0016

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

February 1, 1989

Mr. Michael Glasson
Andalex Resources Inc.
P. O. Box 902
Price, Utah 84501

Mike

Dear Mr. Glasson:

Re: Partial Approval, Pioneer Construction for Aberdeen Mine, Andalex Resources Inc., Centennial Project, ACT/007/019-88(G), Folder #2&3, Carbon County, Utah

The Division has reviewed your proposal to commence construction of the Aberdeen Mine facilities. In consideration of the critical timing for the construction of these facilities at your operations, the Division grants partial approval to commence limited activities at the Aberdeen Site.

To date the Division has not received approval from the Department of Health for the construction of the sediment pond. The operator shall be required to minimize activities on the site until such time as the sediment pond is approved by both Health and the Division, and can be constructed.

The following activity will be allowed on the site until such time as the final approval for the facilities is received.

1. Installation of alternate sediment control structures at the lowest end of the site. These sediment structures (straw bales/silt fences) shall be installed prior to any other activity within the area.

2. Preparations (clearing and grubbing) of the topsoil storage area, and, limited portal pad area (only as necessary for work item #3). All deleterious materials shall be removed from the areas to be disturbed and from any potential material to be used as fill.

3. Development of a pioneer cut along the outcrop of the Aberdeen Seam to the extent that;

   a. The location and the condition of the old workings can be determined.

   b. The thickness and condition of the coal seam and the roof material can be determined for location of portals for access to the seam.

4. Earthwork shall be accomplished in a manner such that the operator will minimize to the extent possible, the amount of sidecast materials from the cut along the seam. Excavated materials shall be accumulated at the east end of the project, below the existing sediment pond. This material must be reworked and recompacted in the spring or summer when conditions allow for backfilling and compaction.

5. In accordance with the proposal, the operator shall, to the extent safely possible, salvage and stockpile topsoil material as construction progresses.

6. As soon as approval has been made for the construction of the sediment pond facilities, and, when weather conditions allow, the operator shall commence construction of the sediment pond and surface diversions and shall cease all other activities within the Aberdeen Mine development site until such time as the sediment pond and diversions have been completed and approved by the Division.

The operator shall notify the Division upon commencement of activities within the Aberdeen Mine facilities area.

Should you have any further questions regarding this conditional approval, please call Rick Summers or myself.

Sincerely,

Lowell

Lowell P. Braxton
Administrator
Mineral Resource Development
and Reclamation Program

cl
cc: J. Helfrich
S. Linner
R. Harden
R. Summers
PFO
BT15/65-66

0017

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

January 20, 1989

Mr. Peter A. Rutledge, Chief
Division of Federal Programs
Office of Surface Mining
Brooks Towers
1020 Fifteenth Street
Denver, Colorado 80202

Dear ~~Mr.~~ Pete Rutledge:

Re: State Decision Document and Technical Analysis, Andalex Resources, Inc., Centennial Project, Underground Lease Additions, ACT/007/019, Folder #2, Carbon County, Utah

Enclosed is Utah's Decision Document and Technical Analysis for the proposed underground lease additions to the Centennial Project. Andalex Resources, Inc. is proposing to add three federal lease modifications, one new federal lease and one new fee lease to the already permitted area at the Centennial Project. The total area of the proposed lease additions is 998 acres.

Since these proposed additions will be mined as underground extensions of existing mines no new surface disturbance will occur, and the Division has done an abbreviated Technical Analysis, analyzing compliance with only those sections of the performance standards which are pertinent to the applicant's proposal.

an equal opportunity employer

The Division has found that, with the addition of three stipulations, the applicant's proposal is adequate to comply with the requirements of the Utah program and SMCRA. We request that you concur with this assessment and expediently forward the package to Washington for approval. If you have any questions, please contact Susan Linner, Permit Supervisor, of my staff.

Best regards,

Dianne

Dianne Nielson
Director

cl
Enclosure
cc: M. Glasson, Andalex
B Team
BT45/155-156

UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

CONTENTS

* Administrative Overview
* Location Map
* Permitting Chronology
* Mine Plan Information Form
* Findings
* Cumulative Hydrologic Impact Assessment (CHIA)
* Stipulations
* Technical Analysis
* Letters of Concurrence
    - Bureau of Land Management, January 13, 1989
    - Division of State History, January 18, 1989
    - Division of Wildlife Resources, November 4, 1988
    - Resource Development Coordinating Committee, November 30, 1988
    - Office of Surface Mining Reclamation and Enforcement Relatedness Report, January 18, 1989

ADMINISTRATIVE OVERVIEW

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

BACKGROUND

Andalex Resources, Inc. (ARI) has proposed two separate underground lease additions to its currently approved permit area for the Centennial Project.

The Mining and Reclamation Plan (MRP) for the Centennial Project was approved by the Office of Surface Mining in November of 1981 and by the Division of Oil, Gas and Mining (DOGM) in January of 1982. The originally approved MRP consisted of 2,240 acres of private and federal coal leases. On May 20, 1986, ARI was issued a permit by DOGM for a 120-acre federal emergency lease. On March 2, 1987, a new five-year permanent program permit was issued incorporating the emergency lease, for a total permitted acreage of 2,360 acres.

In October of 1981, Federal lease numbers U-010581, SL-063058 and SL-027304 were modified by the Bureau of Land Management to include an additional 436 acres. In March of 1988, ARI requested that these three lease modifications be incorporated into the permitted area. In August of 1988, ARI requested that one additional 320 acre federal lease (U-05067) and one 240 acre fee lease be added to the permitted area. This Decision Document addresses the additions of the three lease modifications, the new federal lease, and the new fee lease to the permitted area.

Currently ARI operates two mines, the Pinnacle and Apex, in the Gilson and Lower Sunnyside seams, respectively. A third mine, the Aberdeen, approved in the original MRP to access the Aberdeem Seam, has yet to be developed. ARI is currently preparing to develop the Aberdeen Mine, which will require the addition of the lease modification areas to the permit. The two new leases will be mined as part of the Pinnacle Mine.

ANALYSIS

No additional surface disturbance is proposed in relation to the addition of these underground leases and lease modifications. Therefore this Technical Analysis (TA) addresses specifically effects related to the underground mining of these leases and lease modifications. It is DOGM's opinion that the sections addressed in the following TA differ significantly from the mining and reclamation practices and procedures which were approved in the five-year permit renewal. Those sections not addressed here were determined to be in compliance with the approved MRP and have been addressed in previous TA's.

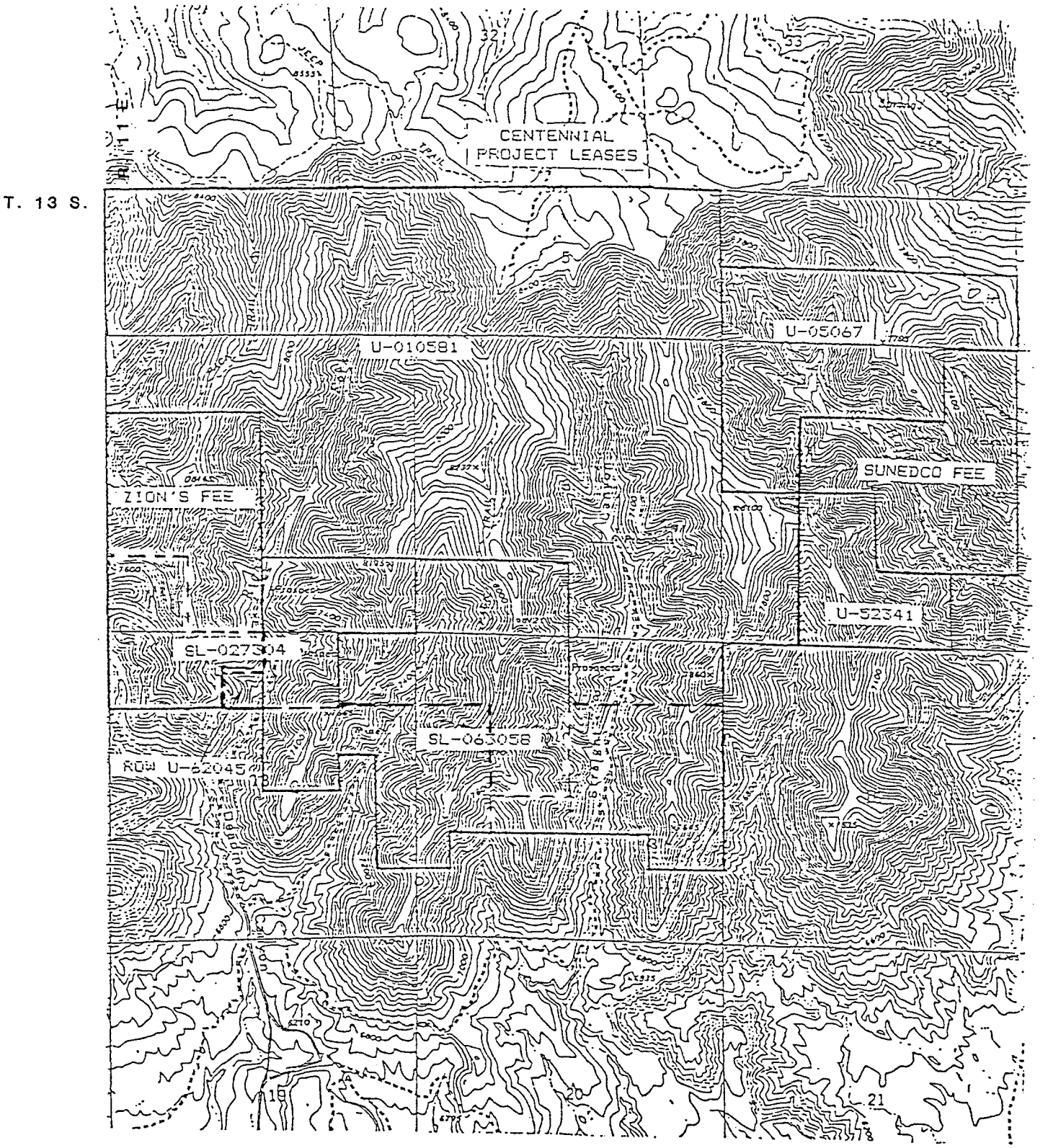
Additional surface disturbance in the amount of 1.68 acres will be done to facilitate development of the Aberdeen Mine. In a separate permitting action, DOGM is handling the additional surface disturbance as an amendment/incidental boundary change to the existing permit. Correspondence regarding this amendment can be found in DOGM's files and the subject is not addressed further in this document.

