

*C/041/002 Incoming*

*# 4446*

*R*

**Sufco Mine**  
Kenneth E. May  
General Manager  
597 South SR24  
Salina, Utah 84654  
(435) 286-4400  
Fax (435) 286-4499

November 7, 2013

Permit Supervisor, Utah Coal Regulatory Program  
Utah Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
PO Box 145801  
Salt Lake City, UT 84114-5801

**RECEIVED**

**NOV 08 2013**

**DIV. OF OIL, GAS & MINING**

Re: 3R2S Panel Block "B", South Fork of Quitchupah, Sufco Mine, Permit Number C/041/0002, Task ID#4367

Dear Sirs:

Please find enclosed with this letter an amendment to the Sufco Mine Permit to add Block "B" of the 3R2S Panel for mining. We have included three redline/strikeout copies of the text and 3 copies of the maps associated with this amendment. There are two confidential drawings and two confidential appendices in this submittal.

A portion of Block "A" of the 2R2S Panel and a portion of Block "B" of the 3R2S Panel are located under the South Fork of Quitchupah Creek channel which required the writing of the monitoring and mitigation plan (Appendix 3-14). The monitoring and mitigation plan that is currently approved for the 2R2S Panel will be followed with some revisions for the 3R2S Panel. For this submittal the monitoring and mitigation plan has been reorganized to enable us to find the commitments more easily. Subheadings have been used and the various commitments organized under the specific subheading.

Studies were performed on the South Fork of Quitchupah Creek where the mining of both the 2R2S (A) and 3R2S (B) cross beneath the creek channel.

- Appendix 3-4 – Raptor Surveys (Confidential), included in this submittal
- Appendix 3-14 – Monitoring and Mitigation Plan, revised and included in this submittal
- Appendix 4-2 – Cultural Resource Study (Confidential) and USFS determination form, included
- Appendix 7-26 – PHC, currently in permit
- 2012 Annual Report – Loss Gain Study, Riparian Vegetation Study

Per our earlier discussion, the Memorandum of Agreement requested in the "Deficiency List" no longer exists and therefore will not be added for this amendment. The other deficiencies have been addressed with this submittal. If you have questions or need addition information please contact Vicky Miller at (435)286-4481.

CANYON FUEL COMPANY, SUFCO Mine

*Vicky S Miller for*

Kenneth E. May  
General Manager

Encl.

cc: DOGM Correspondence File

File in:

- Confidential
- Shelf
- Expandable

Date Folder: *11082013* C/ *041/0002*

*Incoming*  
*See Confidential*

# APPLICATION FOR COAL PERMIT PROCESSING

Permit Change  New Permit  Renewal  Exploration  Bond Release  Transfer

**Permittee:** Canyon Fuel Company, LLC

**Mine:** Sufco Mine

**Permit Number:** C/041/0002

**Title:** Revisions to M&RP 3R2S Panel Block "B", Task ID# 4367

**Description:** Include reason for application and timing required to implement:

**Instructions:** If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- Yes  No 1. Change in the size of the Permit Area? Acres: \_\_\_\_\_ Disturbed Area: \_\_\_\_\_  increase  decrease.
- Yes  No 2. Is the application submitted as a result of a Division Order? DO# \_\_\_\_\_
- Yes  No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- Yes  No 4. Does the application include operations in hydrologic basins other than as currently approved?
- Yes  No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes  No 6. Does the application require or include public notice publication?
- Yes  No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- Yes  No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- Yes  No 9. Is the application submitted as a result of a Violation? NOV # \_\_\_\_\_
- Yes  No 10. Is the application submitted as a result of other laws or regulations or policies?  
*Explain:* \_\_\_\_\_
- Yes  No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes  No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes  No 13. Does the application require or include collection and reporting of any baseline information?
- Yes  No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- Yes  No 15. Does the application require or include soil removal, storage or placement?
- Yes  No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- Yes  No 17. Does the application require or include construction, modification, or removal of surface facilities?
- Yes  No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- Yes  No 19. Does the application require or include certified designs, maps or calculation?
- Yes  No 20. Does the application require or include subsidence control or monitoring?
- Yes  No 21. Have reclamation costs for bonding been provided?
- Yes  No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- Yes  No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

<sup>Three (3)</sup>  
Please attach ~~four (4)~~ review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

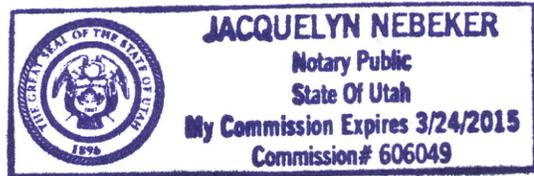
I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Les A. Topham  
Print Name

Les A. Topham 11/07/13  
Sign Name, Position, Date

Subscribed and sworn to before me this 17 day of November 2013

Jacquelyn Nebeker  
Notary Public  
My commission Expires \_\_\_\_\_, 20\_\_\_\_ }  
Attest: State of \_\_\_\_\_ } ss:  
County of \_\_\_\_\_



<p><b>For Office Use Only:</b></p>	<p>Assigned Tracking Number:</p>	<p>Received by Oil, Gas &amp; Mining</p> <p style="font-size: 1.5em; color: red; font-weight: bold;">RECEIVED</p> <p style="font-size: 1.2em; color: black; font-weight: bold;">NOV 08 2013</p> <p style="color: red; font-weight: bold;">DIV. OF OIL, GAS &amp; MINING</p>
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**CHAPTER 3**

**BIOLOGY**

### LIST OF PLATES

#### Plate

- 3-1 Plant Communities and Reference Areas
- 3-2 Elk Range
- 3-3 Deer Range & Raptor Nests

### LIST OF APPENDICES

(Appendices appear in Volume 5)

