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Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

01/22/11
C0410002
#3950
OK

December 21, 2011

Ken May, General Manager
Canyon Fuel Company, LLC
597 South SR24
Salina, Utah 84654

Subject: South Fork Quitchupah 2R2S, Canyon Fuel Company, LLC, Sufco Mine,
C/041/0002, Task #3950

Dear Mr. May:

The Division has reviewed your application to longwall mine under the Panel A block of the 2R2S Panel approved for leasing by the Bureau of Land Management on June 8, 2011.

The Division has determined that there are deficiencies that must be addressed before a determination can be made that the requirements of the R645 Coal Mining Rules have been met, and an approval can be granted. Those deficiencies and the full technical memorandums prepared by the Division staff are listed as an attachment to this letter.

Each deficiency identifies its author by that author's initials in parentheses, such that your staff can directly communicate with that individual should any questions arise relative to the preparation of Canyon Fuel Company's response to that particular deficiency.

The plans as submitted are denied. Please resubmit the entire application.

Sincerely,

Daron R. Haddock
Coal Program Manager

DRH/AAA/sqs
Attachment
cc: Price Field Office
O:\041002.SUF\WG3950\3950 DEFICIENCIES.DOC



Deficiency List

Task No. 3950

Task Name: South Fork Quitcupah 2R2S

The members of the review team include the following individuals:

April Abate (AA)
Ingrid Campbell (IC)
James Owen (JO)

[R645-301-525]: A similar protocol to that of the East Fork of Box canyon should also be adopted at the South Fork of Quitcupah Creek including filming the channel and the corresponding canyon rims. Documentation of the channel width, stream bed substrate, flow conditions, and subsidence cracks along a series of monitoring locations. Monitoring criteria should include fixed vantage points that can easily be reproducible for subsequent monitoring events, collected width and depth measurements of any pools in the stream and height and depth of any cracks. Additional tools should also be used to observe subsidence crack monitoring such as satellite imagery. In the case of East Fork of Box Canyon, a post-subsidence monitoring report was due 90 days after subsidence was complete. Past experience has shown that access to the surface is limited to the summer months where access is available to monitor the stream bed surface and observe subsidence cracks. As a result, the mining of the panel will have to be timed such that access to the surface is possible so that the effects from subsidence can be evaluated.

(AA)

[R645-301.724.100]: There are no groundwater monitoring wells in the canyon where the South Fork of Quitcupah Creek flows. As a result, baseline data from the nearest perched aquifers (if any) closest to the surface is absent. A groundwater well in the vicinity of the stream channel is essential for characterizing baseline groundwater conditions. The additional well in the stream channel will also be instrumental in measuring any losses of perennial flow from the stream that could migrate from fractures in the surface to any groundwater system below. A rise in the groundwater water table will provide important data to help better mitigate effects from loss of surface flow. Furthermore, based on the orientation of the proposed 2R2 panel and the panel adjacent south, it appears that groundwater monitoring well US-81-4 will be destroyed eventually by longwall mining. Please advise the Division if there is a plan to eliminate this well via mining and provide a proposed location for a replacement well. (AA)

[R645-301-724.100]: Geologic resources, baseline and operational data should be included in the Probable Hydrologic Consequences (PHC) report prepared for the South Fork of Quitcupah Creek along with discharge and solute composition of the surface and groundwater properties of all hydrologic resources in the area. Currently, a lack of baseline data from springs, seeps, stock watering ponds and groundwater monitoring wells exists in the area. The locations of the water rights from springs, point to point diversions and stockwatering ponds identified on the adjudication map provided by the Division of Water Rights (DWRi) require field verification with other interested stakeholders such as the US Forest Service, DWRi, the Division and mine personnel. A consensus should be reached among all stakeholders which groundwater resources and ponds should be targeted for an active baseline water monitoring program. An interagency

field reconnaissance will need to be scheduled in the summer of 2012 to identify critical groundwater and stockwater resources in the area. (AA)

[R645-301-728.100]: A PHC needs to be developed by the operator for the proposed longwall mining below the South Fork of Quitchupah Creek. Similar to the PHC for the 3 Left Modification Panel found in Appendix 7-19 of the SUFCO Mining and Reclamation Plan, full characterization of groundwater and surface water systems for the South Fork of Quitchupah Creek needs to be developed prior to the undermining of the South Fork of Quitchupah Creek via longwall mining. The PHC will outline the risks of significant disruption to the hydrologic balance to the hydrologic resources within the area of the South Fork of Quitchupah as well as any nearby springs, seeps and stockwatering ponds found in the area (AA)

