Reclamation Act (SMCRA) of 1977; the Federal Coal Leasing Amendments Act of 1975, as amended; the National Environmental Policy Act (NEPA) of 1969; and regulations: Title 43 Code of Federal Regulations (CFR) Groups 2800 and 3400; and Title 30 CFR Group 700. Other authorizing actions include laws and regulations regarding other specific resources and the Manti-LaSal National Forest Final Environmental Impact Statement and Land and Resource Management Plan (LRMP), November 5, 1986.

Forest Service consent regarding approval of Mining and Reclamation Plans (MRP) and actions which cause significant disturbance of the environment on NFS lands, is required under the Federal Coal Leasing Amendments Act of 1975.

Federal Coal Lease U-47978 contains the following Special Lease Stipulation:

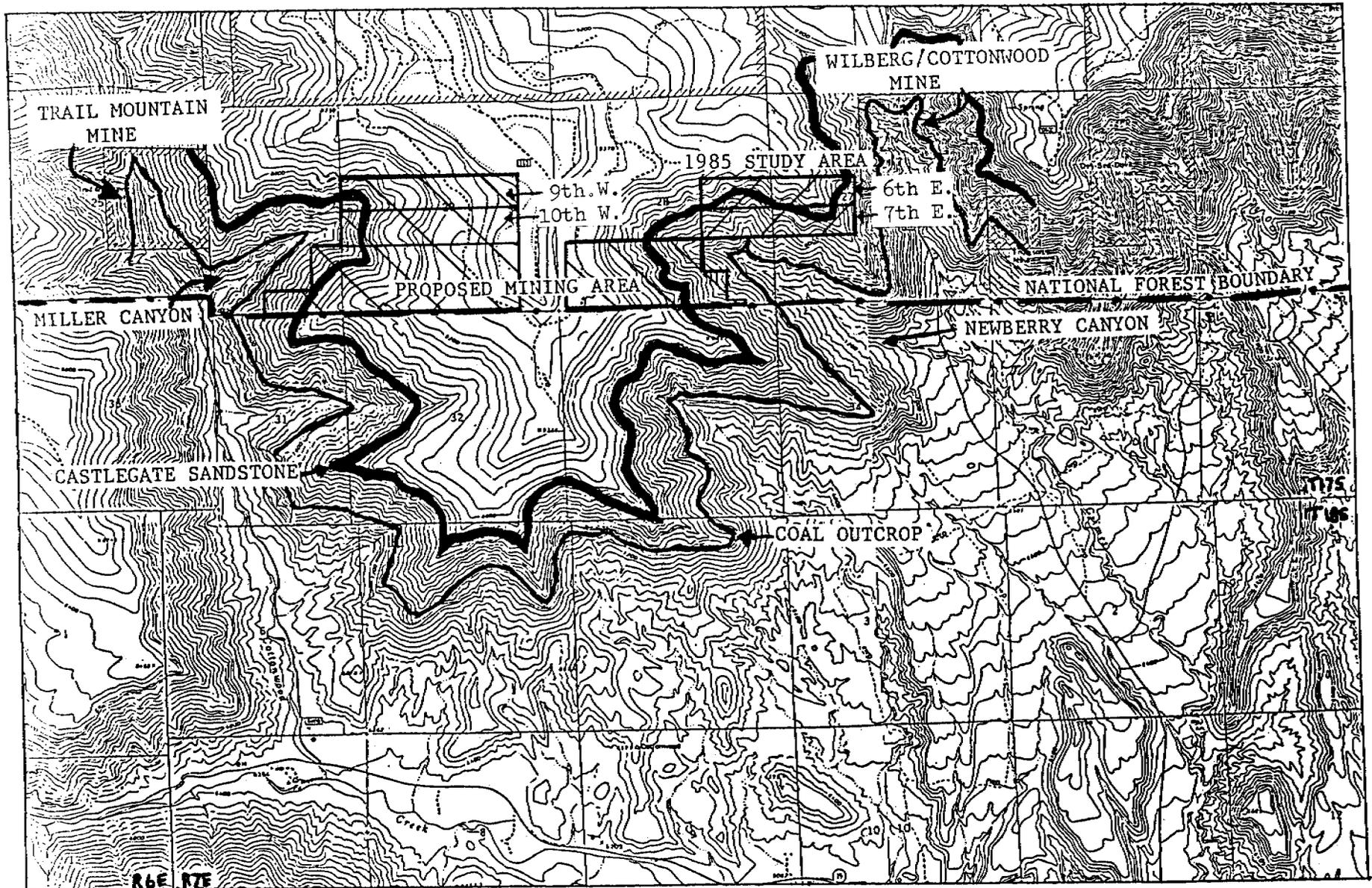
15. Underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to surface structures, and (3) damage or alter the flow of perennial streams. The Lessee in his mining plan shall provide specific measures for the protection of escarpments. The Regional Director in consultation with and concurrence of the District Mining Supervisor and Authorized Officer, Surface Management Agency, shall approve measures and may prescribe any additional measures to be employed such as mining methods, specify the amount of coal recovered, and determine any corrective measures considered necessary to assure that escarpment failure does not occur except at specifically approved locations or that hazardous conditions are not created.

C. Background

In October of 1981, UP&L was issued FCL U-47978 by the BLM. This lease contains approximately 3,347 acres (map 1). Approximately 38 percent (1280 acres) of this lease is on NFS lands administered by the Manti-LaSal National Forest.

UP&L began development of FCL U-47978 after acquiring the exclusive rights to the lease. On May 23, 1983 UP&L submitted a modification to their Wilberg Coal Mine Permit application to include this lease in the permit area for mining. Subsequently, this lease became part of the Wilberg Mine Permit Area on September 11, 1984, when the Wilberg MRP was approved. On December 19, 1984 the Wilberg Mine ceased operations because of the Wilberg Mine Fire.

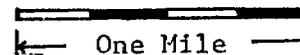
MAP #2



Source: 7.5 Minute Series USGS Topographic
Mahogany Point, Utah
Red Point, Utah



Scale: 1.5 inches per mile



Prepared by:
Mark R. Chatterton
11/3/87

UP&L decided on July 1, 1985 to divide the Wilberg Mine into two separate and distinct mines, the Cottonwood and Wilberg Mines. This allowed UP&L to produce coal from the Cottonwood portion of the mine permit area while recovery work continued in the Wilberg portion of the permit area. Prior to the mine fire, a major portion of the old Wilberg Mine's coal production came from what is now part of the modified Wilberg Mine. Thus, with coal production shifting to the Cottonwood Mine, UP&L was forced to accelerate development of FCL U-47978.

In an attempt to maximize the return on their investment in FCL U-47978, UP&L has designed the Cottonwood Mine in such a manner as to provide for maximum recovery of the coal resource by using the longwall mining method over the entirety of the lease including the escarpment areas. This plan could directly impact the escarpment by causing surface subsidence, escarpment failure and surface cracks.

To determine and quantify the impacts of longwall mining under the escarpment UP&L proposed a study area in Newberry Canyon. This area consisted of two longwall panels (sixth and seventh east) which contained approximately 5000 feet of Castlegate Sandstone exposure.

It was recognized that this proposal could directly impact the escarpment, however, no information was available as a basis for determining the effects of such an operation. UP&L estimated that only minor spalling of the Castlegate Sandstone outcrop would result. On October 2, 1985, the Forest Service, gave its consent to permit longwall mining for the proposed study area. This consent was based on agreements made between the BLM, U.S. Fish and Wildlife Service, and the Forest Service. As part of that consent UP&L would, in conjunction with U.S. Fish and Wildlife Service, conduct a monitoring program to document the extent and results of subsidence and its impact to the escarpment and golden eagle habitat. The results of this study would be used to evaluate the effects of this type of mining in the future including the Miller Canyon area. The study was designed to provide 4 years of data before mining in Miller Canyon would be considered. New data on coal quality and quantity in other areas of the mine has prompted UP&L to accelerate the proposed mining in the ninth and tenth west panels in Miller Canyon. The proposed start-up date is March 1, 1988. Again just prior to completion of this environmental assessment (EA), UP&L has advanced the proposed start-up date for production in Miller Canyon to January 15, 1988.

UP&L has completed only 1.5 years of cliff subsidence and eagle monitoring studies. The findings of these studies are contained in their, 1987, "Assessment of Mining Related impacts in Newberry Canyon" report. This report describes the mining sequence, subsidence, escarpment failure, and related impacts which have occurred so far as a result of the sixth and seventh east longwall panels.

Mining under and directly adjacent to the escarpment presents many unique problems which can directly impact mining techniques, recovery of the coal, wildlife, slope stability, watershed, public safety, etc. UP&L identified impacts to golden eagle nest, vegetation, riparian habitat, and the Grimes Wash watershed when cliff failure events occurred. At the surface above the Castlegate Sandstone formation and immediately north of the sixth and seventh east longwall panels cracks have also been observed.

In addition to the impacts identified in UP&L's report an undetermined number of sensitive plants - Hedysarum occidentale var. canone, have been buried by talus.

D. Issues and Concerns

The following issues and concerns have been identified in association with escarpment failure from longwall mining Newberry and Miller Canyons as proposed:

1. Potential for direct impacts to Hedysarum occidentale var. canone, a category 2 sensitive plant species.
2. Potential for direct impacts to migratory bird habitat by cliff spalling.
3. Potential for creating hazardous conditions for forest users.
4. Potential for accelerated erosion which would increase sediment production causing unquantified impacts on municipal and irrigation water supplies.
5. Long-term impacts from longwall mining under the escarpment are relatively unknown at this time.
6. Provide for the maximum utilization of coal, one of the multiple use resources, consistent with the goals and objectives of management of NFS lands.

E. Opportunities

The use of longwall mining would provide for maximum recovery of the coal resource from the permit area.

F. Negative Declaration

The ID Team determined that implementation of this proposal after mitigation, would not cause impacts to the following: prime or unique rangeland, timberland or farmland; cultural or paleontology resources; wetlands; alluvial valley floors; and, known threatened, endangered plant or animal species. There will be no significant impacts to floodplains.

The ID Team has determined that this proposal would be consistent with the Visual Quality Objectives of the Manti-LaSal National Forest LRMP (see Appendix A).