#### Appendix

- 3-1 Report of 1983 Field Investigations
- 3-2 Aquatic Resource Inventory of Southern Utah Fuel Company Permit Area
- 3-3 Wildlife Assessment of the Southern Utah Fuel Company Mining Property and Adjacent Areas
- 3-4 Raptor and General Avifauna Studies
- 3-5 Fauna of Southeastern Utah and Life Requisites Regarding their Ecosystems
- 3-6 Vegetation Information Guidelines, Appendix A
- 3-7 Power Line Correspondence
- 3-8 Bat Survey for the SUFCO Mine
- 3-9 Vegetation and Wildlife of the Pines Tract Project.
- 3-10 Monitoring and Mitigation Plan for Mining Under the East Fork of Box Canyon
- 3-11 Muddy Creek Technical Report-Wildlife
- 3-12 Mexican Spotted Owl Survey Muddy Tract
- 3-13 Vegetation and Wildlife of the West Coal Lease Modifications
- 3-14 Monitoring and Mitigation Plan for Undermining the South Fork of Quitcupah 2R2S Block "A" and 3R2S Block "B"

**Table 3-1**

**Federally Listed and Proposed Endangered Species in Utah  
 Sevier and Emery Counties  
 April 2, 2013**

<b><u>Plants</u></b>		<b>Status</b>
Barneby Reed-Mustard	<u>Schoenocrambe barnebyi</u>	E
Heliotrope Milk-Vetch	<u>Astragalus montii</u>	T
Jones Cycladenia	<u>Cycladenis humilis var. jonesii</u>	T
Last Chance Townsendia	<u>Townsendia aprica</u>	T
San Rafael Cactus	<u>Pediocactus despainii</u>	E
Wright Fishhook Cactus	<u>Sclerocactus wrightiae</u>	E
Winkler Cactus	<u>Pediocactus winkleri</u>	T
<b><u>Mammals</u></b>		
Utah Prairie Dog	<u>Cynomys parvidens</u>	T
<b><u>Birds</u></b>		
Mexican Spotted Owl	<u>Strix occidentalis lucida</u>	T
Southwestern Willow Flycatcher	<u>Empidonax traillii extimus</u>	E
Greater Sage-grouse	<u>Centrocercus urophasianus</u>	C
Western Yellow-billed Cuckoo	<u>Coccyzus americanus</u>	C
California Condor	<u>Gymnogyps californianus</u>	E
<b><u>Fish</u></b>		
Bonytail Chub	<u>Gila elegans</u>	E
Colorado Pikeminnow	<u>Ptychocheilus lucius</u>	E
Humpback Chub	<u>Gila cypha</u>	E

Canyon Fuel Company, LLC  
SUFCO Mine

Mining and Reclamation Plan  
December 20, 1991 (R 07/12 6/13)

Razorback Sucker

Xyrauchen texanus

E

### **Reptiles**

**None listed in the Sevier and Emery Counties**

### **Snails**

**None listed in the Sevier and Emery Counties**

E - Endangered    T - Threatened    Extirpated - No longer occur in Utah    C - Candidate

For additional information contact: U. S. Fish and Wildlife Service, 2078 Administration Building,  
1745 West 1700 South, Salt Lake City, Utah 84204-5110

Telephone: Commercial (801) 975-330

**Table 3-3**

**USDA-FS Region 4 Sensitive Species**  
**Fishlake and Manti-LaSal**  
**February 2013 Update**

<b>Plants</b>		<b>Status</b>
Link Trail Columbine	<u>Aquilegia flavescens var. rubicunda</u>	K
Cruetzfeldt-flower Cryptanth	<u>Cryptantha creutzfeldii</u>	K
Carrington Daisy	<u>Erigeron carringtoniae</u>	K
Canyon Sweetvetch	<u>Hedysarum occidentale var. canone</u>	K
Maguire Campion	<u>Silene petersonii</u>	K/P
Musinea Groundsel	<u>Senecio musinensis</u>	K
Arizona Willow	<u>Salix arizonica</u>	K
Wonderland Alice Flower	<u>Aliciella caespitosa</u>	K
Chatterley Onion	<u>Allium geyeri var. chatterleyi</u>	K
Sweet-flower Rock Jasmine	<u>Androsace chamaejasme ssp. Carinata</u>	K
Bicknell milkvetch	<u>Astragalus consobrinus</u>	K/P
Isely's Milkvetch	<u>Astragalus iselyi</u>	K
Tushar Paintbrush	<u>Castilleja parvula var. parvula</u>	K
Pinnate Spring-parsley	<u>Cymopterus beckii</u>	K
Abajo Peak Draba	<u>Draba abajoensis</u>	K
Mt. Belknap Draba	<u>Draba ramulosa</u>	K
Creeping Draba	<u>Draba sobolifera</u>	K
Nevada Willowherb	<u>Epilobium nevadense</u>	K
Abajo Daisy	<u>Erigeron abajoensis</u>	K
Kachina Daisy	<u>Erigeron kachinensis</u>	K
Maquire Daisy	<u>Erigeron maguirei</u>	K
LaSal Daisy	<u>Erigeron mancus</u>	K
Elsinore Buckwheat	<u>Eriogonum batemanii var. ostlundii</u>	K

Canyonlands Lomatium	<u>Lomatium latilobum</u>	K
Fish Lake Naiad	<u>Nafas caespitosa</u>	K
Beaver Mountain Groundsel	<u>Packera castoreus</u>	K
Little Penstemon	<u>Penstemon parvus</u>	K
Ward Beardtongue	<u>Penstemon wardii</u>	K
Bicknell Thelesperma	<u>Thelesperma subnudum var. alpinum</u>	K
Barneby Woody Aster	<u>Tonestus kingii var. barnebyana</u>	K
Sevier Townsendia	<u>Townsendia jonesii var. lutea</u>	K