RECOMMENDATION

ARI has demonstrated that mining of the lease modifications and new leases can be done in conformance with the Surface Mining Control and Reclamation Act, and the corresponding Utah Act and performance standards. The Bureau of Land Management has approved the mining plans for the new federal lease and lease modifications. No substantive issues were raised during the review process or the public comment periods. It is therefore recommended that approval be given for the addition of these underground leases and lease modifications to the permitted area and to the currently approved five year permanent program mining permit, with the stipulations delineated in this Decision Document.

LOCATION MAP

ANDALEX RESOURCES, INC.



----- Lease Modification Boundaries

_____ Lease Boundaries

PERMITTING CHRONOLOGY

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

3/11/88	Andalex Resources Inc. (ARI) submits updated Mining and Reclamation Plan (MRP) including addition of three federal lease modifications to the permit area.
3/1-22/88	ARI publishes notice of intent to add the lease modifications to the permit area weekly for four consecutive weeks in the Price Sun Advocate.
4/21/88	Comment period expires with no comments received.
8/9/88	ARI submits plan to incorporate two new leases, one federal and one fee, into the permit area.
8/2-23/88	ARI publishes Notice of Intent to add the new leases to the permit area weekly for four consecutive weeks in the Price Sun Advocate.
9/22/88	Second comment period expires with no comments received.
10/17/88	DOGM forwards notice of a complete permit application for all lease additions to other agencies.
12/19/88	ARI submits proof of right of entry on Lease U-05067
1/20/89	DOGM forwards State Decision Document and Technical Analysis to Office of Surface Mining Reclamation and Enforcement for concurrence and Secretarial signature.

MINE PLAN INFORMATION

Mine Name: Centennial Project State ID: ACT/007/019

Operator: Andalex Resources, Inc. County: Carbon

Controlled By: _____
Contact Person(s): Mike Glasson Position: _____
Telephone:: (801) 637-5385

New/Existing: Both Mining Method: Room and Pillar

New Federal Lease No(s).: U-010581 (Mod.), U-063058 (Mod.), SL-027304 (Mod.), U-05067

Legal Description(s): U-010581: T 13S, R. 11E Section 17: S 1/2 NE 1/4, N 1/2 NE 1/4 SW 1/4, NE 1/4 SE 1/4, N 1/2 NW 1/4 SE 1/4;
U-063058: T 13S, R 11E, Section 17: SW 1/4 NW 1/4, NE 1/4 NW 1/4 SW 1/4, W 1/2 NW 1/4 SW 1/4, Section 18: E 1/2 SE 1/4 NE 1/4, NW 1/4 SE 1/4 NE 1/4 SW 1/4 NE 1/4, E 1/2 NE 1/4 SE 1/4;
SL-027304: T 13S, R 11E, Section 7: Lot 4, Section 18: Lot 1, N 1/2 NE 1/4 NW 1/4, SW 1/4 NE 1/4 NW 1/4;
U-05067: T. 13S, R 11E, Section 4: S 1/2, Section 9: NW 1/4 NE 1/4,W 1/2 NW 1/4, NE 1/4 NW 1/4

Other New Leases (identify): Sunedco Fee Lease

Legal Description(s): T. 13S, R. 11 E. Section 9: SE 1/4 NW 1/4, S 1/2 NE 1/4, NE 1/4 NE 1/4, N 1/2 SE 1/4

Ownership Data:

Surface Resources (acres)	Existing Permit Area	Proposed Permit Area	Total Life Of Mine Area
Federal	2170	758	2918
State			
Private	200	240	440
Other			
TOTAL	2370	998	3368

Coal Ownership (acres):

Federal	2160	758	2918
State			
Private	200	240	440
Other			
TOTAL	2360	998	3358

Coal Resource Data	Total Reserves	Total Recoverable Reserves
Federal		
State		
Private		
Other		
TOTAL	52.5 Millon Tons	35.5 Million Tons

Recoverable Reserve Data	Name	Thickness	Depth
Seam	Aberdeen	4-13 ft.	1060 ft.
Seam	Gilson	4-8 ft.	800 ft.
Seam	Lower Sunnyside	4-6 ft.	600 ft.
Seam			
Seam			
Seam			

Mine Life: 28 years
Average Annual Production: 1.5 Million Percent Recovery: 68%
Date Projected Annual Rate Reached: 1990
Date Production Begins: 1980 Date Production Ends: 2008
Reserves Recoverable By: (1) Surface Mining:
(2)Underground Mining: X
Reserves Lost Through Management Decisions: Unknown
Coal Market: Unknown

Modifications that have been approved:	Date:
Emergency Lease	May 20, 1986

FINDINGS

Andalex Resources Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

1. The revised plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act"), and the approved Utah State Program have been compiled with (UMC 786.19{a}).

2. No additional surface reclamation is required since the additional permit area will be mined as underground extensions of existing mines. There will be no new surface facilities.

3. The assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been made by the regulatory authority. The Mining and Reclamation Plan (MRP) proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas (UMC 786.19 {c} and UCA 40-10-11 {2}{c}) (See Cumulative Hydrologic Impact Analysis (CHIA) following this Findings Document).

4 The proposed lands to be included within the permit area are:

   a. not included within an area designated unsuitable for underground coal mining operations (MRP, p. 17);

   b. not within an area under study for designated lands unsuitable for underground coal mining operations (MRP, p. 17);

   c. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11 {a} (national parks, etc.), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries) (MRP, p. 25);

d. not within 100 feet of a public road (MRP, p.189);

e. not within 300 feet of any occupied dwelling (MRP, p. 17) (UMC 786.19 {d}).

5. The regulatory authority's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19 {e}) (letter from the Division of State History, January 18, 1989, attached to the TA).

6. The applicant has the legal right to enter and complete mining activities in the new lease areas through lease agreements (UMC 786.19 {f}).

7 A 510(c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither Andalex Resources, Inc. or it's parent company are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19 {g}{h}{i}) (See OSMRE Relatedness Report, attached to TA).

8. Underground mining operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area. The closest operating mine is the Soldier Canyon Mine.

9. The applicant has posted a surety bond for the Centennial Project in the amount of $381,839.00. No additional surety will be required, since there is no additional surface disturbance proposed (UMC 786.19 {k}).

10. No lands designated as prime farmlands or alluvial valley floors occur on the permit area (UMC 786.19 {l}) (See MRP pp. 76, 24).

11. The proposed postmining land-use of the permit area is the same as the pre-mining land use and has been approved by the regulatory authority (UMC 786.19 {m}).

12. The regulatory authority has made all specific approvals required by the Act, the Cooperative Agreement and the Federal Lands Program (UMC 786.19{n}).

13. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habits (UMC 786.19 {o}) (See MRP p. 66).

14. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.11- .15).

15. No existing structures will be used in conjunction with mining of the underground lease additions, other than those constructed in compliance with the performance standards and subchapter K under the existing permit (UMC 786.21).

Susan C. Linner
Permit Supervisor

Lowell P. Braxton
Administrator, Mineral Resource Development and Reclamation Program

Kenneth E. May
Associate Director, Mining

Dianne R. Nielson
Director

CUMULATIVE HYROLOGIC IMPACT ASSESSMENT

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

I. Introduction

This report contains a Cumulative Hydrologic Impact Assessment (CHIA) for Andalex Resources, Inc., Centennial Project located in Carbon County, Utah. The assessment encompasses the probable cumulative impacts of all anticipated coal mining on the hydrologic balance in and adjacent to Centennial's proposed and active underground mine complex, and evaluates whether the operations proposed in the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area.

This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under UMC 786.19(c) and 30 CFR 784.14(f), respectively.

This assessment incorporates the Aberdeen Mine. On March 11, 1988 the Division of Oil, Gas and Mining received notification of intent to conduct mining activities in the Aberdeen Mine. The Aberdeen Mine was originally proposed in the Mining and Reclamation Plan (MRP), but remained undeveloped until demand made production from the coal seam feasible. The development proposal was treated as a new permitting action since the proposal included a modification to existing federal leases which increased the permit area by approximately 400 acres by adding 162 acres to Federal Lease U-010581, 160 acres to Federal Lease SL-063058 and 116 acres to Federal Lease SL-027304. The reserves in these three leases will be mined as an extension of the Aberdeen Mine.

This CHIA also assesses an application submitted on August 9, 1988 to incorporate a new mine permit for 560 acres on the north-east corner of the permit area which consists of a new federal lease (U-05067, 320 acres) and a lease from SUNEDCO (240 acres of fee property). The reserves in these two leases will be mined as an extention of the Pinnacle Mine.

I. Introduction

Andalex Resources Inc. Centennial Project is located within the Book Cliffs Coal Field approximately 10 miles north-northeast of Price, Utah (Figure 1). The Book Cliffs form a rugged, southerly facing escarpment that delineates the Uintah Basin to the north from the San Rafael Swell to the south. Elevations along the Book Cliffs range from approximately 5,000 to 9,000 feet.

Outcropping rocks of the Book Cliffs range from Upper Cretaceous to Quaternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Formation) depositional environments. Oscillating depositional environments within the overall reggressive trend are represented by members of the Blackhawk Formation. The major coal bearing unit within the Book Cliffs Coal Field is the Blackhawk Formation.

Precipitation varies from 20 inches at higher elevations to 5 inches at lower elevations. The Book Cliffs area may be classified as mid latitude steppe to desert.

Vegetation varies from the sagebrush/grass community type at lower elevations to the Douglas fir/aspen community at higher elevations. Other vegetative communities include mountain brush, pinyon-juniper, pinyon-juniper/sagebrush and riparian. These communities are primarily used for wildlife habitat and livestock grazing.