II. Alternatives

A. Alternative 1 - Protect the Escarpment (No Action)

Do not give Forest Service consent to longwall mining under the escarpment, that would cause mining induced escarpment failure. Under this alternative UP&L must modify their mine plan to assure that no escarpment failure will occur.

B. Alternative 2 - Consent to Escarpment Failure (UP&L Proposal)

Selection of this alternative would give Forest Service consent to UP&L's proposal and mining induced escarpment failure in Newberry and Miller Canyons, on NFS lands. This consent would be subject to Forest Service mitigations.

C. Alternative 3 - Consent to Modified Mine Plan

Selection of this alternative would give Forest Service consent to mining under the escarpment with modifications to the MRP which will provide for protection of the Castlegate Sandstone outcrop. As new information becomes available succeeding longwall panels will be modified to provide for maximum coal recovery and protect the escarpment.

Mining will proceed in the following manner:

1. Mining in Miller Canyon should protect the escarpment by protecting the Castlegate Sandstone outcrop. The west end of the ninth and tenth west panels must be shifted to the east to a point determined by projecting a 15 degree angle of draw eastward down from the Castlegate Sandstone outcrop to the coal seam.
2. Mining in succeeding panels will be adjusted according to monitored effects in Miller Canyon. If mining in Miller Canyon does not cause significant spalling then mining in Newberry Canyon may begin at a point directly below the Castlegate Sandstone outcrop. If mining in Miller Canyon does cause significant impact to surface resources, then an additional buffer zone plus the angle of draw should be used to determine the starting point of longwall panels. The buffer zone will be determined in consultation with the Utah State Division of Oil, Gas, and Mining, BLM, and the Forest Service.

The following mitigations pertain to Alternatives 2 and 3:

1. UP&L must modify the approved Golden Eagle Nesting/Cliff Subsidence Monitoring Plan to include the additional mining areas.
2. All inactive golden eagle nests within the proposed disturbance area will be made unusable (subject to prior approval by the U.S. Fish and Wildlife Service). This action might require the development of new nest structures.

3. All potentially threatened active golden eagle nests must be moved to an area which will not be adversely affected by escarpment failure. This move must be completed 10 days prior to mining below the affected nest (subject to prior approval by the U.S. Fish and Wildlife Service).
4. Signs will be placed at canyon entrances and at the canyon rims above the impacted area informing the public of the potential safety hazards. Signs should describe the activity occurring and illustrate the hazards. Prior to placing the signs on NFS lands they must be approved by the Forest Service. As determined by the Forest Service, fencing of the canyon rims might be required to prevent human and livestock use of the hazardous areas.
5. If significant escarpment/^{failure}occurs, as determined by the Forest Service, Public Notices will be placed with local newspapers and radio stations in Price and Castle Dale. These notices will describe the activities and associated safety hazards. After the initial publication, notices will be published annually prior to the big game hunting season until the Forest Supervisor or his designated representative inconjunction with UP&L and BLM has deemed that the mining induced safety hazard no longer exists.
6. UP&L will be required to conduct wildlife improvement projects designed to mitigate the loss of habitat which occurs as a result of the mining operations. Wildlife improvement projects will be designed and conducted in consultation with the Forest Service.
7. All disturbed areas will be seeded with 99 percent pure live seed using the following seed mix:

Common Name	Scientific Name	Rate of application/acre
Blue Bunch Wheatgrass	<u>Agropyron spicatum</u>	2 lbs.
Crested Wheatgrass	<u>Agropyron cristatum</u>	2 lbs.
Perenial Rye Grass	<u>Lolium perenne</u>	2 lbs.
Bullgrass (Hardgrass)	<u>Elymus salinus</u>	2 lbs.
Smooth Brome	<u>Bromus inermis</u>	1 lbs.
Paiute Orchard Grass	<u>Dactylis glomerata L.</u>	1 lbs.
Orchard Grass	<u>Dactylis glomerate</u>	1 lbs.
Indian Rice Grass	<u>Oryzopsis hymemoides</u>	1/2 lbs.
Bitter Brush	<u>Purshia tridentata</u>	1 lbs.
True Mountain Mahogany	<u>Cercocarpus montanus</u>	1/2 lbs.
Black Sagebrush	<u>Artemisia nova</u>	1/4 lbs.
Four Wing Saltbush	<u>Atriplex canescens</u>	1 lbs.

Total lbs/acre 14.25

Note: Aerial seeding is acceptable. The disturbed areas will be considered successfully reclaimed when 60 percent of the adjacent ground cover is established (including vegetation, litter, and rock 3/4 inch or larger). Fifty percent of the plant composition must be seeded or other desirable plant species.

8. UP&L must provide an extensive inventory and detailed map showing the estimated plant populations and habitat of Hedysarum occidentale var. canone. Map scale must be at least 1 inch equals 500 feet.

This inventory should consider the extent of the existing population; the percent of the population which has been directly affected by the spalling of the Castlegate Sandstone; the recovery rate (if any) of the population; and the overall affect of the mining to the total population of Hedysarum occidentale var. canone.

9. UP&L will develop and conduct a monitoring program which will determine the extent of impact and the rate of recovery for Hedysarum occidentale var. canone. This monitoring program will last for the life of the mine and 10 years following the mine's closure.
10. If the Hedysarum occidentale var. canone population is disturbed by escarpment failure, UP&L or its contractor(s) will need to collect seed from local or adjacent populations and seed the disturbed habitat. All seed collection, processing and seeding will be done under the direction of the Forest Service.

III. Description of Existing Environment - Affected Environment

A. Topography, Geology, and Mining

Newberry and Miller Canyons are steep, deeply incised box canyons located along the southern end of East Mountain and along the eastern margin of the Wasatch Plateau. Newberry Canyon is tributary to Grimes Wash and Miller Canyon is tributary to Cottonwood Creek. Both Grimes Wash and Cottonwood Creek drain the southern end of East Mountain. The east margin of the Wasatch Plateau and the canyons are characterized by a steep erosional escarpment.

The escarpment consist of alternating sandstone cliffs and talus slopes formed by differential erosion of sedimentary rock layers. The massive sandstone formations (cliff-formers) form the vertical cliffs while less resistant rock formations consisting of interbedded shales, mudstones and siltstones and thin poorly consolidated sandstones form the slopes (slope-formers). The cliff-formers provide support for the escarpment and slopes-formers above them.

The rock formations exposed in the canyons are, from oldest to youngest, the Cretaceous - Masuk Shale (upper member of the Mancos Shale), Starpoint Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation; Cretaceous/Tertiary - North Horn Formation; and Tertiary - Flagstaff Formation. The Masuk Shale forms the canyon bottoms and the North Horn Formation generally forms the canyon rims.

The Hiawatha Coal Seam which is proposed for longwall mining under the escarpment, forms the base of the slope-forming Blackhawk Formation above the cliff-forming Starpoint Sandstone. The rock formations above the seam will be subjected to subsidence. The Blackhawk Formation is approximately 800

feet thick in the project area consisting of alternating mudstones, siltstones, sandstones, and coal.

The Castlegate Sandstone is a massive cliff-forming sandstone approximately 250 feet thick. It forms the support for the remainder of the slope or escarpment above, to the canyon rim.

Overlying the Castlegate Sandstone are the slope-forming Price River and North Horn Formations. These formations are similar in composition to the Blackhawk Formation with the exception that they do not contain coal.

The coal found in the Wasatch Plateau (Wasatch Plateau Coal Field) is exposed on the plateau's eastern margin. FCL U-47978 contains more than 7 miles of escarpment and coal outcrop of which approximately 2.5 miles is on NFS lands (map 1). The remaining portion of the coal outcrop is to the south on public lands administered by the BLM.

Longwall mining under the escarpment has already occurred in the sixth and seventh east panels. Mining began on September 8, 1986 and was completed on September 4, 1987. Prior to mining UP&L initiated the Golden Eagle and Cliff Subsidence Monitoring Plan." The mining resulted in surface subsidence, cracks, and failure of the escarpment by cliff spalling. Visual observations indicate that actual failure of the escarpment has to date been confined to spalling of the cliff-forming Castlegate Sandstone. More extensive escarpment failure and surface cracks, however, might develop as subsidence continues. For further details refer to UP&L's report entitled "Assessment of Mining Related Impacts in Newberry Canyon Cottonwood Coal Mine, Emery County, Utah," December 1987.

UP&L describes escarpment failure (cliff spalling) in three modes, rock falls, topplings and foundation failures. Rock falls occur where fracturing has loosened blocks of sandstone and gravity causes the blocks to simply fall from the cliff face. Toppling involves rotational movement of blocks of sandstone and then falling due to gravity. Foundation failure is more complex, involving the crushing of weak layers of shale within or at the base of the sandstone. Additional force is exerted on the shaley areas due to fracturing of the sandstone and a decrease in shear resistance along joints from adjacent rock. Foundation failure can then result in spalling by rock falls and topplings.

Failure of the Castlegate Sandstone cliff in the sixth and seventh east panels has involved the majority of the undermined length (5,000 feet) and occurred almost immediately following mining. Rock spalling has resulted in deposition of talus on the underlying slopes and in the canyon bottom. The talus material ranges in size from silt particulates to massive blocks of sandstone.

Fracturing of the slope above the Castlegate Sandstone has also occurred, discovered in July, 1987. The cracks generally parallel the slope, discontinuously for a total length of approximately 2,000 feet. Vertical and horizontal displacements range from a few inches to five feet.

Fractures and spalling of the sandstone cliffs along the escarpment is a natural process but at a slower rate, usually affecting small areas at a given time. Longwall mining underneath the escarpment (Castlegate Sandstone)

has resulted in accelerated escarpment failure. The affects of subsidence are expected to incorporate the mined area and an additional area around the panels defined by a 15 degree angle of draw. The 15 degree angle of draw is based on personnel communication with the BLM.

UP&L's monitoring program has collected approximately 1.5 years of data. Mining was completed on September 4, 1987, therefore, only 3 months of data is available regarding the effects of longwall mining after mining has been completed.

The LRMP contains the following management direction pertaining to escarpment failure:

Forest-Wide Direction page III-34 - Geologic Resources Management general direction - "Assure that appropriate geotechnic and/or geologic data are included in design and construction of facilities, or other developments so as to minimize the potential of inducing failure."