### **Mammals**

Townsend's Western Big-eared Bat	<u>Corynothinus townsedii townsendii</u>	K
Spotted Bat	<u>Euderma maculatum</u>	K
Bighorn Sheep	<u>Ovis canadensis</u>	K
Pygmy Rabbit	<u>Brachylagus idahoensis</u>	K

### **Birds**

Northern Goshawk	<u>Accipiter gentilis</u>	K
Flammulated Owl	<u>Otus flammeolus</u>	K
Northern Three-toed Woodpecker	<u>Picoides tridactylus</u>	K
Bald Eagle	<u>Haliaeetus leucocephalus</u>	K
Greater Sage-grouse	<u>Centrocercus urophasianus</u>	K
Peregrine Falcon	<u>Falco peregrinus anatum</u>	K
Yellow-billed Cuckoo	<u>Coccyzus americanus</u>	K/P
Southwestern Willow Flycatcher	<u>Empidonax traillii extimus</u>	K

### **Fish**

Colorado River Cutthroat Trout	<u>Oncorhynchus clarki pleuriticus</u>	K
Bonneville Cutthroat Trout	<u>Oncorhynchus clarki utah</u>	K
Southern Leatherside Chub	<u>Lepidomeda aliciae</u>	K

### **Amphibians**

Canyon Fuel Company, LLC  
SUFCO Mine

Mining and Reclamation Plan  
December 20, 1991 (R 07/42 6/13)

Columbia Spotted Frog	<u>Rana luteiventris</u>	K
Boreal Toad	<u>Bufo boreas</u>	K

Sensitive: Any species which, although still occurring in numbers adequate for survival, has been greatly depleted or occurring in limited areas and/or numbers due to a restricted or specialized habitat.

K - Known distribution species and or habitat

P - Suspected species or potential habitat

USDA-Manti-LaSal National Forest, 599 Price River Dr., Price , Utah 84501

supporting riparian vegetation is derived from the fine-grained rocks of the Price River and North Horn formations. This alluvium is expected to naturally readily fill fractures that may occur in the channel substrate thus limiting the loss of flow, if any, supporting the riparian vegetation.

Though not anticipated, short segments of Cowboy Creek could be subsided in the SITLA Muddy Tract. If this is anticipated to occur, Sufco, with the approval of the Division and concurrence of the Forest, will instigate a vegetation monitoring and mitigation plan similar to the plan implemented prior to the undermining of the East Fork of Box Canyon. If mitigation of surface cracks is required, methods similar to those proposed and implemented in the East Fork of Box Canyon as described in Chapter 5 Section 5.2.5.1 and Chapter 7 Section 7.3.1.8 will be used.

The monitoring and mitigation plan for undermining the South Fork of Quitcupah 2R2S Block "A" and 3R2S Block "B" is located in Appendix 3-14. Appendix 3-14 contains a Threatened, Endangered and Sensitive survey prepared by Mt. Nebo Scientific.

The applicant will request that future power lines on the SUFCA Mine site be constructed per OSM and UDOGM regulations or with alternative guidelines approved by the regulatory authority. Additional information referencing power lines is located in Section 3.5.8.5.

Efforts will be taken to regulate the use of pesticides when needed. Before a pesticide is used, the type and concentration will be approved by the Regulatory Authority.

APPENDIX 3-14

Monitoring and Mitigation Plan for Undermining  
the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B"

## **Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block “A” and 3R2S Block “B”**

Implementation of the mitigation plan will **assist in** identifying surface disturbance or impacts from subsidence fractures intercepting spring and stream flows. Frequent monitoring will establish the degree of impacts to water resources, vegetation, wildlife and other uses.

The monitoring and mitigation plan will provide sufficient data for stakeholders associated with these resources and lands to make a determination of the degree of impacts. Information and data will be collected before the area is mined, throughout the mining period, and after mining is past. Monitoring and data collection will continue until the mine, Division and Forest agree that mining impacts, if any, have occurred, have been mitigated, and no further impacts are anticipated.

Subsidence R645-301-525.454

**Pre- and post-mining subsidence surveys will be conducted of the length of stream channel where it will be undermined by Block “A” of the 2R2S panel and by Block “B” of the 3R2S panel. The procedures will be similar for the pre- and post-mining subsidence surveys.**

### Hydrology

1. Conduct a stream channel profile survey from 006A above the 2R2S Panel Block “A” to 006D located below the 3R2S “B” panel.
2. Establish at least 4 stations to portray stream flow, ~~vegetation, soils, etc.~~ **The** four sites **will** include 006, 006A, 006B and 006C. GPS coordinates shall be obtained for each site. Each site must be documented with fixed photo points that can be reproduced during subsequent monitoring intervals.
3. Establish location of perennial flow, gaining/losing reaches of the stream channel from site 006A to 006D.
4. Water monitoring shall be conducted prior to mining under the stream channel.
5. Stream channel geomorphology – **will be** define at a minimum as geologic/surface substrate of stream bottom **and** width of stream channel at water-monitoring locations.
6. Spring and surrounding area geomorphology – **will be** define at a minimum as geologic/surface substrate of spring area where the water discharges; geologic/surface substrate of the spring tributary where water converges from the discharge site(s) and forms a tributary of the South Fork Quitchupah stream.

### Monitoring

1. While mining under the channel, promptly identify subsidence-induced fractures, dewatering, diminution of water quality, and movement of the stream channel.
2. Semi-weekly visual inspections for fractures, stream channel and flow observations while mining within the angle-of-draw of the stream channel. Refer to “Lack of Access” for exceptions.

Monitor surface water flow **twice a month** while mining within the angle-of-draw **of the stream channel**. Refer to “Lack of Access” for exceptions.