Surface runoff from the Book Cliffs area flows into the Price River drainage basin of east-central Utah. The Price River originates near Scofield Reservoir and flows southeasterly into the Green River, north of the town of Green River, Utah. Water quality is good in the mountainous headwater tributaries, but deteriorates rapidly as flow traverses the Mancos Shale. The shale lithology typically has low permeability, is easily eroded and contains large quantities of soluble salts that are a major contributor to poor water quality. Depending upon the duration of contact, water quality degrades downstream to where total dissolved solids (TDS) levels of 3,000 milligrams per liter (mg/l) are common. The predominant ion leached from the Mancos Shale is sulfate (SO_4) with values over 1,000 mg/l common in the lower reaches of the Price River.

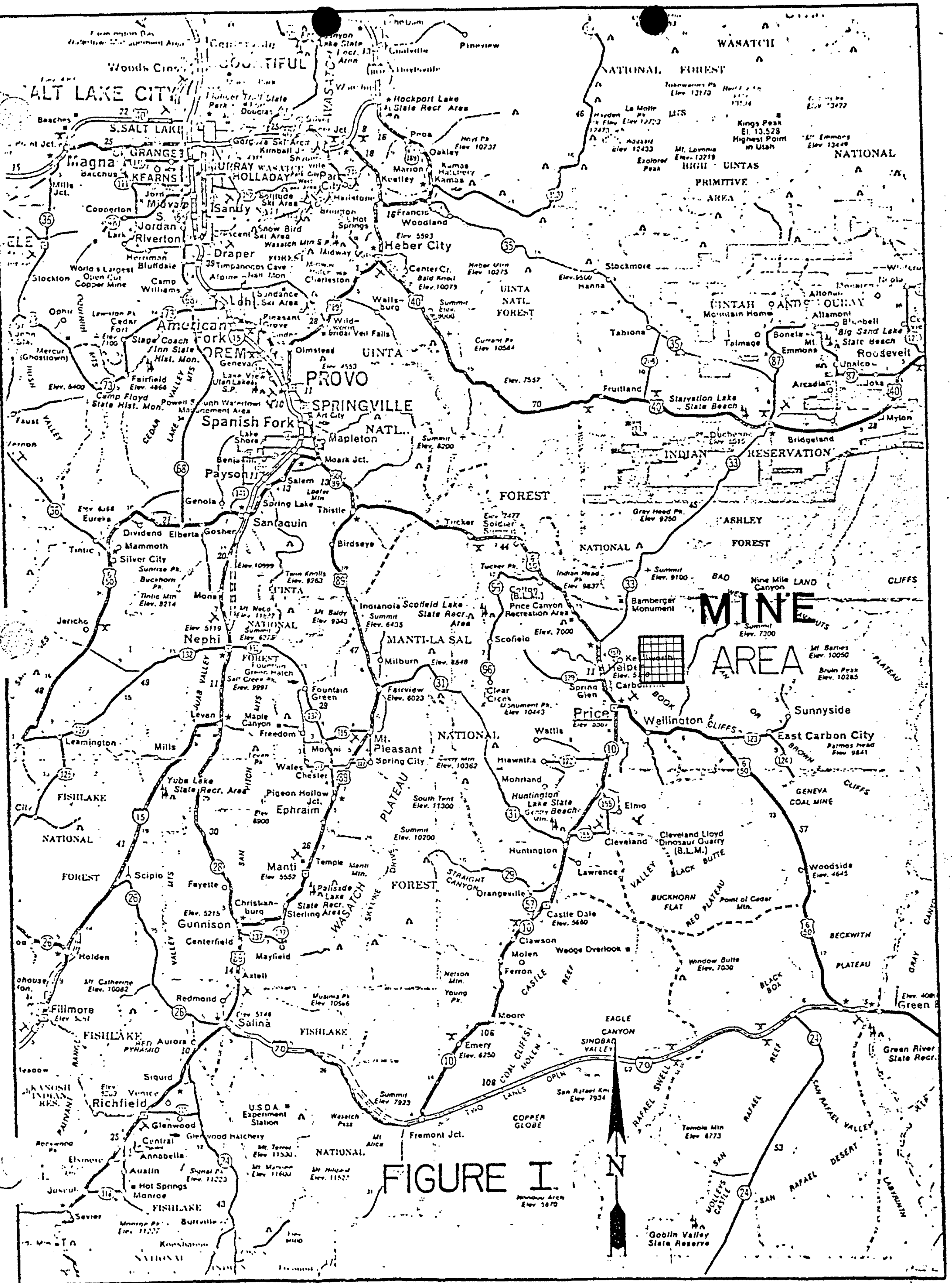

MINE
AREA
SALT LAKE CITY
BOUNTIFUL
PROVO
SPRINGVILLE
Spanish Fork
Payson
Santaquin
Nephi
Price
Helper
Wellington
Sunnyside
East Carbon City
Heber City
Park City
Orem
American Fork
Mt. Pleasant
Ephraim
Manti
Gunnison
Salina
Richfield
Fillmore
Huntington
Castle Dale
Emery
Green River
Roosevelt
Duchesne
WASATCH
NATIONAL FOREST
UINTA
MANTI-LA SAL
FISHLAKE
ASHLEY
UINTAH AND OURAY
INDIAN RESERVATION
BOOK CLIFFS
SAN RAFAEL SWELL
N

FIGURE I

II. Cumulative Impact Area (CIA)

Plate 1 delineates the CIA for the current Centennial Project operations. The CIA includes the Deadman Canyon drainage, the Straight Canyon drainage, the Hoffman Creek drainage and several other unnamed ephemeral drainages between Deadman Canyon and Hoffman Creek. The northern boundary of the CIA has been established at the natural drainage divide between drainages flowing north into the Price River and drainages flowing south into Deadman Canyon and Coal Creek and eventually into the Price River.

The Centennial Project is located entirely within the watershed flowing to the south. The eastern boundary of the CIA is designated by Coal Creek, a perennial stream. Mining in the Centennial Project will not occur beneath Coal Creek and therefore the limits of the CIA do not extend to the east of Coal Creek. The western and southern boundaries of the CIA are defined by the western extent of Sections 19 and 30 in T 13 N, R 11 E and the southern extent of Sections 27, 28, 29 and 30 in T 13 N, R 11 E, respectively. A first level analysis was conducted using the section lines as the CIA boundary. Completion of the review at this level indicated that cumulative hydrologic impacts did not exist within these limits. Therefore, further analysis was not conducted beyond these limits and the CIA was determined to be complete. The CIA encompasses approximately 20.2 square miles.

III. Scope of Mining

Initial mining operations of the Centennial Project began in October, 1980 in the Pinnacle Mine on the Zion's fee lease. The original Mining and Reclamation Plan was approved in January, 1982, and mining progressed onto the federal leases. In June, 1982 the Apex Mine was opened. In October, 1981 modifications to three federal leases were granted, however these leases were not added to the overall mine plan area at that time. A 120 acre federal emergency lease was granted in November of 1983 and permitted in May of 1986. The coal mined from the emergency lease was extracted as an underground extension of the existing Pinnacle Mine operation.

With the inclusion of the three Aberdeen Seam lease modifications (SL-063058, SL-027304, and U-01081), the new federal lease (U-05067), the SUNEDCO lease and the BLM right-of-way (see Figure 2), the Centennial Project area totals 3,348 acres of which 2,928 acres are federal. Mineable reserves within the plan will total approximately 52 million tons, with recoverable coal estimated at 33 million tons. To date 3.5 million tons have been mined.

Surface disturbance will be contained within the Right Fork of Deadman Canyon adjacent to the mine entries. A total of 34.20 acres is planned for surface disturbance and reclamation.