Forest-Wide Direction pages III-35 and III-36 - Minerals Management Leasables general direction - "Negative recommendations, denials, or consent for leasing permitting, or licensing will be based on site specific environmental assessments using appropriate standards and guidelines." Standard and Guidelines; d. "... Coal leases may be denied or limited by special stipulation where: "(5) Operations would result in unacceptable or unmitigateable impact on wildlife or fisheries. (6) Operations could result in aggravating land instability."

B. Vegetation

The proposed project area has two major vegetation types. They are, as defined in the Vol. 2 page 2-105 of the Wilberg/Cottonwood MRP, pinyon-juniper and mixed conifer vegetation types. The pinyon-juniper vegetation type is found on the steep, rocky slopes with a southern exposure and the relatively flat ground at the lower elevations. At the higher elevations and on northfacing slopes, it is common for the pinyon-juniper community to intermix with the mixed conifer community. Elevations for the pinyon-juniper vegetation type varies from 7,000 to 9,000 feet. The mixed conifer vegetation type in the project area occurs only in Miller Canyon on the northfacing slope.

Sensitive Plants

Hedysarum occidentale var. canone, a sensitive plant, can be found in the proposed project area. Forest Service Manual 2670.5--4 No.19 defines sensitive species as follows:

"those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidence by:

- a. Significant current or predicted downward trends in population numbers or density.

b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution."

Hedysarum occidentale var. canone is commonly known as variation of Western Sweetvetch and can be found in Duchesne, Carbon, and Emery Counties. Its leaflet features are what set var. canone apart from the more common variety of Western Sweetvetch. Two significant populations of this sensitive plant are found in the vicinity of the proposed mining induced escarpment failure areas (map 3).

During the initial mining in Newberry Canyon, a portion of this sensitive Sweetvetch population and habitat were directly impacted by the spalling of the Castlegate Sandstone. Although the extent of the impact has not been quantified at this time it is estimated that 10 percent of the plant's habitat has been impacted. Map 4 illustrates the area impacted by mining induced escarpment failure in Newberry Canyon. The remaining portion of the main population of Hedysarum occidentale var. canone are directly below the Castlegate Sandstone outcrop.

In Miller Canyon it has been determined that the main population of Hedysarum occidentale var. canone is found in the vicinity of the Blackhawk Formation at the head of the canyon and directly below the Castlegate Sandstone outcrop.

It is estimated that these two populations (Newberry and Miller Canyons) of Hedysarum occidentale var. canone comprise of approximately 90 percent of total population in the vicinity of East Mountain.

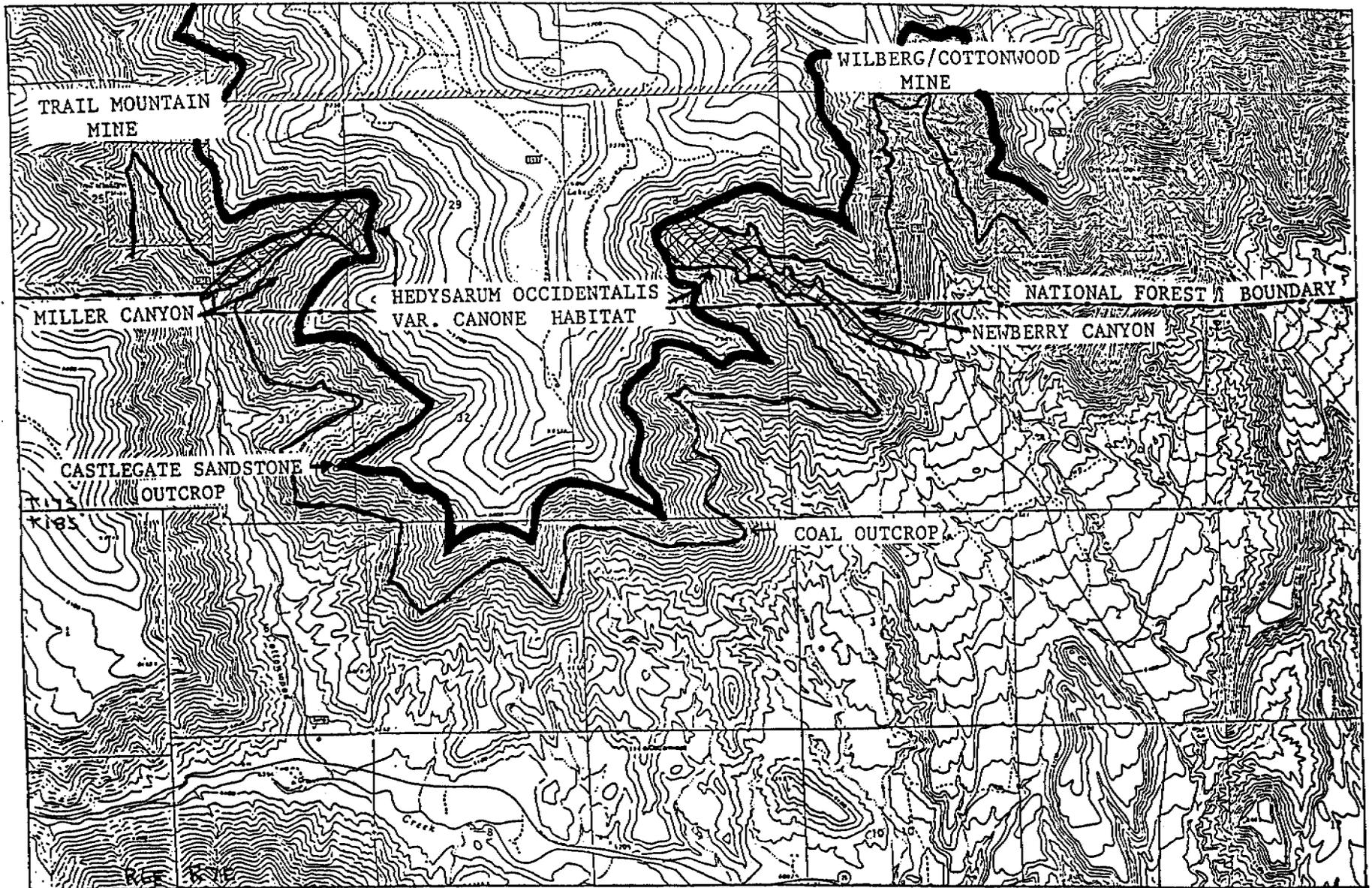
In addition to Hedysarum occidental var. canone, there are several plants found within the vicinity of these two canyons which are considered rare and not commonly found in Utah. The following is a list of rare plants found in the vicinity of Newberry and Miller Canyons:

<u>Common Name</u>	<u>Scientific Name</u>
Helleborine (Orchid Family)	<u>Epipactis gigantea</u>
Hawksbeard	<u>Crepis runcinata var. glauca</u>
Yellow Columbine	<u>Aquilegia flavescens</u>
Foxtail Muhly	<u>Muhlenbergia andina</u>
Muhly Grass	<u>Muhlenbergia spp.</u>

The LRMP contains the following management direction pertaining to sensitive plants:

Forest-Wide Direction page III-21 - Wildlife and Fish Resource Management general direction - "Manage habitat of sensitive species to keep them from becoming threatened or endangered." This direction was based on standards and guidelines contained in Forest Service Manual (FSM) 2670.

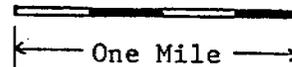
MAP 3



Source: 7.5 Minute Series USGS Topographic
Mahogany Point, Utah
Red Point, Utah



Scale: 1.5 inches per mile



Prepared by:
Mark R. Chatterton
12/7/87

Riparian

Approximately 0.1 acre of riparian area exist in association with a seep in Newberry Canyon. This community is characterized primarily by Elymus spp. (grasses) and Juncus spp. (rushes). The area occupies a narrow strip of land, approximately 5 feet wide and 700 feet long.

In Miller Canyon less than 0.1 acre of riparian area exist. This area is similar to that found in Newberry Canyon. The area is a wet meadow type site rather than a flowing stream. The riparian areas are illustrated on Map 6.

The LRMP contains the following management direction pertaining to riparian areas:

Forest-Wide Direction page III-31 - Riparian, Flood Plain, & Wetland Management general direction 02 - "Give preferential consideration to riparian area dependent resources in cases of unresolvable resource conflicts." The Standards and Guidelines are contained in FSM 2526.

Management Unit Direction page III-72 - Management Prescription Riparian - Minerals Management general direction 01 - "Avoid and mitigate detrimental disturbance to the riparian area by mineral activities. Initiate timely and effective rehabilitation of disturbed sites."