Continue monitoring quarterly for 2-year period after no subsidence, interception, diminution or diversions are identified. However, additional surface and/or groundwater samples will be collected for total iron if a visible iron precipitate is noted within the stream channel or originating from the springs and seep.

3. Stockponds 94-115 (**North Duncan**) and 94-116 (**North Duncan Flat**) will be monitored prior to mining and while mining within the angle-of-draw of the stream channel.
4. Conduct uninterrupted longwall mining progression, except for normally scheduled maintenance, while under the 15-degree angle-of-draw of the stream channel.
5. Provide a bi-weekly (once every two weeks) report to DOGM and the Fishlake National Forest via e-mail. Identify any changes in surface expression, dates, any fracturing of surface (location, width, spacing, etc.), any repairs, and location of longwall.

### Lack of Access

If the applicant cannot gain access to the site, due to weather conditions, etc., attempts must be documented. **The determination to preclude access to the site due to unsafe conditions will be determined by mine management and documented.**

### Mitigation

1. Mitigate subsidence cracks and fractures identified within the stream channel wet bank. Access must be limited to methods that would not cause additional effects to the aquatic ecosystem.
2. Mitigation of cracks that interrupt or divert flows from the stream channel will be sealed immediately with an appropriate impermeable grout or, in some cases, native materials. Sufco will attempt to seal cracks with the least intrusive methods (typically hand placement of grout or native materials) first. The sealing material may be placed by pouring it directly into the crack or, if cracks occur in an actively flowing portion of the stream, the stream may be temporarily diverted using native materials (or a designed flume if necessary to maintain the flow) until the crack is sealed. If cracks are present in channel walls defined by soil, the soil cracks may be hand filled using a native

soil/bentonite mix. The sealing of the channel floor and walls will be accomplished with hand tools such as shovel, picks, trowels, etc.

3. As a backup plan, in the unlikely event that cracks too large to be sealed through the efforts of one or two persons in one day do occur and it appears there is a danger of water being diverted from the channel for an extended period of time, the stream will be temporarily diverted using native materials and a pipe to carry the flow over the crack to maintain the channel flow. Arrangements will be made to get a contractor to the site as soon as possible to repair the crack after consultation with the Forest Service.
4. There may be sections of the stream channel that may require more intensive mitigation efforts to restore surface flows in the creek. These efforts could include the drilling of closely spaced shallow boreholes in and adjacent to the stream channel and the injection of an acceptable impermeable grout into the alluvium or bedrock. The work will be accomplished either using hand tools or low impact equipment to minimize surface disturbance. Existing roads and turnouts will be used as staging areas to locate larger equipment and supplies. Any hoses or lines will be transported from the staging areas to the nearby worksites either by hand, the use of pack animals, or by helicopter. This work will be done with a contractor selected after consultation with the Forest Service.
6. A stream alteration permit is required by Utah Division of Water Rights for any stream channel construction activities. The mine will obtain a stream alteration permit prior to construction activities within the stream channel.
5. The applicant will be required to abide by the mitigation outlined in the approved MRP and comply with Resource Recovery and Protection Plan (June 8, 2011), federal and State rules and regulations.
1. After calculating the amount of diminished flow from monitoring data, the mine will promptly provide alternate sources of water, replace or compensate any State appropriated water supply that is contaminated, diminished or interrupted by mining operations for wildlife, cattle, and drinking water.

### Erosion

1. Describe effects of erosion along stream channel, on hillsides flanking the stream channel, and at spring locations. Numerically rate erosion effects. For example, 1=extreme erosion, 2=high erosion, 3=moderate erosion, 4=slight erosion, 5=no erosion.

### Vegetation

1. Qualified botanist must participate in a survey of the channel to identify major representative plant species along the stream channel and riparian and spring areas.
2. Define vegetation communities at all monitoring locations. Create inventory map of

vegetation communities at monitoring locations. **Inventory** stream channel and spring area **for** threatened, endangered, candidate, and sensitive species, **if found include** population location and individual numbers for each population. **Document** width of the spring tributary at the location where the consultant surveys vegetation.

3. **Prior to mining** take photographs at established photo points of communities along stream channel, on hillsides flanking the steam channel, and at spring locations.
4. Repeat vegetation community condition observations two times a year (beginning and end of growing seasons) **at spring(s) and monitoring locations per the table below.**

Panel/Block No.	Baseline	DOGM Annual Report	Year 1 (Est.)	DOGM Annual Report (Est.)	Year 2 (Est.)	DOGM Annual Report (Est.)	Year 5 (Est.)	DOGM Annual Report (Est.)
2R2S "A"	2012	2013 (C)	2014	2015	2015	2016	2018	2019
3R2S "B"	<b>2013</b>	<b>2014</b>	2015	2016	2016	2017	2019	2020

Est. - Estimated year for survey and/or submittal in annual report.

**(C)** Completed

Provide two copies of the survey reports to DOGM, include one copy in DOGM Annual Reports. The Division will provide the second copy to the Fishlake National Forest.

5. The mine operator will implement, if necessary, a revegetation/mitigation plan as determined by DOGM in consultation with the USFS.

### Biological Monitoring

1. A qualified **biologist will create a map of survey** animal species expected to be present in the area of the **along-stream channel, and riparian and spring areas from** Sufco- 006A above the 2R2S Panel (**Block "A"**) to 006D located below the **3R2S panel (Block "B").**
2. **Using approved survey protocol, determine** macroinvertebrates presence at a minimum three monitoring stations along the stream channel and riparian and spring areas (organism species and number (#/m2). **It should be noted that this stream channel is not perennial and is periodically dry for months at a time, from above the 006A spring to below monitoring point 006D. Contractor must use an approved survey protocol.**

### Cultural Resource Monitoring Plan

Cultural and Historic information summary is located in **Chapter 4 of the** M&RP. Cultural resource information and maps identifying cultural and historical study areas are located in Appendix 4-2 in the Confidential folder of the M&RP. No extraordinary monitoring, outside of that which is already required by the regulatory authorities and SHPO throughout the permit area, is required for **the area of the mining** panels.