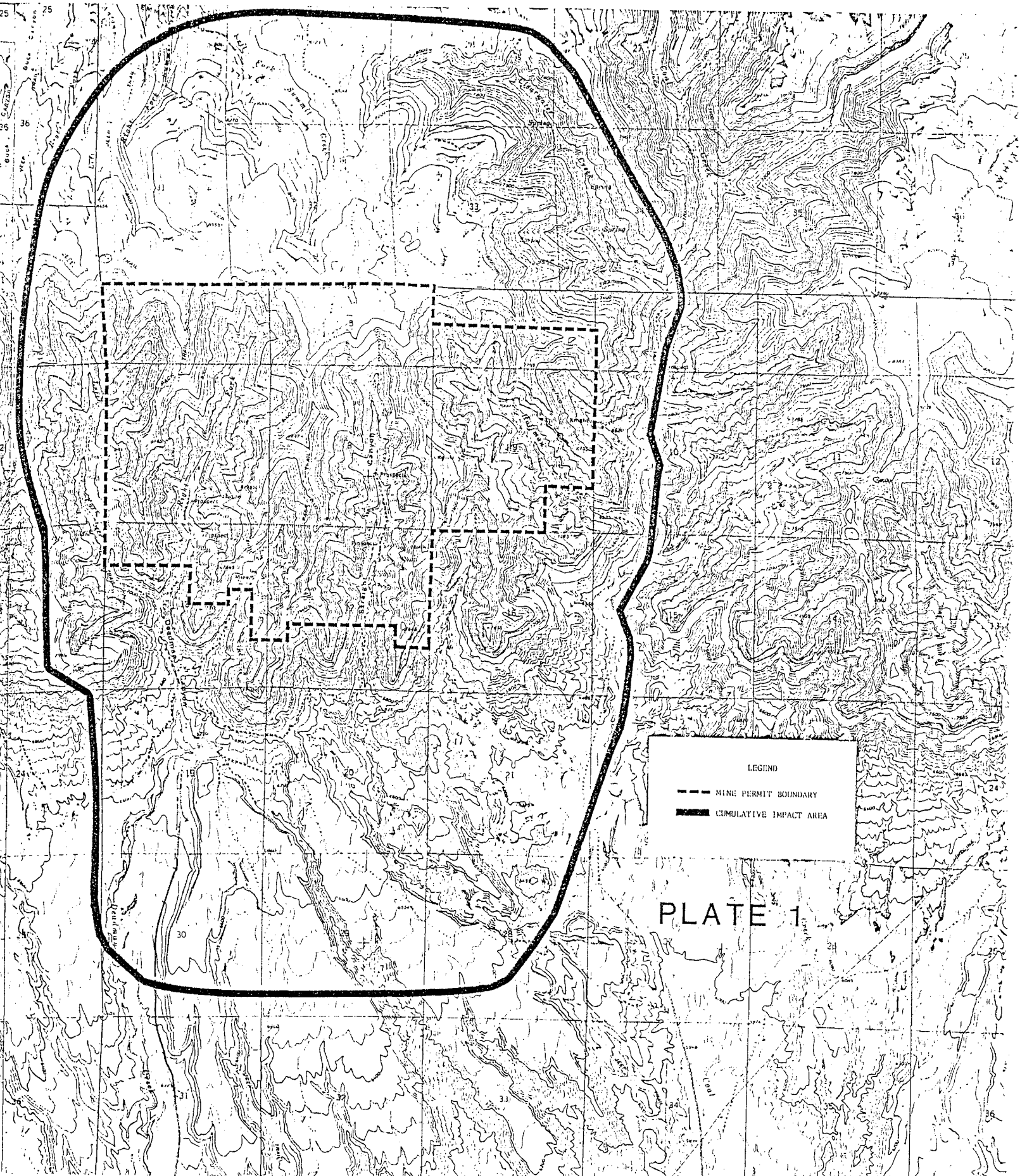


PLATE 1

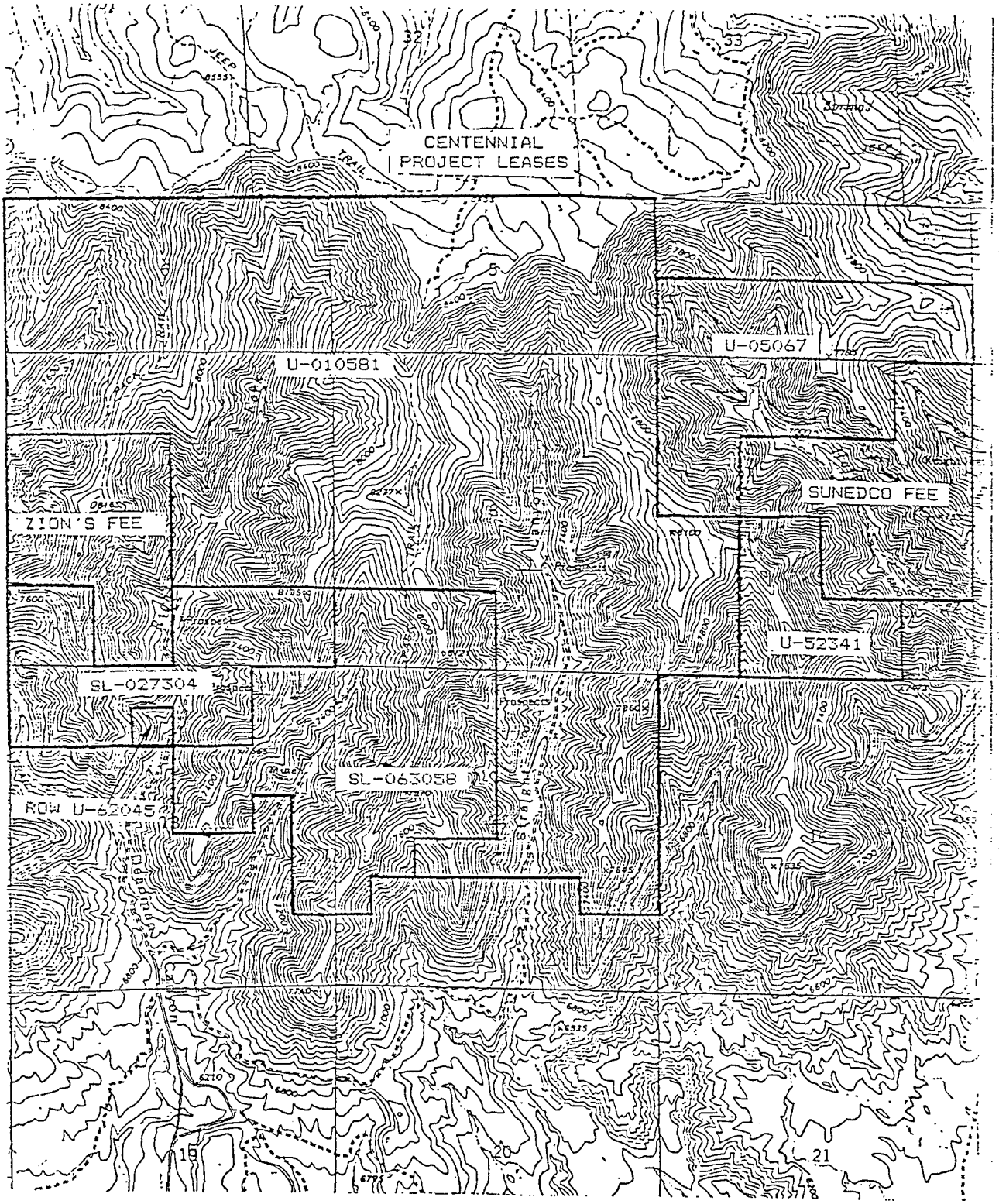

CENTENNIAL
PROJECT LEASES
U-010581
U-05067
SUNEDCO FEE
ZION'S FEE
U-52341
SL-027304
SL-063058
ROW U-62045
32
33
19
20
21

Figure 2

Three seams of mineable coal are located within the permit area (Figure 3). The approved Mining and Reclamation Plan for the Centennial Project calls for the eventual development of a separate mine in each seam. Currently two mines, the Pinnacle Mine in the Gilson Seam and Apex Mine in the Lower Sunnyside Seam have been developed and are currently operating. A third mine, the Aberdeen Mine, now has plans for development in the Aberdeen Seam.

Production will be from room and pillar mining methods with secondary pillaring. Mine development will occur simultaneously in each of the three seams. Longwall mining may be introduced if conditions prove favorable. Overburden thickness ranges from approximately 0 to 2400 feet.

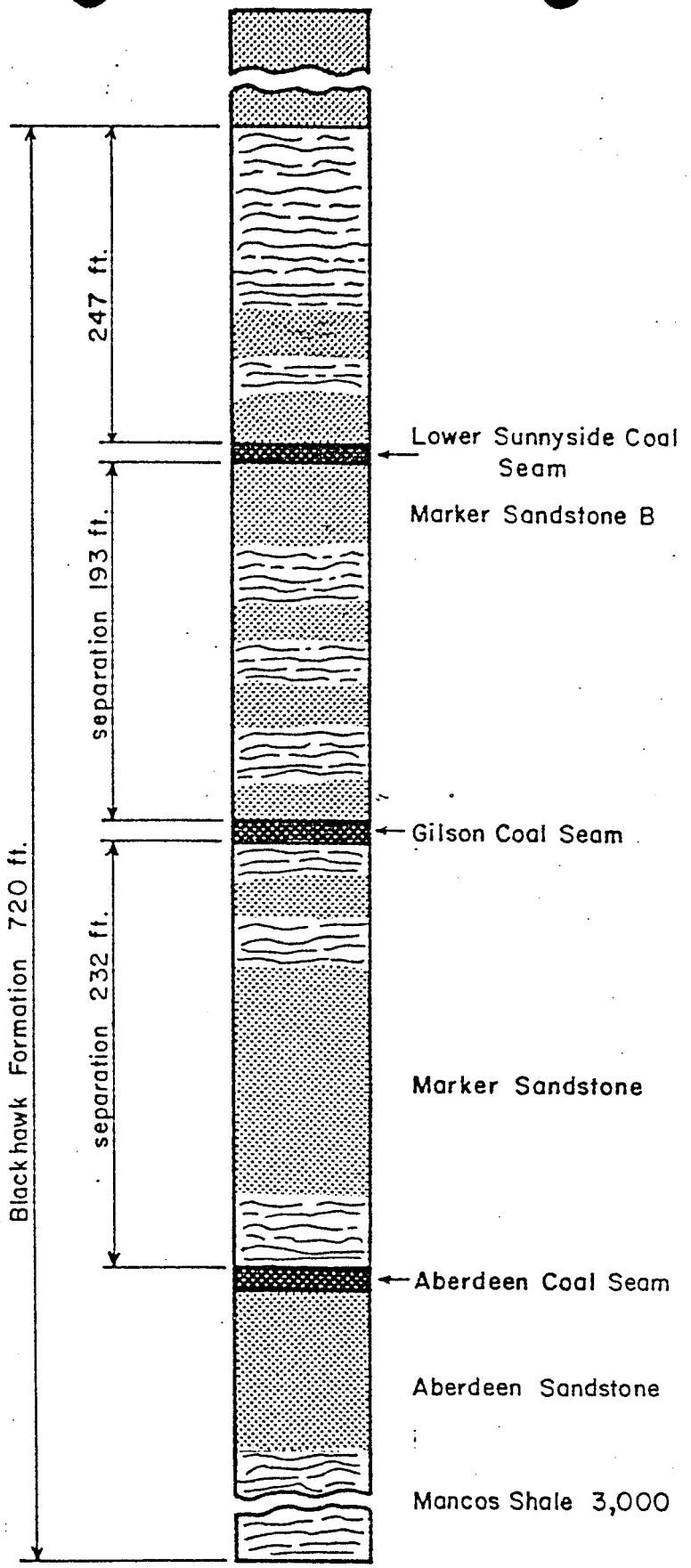
IV. Study Area

A. Geology

The Book Cliffs are basically a homocline (dip slope) dipping into the Uintah Basin with the cliff front roughly paralleling the strike of the feature. The beds are mostly uniform with dips of 3° to 8° to the north and northeast. Occasional faults cut the coal measures in the Book Cliffs but are of small displacement and have been of little consequence in mining. There are no faults known to exist within the Centennial Project. No major faults exist in the area adjacent to the mine plan area, however, Doelling (1972) shows that one minor fault may exist about one-half mile south of the portal area.

Geologic formations exposed within the mine plan area are the Blackhawk and Price River Formation of the Mesa Verde Group and the North Horn and Flagstaff members of the Wasatch Formation (Figure 4). The Blackhawk Formation, which directly overlies the Mancos Shale in the vicinity of the Centennial Project (Doelling, 1972) is the middle and coal bearing unit of the Mesa Verde Group. The Blackhawk consists of a basal sandstone (the Aberdeen Sandstone) overlain by massive beds of gray to buff sandstone with alternating beds of sandy shale, shale and coal (Clark, 1928). In the vicinity of the Centennial Project, the Blackhawk Formation is approximately 1000 feet thick (Doelling, 1972).