C. Migratory Birds

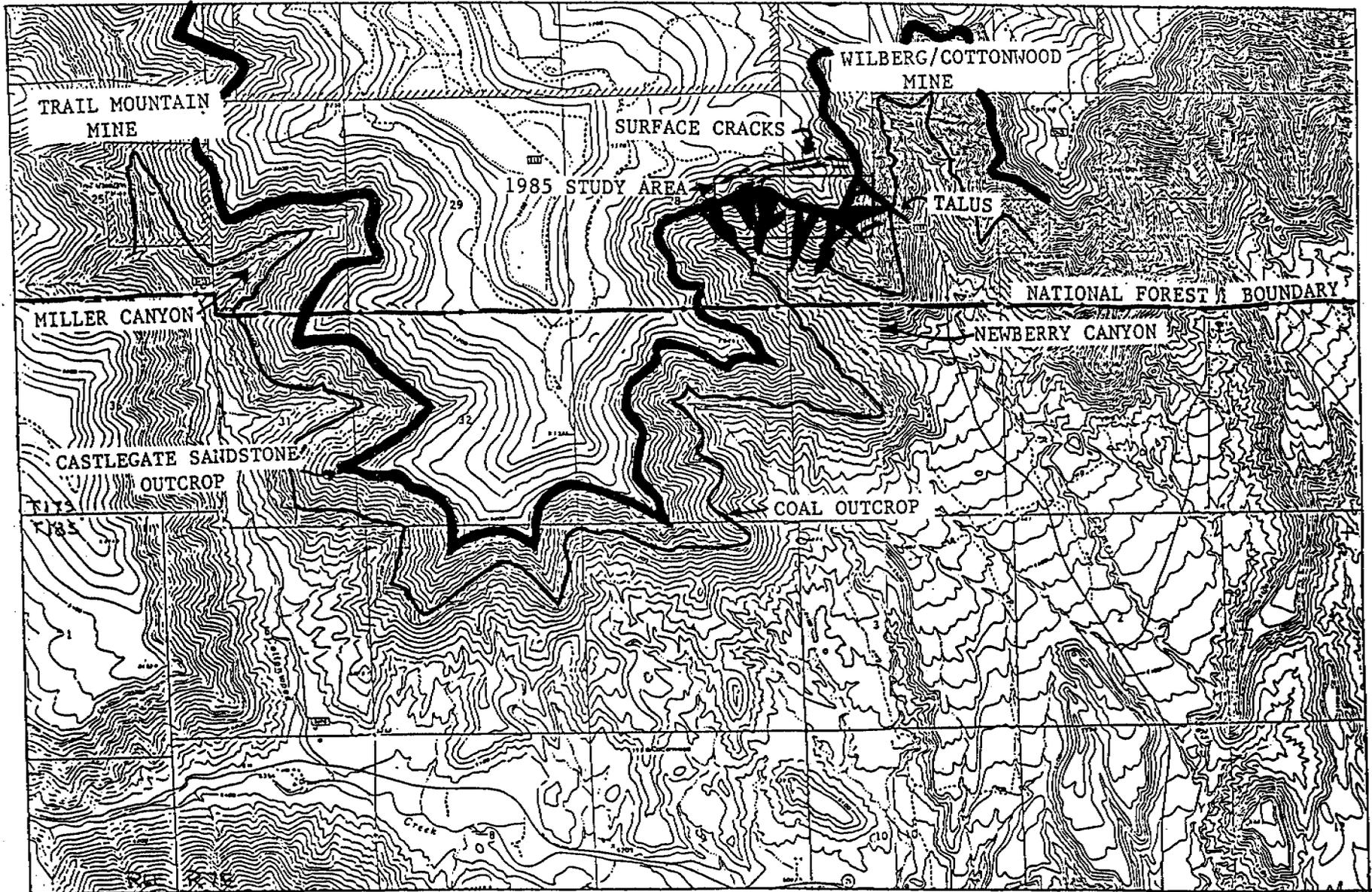
There are several migratory birds which can be found at various times of the year on the Wasatch Plateau. The following list of migratory birds have been observed in the project area by UP&L and could be negatively impacted by escarpment failure:

<u>Common Name</u>	<u>Scientific Name</u>
Red-tailed Hawk	Buteo jamaicensis
Golden Eagle	Aquila chrysaetos
Prairie Falcon	Falco mexicanus
American Kestrel	Falco sparverius
White-throated Swift	Aeronautes saxatalis
Common Raven	Corvus corax
Pinyon Jay	Gymnorhynchus cyanocephala
Canyon Wren	Catherpes mexicanus

Note: By no means is this list all inclusive, rather it is very likely that other species, protected under the Migratory Bird Species Act may be present in the area. For a more detailed list of the birds which might be found on the Wasatch Plateau see Vol. 2, Table I of the Wilberg/Cottonwood MRP.

Probably the most significant of the migratory birds found within a 10 mile radius of the project area is the bald eagle, which is listed as an endangered species. At the time of this proposal there were no known bald eagle nest sites identified within the areas that would be impacted. It should be noted, however, that bald eagles are known to migrate through this

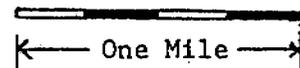
MAP 4



Source: 7,5 Minute Series USGS Topographic
Mahogany Point, Utah
Red Point, Utah



Scale: 1,5 inches per mile



Prepared by:
Mark R. Chatterton
12/7/87

area and stay within the 10 mile radius of the project area for extended periods of time.

Another significant migratory bird found in Miller and Newberry Canyon is the golden eagle. As part of the agreement and a condition for approval to mine the sixth and seventh east longwall panels in Newberry Canyon, UP&L prepared and implemented the "Golden Eagle Nesting/Cliff Subsidence Monitoring Plan." The objectives of the plan were and are:

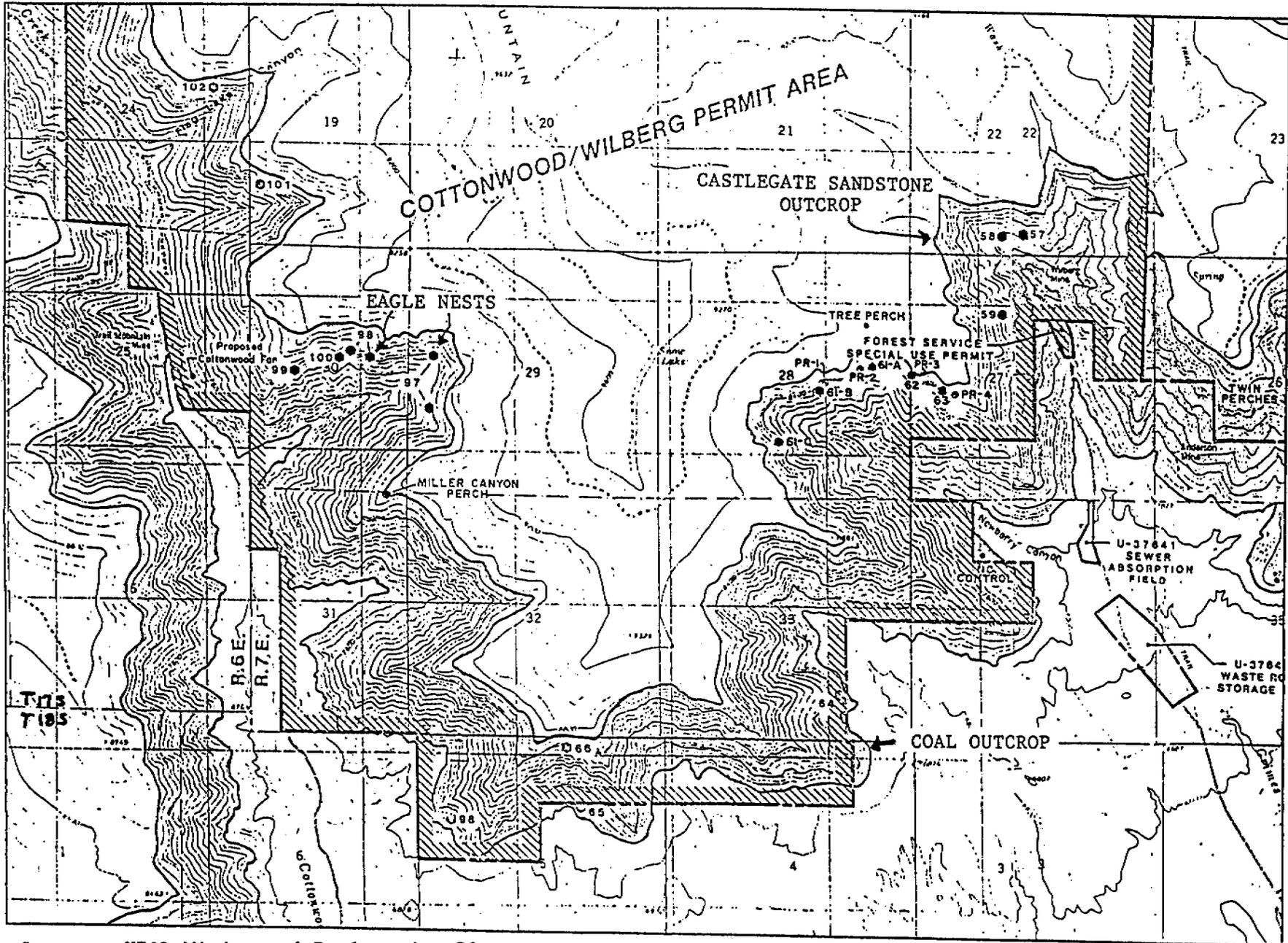
- 1) To collect information on nest location, nest status and nesting success of golden eagles within the study area.
- 2) To monitor the effects of subsidence on golden eagles nests in potentially impacted areas.
- 3) Collection of nest and subsidence monitoring information to develop methods to eliminate or minimize adverse subsidence related impacts on golden eagles in the study area and to serve as guidance to avoid or resolve similar resource conflicts in the future.

It appears that in Newberry and Miller Canyons there are two separate and distinct nesting pairs of golden eagles. Both nesting pairs have been monitored by UP&L and separate and distinct territories have been confirmed. The Newberry Canyon nesting pair has a territory which incorporates Newberry Canyon and the other nesting pair's territory includes Miller Canyon. One nesting pair occupied nest 61c and the other nesting pair occupied one of the nests in nest cluster 98 in Miller Canyon during the 1987 nesting period. Map 5 shows the location of the known golden eagle nests which have been identified in the southern portion of the Cottonwood/Wilberg Mine Permit Area. Some of these identified nest sites are actually clusters of nests. In Newberry Canyon there remains a total of two nest sites. In Miller Canyon there is a total of ten nest sites.

The LRMP contains the following management direction as it pertains to the management of golden eagles (an indicator species):

Forest-Wide Direction pages III-19 and III-20 - Wildlife and Fish Resource Management general direction - "Provide habitat needs, as appropriate, for management indicator species. Standards and Guidelines for B. Golden Eagle states; "Avoid activities that could cause abandonment of active nests."

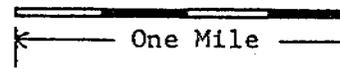
There are several acts which have direct bearing on this proposal. They include but are not limited to the Migratory Bird Treaty Act (16 U.S.C. 703-711), Bald Eagle Protection Act (16 U.S.C. 668-688d), and Endangered Species Act (16 U.S.C. 1513-1543).



Source: UP&L Mining and Reclamation Plan
 Wilberg / Cottonwood Mine

Scale: 1.75 inches per mile

Prepared by:
 Mark R. Chatterton
 12/7/87



1. Migratory Bird Treaty Act (MBTA) - This act was passed in 1918 and has since been amended. The act makes it unlawful, except by permit, to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10. This includes feathers or other parts, nests, eggs, or products.
2. Bald Eagle Protection Act (BEPA) - This act was passed in 1940 to reduce human caused mortality of bald eagles. There have been several amendments the most notable in 1962 (P.L. 87-844) when the Act's protective provisions were extended to the golden eagle. Currently the BEPA makes it illegal, except by permit, to import, export, take, sell, purchase, or barter any bald or golden eagle, including feathers or other parts, nests, eggs, or products.
3. Endangered Species Act (ESA) - This act was passed in 1973 to clarify previous acts involving threatened and endangered species and provide guidance for the management of threatened and endangered plants and animals. ESA and amendments prohibit the import, export, taking, possession, transport, sale, or trade of any listed species.