#### Hydrologic and Subsidence Summary Report

The mine will submit a summary report to the Division documenting the pre- and post-mining conditions of springs and stream channels. The report will describe all activities and work conducted by the mine for site evaluation and mitigation. Further, the report will identify if impacts have occurred, and if mitigation activities have prevented material damage to resources. The report will be due 90 days after subsidence monitoring is complete for the 2R2S Block "A" and 3R2S "B" panel sections. The Division will provide a copy of the report to the Fishlake National Forest.

#### Baseline Data Report(s)

Reports will be prepared for the collection of baseline data prior to undermining and submitted in the following year's Annual Report and in the fifth year following undermining. The fifth year survey data will be submitted in the DOGM annual report the year following the survey(s).

Shown below are the federally listed threatened, endangered and candidate species for Sevier County, Utah. Also included are site-specific notes about each species and potential impacts to them from mine-related subsidence in South Fork Quitcupah Creek study area.

NOTE: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). This list includes both current and historic records. (last updated January 12, 2012).

Scientific Name	Common Name	Site-Specific Notes
<b>ENDANGERED</b>		
<i>Sclerocactus wrightiae</i>	Wright fishhook cactus	Wright's fishhook cactus is known to be present primarily in salt desert habitats on Mancos Shale, Dakota, Morrison, Summerville and Entrada Sandstone formations. This habitat is not present in the study area. Consequently, there will be no impact to this species as a result of underground mining in the area.
<b>THREATENED</b>		
<i>Astragalus montii</i>	Heliotrope milkvetch	This species is known to occur only in Flagstaff Limestone, a formation that is not present in South Fork Quitcupah Creek drainage.  There should be no impact to this species as a result of underground mining in the area.
<i>Cynomys parvidens</i>	Utah prairie-dog	Habitat for this prairie-dog does not exist in the study area. Consequently, there will be no impact to this species as a result of underground mining in the area.
<i>Townsendia aprica</i>	Last chance townsendia	Although this species can be found in pinyon-juniper communities and this community is relatively close to the study area, it most commonly occurs on clay and clay-silt exposures on the Mancos Shale formation. This formation is

Shown below are the federally listed threatened, endangered and candidate species for Sevier County, Utah. Also included are site-specific notes about each species and potential impacts to them from mine-related subsidence in South Fork Quitchupah Creek study area.

NOTE: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). This list includes both current and historic records.  
(last updated January 12, 2012).

		not found in the study area. Consequently, there should be no impact to this species as a result of underground mining in the area.
<i>Lynx canadensis</i>	Canada lynx	<p>State of Utah, Division of Wildlife Resources (DWR) distribution maps show that the general area on the Wasatch Plateau in Sevier County may be "critical habitat" for this species.</p> <p>The Canada lynx range extends from Canada and Alaska south to Maine, the Rocky Mountains, and also to the Great Lakes region. DWR biologists state that, <i>although sightings of the Canada lynx in Utah over the past twenty years are exceedingly rare, the USDA Forest Service recently announced that Canada lynx hair was found in the Manti-La Sal National Forest during 2002.</i></p> <p>The preferred habitat of the Canada lynx is montane coniferous forest, where it often hunts snowshoe hares. Coniferous forests exist near the study area, however, if the Canada lynx happened to be present in or near the Quitchupah Creek drainage, and if subsidence were to occur, it would likely have little or no impact on the species.</p>
<i>Ursus arctos</i>	Brown (grizzly) bear	The brown or grizzly bear was extirpated from Utah in the 1920s. It probably once occurred in the Wasatch Plateau.

Shown below are the federally listed threatened, endangered and candidate species for Sevier County, Utah. Also included are site-specific notes about each species and potential impacts to them from mine-related subsidence in South Fork Quitchupah Creek study area.

NOTE: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). This list includes both current and historic records.  
(last updated January 12, 2012).

		<p>Although this project area may be suitable habitat for the brown bear, it does not presently exist there.</p> <p>This habitat would not be significantly impacted by the proposed underground mining in the area in a way that would negatively affect this species' habitat.</p>
<b>CANDIDATE</b>		
<i>Centrocercus urophasianus</i>	Greater sage-grouse	<p>Greater sage-grouse inhabit sagebrush zones in Utah's mountain valleys and foothills. Although some brood-rearing habitat is known in the areas northeast of the North Fork Quitchupah Creek, no brooding or winter habitat for this species is shown on the DWR database in or adjacent to the South Fork Quitchupah Creek.</p> <p>There should be no impact to this species as a result of subsidence in this area.</p>

**CHAPTER 4**  
**LAND USE AND AIR QUALITY**

The Applicant agrees, however, to notify the regulatory authority and the Utah State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of mining operations. The Applicant also agrees to have any such cultural resources evaluated in terms of National Register of Historic Places eligibility criteria.

#### **West Coal Lease Modification Areas**

**Cultural and Historic Information.** Cultural resource information and maps identifying cultural and historical study areas are located in Appendix 4-2 in the Confidential folder of the M&RP. EarthTouch, Inc. conducted an intensive evaluation of the West Coal Lease Modification Areas.

The results of the cultural resource inventory for the project resulted in the identification of 15 cultural resource sites, which included three previously recorded sites (42SV1301, 42SV1386 and 42SV2688), and 12 new sites (42SV3207-3215 and 42SV3246-3248). Overall, the identified cultural resource sites consist of small- to moderate-sized lithic scatters and small rock shelters/overhangs, some with associated pictographs. Of the 15 sites identified within the West Coal Lease Modification Areas, six sites are recommended eligible for the National Register of Historic Places. These sites include 42SV3209, 42SV3211, 42SV3212, 42SV3213, 42SV3247 and 42SV3248 which consist of small rock shelters and rock shelters with pictographs. Site 42SV3209 will be the only site undermined under the present mine plan. This shelter is more of a terrace overhang that extends 6 meters long, with a 1.5 meter overhang or width.