Overlying the Blackhawk Formation is the Price River Formation. The Price River Formation is composed of a massive basal sandstone (referred to as the Castlegate Sandstone) and upper beds overlying the Castlegate (Clark, 1928). The Castlegate Sandstone consists of



Measured Section of the Blackhawk Formation

Deadman Canyon No Scale

Figure 3

GEOLOGIC COLUMN OF CENTENNIAL AREA

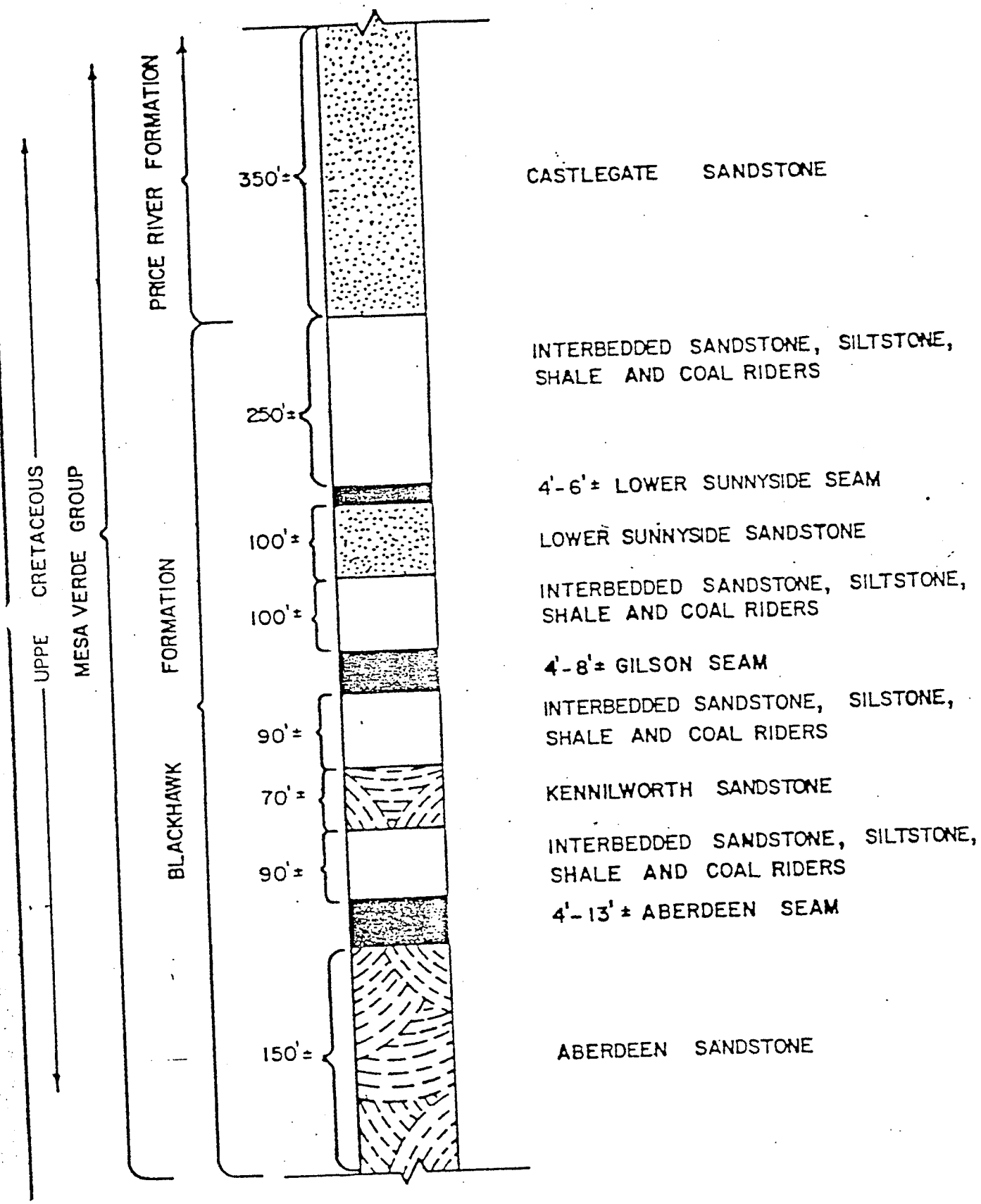


Figure 4

massive, fine-grained to medium-grained sandstone beds (Doelling, 1972) which are gray to buff and composed mainly of semi-rounded quartz grains (Clark, 1928). The Castlegate Sandstone is approximately 250 feet thick near the Centennial Project (Doelling, 1972). The upper portion of the Price River Formation consists of two or more thick beds of sandstone, interbedded with thin-bedded shale and sandy shale (Clark, 1928).

The North Horn Formation, the lower most member of the Wasatch Formation, consists of a series of shale, mudstone, sandstone, minor conglomerate and freshwater limestone. Near the Centennial Project, the North Horn Formation is approximately 600 feet thick.

The Flagstaff Limestone, also a member of the Wasatch Formation, consists of thin-bedded limestones, shales, and sandstones (Doelling, 1972). The Flagstaff Limestone is exposed just north of the mine plan area on the Plateau.

B. Topography and Precipitation

Topography in the area is generally very steep and rugged, with elevations ranging from approximately 6400 feet to 8500 feet above sea level. Slopes vary from vertical cliffs to less than 2 percent. The entire CIA is characterized by a south to south-east ephemeral drainage system that originates above 8400 feet and progressively traverses nonmarine and marine Cretaceous rocks and alluvial fan deposits. The Right and Left Forks of Deadman Canyon and an unnamed ephemeral drainage drain the western portion of the CIA. Straight Canyon, an unnamed ephemeral drainage and Hoffman Creek drain the southeastern portion of the CIA and are tributary to Coal Creek. Coal Creek and Deadman Canyon are both tributary to the Price River.

Precipitation in the Book Cliffs Coal Field ranges from 5 inches to a maximum of 20 inches annually. For the most part along the coal outcrops, 10 to 12 inches of rain are expected (Doelling, 1972).

C. Vegetation

Mountain-Brush, Desert-Shrub, Pinyon-Juniper Woodland, Sagebrush-Grass, Conifer-Aspen and minor stream side vegetative types cover the total CIA. Most of the area is covered by the Mountain-Brush type while the Pinyon-Juniper Woodland type is predominant in the mine mouth area as well as the access routes and utility corridors.

V. Hydrologic Resources

A. Ground Water

The principle factor controlling the occurrence and availability of groundwater in any area is geology. As noted by Price and Waddell (1972), nearly all of the region in the CIA is underlain by rocks of continental and marine origin, consisting predominantly of interbedded sandstones and shales. Although some of the sandstones in the region serve as the principle water-bearing strata, their ability to yield water for extended periods of time is largely controlled by the fact that the sandstone beds are relatively impermeable and by the existence of the impermeable interbedded shale layers, which prevent the downward movement of a significant amount of water. According to the U. S. Geological Survey (1979), groundwater in the region exists under water table, artesian and perched conditions. Water table conditions exist primarily in shallow alluvial deposits along larger perennial streams and in relatively flat lying sedimentary rocks. Artesian conditions exist at greater depths where a confining layer overlies a more permeable strata. However, pressures are generally not sufficient to produce flowing wells.

Snowmelt at higher elevations provides most of the groundwater recharge, particularly where permeable lithologies such as fractured or solution limestone are exposed at the surface. Vertical migration of groundwater occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates when ground water encounters impermeable rocks and continues until either the land surface is intersected (and spring discharge occurs) or other permeable lithologies or zones are encountered that allow further vertical flow.

The Kenilworth Member, Sunnyside Member and Upper Mudstone Member of the Blackhawk Formation; Castlegate Sandstone; Bluecastle Sandstone Member of the Price River Formation; undifferentiated North Horn/Flagstaff Formation; and Quaternary deposits are potential reservoirs or conduits for groundwater in the CIA. Reservoir lithologies are predominantly sandstone and limestone. Sandstone reservoirs occur as channel and overbank lenticular and tabular deposits, whereas limestone reservoirs have developed through solution processes and fracturing. Shale, siltstone and cemented sandstone beds act as aquacludes to impede ground-water movement. The Mancos Shale is a regional aquaclude that delimits downward flow within the CIA.

Localized aquacludes include the Aberdeen Member and Lower Mudstone Member of the Blackhawk Formation, Lower Unnamed Member of the Price River Formation and relatively thin impermeable lithologies occurring within overlying units.

Well test data from two water wells completed in the Blackhawk Formation near the portal area have been obtained from pumping tests. Well #1 is 130 feet deep and had a static water level of 58 feet below land surface prior to testing. After four hours of pumping at 50 gallons per minute, the water level had been lowered to 67 feet below land surface. In January 1981, after about three months use, this well was almost dry. These facts indicate that the aquifer may yield up to 5.5 gallons per minute per foot of drawdown but cannot produce a sustained yield over a period of time.

Well #2 was initially drilled to a depth of 155 feet and had a static water level of 57 feet below land surface. After two hours of pumping at 30 gallons per minute, the water level was lowered to 88 feet below land surface. The well was then drilled to a depth of 230 feet and pumped again. After only one hour of pumping at a rate of 30 gallons per minute the water level was lowered from 57 feet to 100 feet below land surface. After three weeks of pumping, in February of 1981, this well also almost dried up. The test results from well #2 indicate that the water bearing zone is less transmissive than well #1 but like well #1, it is very limited in areal extent.

The testing program of wells #1 and #2 was very limited and as a result the data from these tests must be regarded as such. However, estimates of transmissivity and areal extent of the aquifers in which these wells were completed indicate zones of low to moderate transmissivity of limited areal extent. In general these facts substantiate the lenticularity of the Blackhawk Formation and the fact that the water bearing zones are perched with a limited amount of recharge.

Seeps and springs were inventoried within and adjacent to the Centennial Project. Two springs occur within and adjacent to the mine permit area. One spring was identified approximately one-half mile south of the portal area and the other spring is located at the mouth of Hoffman Canyon. Both of these springs occur at or near the contact of the Blackhawk Formation and the Mancos Shale. Average flow is estimated to be less than ten gallons per minute for each spring.