[R645-301.731.224.1]: Quarterly laboratory analytical data will be collected on the stream samples SUFCO 006, as defined in the water monitoring protocol of the MRP on page 7-41. However, additional surface and/or groundwater samples should be collected for total iron if a visible iron precipitate is noted within the stream channel or originating from the springs and seeps. (AA)

[R645-301.731.530]: It is in the best interest of the mine operator, as well as the regulatory management agencies involved to have a well-defined water replacement contingency plan in place prior to the onset of mining under the S. Fork of Quitchupah Creek. This mitigation plan can be incorporated into the PHC prepared for the S. Fork of Quitchupah Creek. Comment letters received from DWRi declared that all surface and groundwater within the drainage that supplies Quitchupah Creek is considered State-appropriated and will be required to satisfy downstream water rights. The USFS expressed concern over the statements made regarding if the mine is unsuccessful in restoring flow after two spring runoff periods and that Canyon Fuel Company will initiate “additional planning and analysis with the Forest Service”. The USFS’ position is that a solid mitigation plan should be hashed out prior to any water loss or riparian habitat loss. (AA)

[R645-300-113 and R645-301-333]: The Fish and Wildlife Service should be consulted on the undermining of the South Fork of the Quitchupah. The Permittee should address the requirements of the Fish and Wildlife Service’s Colorado Fish Recovery Program. (IC)

[R645-301-321]: Please provide a monitoring plan for the riparian vegetation along the South Fork of Quitchupah creek that could be impacted from mining through loss of water or subsidence cracks. (IC)

[R645-301-322.210]: Please provide an updated list and investigation of effect of mining on listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the Endangered Species Act of 1973 and species or habitats protected by similar states statutes. (IC)

[R645-301-322.220, -333,-358, and 358.400]: Please provide a commitment to provide alternate sources of water for wildlife via “development of springs, wells or guzzlers at strategic

locations", as suggested by the Smith and Pritchett Report in Appendix 3-3 and page 3-40 of the MRP, in the case that water is lost due to undermining the South Fork of Quitcupah Creek. This commitment would have to be implemented immediately upon discovery of water loss, which may be prior to long term plans of water restoration development approval. **(IC)**

[R645-301-322]: Please provide a monitoring plan for aquatic wildlife prior to undermining to assess potential degradation impacts as suggested in the Smith and Pritchett Report Appendix 3-3 page 45. **(IC)**

[R645-301-358]: Annual raptor surveys must be conducted over areas that mining could disturb nests or nesting raptors including subsidence areas and surface disturbance areas. The survey conducted in 2011 does not include areas over projected mine panels. The 2012 annual raptor survey must include areas over projected panels for the 2012 mining year. **(IC)**

[R645-301-411]: A monitoring and mitigation plan must be developed for the protection of site 42SV3464 as suggested by the Canyon Environmental Report No. 110122. The plan must be developed prior to undermining the South Fork of Quitcupah Creek and prepared in consultation with the US Forest Service, the Division and the State Historic Preservation Office. The MOU in appendix 4-5 does not currently include this site. **(IC)**

[R645-301.525.500]: On page 5-39E of the application, CFC states that if mitigation measures by Sufco personnel, and their consultants and contractors, are not successful in restoring flows after two spring runoff periods, Sufco will initiate additional analysis and planning with the Forest Service. In accordance with the Utah Coal Mining Rules as well as the requests from the US Forest Service, the applicant must include with this application a definite contingency plan for the event that mitigation measures are not successful. The Division and USFS seek to avoid a situation where the currently planned mitigation measures are unsuccessful and there is no "backup" plan in place. **(JO)**

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

December 21, 2011

TO: Internal File

THRU: Daron Haddock, Coal Program Manager 

FROM: April A. Abate, Environmental Scientist III and Team Lead

RE: South Fork Quitchupah 2R2S, Canyon Fuel Company, SUFCO Mine, Permit # C/041/0002, Task #3950

SUMMARY:

On November 2, 2011, Canyon Fuel Company (CFC), the Permittee submitted an amendment to undermine the South Fork of Quitchupah Creek located within Sections 23, 24, 25 of T21S R4E and Section 30 of T21S R5E. Longwall mining is proposed under the creek in a panel known as the 2R2 South A LW Block, which was granted approval to mine under Bureau of Land Management (BLM) approval on June 8, 2011. This area is located within the SUFCO mine lease area that CFC operates and maintains responsibilities for.