All three of these acts use the term "take" in their prohibitions. It is important to understand the scope and meaning of the term. Under the MBTA take "means to pursue, hunt, shoot, kill, capture, or collect" (50 CFR 10.12); BEPA take "includes . . . pursue, trap, collect, molest, or disturb" (U.S.C. 688c); ESA take "means harass, harm, pursue, hunt, shoot, wound, kill, trap, . . ." (U.S. Congress 1983:4); "Harass . . . means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns including, breeding, feeding, or sheltering" (50 CFR 17.3).

D. Public Safety

The topography and geology of Newberry and Miller Canyons are such that public safety might be threatened. The publics that could be threatened are the general public, permittees, and field investigators (public, UP&L and contractors, and government agencies).

Previous mining activities in Newberry Canyon has demonstrated that longwall mining can accelerate escarpment failure. With the acceleration of the erosive process along the escarpment there is an increase in hazardous conditions to the public.

Newberry and Miller Canyons are narrow side canyons to Grimes Wash and Cottonwood Canyon respectively. Both canyons are box type canyons which have high cliffs and ledges which restrict travel. There is potential for the public, most likely hunters, to hike up the canyon bottoms. The high cliffs and ledges make it very difficult for anyone to access the top of East Mountain from these canyons. There is one noted exception to this in Newberry Canyon. On public lands near the Forest boundary there is a trail which does access the top of East Mountain. This trail is on the south side and near the mouth of the canyon. Historically, it was used to trail livestock, however, there is presently very little known use of this trail

with the exception of field investigators involved with the mining activities.

With the exception of hunting, livestock grazing, and mining related field investigations, there is nothing of significance which would draw the public into either of these canyons.

E. Watershed

The proposed area of disturbance in Miller and Newberry Canyons is within the Straight Canyon watershed. The Straight Canyon watershed has a Water Resource Council Designation of 14060009 and the proposed area of disturbance is within National Forest Watershed Number 5. The State basin designation is 93. Straight Canyon is tributary through the San Rafael and Green Rivers to the Colorado River.

The average annual precipitation is about 18 inches (Utah Hydrologic Atlas). About 8 inches of this falls between September and May, probably as snow. Summertime precipitation is characterized by high intensity convective thunderstorms. The vegetation and soils in Miller and Newberry Canyon have little water holding capacity which means that the rain that falls generally runs off. In pinyon-juniper vegetation communities, erodible soil particles have little cover and are easily eroded during thunderstorm events.

In 1981, Fletcher et.al. in "Precipitation Characteristics of Summer Storms at Straight Canyon Barometer Watershed, Utah," stated the following:

The greatest annual rainfall intensities can be expected at the lowest elevation on the Straight Canyon Barometer Watershed. . . Osborn (1964). . . report that, in the semi-arid Southwest rangeland, major runoff events are often the result of short-lived, high-intensity convective storms. Osborn's conclusion is generally applicable to our study areas (the Straight Canyon Barometer Watershed). Major amounts of summer runoff will usually come from storms of medium duration--namely 2 to 6 hours with brief periods of high intensity rainfall bursts.

The Manti-LaSal National Forest files contain several reports describing floods and debris flows which have occurred in tributary canyons of Cottonwood Canyon and Grimes Wash. While none of these reports names Newberry or Miller Canyons, many of the nearby canyons are mentioned. These floods and debris flows were generated by high-intensity storms.

The change from a pinyon-juniper type plant community to mineral soil and rock will increase the amount of erodible soil particles that are exposed to these storms. This will result in an increase in the amount of erosion and sediment production. Since cliff spalling has occurred in Newberry Canyon, debris flows are expected from the talus slopes created by the escarpment failure events and the accumulation of loose material in the canyon.

The Miller Canyon portion of this proposal is above the water diversion that supplies municipal water for the communities of Orangeville and Castle Dale.

The Newberry Canyon portion of this proposal is tributary to Grimes Wash. The confluence of Grimes Wash and Straight Canyon lies below the municipal water diversion (map 6). The drainages of both canyons are ephemeral.

Miller Canyon is tributary to Cottonwood Creek which is currently experiencing the affects of activities that include the Trail Mountain Mine, the Cottonwood Fan Portal, and the Meridian Oil gas field. Newberry Canyon is tributary to Grimes Wash which is currently experiencing the affects of activities that includes the Wilberg/Cottonwood Mine Complex.

East Mountain is part of the recharge area for a multiaquifer system which includes perched aquifers and the Blackhawk-Starpoint Regional Aquifer. The main sources of recharge to the multiaquifer system are snow melt and rain. Discharge of water is mainly by springs. Springs that issue from perched aquifers are sources of water for livestock and wildlife on East Mountain. For further information pertaining to the Blackhawk-Starpoint Aquifer refer to USGS Water Supply Paper 2259.

A seep occurs in the Newberry Canyon originating at the contact between the Starpoint Sandstone and the Masuk Shale, a member of the Mancos Shale formation. Flow from this seep is less than one gallon per minute and terminates approximately 800 feet from the point of origin. No groundwater sources, seeps or springs, are located above the Newberry Canyon project area. There is also a seep area in Miller Canyon, although this seep does not have a measurable flow.

The LRMP contains the following management direction as it pertains to accelerated erosion:

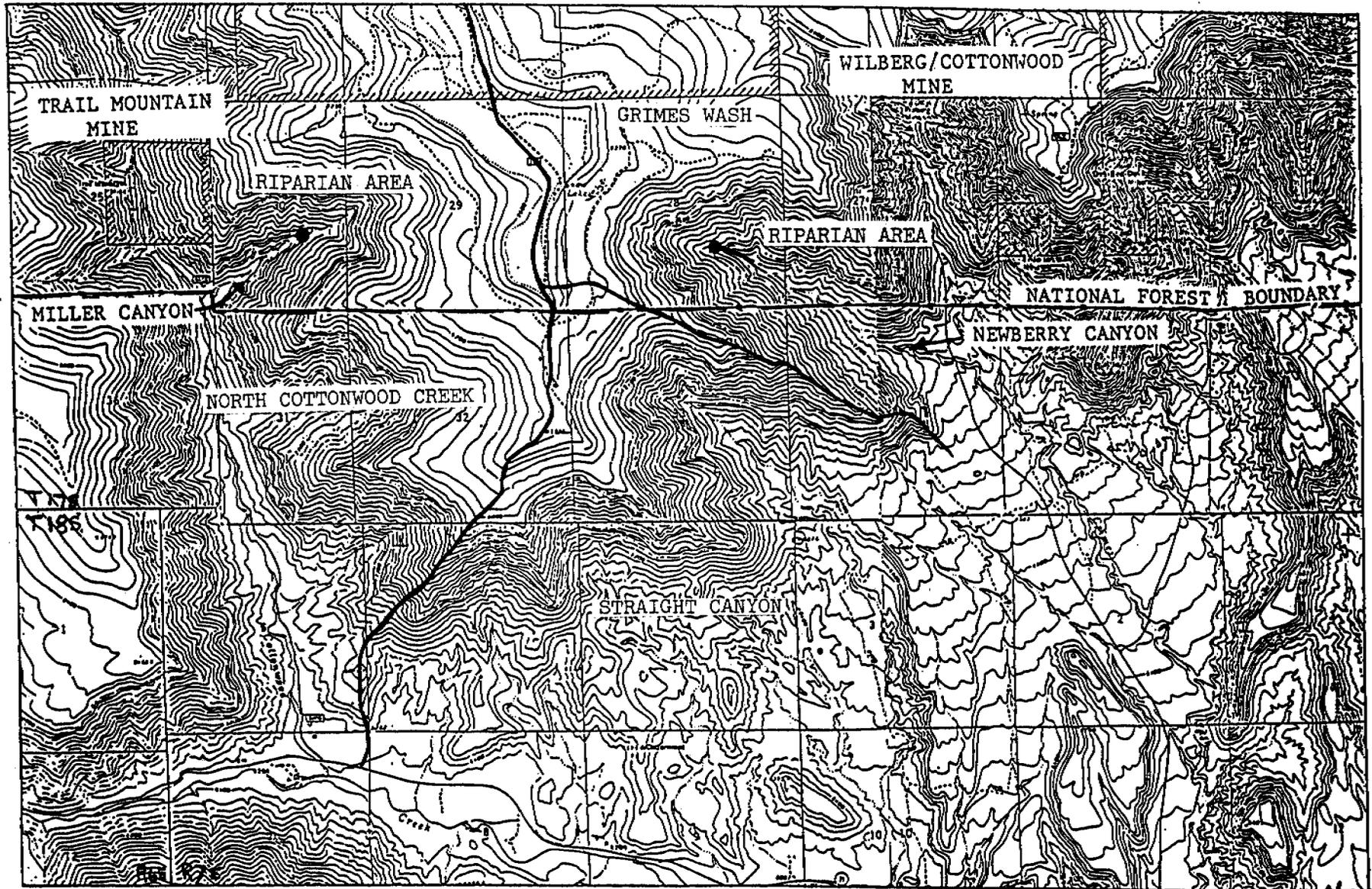
Forest-Wide Direction page III-32 - Soil Resource Management general direction - "Minimize adverse, man-caused impacts to the soil resource including accelerated erosion, compaction, contamination, and displacement."

IV. Management Direction

Analysis of the impacts should reflect the following points:

1. All actions should be consistent with the Manti-LaSal National Forest Land and Resource Management Plan.
2. All actions should be consistent with the applicable Federal, State, and local laws, rules and regulations.
3. All actions should meet the intent of sections 5 and 7 of the Endangered Species Act of 1973 as amended. Section 5 directs the Secretary of Agriculture to "establish and implement a program to conserve fish, wildlife and plants," including federally listed species. Section 7 directs Federal departments and agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats.