#### **South Fork of Quitchupah Area of 2R2S Block "A" and 3R2S Block "B"**

**Cultural and Historic Information.** Cultural resource information and maps identifying cultural and historical study areas are located in Appendix 4-2 in the Confidential folder of the M&RP. Canyon Environmental conducted an evaluation of the South Fork of Quitchupah in and adjacent to the 2R2S Block "A" panel Area.

The results of the cultural resource inventory for the project resulted in the identification of 4 cultural resource sites, which included one previously recorded site (42SV2690), and 3 new sites (42SV3462, 42SV3463 and 42S3464). Overall, the identified cultural resource sites consist of lithic scatters and a small rock shelter/overhang. Of the 4 sites identified within the South Fork of Quitchupah Area, two sites are recommended eligible for the National Register of Historic Places.

These sites include 42SV2690 which consists of a lithic scatter and 42SV3464 which consists of a lithic scatter associated with a small rock shelter. Both sites will be undermined under the present mine plan. This shelter is more of a terrace overhang that measures approximately 1.5 meters high and 4 meters wide at the opening and extends 1.5 meters beneath the rock to a tapered edge. The shelter shows signs of modern disturbance and it appears that some of the fill material has been disturbed by minor looting activities.

A cultural resource investigation plan for the 42SV3464 rock shelter was requested and approved between the U.S. Forest Service, Utah State Historic Preservation Office (SHPO), EnviroWest, LLC and Canyon Fuel Company, LLC since the shelter appeared to have been disturbed. Testing of the rock shelter for significance was conducted by EnviroWest and Fishlake National Forest Archaeologist in the fall of 2012. While the site was initially evaluated as being eligible for listing in the National Register of Historic Places, subsequent testing has found it to be ineligible for listing due to disturbance. A copy of the cultural resource investigation testing report and the Determination of Significance and Effect form are located in Appendix 4-2 in the Confidential folder of the M&RP. No further testing of the 42SV2690 lithic scatter was required.

#### South Fork of Quitcupah Canyon - 2013 Inventory

During July and August 2013 a file search of archeological/cultural resource records and a pedestrian inventory of the study area was performed by EnvironWest LLC. The report is located in Appendix 4-2, Confidential Folder. During the pedestrian inventory five new cultural resource sites were documented, three consisted of lithic scatters located on the bench area and two rock shelters in the canyon. The lithic scatters were recommended as ineligible for listing in the National Register of Historic Places (NRHP) and the two rock shelters were recommended to be eligible for listing in the NRHP (Determination of Significance and Effect, Appendix 4-2, Confidential).

Due to the length of time required for review of the information and the processing of the "Determination of Significance and Effect" documents, the opportunity for the recovery/excavation of the rock shelters has been delayed until 2014. The applicant commits not to mine beneath the rock shelters until the recovery/excavation of the two shelters or other recommendations of actions by the USDA Forest Service have been completed.

In accordance with previous commitments the mine has made in previous sections of this M&RP, protection of eligible cultural resources will be in accordance with regulatory authority and Utah SHPO requirements. The Applicant will also instruct its employees that it is a violation of federal and state laws to collect individual artifacts or to otherwise disturb cultural resources.

The Applicant agrees to notify the regulatory authority and the Utah State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of mining operations. The Applicant also agrees to have any such cultural resources evaluated in terms of National Register of Historic Places eligibility criteria.

#### **4.1.1.2 Previous Mining Activity**

Portions of the mine plan area were mined prior to the filing of this permit application. SUFACO Mine began a small operation mining the Upper Hiawatha Coal seam in 1941. There was no previous mining activity prior to the 1941 SUFACO operation.

From 1941 through 1974, the coal was removed by conventional mining techniques. From 1974 through 1978, both conventional and continuous mining methods were used. From 1978 until October 1985, all mining used continuous mining methods. Since October 1985 both continuous mining and longwall mining methods have been used. The portion of the seam mined by conventional methods was only partially extracted leaving all pillars for support. The majority of the mining done has been full extraction. All longwall mining is full extraction.

The quantity of coal mined prior to this permit application was approximately 37,058,100 tons. The earlier workings are shown on Plate 5-1 as an integral part of the mining operation.

Use of the land preceding mining was primarily grazing. The area also supported limited timbering in the Ponderosa stands and hunting.

**CHAPTER 5**  
**ENGINEERING**

stream channel or reduction in stream flows were noted as a result of undermining that portion of Burnout Canyon using the approved mining schedule.

A weekly report will be submitted via e-mail to the Division detailing the results of the inspections. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field activities; noted changes in stream and local geomorphology; location, width, frequency of cracks; and a description of repairs, if any, conducted. If the prescribed inspections cannot be conducted, the reason for the missed inspection and a record of the attempt to conduct the inspection will be submitted to the Division in the weekly report. The Division will be notified immediately after mining-induced cracks, if any, are found in the East Fork stream channel and the steps taken or planned to be taken as mitigation. Thereafter, the Division will be advised of continuing mitigation efforts, if needed, in the weekly report.

A copy of the October 2003 "Monitoring and Mitigation Plan for Mining Under the East Fork of Box Canyon" prepared by the Division and reviewed and accepted by the Forest with some modifications has been included in Appendix 3-10. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation responsibilities described in the plan as it pertains to the undermining of the East Fork of Box Canyon.