Approval of the amendment is not recommended until the following deficiencies are satisfied:

[R645-301-525]: A similar protocol to that of the East Fork of Box canyon should also be adopted at the South Fork of Quitchupah Creek including filming the channel and the corresponding canyon rims. Documentation of the channel width, stream bed substrate, flow conditions, and subsidence cracks along a series of monitoring locations. Monitoring criteria should include fixed vantage points that can easily be reproducible for subsequent monitoring events, collected width and depth measurements of any pools in the stream and height and depth of any cracks. Additional tools should also be used to observe subsidence crack monitoring such as satellite imagery. In the case of East Fork of Box Canyon, a post-subsidence monitoring report was due 90 days after subsidence was complete. **Past experience has shown that access to the surface is limited to the summer months where access is available to monitor the stream bed surface and observe subsidence cracks. As a result, the mining of the panel will have to be timed such that access to the surface is possible so that the effects from subsidence can be evaluated.**

TECHNICAL MEMO

[R645-301.724.100]: There are no groundwater monitoring wells in the canyon where the South Fork of Quitchupah Creek flows. As a result, baseline data from the nearest perched aquifers (if any) closest to the surface is absent. A groundwater well in the vicinity of the stream channel is essential for characterizing baseline groundwater conditions. The additional well in the stream channel will also be instrumental in measuring any losses of perennial flow from the stream that could migrate from fractures in the surface to any groundwater system below. A rise in the groundwater water table will provide important data to help better mitigate effects from loss of surface flow. Furthermore, based on the orientation of the proposed 2R2 panel and the panel adjacent south, it appears that groundwater monitoring well US-81-4 will be destroyed eventually by longwall mining. Please advise the Division if there is a plan to eliminate this well via mining and provide a proposed location for a replacement well.

[R645-301-724.100]: Geologic resources, baseline and operational data should be included in the Probable Hydrologic Consequences (PHC) report prepared for the South Fork of Quitchupah Creek along with discharge and solute composition of the surface and groundwater properties of all hydrologic resources in the area. Currently, a lack of baseline data from springs, seeps, stock watering ponds and groundwater monitoring wells exists in the area. The locations of the water rights from springs, point to point diversions and stockwatering ponds identified on the adjudication map provided by the Division of Water Rights (DWRi) require field verification with other interested stakeholders such as the US Forest Service, DWRi, the Division and mine personnel. A consensus should be reached among all stakeholders which groundwater resources and ponds should be targeted for an active baseline water monitoring program. An interagency field reconnaissance will need to be scheduled in the summer of 2012 to identify critical groundwater and stockwater resources in the area.

[R645-301-728.100]: A PHC needs to be developed by the operator for the proposed longwall mining below the South Fork of Quitchupah Creek. Similar to the PHC for the 3 Left Modification Panel found in Appendix 7-19 of the SUFCO Mining and Reclamation Plan, full characterization of groundwater and surface water systems for the South Fork of Quitchupah Creek needs to be developed prior to the undermining of the South Fork of Quitchupah Creek via longwall mining. The PHC will outline the risks of significant disruption to the hydrologic balance to the hydrologic resources within the area of the South Fork of Quitchupah as well as any nearby springs, seeps and stockwatering ponds found in the area

[R645-301.731.224.1]: Quarterly laboratory analytical data will be collected on the stream samples SUFCO 006, as defined in the water monitoring protocol of the MRP on page 7-41. However, additional surface and/or groundwater samples should be collected for total iron if a visible iron precipitate is noted within the stream channel or originating from the springs and seeps.

[R645-301.731.530]: It is in the best interest of the mine operator, as well as the regulatory management agencies involved to have a well-defined water replacement contingency

plan in place prior to the onset of mining under the S. Fork of Quitchupah Creek. This mitigation plan can be incorporated into the PHC prepared for the S. Fork of Quitchupah Creek. Comment letters received from DWRi declared that all surface and groundwater within the drainage that supplies Quitchupah Creek is considered State-appropriated and will be required to satisfy downstream water rights. The USFS expressed concern over the statements made regarding if the mine is unsuccessful in restoring flow after two spring runoff periods and that Canyon Fuel Company will initiate "additional planning and analysis with the Forest Service". The USFS' position is that a solid mitigation plan should be hashed out prior to any water loss or riparian habitat loss.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