In 1983 Andalex Resources encountered groundwater in an area of burned coal during mining operations adjacent to the Emergency Lease. The water exists in the burn area between the underlying and overlying sandstones. The burn area, consisting of burned coal and rubble, acts as a reservoir with limited storage capacity. Recharge is from direct infiltration of precipitation and runoff directly into the outcrop. Due to the permeable nature of the burned outcrop, water easily percolates into the strata, flowing downgradient until the maximum available storage capacity of the burn area is achieved. Further movement downgradient is prevented by the existence of the relatively impermeable unburned coal. Andalex estimates that approximately seven million gallons of water are contained in the burn area.

Very little water has been encountered in the Pinnacle Mine. Water that has been encountered has been in the form of small roof leaks that dry up within a few days or weeks after mining progresses downdrift. Mine inflow is most likely attributed to localized zones of saturation in the Blackhawk Formation.

B. Surface Water

The Centennial Project CIA is situated in the Book Cliffs near the headwaters of the Price River Basin. In general, the chemical quality of water in the headwaters of the Price River Basin is excellent, with this watershed providing most of the domestic water needs of the people below. However, this quality rapidly deteriorates downstream as the streams cross shale formations (particularly the Mancos Shale in and adjacent to Castle Valley) and receive irrigation return flows from lands situated on Mancos-derived soils (Price and Waddell, 1973). Within the Price River Basin, for example, Mundorff (1972) reports that the Price River and its tributaries generally have a dissolved solids concentration of less than 400 milligrams per liter upstream from Helper. The water in this area is of a calcium-bicarbonate type. Between this point and the confluence with Miller Creek, most of the flows originate on or tranverse Mancos shales. Much of the flow is derived from irrigation return flows. The Price River at Wellington, which is near the center of the basin, has an average dissolved solids content of about 1700 milligrams per liter and is of a mixed chemical type (calcium-magnesium-sodium-sulfate). At Woodside, which is about 22 miles upstream from the confluence of the Price River with the Green River, the weighted average dissolved solids content has generally been between 2000 and 4000 milligrams per liter, with the water type being strongly sodium-sulfate.

Sediment yield from the upper portion of the basin is probably negligible (Mundorff, 1972). According to the U. S. Soil Conservation Service (1975), erosion rates in the Price and San Rafael River basins vary from 0.1 to 3.0 acre-feet per square mile per year. The bulk of the sediment yielded each year at the mouth of the Price River comes from limited areas covered with highly erodable shales (Mundorff, 1972).

The Centennial Project area is drained by ephemeral drainages heading primarily in a southerly direction. The Right and Left Forks of Deadman Canyon and an unnamed ephemeral drainage drain the western portion of the CIA including the area of the surface facilities. Straight Canyon, Hoffman Creek, and an unnamed ephemeral drainage drain the eastern portion of the CIA and are tributary to Coal Creek, a perrenial stream. Coal Creek and Deadman Canyon are both tributary to the Price River.

Surface disturbances related to coal mining occur only in the Right Fork of Deadman Canyon. Interaction between the surface disturbances and this ephemeral drainage are minimized due to sediment control facilities that are in place. Mining has occured beneath the Right Fork of Deadman Canyon, two unnamed ephemeral drainages, and Straight Canyon. Mining in the Emergency Lease continued under the Hoffman Creek drainage.

The ephemeral drainages flow in response to snowmelt and rainfall events. Water quality analyses of snowmelt runoff in the ephemeral drainages generally indicate major dissolved chemical constituents of magnesium, sodium, sulfate and bicarbonate.

VI. Potential Hydrologic Impacts

A. Ground Water

Dewatering and subsidence related to mining have the greatest potential for impacting groundwater resources in the CIA.

Dewatering

Very little water has been encountered in the currently operating mines within the Centennial Project. Water that has been encountered has been in the form of very small roof leakers that dry up within a few days or weeks after mining progresses downdrift. No mine water, with the exception of the intercepted burn area water, has been discharged in the past.

Water well test data indicate perched aquifers of low transmissivity and limited areal extent. A mining induced dewatering impact is therefore, determined to have a low probability.

Subsidence

Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of groundwater flow.

Potential changes include increased flow rates along fractures that have "opened" and diverting flow along new fractures or permeable lithologies. Subsurface flow diversions may cause the depletion of water in certain localized aquifers, whereas increased flow rates along fractures would reduce groundwater residence time and potentially improve water quality.

B. Surface Water

The main concern in terms of impacts to surface water is water quality deterioration downstream from the minesite. There will be no impact to the quantity of water due to the ephemeral nature of the drainages. All drainages in the CIA flow only in response to snowmelt runoff and rainfall events. Infiltration rate and runoff volumes will not be affected by the mining operations.

The area influenced by surface disturbance is of limited areal extent and confined only to the Right Fork of Deadman Canyon. Surface sediment controls currently are in place and will continue to be in place during reclamation. The water quality impacts associated with reclamation will be minimal or nonexistent due to the fact that all drainage from the disturbed area will be routed through sediment controls and treated via the use of sedimentation ponds prior to any release of disturbed area drainage.

VII. Influence of Other Mining

The Centennial Project has the only active coal mines in the CIA. The Soldier Canyon Mine is located approximately six miles to the east in Soldier Canyon and the Price River Mine Complex is located approximately nine miles to the west in the Price River Canyon. With the latest additions the eastern border of the mine plan area is 2 1/4 miles from the western border of Soldier Creek Coal Company's mine plan area.

A cumulative hydrologic impact assessment prepared in December of 1984 for the Soldier Canyon Mine has addressed the hydrologic impacts for the anticipated mining in the Soldier Creek drainage. The greatest ground water concern with respect to the Soldier Canyon Mine is the undermining of Soldier Creek and the potential for streamflow to be lost into the mine via subsidence fractures through a minimum of 150 feet of overburden material. Three springs overlying the mine could be affected by subsidence associated with mining. These effects are possible but unlikely because the springs are located in the Flagstaff Limestone and the North Horn Formation and separated from the coal seams by approximately 900 feet of overburden. Additionally, approximately 50 gallons per minute currently enters the Soldier Canyon Mine from diffuse sources from the lenticular sandstones, shales and coal of the Blackhawk Formation.

The probable hydrologic impacts to the ground water are distinct and independent at the Centennial Project and at the Soldier Canyon Mine. There is no hydrologic connection between the alluvial aquifer underlying Soldier Creek and the operations at the Centennial Project. While both mining operations occur in the Blackhawk Formation, the aquifers associated with this Formation are perched and lenticular in nature. Pump test data in the Blackhawk Formation and monitoring of ground water inflow at each of the mines has demonstrated the absence of a regional aquifer in this Formation. The hydrologic impacts of the Centennial Project with respect to ground water will therefore not affect or be affected by the mining activities at the Soldier Canyon Mine.

The cumulative hydrologic impact assessment prepared for the Soldier Canyon Mine indicates that the greatest impacts to the surface water resource are related to changes in water quality caused by discharge of mine waters with a relatively high total dissolved solids (TDS) concentration. The Soldier Creek Coal Company has committed to limiting the volume of discharge so that the discharge TDS load will be less than the NPDES limits of 1.0 tons per day.

The Centennial Project has encountered very little water in the perched aquifers associated with the Blackhawk Formation and has not discharged water out of the mine due to the interception of the water by mining activities. Water out of an area of burned coal was discharged in 1983. Andalex Resources, Inc. has committed to obtaining an NPDES Permit and submitting a monitoring plan in the event that any unexpected mine water is encountered and must be discharged from the mine. Hydrologic impacts resulting from any treated discharge are therefore minimized and will not affect or be affected by the mine water discharge at the Soldier Canyon Mine.

A cumulative hydrologic impact assessment prepared in July of 1984 for the Price River Mine Complex has addressed the hydrologic impacts for the anticipated mining with respect to the Price River Basin. The CHIA has determined that the hydrologic effects of the Price River Coal Company (now Castle Gate Coal Company) mining operation will have no cumulative impacts with existing or proposed coal mining operations. Intercepted ground water from the Blackhawk Formation during mining operations has been determined to be approximately 0.64 to 0.96 cubic feet per second. This would reduce baseflow to springs and streams in the area by a lesser amount because water is discharged from the mine. Pump test data in the Blackhawk Formation and monitoring of ground water inflow into the mine at the Price River Complex (PRC) as well as at the Centennial Project demonstrate that there is no hydrologic connection in the Formation between the two mining operations. Therefore, the hydrologic impacts associated with the two mining operations will not affect each other.

The cumulative hydrologic impact assesssment prepared for the PRC indicates that there will be minimal impact to the surface water quantity and quality due to mining operations. The surface water control plan in place at the PRC is sufficient to prevent additional sediment from disturbed areas from entering streams or drainages in the permit area. Mine water discharge is controlled by an NPDES Permit and is therefore not contributing to the degradation of the existing surface water quality.

The Centennial Project has and will continue to treat surface water runoff from disturbed areas and any unexpected mine water discharge. The hydrologic impacts of the Centennial Project with respect to the surface water will therefore not affect or be affected by mining operations at the PRCC Complex.

The operational design proposed for the Centennial Project is herein determined to be consistent with preventing damage to the hydrologic balance outside the mine plan area.

WPOB79/7-23

REFERENCES

Clark, Frank R., 1928. Economic Geology of Castlegate, Wellington and Sunnyside Quadrangles, Carbon County, Utah: U. S. Geological Survey Bulletin 793.

Doelling, H. H. 1972. Wasatch Plateau Coal Fields. In Doelling, H. H. (ed.). Central Utah Coal Fields; Sevier-Sanpete, Wasatch Plateau, Book Cliffs and Emery. Utah Geological and Mineralogical Survey Monograph Series No. 3. Salt Lake City, Utah.

Mundorff, J. C. 1972. Reconnaissance of Chemical Quality of Surface Water and Fluvial Sediment in the Price River Basin, Utah. Utah Department of Natural Resources, Division of Water Rights. Technical Publication No. 39. Salt Lake City, Utah.

Price, D. and K. M. Waddel. 1973. Selected Hydrologic Data in the Upper Colorado River Basin. U. S. Geological Survey Hydrologic Investigations Atlas HA-477. Washinton, D. C.