South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" Subsidence Monitoring and Mitigation

Portions of the South Fork of Quitchupah will be undermined and subsided as longwall panels 2R2S and 3R2S are extracted. A monitoring and mitigation plan (Appendix 3-14) that is more intensive than the general Mining and Reclamation Plan area has been proposed for monitoring surface and ground water flows, subsidence cracks and repair of the cracks in the portions of the South Fork of Quitchupah channel to be undermined. The subsidence portion of the monitoring and mitigation plan is discussed in detail in the following text.

Prior to the initiation of undermining and subsidence, a pre-subsidence survey of the stream channel will be conducted in the portion of South Fork of Quitchupah that flows over the 2R2S and 3R2S

panels and associated gate roads. The survey will consist of a gain/loss survey of flow within the stream channel paying particular attention to surface flows and ground water discharge, soil conditions, and the general channel geomorphology of the area. A similar study was performed in the past but all stream measurements were not conducted on the same date. The second gain/loss survey will be completed on a single day at or near base flow conditions late in the summer or early fall of 2011. The mine will attempt, as part of this second survey, to occupy the same monitoring sites in the panel area as those chosen in the initial survey. The monitoring of surface and ground water flows are discussed in greater detail in Section 7.3.1.2.

The subsidence monitoring plan for the South Fork of Quitcupah will include frequent inspection of the stream channel during and after active subsidence. While mining is occurring under the stream channel, and within the 15-degree angle-of-draw above the active longwall face, that area of the channel will be inspected semi-weekly for subsidence cracks or other related features. As the longwall face advances and the 15-degree angle-of-draw area follows, the portions of the channel that now lie outside the 15-degree angle-of-draw will be monitored for subsidence features on a quarterly basis for two years following the cessation of subsidence related effects, if any, due to mining.

Mitigation of cracks that interrupt or divert flows from the stream channel will be sealed immediately with an appropriate impermeable grout or, in some cases, native materials. Sufco will attempt to seal cracks with the least intrusive methods (typically hand placement of grout or native materials) first. The sealing material may be placed by pouring it directly into the crack or, if cracks occur in an actively flowing portion of the stream, the stream may be temporarily diverted using native materials (or a designed flume if necessary to maintain the flow) until the crack is sealed. If cracks are present in channel walls defined by soil, the soil cracks will be hand filled using a native soil/bentonite mix. The sealing of the channel floor and walls will be accomplished with hand tools such as shovel, picks, trowels, etc.

As a backup plan, in the unlikely event that cracks too large to be sealed through the efforts of one or two persons in one day do occur and it appears there is a danger of water being diverted from the

channel for an extended period of time, the stream will be temporarily diverted using native materials and a pipe to carry the flow over the crack to maintain the channel flow. Arrangements will be made to get a contractor to the site as soon as possible to repair the crack after consultation with the Forest Service.

There may be sections of the stream channel that may require more intensive mitigation efforts to restore surface flows in the creek. These efforts could include the drilling of closely spaced shallow boreholes in and adjacent to the stream channel and the injection of an acceptable impermeable grout into the alluvium or bedrock. The work will be accomplished either using hand tools or low impact equipment to minimize surface disturbance. Existing roads and turnouts will be used as staging areas to locate larger equipment and supplies. Any hoses or lines will be transported from the staging areas to the nearby work sites either by hand, the use of pack animals, or by helicopter. This work will be done with a contractor selected after consultation with the Forest Service.

Additionally, it may be required to remove loose rock from the channel floor, either where the channel flows across thin-bedded bedrock or where large rock have fallen into the channel and is impeding flows. In the instance of the former, past experience has shown this can occur in the upper Blackhawk Formation and is easily repaired by removing enough of the broken channel surface to again expose the stream flow. In the instance of the later, removal of large rocks could be accomplished by drilling and then fracturing the rock into smaller fragments more easily moved to locations where they are not impeding flow. This work may be completed using available pneumatic or hydraulic tools that do not require road or pad building disturbances. In the unlikely event that large boulders do need to be moved, pumps and tanks necessary to complete the work will be located in pre-disturbed areas, such as roads or turnouts, and hoses will be walked into the work area.

A copy of the 2012 "Monitoring and Mitigation Plan for Undermining the South Fork of Quitcupah 2R2S Block "A" and 3R2S Block "B" has been included in Appendix 3-14. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation

responsibilities described in the plan as it pertains to the undermining of the South Fork of Quitcupah 2R2S Block "A" and 3R2S Block "B"

Sufco will conduct longwall mining operations in such a manner as to minimize surface disturbance while mining within the 15-degree angle-of-draw area that includes the South Fork stream channel. This will be accomplished by advancing the longwall on a schedule where mining will not be suspended for a period to exceed 48 hours.

A bi-weekly (once every two weeks) report on the impacts to stream flow and required mitigation, if any, will be submitted via e-mail to the Division and the forest detailing the results of the inspections while mining is occurring under the stream channel. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field activities; noted changes in stream and local geomorphology; location, width, frequency of cracks; and a description of repairs, if any, conducted. If the prescribed inspections cannot be conducted, the reason for the missed inspection and a record of the attempt to conduct the inspection will be submitted to the Division and the forest in the report. The Division and the forest will be notified immediately after mining-induced cracks, if any, are found in the South Fork stream channel and the steps taken or planned to be taken as mitigation. Thereafter, the Division and the forest will be advised of continuing mitigation efforts, if needed, in the report.

Though not anticipated, short segments of Cowboy Creek could be subsided in the SITLA Muddy Tract. If this is anticipated to occur, Sufco, will submit a plan for mitigation to address, if it occurs, adverse impacts to Cowboy Creek. With the approval of the Division and concurrence of the Forest, Sufco will instigate a flow monitoring plan similar to the plan implemented prior to the undermining of the East Fork of Box Canyon. If mitigation of surface cracks are required, methods similar to those proposed and implemented in the East Fork of Box Canyon as described above could be used.