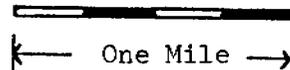
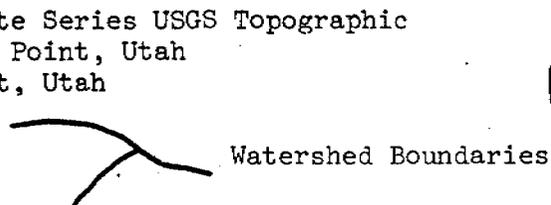
MAP 6



Source: 7.5 Minute Series USGS Topographic
Mahogany Point, Utah
Red Point, Utah

Scale: 1.5 inches per mile

Prepared by:
Mark R. Chatterton
12/23/87



4. All actions should be consistent with FSM 2670.12 - 3. Avoid actions "which may cause a species to become threatened or endangered."
5. All actions should be consistent with FSM 2670.22 - 2 and 3. Maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed through their geographic range on NFS lands.

Develop and implement management objectives for populations and/or habitat of sensitive species.

6. All actions should be consistent with FSM 2670.32 parts 2-5. As part of the NEPA process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.

Avoid or minimize impacts to species whose viability has been identified as a concern.

If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. The decision must not result in loss of species viability or create significant trends toward Federal listing.

Establish management objectives in cooperation with the State when projects on NFS lands may have a significant effect on sensitive species population numbers or distributions. Establish objectives for Federal candidate species, in cooperation with the Fish and Wildlife Service or National Marine Fisheries Services and the States.

V. Environmental Consequences - Environmental Impacts

A. Alternative 1 - No Action

Selection of the "No Action" alternative is consistent with the Forest LRMP and associated acts, laws, and regulations. If selected the Forest Service would not consent to mining induced escarpment failure. Thus, sensitive and rare plants, golden eagles and nests, and the watershed in Newberry and Miller Canyon would not be adversely impacted. In addition, public safety would not be affected. The following effects regarding the recovery of coal will occur:

Short-Term and Residual Impacts

If this alternative is selected, UP&L would have to modify this proposal by limiting the longwall mining to interior areas of East Mountain, shift coal production to some other part of the mine, or use other mining methods which provide adequate support for the escarpment.

This alternative might result in a short-term interruption in longwall mining while development mining is adjusted to shorten the ninth and tenth west panels and provide for protection of the escarpment. During this adjustment period coal needed to meet the demands of UP&L's power plants might need to be obtained from UP&L's Deer Creek Mine or another coal mine in the area.

Short-Term Use vs. Long-Term Production

Without Forest Service consent to mining which would result in escarpment failure, longwall coal mining may be delayed until the mine plan is altered to provide adequate protection of the escarpment as discussed above. The long-term mine plan would need to be altered to provide for protection of the escarpment.

Under this alternative, considering longwall mining, the BLM estimates that more than 2.2 million tons of potentially recoverable coal on NFS land would be left in place.

If an alternate mining method such as room-and-pillar mining designed to prevent escarpment failure, is used to recover coal under the escarpment, the recoverable reserves would be significantly reduced as compared to longwall mining and mining costs would be higher. UP&L has stated that, considering their present operations, it would not be economical to mine this area using the room-and-pillar mining method.

Irreversible and Irretrievable Commitments

Any coal left within the lease area after retreat mining has occurred, would not be economically recoverable using current available technology. The coal left in-place, as discussed in the prior discussion regarding long-term productivity, would not be recoverable resulting in an irreversible and irretrievable commitment of the resource.

Coal is not a renewable resource, therefore, coal production and utilization is an irreversible and irretrievable commitment of the coal resource.

B. Alternative 2 - Consent to Escarpment Failure (UP&L Proposal)

Selection of Alternative 2 is not consistent with the LRMP, Forest Service policy, and associated regulations. If selected, the Forest Service would consent to UP&L's proposal and the resulting mining induced escarpment failure. The potential effects are discussed as follows:

Topography, Geology, and Mining

Information on the effects of longwall mining in the sixth and seventh east panels, from commencement of mining in September, 1986 to December, 1987, is available in UP&L's report entitled "Assessment of Mining Related Impacts in Newberry Canyon, December, 1987." Considering that mining was completed on September 4, 1987, only information on short-term effects is available. In an effort to predict the potential results of longwall mining in Miller Canyon, UP&L in consultation with Seegmiller International Mining Geotechnical Consultants/Engineers, Salt Lake City, Utah, conducted a geotechnical evaluation of the existing sixth and seventh east panels and the area proposed for the ninth and tenth west panels. The study is entitled "Surface Stability Evaluation 6E/7E and 9W/10W Panels Cottonwood Mine Emery County, Utah." The report was completed in November of 1987 and is contained within the 1987 Assessment referenced above.

The geotechnical study compared fracture systems, the lithology of the Castlegate Sandstone, the orientation of the longwall panels, and the shape and orientation of the Castlegate Sandstone outcrop for the Newberry and Miller Canyon areas. Based on the comparisons, Seegmiller and UP&L theorized that the proposed ninth and tenth west panels, as oriented, would induce much less or possibly no escarpment failure above the panels.

Based on the limited time that the mining has been monitored, the theoretical nature of the information and the escarpment failure that occurred in Newberry Canyon over the sixth and seventh east panels, this assessment must address the proposed mining based on the reasonable worst case scenario.

For the purposes of this assessment it is postulated that the majority or all of the escarpment area undermined by longwall panels will experience subsidence, surface cracking, and escarpment failure. The area of potential disturbance is expanded by projecting the mined area to the surface using a 15 degree angle of draw from vertical as described in the Affected Environment (Section III).

Vegetation

Short-Term and Residual Impacts

Subsidence and spalling of the Castlegate Sandstone cliff will result in deposition of talus on the slope below and will bury and destroy existing vegetation. The spalling that occurred in Newberry Canyon along the sixth and seventh east panels has impacted approximately 40-50 acres of vegetation. If spalling continues, which is highly probable, additional vegetation might be disturbed. Spalling related to the new proposed mining areas could potentially impact up to an additional 7000 foot length of escarpment and the associated vegetation below this part of the escarpment.

A small portion of the riparian area in Newberry Canyon was disturbed by spalling. Continued spalling above the already mined panels and the new mining in Newberry Canyon could damage additional portions of the riparian area. It is not likely that the riparian area in Miller Canyon will be significantly affected unless massive failures occur.

Included in the vegetation which has already been impacted in Newberry Canyon and which could be further impacted under this alternative in both canyons is the sensitive plant species Hedysarum occidentale var. canone. It is estimated that the populations of this plant present in Newberry and Miller Canyons consist of approximately 90 percent of the total population in the East Mountain area.

Approximately 50-60 percent of the total populations in Newberry Canyon and 80-90 percent of the population in Miller Canyon lie below the Castlegate Sandstone in areas proposed for mining and could be subject to spalling. A substantial portion of the plants in these areas could be destroyed. The population areas at the head of the canyons are of particular concern. These areas provide the preferred habitat. The entire area at the head of Miller Canyon and a large portion of the population at the head of Newberry Canyon are subject to spalling. These areas are the most significant and serve as a source of seed which supports the remaining population along the canyon

bottom and slopes below. Destruction of the plants at the canyon head would impact the entire population.

Reseeding efforts must be employed under this alternative in an attempt to re-establish damaged populations. It is not known at this time, if revegetation efforts would be successful once the soil is altered by introduction of rock talus. Experimental attempts to start a population by seeding in similar areas have failed after two to three years. If destruction of the major populations at the canyon heads occurs, this could result in loss of the species viability and create a significant downward trend. This could result in Hedysarum occidentale var. canone becoming Federally listed as threatened.

Short-Term Use Vs. Long-Term Productivity

This alternative could result in a substantial loss of vegetation and alteration of the habitat in areas where spalling occurs. The duration of the loss will involve the time it takes to revegetate the areas with desirable species. It is estimated that this will take at least 5-10 years. It will take many more years beyond this time to establish ground cover equivalent to the pre-mining condition.

Even with reseeding efforts, this alternative could result in a permanent loss of viability of sensitive plant Hedysarum occidentale var. canone.

If portions of the riparian areas become buried, the resulting loss of vegetation would be long-term and possibly permanent.

Irreversible and Irretrievable Commitments

The loss of vegetation, until it can be re-established, would be an irretrievable commitment of the resource.

The loss of viability of sensitive plant Hedysarum Occidentale var. canone could be irreversible.

Migratory Birds

Short-Term and Residual Impacts

Impacts to migratory birds and their habitat could occur as a result of spalling and talus deposition. Several species have been observed in the area (Section III). At this time, however, only golden eagle nests sites and perches have been studied and mapped in the canyons by UP&L in their monitoring program.

Nests #61a and #61b in Newberry Canyon were destroyed due to spalling of the Castlegate Sandstone above the sixth and seventh east panels in, 1987. They were inactive at the time. Nest #62 and Perch #63 are between two areas which have already spalled and could still be destroyed by continued spalling in this area.

There is a high probability that the proposed mining will result in the destruction of nest #61c in Newberry Canyon and nests #97a and #97b and the Miller Canyon Perch in Miller Canyon. Nest #61c was active in 1987. This

could potentially eliminate all known nests in Newberry Canyon and leave 8 nests in Miller Canyon.

To prevent a direct threat to a nesting pair and fledgling(s) UP&L will be required to prevent occupancy of the existing threatened nests and discourage construction of new nests in the mining area for as long as there is potential for induced spalling. In addition, artificial perches and/or nests could be constructed in unaffected areas to offset the potential loss of habitat and natural nests.

If any new nests are constructed in the affected area while induced spalling is active, there is potential for the nests and eagles to be destroyed. Once construction of a nest begins and is discovered through monitoring, measures taken to prevent continued construction or use would be required. This would result in direct disturbance to the nesting pair and could result in abandonment of the nesting attempt for the season. This potential impact will continue until the escarpment stabilizes.

The habitat for prey species in the canyon will be impacted by talus deposition. Vegetation and burrows would be destroyed. The populations will be reduced by an undetermined amount and the duration of this impact would be dependent on the rate of recovery of the vegetation and prey base populations.

Short-Term Use Vs. Long-Term Productivity

The duration of the affects to nesting sites discussed above is dependent upon the rate at which the escarpment fails and how long it takes for the escarpment to stabilize following mining. Long-term information at this time is not available, however long-term impacts can be reasonably expected. Construction of artificial nest sites should mitigate the impact on long-term productivity of the species. Effects to the prey base will last until the vegetation in the disturbed areas can be re-established. Seeding by UP&L in a reclamation effort, should accelerate this process. It is estimated that it would take approximately 5 to 10 years to revegetate the disturbed areas. Continued spalling and erosion in certain areas would, however, again disturb the reclaimed areas and delay successful revegetation.