U. S. Soil Conservation Service. 1975. Erosion, Sediment, and Related Salt Problems and Treatment Opportunities. Special Projects Division. Golden, Colorado.

United States Geological Survey, 1979. Development of Coal Resources in Utah, Final Environmental Statement, Part 1.

WPOB79/

STIPULATIONS

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

Stipulation UMC 817.48-(1) - JSL

1. The operator must commit, within 60 days of permit approval, to monitor the roof, floor, and mid-seam according to Table 6 of the "Guidelines for the Management of Topsoil and Overburden" (April 1988) for possible toxic contaminants. Monitoring shall be conducted on an annual basis or more if the general location of the mining operations change and this change affects the quality of the floor, roof, or mid-seam. Results of the analysis are to be reported in the annual report.

Stipulation UMC 817.52-(1) - RPS

1. Within 30 days of permit approval, the applicant must submit an approvable revised surface water monitoring plan. The plan must include a commitment to maintain a rain gauge at the site and keep daily records of precipitation events or nonoccurence of events. The plan must commit to collection of at least one sample per quarter for a two year period for the surface water monitoring sites with analysis as per the Division's Baseline parameter list. The plan must commit to the same schedule with analysis as per the Division's Operational parameter list for the remainder of the permit term. The plan may state that a sample will not be collected due to a lack of precipitation events in that quarter as documented by the rain gauge records. The plan must commit to retaining the precipitation records at the minesite to be available for inspection upon request by Division staff.

Stipulation UMC 817.52-(2) - DD

2. The applicant must summarize all water monitoring data in a logical order. Data should be plotted to show sequence and concentration of sample. This information should be organized for insertion into the Mining and Reclamation Plan and submitted within 30 days of permit approval.

TECHNICAL ANALYSIS

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

UMC 817.48 Hydrologic Balance: Acid-Forming and Toxic-Forming Materials - JSL

Existing Environment and Applicant's Proposal

The primary potential effects to the hydrologic system from the Lease Modification or the New Lease areas will come from potential leaching from the roof, floor, or unrecovered coal in the mined areas. To determine the potential for this to occur, samples have been collected and analyzed. Data was received August 29, and November 14, 1988.

Compliance

The Mining and Reclamation Plan (MRP) does not adequately address the requirements of this section. The analysis received is not accurate. In accordance with the "Guidelines for Management of Topsoil and Overburden" (April 1988) roof, floor, and mid-seam must, at a minimum, be corrrectly analyzed according to the referenced procedures, or other procedures if equilavent or otherwise approved by the Division, for the parameters listed in Table 6. The November analysis represented total boron, not available boron as requested. The data indicates that high levels of boron may exist. Boron should be analyzed by either hot water or saturation extract procedure.

Stipulation UMC 817.48-(1) - JSL

1. The operator must commit, within 60 days of permit approval, to monitor the roof, floor, and mid-seam according to Table 6 of the "Guidelines for the Management of Topsoil and Overburden" (April 1988) for possible toxic contaminants. Monitoring shall be conducted on an annual basis or more if the general location of the mining operations change and this change affects the quality of the floor, roof, or mid-seam. Results of the analysis are to be reported in the annual report.

UMC 817.52 Hydrologic Balance: Surface and Groundwater Monitoring - RPS/DD

Surface Water

Existing Environment and Applicant's Proposal

A surface monitoring plan is described in section 3.1-1.2 and the monitoring locations are depicted on Figure IV-11 of Chapter 4. Monitoring site 25-2 is established in the Hoffman Creek drainage, sites 7-1, 18-2, 18-3, and 18-4 have been established in the Deadman Canyon drainage, and 8-1 has been established in the Straight Canyon drainage. Sites 18-3, and 18-4 will monitor the Right and Left Forks of Deadman Canyon and site 18-2 will monitor the unnamed north fork tributary to Deadman Canyon down gradient from the lease areas. Sites 7-1 and 8-1 will monitor the Right Fork of Deadman Canyon and Straight Canyon respectively near the headwaters of the streams.

Compliance

The drainages in the lease areas are all reported to be ephemeral in nature (Appendix L, Vaughn Hansen and Assoc. Report, MRP). The applicant states that the above referenced sites will be monitored as access permits on a quarterly basis. The applicant's water quality data submitted in Appendix L indicates that very few (usually only one or two) samples have been collected for each site since 1981. The Division feels that the existing monitoring plan is not fulfilling the requirements of this regulation. In addition, the permit is not enforceable for missed samples if a runoff event occurs. Stipulation UMC 817.52-(1) - RPS is necessary for approval.

Stipulation UMC 817.52-(1) - RPS

1. Within 30 days of permit approval, the applicant must submit an approvable revised surface water monitoring plan. The plan must include a commitment to maintain a rain gauge at the site and keep daily records of precipitation events or nonoccurence of events. The plan must commit to collection of at least one sample per quarter for a two year period for the surface water monitoring sites with analysis as per the Division's Baseline parameter list. The plan must commit to the same schedule with analysis as per the Division's Operational parameter list for the remainder of the permit term. The plan may state that a sample will not be collected due to a lack of precipitation events in that quarter as documented by the rain gauge records. The plan must commit to retaining the precipitation records at the minesite to be available for inspection upon request by Division staff.

Ground Water

Existing Environment and Applicant's Proposal

The applicant describes the geologic characteristics in the vicinity of the mine area in Chapter III, 3.3-1, and in Appendices E and L.

Ground water inventories were conducted over lease U-05067 and the SUNEDCO fee lease during the fall of 1980. Figure 5 shows the location of all springs and wells on and adjacent to the mine plan area. The applicant commits to identifying and monitoring any significant ground water inflows to the mine, should they occur.

The applicant has presented a new ground water monitoring program in Chapter IV, Part 1, Section 3.1. These changes will decrease the number of parameters currently monitored and conform to operational guidelines suggested by DOGM.

Ground water hydrology is discussed in Appendix L, page 114. Ground water monitoring sites are depicted on Figure IV-11, page 118 and include Well #1, springs S18-1 and S25-1. Data from these selected sites are given in Appendix H.

The information presented in the Mining and Reclamation Plan by Andalex is sufficient to define the ground water system in the vicinity of the mine for the next 5-year permit term. The ground water hydrology for the Aberdeen seam is essentially identical to that of the remainder of the permit area.

There are no springs located in the initial field survey on the Aberdeen mine plan area. Two springs lie outside the mine plan area. The Blackhawk in the vicinity of the mine is very lenticular and unfractured. Neither of these springs issue from the Blackhawk Formation. A few small perched aquifers exist over the mine plan area.

Two wells have been drilled on the property. Well #1 is 150 feet deep and Well #2 is 155 feet deep. These wells supply small amounts of water for mine use. Very little water is encountered in the mines. What water has been encountered has been stored and used in the mine.

The applicant plans to monitor the two wells and Spring S18-1.

Compliance

The applicant has complied with the requirements of this section. The ephemeral nature of Hoffman Creek indicates that there are not significant springs in the canyon to sustain a flow to the creek. Hence, there would be essentially no impacts to perched ground water sources.

Current ground water monitoring data appears incomplete with respect to the proposed (old permit submitted) permit monitoring frequency. The data that is presented should be summarized and presented in an organized manner.

Stipulation UMC 817.52-(2) - DD

2. The applicant must summarize all water monitoring data in a logical order. Data should be plotted to show sequence and concentration of sample. This information should be organized for insertion into the Mining and Reclamation Plan and submitted within 30 days of permit approval.

UMC 817.59 Coal Recovery - JRH

Existing Environment and Applicant's Proposal

The underground permit application submitted by Andalex proposes to add new lease areas to their current permit area. The new lease area consists of 758 acres of federal leases and 240 acres of fee. Total lease area for the approved and proposed permitted area is as follows:

LEASE	TOTAL	ADDITIONAL	CURRENT
ZION FEE	200	0	200
SL-027304	236	116	120
SL-063058	400	160	240
U-010581	1,842	162	1680
U-52341	120	0	120
U-05067	320	320	0
SUNEDCO FEE	240	240	0
TOTAL ACREAGE	3358	998	2360

Locations for the leases and lease modifications can be identified in the plan on Plate 4. Development and production from these new and modified leases will be from the existing adjacent facilities. No new surface disturbance or additional surface facilities will be required in conjunction with the utilization of these new leases.

Mining methodology for the new areas is similar to that of the existing permit for Andalex. Mining will be conventional room and pillar methods with utilization of continuous miners. No longwall mining is anticipated for the project.

Coal contours and layout for mining of the three coal seams is found on plates 29-31 of the proposal.

Andalex indicates that there are approximately 52.5 million tons of reserves in the entire mine plan area, of which 34.5 million tons are considered to be recoverable. To date, Andalex has mined approximately 3.5 million tons. Coal reserves include three mineable seams, the Lower Sunnyside, the Gilson, and the Aberdeen. Portals are proposed to be driven for each of the three seams. Only the Aberdeen seam is yet to be developed. Mine facilities for the other two seams are currently in existence.

Mining will be accomplished in all three seams utilizing standard room and pillar methods with continuous miners. The operator has submitted for approval and/or has received approval for roof control, ventilation and mining sequence plans from the BLM and MSHA.

Production from the mining facilities, which requires the simultaneous mining of all three seams is expected to gradually increase to 1.5 million tons per year in 1990 and remain constant throughout the life of the mining operations. The estimated life of the mine is approximately 20 years.

Sequence and timing of the mining operation is provided by the operator on plates 29, 30 and 31. Existing and abandoned mine workings are also provided on these drawings. Details of the current mine workings and the ventilation plan are provided on plates 32 and 33. No mining of the Aberdeen seam has yet occurred by the operator.

Compliance

This section of the regulations is considered to be complete and technically adequate. The operator has detailed the timing and the sequence of the mining operation for the permit term and has indicated the extent of mining throughout the projected life of the mine.

Lease modification and new lease information has been included and incorporated into the MRP.

Stipulations

None.

UMC 817.71 Disposal of Excess Spoil and Underground Development Waste: General Requirements - JRH

Existing Environment and Applicant's Proposal

The applicant has addressed information regarding the requirements of this section on pages 190-192 of the MRP.