Mining within the area of the East Fork of the Box Canyon, South Fork of Quitcupah and within the area of Cowboy Canyon in the SITLA Muddy Tract will be conducted in accordance with State and Federal rules and regulations and the requirements and stipulations presented in the BLM's

**CHAPTER 7**  
**HYDROLOGY**

1. Determine if ground water discharge in the area of Pines 105 and Joes Mill Pond springs continue to discharge to the alluvium;
2. Monitor and evaluate the effects of mining on the surface and subsurface water in the Pines 310 and Pines 311 spring areas; and
3. Determine the potential for completing and operating ground water wells in the spring areas as part of the spring site mitigation activities.

The piezometers/wells completed as part of this project will be monitored on a bi-weekly basis through December 2006 or as accessible. Transducers with data loggers will be placed in several of the piezometers to record data on a more continuous basis. The monitoring frequency of the piezometers/wells after December 2006 will be dependant upon the results of the drilling investigation and the impacts to springs Pines 310, 311, 105, and the Joes Mill Pond of mining the 6LPE panel in the fall and winter of 2006.

A report detailing the results of the drilling and piezometer/ well installation and completion will be submitted to the Division by the end of October 2006. Water level data collected from the piezometers/wells will be reported to the Division electronically within two weeks at the end of each the month through December 2006. The Division will also be notified within three days via e-mail or telephone of significant changes to ground water elevations in Pines 310, 311, 105 spring areas as the 6LPE longwall panel is mined. A report compiling the water level data and interpretation of the data will be submitted to the Division by the end of January 2007.

Based on the findings of the investigation, Sufco will submit to the Division either additional plans (if water is not found in the Pines 105 and Joes Mill Pond area, additional bedrock drilling may be required to locate a suitable source of ground water) or a final plan for mitigation of the effected spring areas.

#### South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B" Monitoring and Mitigation Plan

A monitoring and mitigation plan that is more intensive than the general Mining and Reclamation Plan area has been proposed for monitoring water flows, subsidence cracks, and repair of the cracks in the portions of the South Fork of Quitchupah channel to be undermined. This plan is outlined below.

Prior to the initiation of undermining and subsidence, a pre-subsidence survey of the stream channel will be conducted in the portion of South Fork of Quitchupah that flows over the 2R2S Block "A" and 3R2S Block "B" panels and associated gate roads. The survey will consist of a gain/loss survey of flow within the stream channel paying particular attention to surface flows and ground water discharge, soil conditions, and the general channel geomorphology. A similar study was performed in the past but all stream measurements were not conducted on the same date. The second gain/loss survey will be completed on a single day at or near base flow conditions late in the summer or early fall of 2011. The mine will attempt, as part of this second survey, to occupy the same monitoring sites in the panel area as those chosen in the initial survey.

Two weeks before and then once every two weeks after subsidence mining begins, the measuring locations occupied during the gain/loss survey will be reoccupied and flow measurements of the stream flow will be obtained. The approximate locations of these sites are illustrated on Figure 7-9. The once every other week flow measurements will be supplemented by visual observations of flow performed twice a week or once every three to four days. Flow/no flow conditions will be described on these days. If no flow or diminished flows are noted, the appropriate mine and Forest personnel will be contacted and the mitigation plan to restore flows will be implemented.

Semi-weekly flow observations and visual inspections will continue for at least 12 weeks, or as conditions allow, after the completion of mining under the stream channel. The bi-weekly (once every two weeks) stream flow monitoring will continue for at least four weeks, or as conditions and monitoring results indicate necessary, after the completion of subsidence mining under the stream channel. The monitoring plan will then change to quarterly flow and field parameter measurements for two years at four sites: one upstream of the panel, one within the panel, and two downstream of the panel. The location of these new temporary monitoring sites are listed in Table 7-2 and shown on Plate 7-3 and labeled as sites 006A, 006B, 006C and 006D. Additional flow monitoring may be needed to determine specific locations where flow is being lost, and treatments are needed.

The subsidence monitoring plan for the South Fork of Quitchupah will include frequent inspection of the stream channel during and after active subsidence. While mining is occurring under the stream

the staging areas to the nearby work sites either by hand, the use of pack animals, or by helicopter. This work will be done with a contractor selected after consultation with the Forest Service.

Additionally, it may be required to remove loose rock from the channel floor, either where the channel flows across thin-bedded bedrock or where large rock have fallen into the channel and is impeding flows. In the instance of the former, past experience has shown this can occur in the upper Blackhawk Formation and is easily repaired by removing enough of the broken channel surface to again expose the stream flow. In the instance of the later, removal of large rocks could be accomplished by drilling and then fracturing the rock into smaller fragments more easily moved to locations where they are not impeding flow. This work may be completed using available pneumatic or hydraulic tools that do not require road or pad building disturbances. In the unlikely event that large boulders do need to be moved, pumps and tanks necessary to complete the work will be located in pre-disturbed areas, such as roads or turnouts, and hoses will be walked into the work area.

Sufco will conduct longwall mining operations in such a manner as to minimize surface disturbance while mining within the 15-degree angle-of-draw area that includes the South Fork stream channel. This will be accomplished by advancing the longwall on a schedule where mining will not be suspended for a period to exceed 48 hours.

A copy of the 2012 "Monitoring and Mitigation Plan for Undermining the South Fork of Quitcupah 2R2S Block "A" and 3R2S Block "B" has been included in Appendix 3-14. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation responsibilities described in the plan as it pertains to the undermining of the South Fork of Quitcupah 2R2S Block "A" and 3R2S Block "B".

A bi-weekly (once every two weeks) report on the impacts to stream flow and required mitigation, if any, will be submitted via e-mail to the Division and the Forest detailing the results of the inspections while mining is occurring under the stream channel. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field