Until their food supply is adequately re-established, golden eagles and other migratory birds may not select nesting areas in the canyons.

Irreversible and Irretrievable Commitment

The loss of a nesting pair of golden eagles or other migratory birds due to escarpment failure would be irreversible. This probability should be low, however, if birds are adequately prevented from occupying existing nests or constructing new nests in the affected areas while escarpment failure occurs. If nesting pairs are prevented from nesting in the project area and do not nest in another area, the resulting loss of reproduction would be irreversible.

The loss of vegetation and prey base habitat and populations during the recovery period is an irretrievable commitment of this resource.

Public Safety

Short-Term and Residual Impacts

Escarpment failure and surface cracking would present a potential safety hazard to the general public, permittees and field investigators (public, UP&L and their contractors, and government agencies). The hazard in the canyons would be from falling rocks. The hazard along the canyon rim would be presented by surface cracks and the potential for weakend portions of the rim to fall into the canyon. At the present time, the mining in the sixth and seventh east panels presents only a minor hazard. If escarpment failure and surface cracking continue, the safety hazard will increase. At the present time use of the areas is only occasional. The greatest potential hazard is to hunters during the big game hunting seasons and to field investigators working in the area.

The proposed new mining could increase the area of potential escarpment failure and surface cracking to an additional 7000 feet of the escarpment and a corresponding area in the canyons below.

At such time as escarpment failure and surface cracks are determined to present a major safety hazard, UP&L will be required to fence the area and post signs warning the public of the hazard. Once the areas are fenced, the hazard would be mitigated as long as the fencing is maintained and individuals honor the fences and signs.

Short-Term use Vs. Long-Term Productivity

The safety hazards would be present until the escarpment stabilizes and surface cracks heal by natural processes. In regard to cracks along the escarpment rim, the process of filling the cracks by natural sedimentation is expected to be a long-term process, dependent upon the rate of stabilization of the escarpment and subsidence. In areas where subsidence and escarpment failures stabilize quickly, the crack healing process will advance more rapidly. Any renewed movement along the escarpments, however, would again aggravate the cracks.

The long-term productivity of the area regarding use by humans and livestock would be affected. The duration would be for the length of time needed for the areas to stabilize to the point where the induced hazard has been reduced and the fence can be removed.

Irreversible and Irretrievable Commitments

Eliminating human and livestock use would involve an irretrievable commitment of these uses for the length of time that the safety hazard and the fence remain.

Watershed

Short-Term and Residual Impacts

As escarpment failure occurs, the configuration and slope of the escarpment will be altered creating a renewed cycle of erosion in the affected area

which will extend to the ridge tops. This accelerated erosion might take place rapidly or over a long-term depending on how long it takes for subsidence and escarpment failure to occur and stabilize. Spalling of the Castlegate Sandstone will destroy some vegetation and change the cover in these areas from vegetation to barren talus. The spalling rock will disturb the existing talus materials resulting in scoured and loosened materials. Organic constituents in the soils will be scoured and/or buried. Revegetation of the areas is estimated to take at least 5 to 10 years with seeding. Increased sediments will be introduced into Miller and Newberry Canyons. The amount and overall increase in sedimentation cannot be quantified at this time.

High intensity thunderstorms are likely to generate shallow debris flows from the spalling areas. Historically, damaging floods and debris flows have been generated from small areas (5-10 acres) in the tributary canyons of Cottonwood Canyon and Grimes Wash. Such flows will reach the canyon floors with potential for damage to the highways and deposit sediment and debris at the mouths of the canyons.

Increased sediments and debris flows in Miller Canyon would increase the potential for damage and temporary closure of the Orangeville and Castle Dale municipal water diversion system. Increased sediments and debris flows in both Miller and Newberry Canyons would increase the potential for such damage to downstream irrigation water diversions.

Short-Term Use Vs. Long-Term Productivity

Erosion will slow the rate of re-establishing vegetation in disturbed areas resulting in a long-term decrease of vegetation production. Water yield from the canyons and slopes is not expected to change significantly considering the pinyon-juniper plant community found in the canyons and sparse amounts of vegetation found on the slopes. Sediment yield will, however, increase as a result of the proposed mining.

Irreversible and Irretrievable Commitments

The increased sediment and resulting decrease in water quality which is expected to occur due to the proposal, would be an irretrievable commitment of water quality for as long as the increased levels of sediment occur.

C. Alternative 3 - Consent to Modified Mine Plan

Selection of Alternative 3 is consistent with the LRMP and associated acts, laws, and regulations. If selected the Forest Service would consent to longwall mining in a manner which should provide protection of the Castlegate Sandstone outcrop in Miller and Newberry Canyons. Thus, the potential for impacts to sensitive and rare plants, golden eagles and nests, watershed, and public safety, after mitigations, should be reduced to an acceptable level.

Topography, Geology, and Mining

Under this alternative, the MRP would be modified to provide for reasonable protection of the Castlegate Sandstone from the affects of spalling. In Miller Canyon, the ninth and tenth west panels would be shortened on the west

end to a point where subsidence should not significantly impact the Castlegate Sandstone outcrop. If spalling does occur, it should be minor and be significantly less than expected under the proposed action (Alternative 2). Spalling impacts, although accelerated, should involve only small discontinuous areas.

Depending on the results of longwall mining in the ninth west longwall panel, an adjustment to the starting point of the remaining longwall panels in both Newberry and Miller Canyons will be made. If significant impacts occur to the Castlegate Sandstone outcrop, a buffer zone will need to be developed to provide additional protection to the escarpment. If the Castlegate Sandstone does not receive significant impacts, such as cliff spalling, the starting point of the remaining longwall panels can be shifted further into the escarpment, potentially to a point directly beneath the Castlegate Sandstone outcrop.

The amount of coal production from the escarpment area will change according to the necessary adjustment made on the end of the remaining longwall panels. Selection of this alternative provides for maximum recovery of the coal resource and should protect the escarpment as stipulated in the lease. Under this alternative, coal production from the escarpment area would be less than that for the proposed action (Alternative 2), but could potentially be greater than that for the No Action Alternative (Alternative 1).

Subsidence and escarpment failure in the already mined sixth and seventh east panels will probably continue as discussed under Alternative 2.

Other Resources

Under this alternative, the impacts discussed under the proposed action (Alternative 2), should be reduced to a acceptable level and will involve only small discontinuous areas of the escarpment.

VI. Cumulative Effects

The East Mountain area is being mined exclusively by UP&L through three major coal mining complexes and corresponding permit areas. The three complexes are the Deer Creek Mine, the Wilberg/Cottonwood Complex and the Desert-Beehive-Little Dove (Des-Bee-Dove) Complex.

A portion of the Deer Creek and Wilberg/Cottonwood Permit Areas overlap due to mining of three separate coal seams. The Deer Creek Mine, located within the Forest boundary on UP&L property in Deer Creek Canyon, involves extraction of coal from the Blind Canyon (upper) seam. Annual production exceeds 2 million tons. The Wilberg/Cottonwood Complex located on NFS lands in Grimes Wash involves mining from three seams. The Blind Canyon (upper), Cottonwood (middle) and Hiawatha (lower) seams. Approximately 2.5 million tons of coal annually is produced from this complex. The Des-Bee-Dove Complex is a 3 mine complex located within the Forest boundary on UP&L property in an unnamed canyon approximately 2 miles east of the Wilberg/Cottonwood Complex. The complex is temporally closed. When operating, mining occurs in the Blind Canyon and Hiawatha Seams. The Des-Bee-Dove Complex Permit Area is separated from the Deer Creek Mine and Wilberg/Cottonwood Complex Permit Area by the north-south trending Deer Creek

Fault. When operating, annual production at the Des-Bee-Dove Complex was approximately 1 million tons.

The proposed mining under the escarpment which is assessed in the EA only involves mining of 1 seam, the Hiawatha Seam. In other areas on East Mountain up to three seams will be mined in the same area resulting in compounded effects of subsidence. As required by Federal and State laws and regulations, UP&L has developed a rigorous subsidence and resource monitoring plan. Results are submitted to the regulatory agencies in annual reports.

Escarpment failure from mining under the escarpment on Federal lands has occurred in two areas on East Mountain. The first was in the Wilberg Mine first right and Deer Creek Mine ninth east area which is under the east slope or escarpment of Grimes Wash above the Wilberg/Cottonwood Mine Complex (map 7). The other is the Cottonwood Mine sixth and seventh east longwall panel area in Newberry Canyon (map 7).

Mining in the Wilberg first right/Deer Creek ninth east area involved room-and-pillar mining of two overlapping seams (Blind Canyon and Hiawatha Seams) under the escarpment. The support pillars were pulled (second mining) in both seams resulting in subsidence and escarpment failure. Subsidence of the ground surface within the mined area reached 20 feet. Escarpment failure resulted in rock falls, toppling, foundation failure, and extensive surface cracking at and above the Castlegate Sandstone outcrop. Mining in this area was completed in 1984. According to UP&L's subsidence monitoring studies, short-term effects of subsidence has stabilized. Forest Service observations have shown that the cracks are continuing to develop along the escarpment face indicating that additional rock falls and toppling might result.