The applicant indicates in part UMC 784.19 that there has been no development waste or excess spoil and there will be none. The applicant further states that raw coal (run-of-mine coal) is the only product from the mine and that there are no coal processing waste facilities within the permit area.

The applicant states that the only spoil material which will be developed at the minesite will be sediment pond waste. Waste material developed underground is anticipated to remain underground or will be placed in an area which will report to a sediment pond.

Compliance

All facilities regarding the storage, treatment and disposal of excess spoils and mine development waste have been reviewed within the existing permit except for the proposed construction of the sediment pond and portions of those facilities located on BLM Right-of-Way Permit U-62045. No new surface facilities are proposed within the new coal lease areas.

The applicant complies with this section.

Stipulations

None.

UMC 817.121-.126 Subsidence Control Plan - DD

Existing Environmental and Applicant's Proposal

The subsidence control plan is outlined in Chapter IV, page 177 of the Mining and Reclamation Plan. More information on mining methods is presented in Chapter IV, page 73.

Mining in the Aberdeen Seam over the remainder of the 5-year permit term will be only developmental. There are no plans to pull pillars and cause conditions for subsidence. This information is shown on mining development maps, Plates 29, 30 and 31.

The applicant states that no structures or surface features which would be affected by subsidence exist over the new lease areas. Subsidence monitoring locations are referenced to Plate 25 and 32 as required under 30 CFR. Subsidence monitoring will take place upon retreat.

Compliance

A review of this section reveals that no adverse impacts will occur from subsidence during the current 5-year permit term from mining in the Aberdeen Seam. The applicant has addressed the concerns of these regulations.

In recognition of the potential of mining multiple seams and low cover in the SUNEDCO lease area the applicant will collect baseline information before mining of the area. Map 32 was not included in the submittal. Subsidence stations were found on Map 25.

Stipulations

None.

WPOB79

LETTERS OF CONCURRENCE

Andalex Resources, Inc.
Centennial Project
Underground Lease Additions
ACT/007/019
Carbon County, Utah

January 18, 1989

File ACT/007/019 #2

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab District
P. O. Box 970
Moab, Utah 84532

3482
(U-06067)
(SL-027304)
(U-065)

RECEIVED JAN 11 1989
JAN 13 1989
DIVISION OF
OIL, GAS & MINING

Susan Linner, Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Ms. Linner:

On August 15, 1988 your office forwarded a two-volume set of a Permit Application Package for Centennial Project, ACT/007/019, Andalex Resources, Inc. An initial review was made and geologic and engineering deficiencies were found. On October 15, 1988 a letter was sent to you noting these deficiencies. Since that time we have been in contact with Andalex Resources, Inc. and the deficiencies have been adequately satisfied.

Based on a review of the Resource Recovery and Protection Plan (R2P2) of the Permit Application Package, the Bureau of Land Management (BLM) recommends approval of this permit.

If you have any questions please contact Brent Northrup, Chief Solid Minerals or Shannon DeAun Hoefeler at (801) 259-6111.

Sincerely yours,

William C. Stringer

District Manager

cc:
U-921
U-066

ACTING

State of Utah

Division of State History
(Utah State Historical Society)
Department of Community and Economic Development

Norman H. Bangerter
Governor

Max J. Evans
Director

300 Rio Grande
Salt Lake City, Utah 84101-1182
801-533-5755

RECEIVED
JAN 20 1989
DIVISION OF
OIL, GAS & MINING

January 18, 1989

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

Attention: Mr. David Darby

RE: Determination of Completeness, Andalex Resources, Inc., Centennial Project, Underground Lease Additions, ACT/007/019, Folder #2, Carbon County Utah

In Reply Please Refer to Case No. K439

Dear Mr. Braxton:

The Utah State Historic Preservation Office has reviewed its files for information on prehistoric and historic sites which might be affected by the above referenced project. There are recorded historic sites located in Sections 17 and 18 of Township 13 South Range 11 East of the proposed expansion area. It was difficult to ascertain whether the project will impact any of these sites.

We understand, however, that this proposed mine extension is for underground expansion. Therefore, there should be no impact to any historic or prehistoric resources as a result of this project. The Division of Oil, Gas, and Mining can use this information in making any further recommendations on the project.

The above has been provided on request as outlined in 36 CFR 800 or Utah Code, Title 63-18-37. The Utah SHPO makes no regulatory requirement in this matter. If you have questions, please call us at (801) 533-7039.

Sincerely,

Diana

Diana Christensen
Regulation Assistance Coordinator

DC:0228j/K439

Board of State History: Thomas G. Alexander, Chairman • Dean L. May, Vice Chairman • Douglas D. Alder
Phillip A. Bullen • Ellen G. Callister • J. Eldon Dorman • Hugh C. Garner • Dan E. Jones • Leonard J. Arrington • Amy Allen Price • Sunny Redd

M 007/014

cc: S. Linner
Original File

STATE OF UTAH
NATURAL RESOURCES
Wildlife Resources

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
William H. Geer, Division Director

1596 West North Temple • Salt Lake City, UT 84116-3154 • 801-533-9333

November 4, 1988

RECEIVED
NOV 09 1988
DIVISION OF
OIL, GAS & MINING

Dr. Dianne R. Nielson, Director
Utah Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

Attn: Susan Linner

Dear Dianne:

The Division has reviewed a Determination of Completeness for addition of 996 acres of lease area to Andalex Resources' Centennial project. As you know, access to these leases will be via existing or approved facilities. Our primary concern relates to the impacts of subsidence on wildlife. Our opinion on this issue was relayed to the Company on October 12, 1988 and copy forwarded to Susan Linner at your office.

Thank you for an opportunity to provide comment.

Sincerely,

William H. Geer
Director

File ACT/007/019 #2

STATE OF UTAH
NATURAL RESOURCES
Wildlife Resources

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
William H. Geer, Division Director

Southeastern Region • 455 West Railroad Avenue • Price, UT 84501-2829 • 801-637-3310

October 12, 1988

RECEIVED
OCT 14 1988
DIVISION OF
OIL, GAS & MINING

Mr. Sam Quigley
Andalex Resources, Inc.
Centennial Mining Project
P.O. Box 902
Price, UT 84501

Attn: Mike Glasson

Dear Sam:

In regard to your recent inquiry concerning the relationship of subsidence from coal mining operations to wildlife, the following is offered for your information. Generally speaking, the effects of subsidence on wildlife lie in two general arenas: hydrologic ecosystems and terrestrial ecosystems.

Subsidence can result in drying up of impounded water bodies or modification to flows at seeps, springs, perennial or even intermittent channels. This can result from the capture in subsidence cracks of water and its resultant migration into other geological strata. Some strata may not allow water to discharge to the surface. Such an impact can have serious consequence to a local area's wildlife in that drinking water may become reduced in value or unavailable to terrestrial animals.

Seeps or springs providing flow during periods when wildlife are present represent a critical valued resource to all of the local areas wildlife. Most wildlife have small and limited home ranges. As a result, when one of these critical valued aquatic resources is lost, the animal does not have the physical capability of "packing his bags" and moving to another area of acceptable habitat. Those few species that have such a physical capability usually find the home ranges in adjoining areas already filled to capacity. It is for that reason that the Division holds firm to the philosophy that each and every seep and spring is a critical resource for wildlife.

In the event that coal mining results in subsidence that impacts the flows at seeps and springs, mitigation is

whether that is a valid concern in that small rodents are extremely abundant. Since subsidence occurs over such small and limited areas, impacts to rodents would not be of consequence. Most rodents probably have trouble with their burrows caving in at times anyway. Thus, they are adapted to digging around such cave-ins. It is likely that cracks and surface displacement created by subsidence represent escape cover for small animals, and to some degree, access points for burrowing animals.

Subsidence has caused escarpment failures. When raptor nests exist in the escarpments, such failures would be of negative consequence, since raptors typically return to reuse their nests over the years. Where escarpment failure occurs and there are no raptor nests, such failure could create suitable raptor nesting habitat.

Many surface displacement lines from subsidence in Utah's coal mining areas are utilized extensively by big game as travel corridors. These fracture lines, once they become filled in, represent a flat trail on which the animals can easily walk around the contours of a mountain or across ridge tops.

It is hoped that the aforementioned information will prove useful to you in coal leasing decisions. If the Division can be of any further service, please coordinate as appropriate with the Southeastern Region's Resource Analyst, Larry Dalton (Telephone 637-3310).

Sincerely,

Larry B. Dalton, Wildlife Program Manager
Resource Analysis/Habitat Protection

LBD/dd

cc: Darrell Nish, DWR
Susan Linner, DOGM
Clark Johnson, USFWS
Linda Seibert, BLM

Orig: Mine File
cc: S. Linner

State of Utah
OFFICE OF PLANNING AND BUDGET

Norman H. Bangerter
Governor
Dale C. Hatch, C.P.A., J.D.
Director
Michael E. Christensen, Ph.D.
Deputy Director

116 State Capitol Building
Salt Lake City, Utah 84114
(801) 538-1027

RECEIVED
DEC 05 1988
DIVISION OF
OIL, GAS & MINING

November 30, 1988

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

007-019

SUBJECT: Underground Lease Additions at Andalex Resources, Inc., Centennial Project, Carbon County
State Application Identifier #UT881020-020

Dear Mr. Braxton:

The Resource Development Coordinating Committee of the State of Utah has reviewed this proposed action. We have received no comments from potentially affected state agencies.

The Committee appreciates the opportunity of reviewing this document. Please address any other questions regarding this correspondence to Carolyn Wright (801) 538-1535.

Sincerely,

Michael E. Christensen

Michael E. Christensen
Deputy Director

MEC/jw

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT
RELATEDNESS REPORT

APPNO: ACT007019
STATE: UT
NAME: TOWER RESOURCES INC

DATE: 18 JAN 89
TIME: 11:47:16
PAGE: 1

APPLICATION INFORMATION
==========

ST	APPL #	MSHAID	PERMIT	PPERMIT	APPID
UT	ACT007019	4201474	ACT007019		060105

NAME: TOWER RESOURCES INC
ADDR: PO BOX 1027 PRICE UT 84501

****

****
* SYSTEM RECOMMENDATION FOR ACT007019 = ISSUE *
****

1/18/89

>
End for ATtention, Home to SWitch ¤ Capture Off ¤ On: 00:22:40