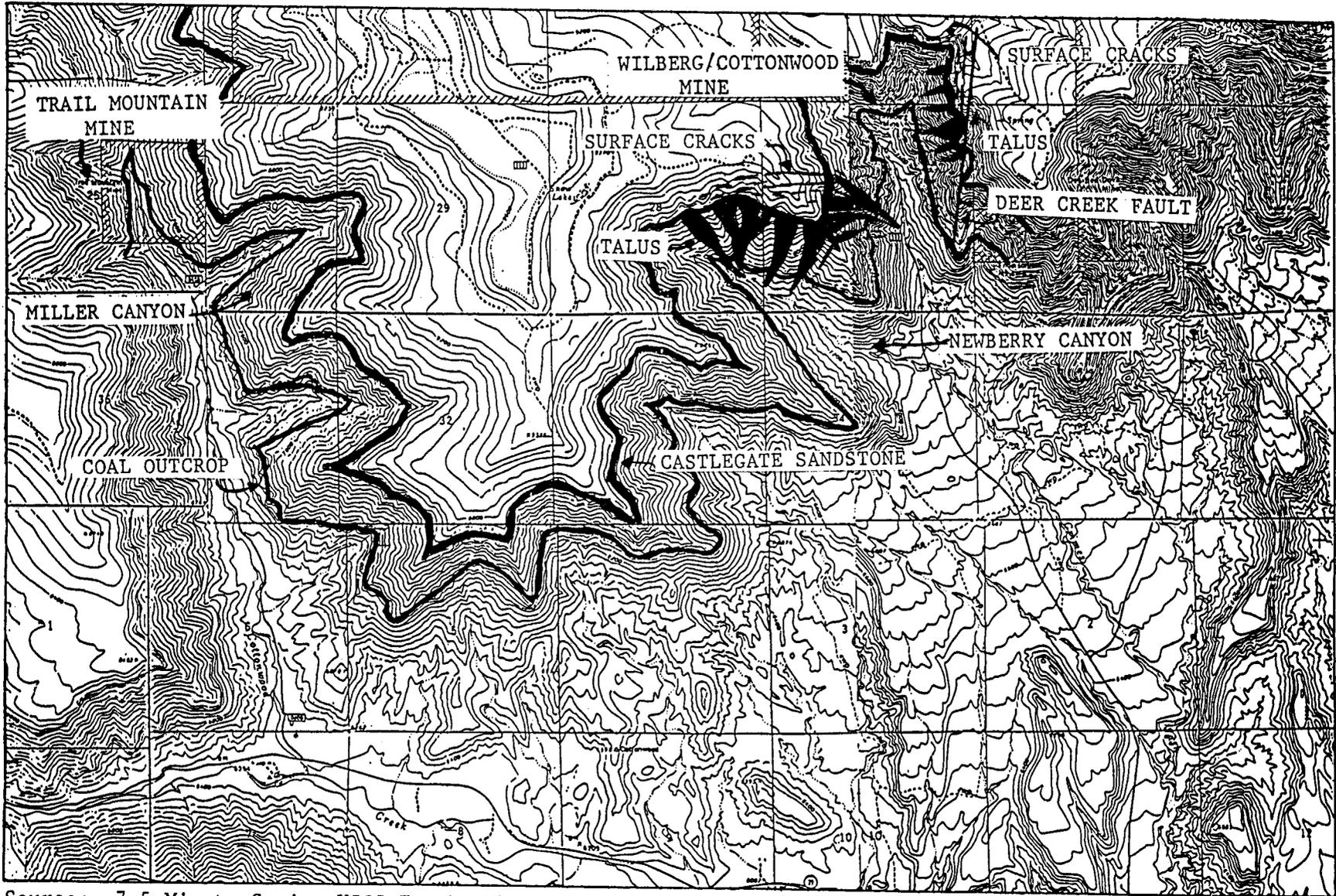
It is estimated that the area which has experienced visible impacts from subsidence on and above the escarpment is from 70-80 acres. Approximately 2,200 feet of the escarpment in this area has experienced failures.

The sixth and seventh east area in Newberry Canyon involved longwall mining of the sixth and seventh east longwall panels under the escarpment. Visible impacts of subsidence include escarpment failure and surface cracks. Short-term impacts of subsidence have involved from 70-100 acres. Approximately 4,100 feet of the undermined escarpment (5,000 feet) has suffered escarpment failure (spalling of the Castlegate Sandstone outcrop). Longwall mining started on September 8, 1986 and was completed on September 4, 1987. Additional area could be affected if subsidence and escarpment failure continue.

Other disturbances of the East Mountain area includes coal exploration drilling, livestock grazing, and dispersed recreation. The most significant of dispersed recreation use is the annual big game hunting season.

The effects of the three alternatives discussed in this EA will be cumulative with those discussed in this section.

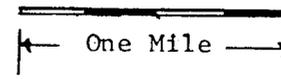
MAP 7



Source: 7.5 Minute Series USGS Topographic
Mahogany Point, Utah
Red Point, Utah

Scale: 1.5 inches per mile

Prepared by:
Mark R. Chatterton
12/7/87



VII. Personal and Public Involvement

A. Interdisciplinary Team

The ID Team consisted of the following Forest Service personnel:

Mark R. Chatterton	Geologist	Team Leader
Carter Reed	Geologist	
Jim Jensen	Landscape Architect	
Dennis Kelly	Hydrologist	
John H. Healy	Range Conservationist	
John Niebergall	District Ranger	
Bob Thompson	T&E Plant Specialist	
Rod Player	Wildlife Biologist	

B. Other Agencies Consulted

Bureau of Land Management (Moab District and San Rafael Resource Area)
 U.S. Fish and Wildlife Service
 State of Utah Natural Resources, Division of Oil, Gas and Mining

C. Public Contacts

The following agencies, groups, and individuals have been contacted in connection with this project:

Newspaper Notification

An article describing the proposed action was placed in the Emery County Progress on November 3, 1987. A copy of this article can be found in Appendix B.

Forest Planning Contacts

A list of individuals, groups, and organizations that wanted to be kept informed of activities occurring on the Ferron Ranger District were identified during the Forest planning process. A letter briefly describing UP&L proposal and the anticipated effects was sent requesting their comments. A copy of this list and the letter can be found in Appendix C.

D. Intensity of Public Interest

Few comments were received concerning this proposal and no new issues or concerns were identified. Letters received pertaining to this proposal from the Forest Planning Contacts can be seen in Appendix D.

VIII. References Cited

- Forest Service Manual 2670
- Manti-LaSal National Forest Land and Resource Management Plan, Nov. 5, 1986
- National Wildlife Federation Scientific and Technical Series No. 10, Raptor Management
- Personal contact with Steve Falk, Geologist, BLM, San Rafael Area Office, Moab District, 1987
- UP&L 1986 Cliff Subsidence Eagle Monitoring Report
- UP&L 1987 Assessment of Mining Related Impacts in Newberry Canyon
- U.S. Geological Survey Water-Supply Paper 2259, "The Ground-Water System and Possible Effects of Underground Coal Mining in the Trail Mountain Area, Central Utah," 1985, 31p.
- UP&L Wilberg/Cottonwood Mining and Reclamation Plan
- UP&L Golden Eagle Nesting/Cliff Subsidence Monitoring Plan, May, 1986

IX. Appendix

- Appendix A Visual Quality Objective Report
- Appendix B Newspaper Article
- Appendix C Forest Planning Contacts
- Appendix D Written Responses from Public

UP&L LONGWALL MINING

COTTONWOOD MINE

MILLER AND NEWBERRY CANYONS

Ferron Ranger District
Manti-LaSal National Forest

by
James A. Jensen
Visual Management Consultant
December 1, 1987

Note: The Visual Management System, Chapter 1, Volume 2, was used as a guide to provide input into this report.

Escarpment Failure Associated with the Cottonwood UP&L Proposal

Cultural Modifications

Newberry Canyon

The Wilberg Mine is located approximately one mile to the northeast of the escarpment with the mine haul road passing approximately one mile east. Adjacent on the west side of the haul road at the canyon mouth is an abandoned well site which is occasionally used for various purposes. The abandoned Anderson Mine is located approximately one and one-half miles east of the Newberry Canyon escarpment. Traversing through Newberry Canyon is an old livestock trail used primarily by wildlife. On the plateau top are various roads constructed for coal drilling activities. A cabin also exists on private land.

Miller Canyon

Trail Mountain Mine is located approximately three-fourths of a mile north of the mouth of Miller Canyon. The Cottonwood Road is a Forest land access road and also provides access to the Trail Mountain Mine. A powerline parallels the road to the mine. There is a breakout (very low visual impact) in the Miller Canyon escarpment area. On the plateau top are existing coal drilling roads and some evidence of Ranger timber sales.

Scenic Quality

The viewshed contains average or "common" features in terms of overall form, line, color and texture associated with vegetation, water and land. The scenic or variety class is "B".

Visual Resource Management Class

The Visual Quality Objectives (VQO) are "Partial Retention." Partial Retention means that man's activities may be evident to the casual Forest visitor, but must appear subordinate to the natural landscape. The objectives were developed through the land management planning process associated with the Land and Resource Management Plan, Manti-LaSal National Forest, November 6, 1986.

Newberry Canyon - The activity meets the V.Q.O.

Existing escarpment failure is apparent as viewed in foreground and middleground from the Wilberg coal haul road, however the user's concern for scenic quality from this road is very low. The failures are also visible for short distances along Highway 29 if one knows what to look for and where to look. Even then, they appear subordinant to the natural landscape.

Miller Canyon - The activity meets the V.Q.O.

Some escarpment failure would be apparent in middleground if one were to stop at one spot at the mouth of the Miller Canyon and the Cottonwood Road and look for it. Viewing from the road, however, would meet the Partial Retention V.Q.O.

Appendix B Newspaper Article

Forest Service studies UP&L coal proposal

The Ferron Ranger District of the Manti-LaSal National Forest has received a proposal from Utah Power and Light Company which affects the surface environment of National Forest System lands in Newberry and Miller canyons.

Utah Power and Light Company has proposed the continued use of the longwall mining method between the coal outcrop and the cliff forming Castlegate sandstone in Newberry Canyon and to begin using the same longwall mining method in Miller Canyon.

In 1985 this method of mining was approved for a portion of the north side of Newberry Canyon. The intent of the approval was to determine what effect longwall mining would have on the eastern margin of the Wasatch Plateau (often referred to as the escarpment). This study has demonstrated that longwall mining does accelerate the erosion rate of the escarpment. When coal is removed by mining subsidence occurs. Subsidence causes the overlying rock to fracture. When near the escarpment,

rockfalls occur which generally removes or buries the vegetation below the failure.

Utah Power and Light Company has requested approval for continued use of the longwall mining method in the Newberry Canyon and approval for use of the longwall mining method in Miller Canyon. They propose starting production in Miller Canyon in January 1988.

To determine the environmental effects of the proposed action, the Ferron Ranger District is conducting an environmental analysis of the proposal. It is anticipated that the environmental analysis will be completed during the first part of December.

If anyone has comments on this project, please address them to John Niebergall, Ferron District Ranger, Manti-LaSal National Forest, P.O. Box 310, Ferron, Utah 84523. Any comments should be sent by Nov. 20, 1987.

If there are questions or you desire further information, please contact John Niebergall at 801-381-2372.

Appendix C Forest Plannig Contects