The location of panel A of the 2R2 reserve coal block was given approval to mine by the BLM on June 8, 2011. The panel is located in Section 24 of T21S R4E on Federal lease UTU-63214. The 2R2 reserve coal block is outside any of the SUFCO permitted disturbance areas. However, the area is located within the hydrologic adjacent area boundary and falls under the jurisdiction of the Quitchupah/Muddy Creek Cumulative Hydrologic Impact Area document prepared by the Division (latest ver. November 2010). The purpose of the document is to prepare findings showing that any proposed coal mining and reclamation activities have been designed to prevent material damage to the hydrologic balance outside the permit area.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

TECHNICAL MEMO

Subsidence cracks have been reported and characterized in the Quitchupah tract. According to Section 6.3.2 of the approved SUFCO MRP, cracks are typically surveyed and included in an annual Subsidence Report to the Division. Subsidence in the area of the Quitchupah tract, where the drainage is characterized by a deep canyon capped with Castlegate sandstone has been observed as cracks typically forming parallel to the drainage rim and may or may not be parallel to the axis of the panel. Occasionally, when the larger cracks remain open, SUFCO has repaired several cracks on the rim when it was determined to present a safety hazard. Where the bedrock is exposed at the surface, cracks were described as forming an "en echelon" pattern with a local joint pattern evident. This pattern tends to occur where the Castlegate Sandstone has subsided at or near the rim of the drainages or canyons. In these areas, large blocks of Castlegate Sandstone were reported to rotate toward the drainage during subsidence.

Overburden thickness above the coal seam varies considerably due to canyon and plateau landforms that characterize the lease area. Regional overburden ranges from approximately 600 to 1,800 feet and averages about 900 feet of thickness. According to the Overburden Isopach Map provided in the MRP as Plate 5-11, the Castlegate Sandstone forms the canyon rim area of the South Fork of Quitchupah creek above the 2R2 South A LW Block panel at a thickness of approximately 900 feet. The Price River Formation overlies the Castlegate and gradually thickens toward the west above the panel at a thickness of up to 1,200 feet. By comparison, the East Fork of Box Canyon where Pines 105 was damaged, the entire area was underlain by Castlegate Sandstone at an approximate thickness of 800-900 feet. By further comparison, Box Canyon located in the Pines Tract contains a perennial stream that was undermined in 2004 by approved longwall mining activity. Average overburden thickness of the Castlegate in the area of Box Canyon is reported to be approximately 900 feet.

The Quitchupah/Muddy Creek Cumulative Hydrologic Impact Area (CHIA) report document reports on page 37 that substantial fracturing has occurred because of subsidence reported at rates of between 5-6 feet. Because of the high risk of aquifer dewatering and spring and surface water diminution, it is critical that a comprehensive monitoring program and mitigation plan as the result of subsidence is put in place. Based on the geology of the region, subsidence cracks have been documented routinely in the Castlegate Sandstone. A lowering of the water table was demonstrated at PINES 105 spring located in the Pines Lease tract as a result of subsidence fracturing. In 2003/2004, SUFCO undermined the perennial stream in the East Fork of Box Canyon when the 3LPE panel was mined. At that time, pre-mining and post-mining subsidence surveys were performed involving video taping the stream channel. The identification of springs sources and which geologic formation they occur in was also planned. After mining panel 3L, mitigation measures to seal subsidence cracks in the East Fork of Box Canyon included bentonite grouting. An appropriate pre-mining subsidence survey protocol was employed before and after the undermining of Box Canyon. A similar protocol to that of the East Fork of Box canyon should also be adopted at the South Fork of Quitchupah Creek including filming the channel and the corresponding canyon rims. Documentation of the channel

width, stream bed substrate, flow conditions, and subsidence cracks along a series of monitoring locations. Monitoring criteria should include fixed vantage points that can easily be reproducible for subsequent monitoring events, collected width and depth measurements of any pools in the stream and height and depth of any cracks. Additional tools should also be used to observe subsidence crack monitoring such as satellite imagery. In the case of East Fork of Box Canyon, a post-subsidence monitoring report was due 90 days after subsidence was complete.

Findings:

[R645-301-525]: A similar protocol to that of the East Fork of Box canyon should also be adopted at the South Fork of Quitcupah Creek including filming the channel and the corresponding canyon rims. Documentation of the channel width, stream bed substrate, flow conditions, and subsidence cracks along a series of monitoring locations. Monitoring criteria should include fixed vantage points that can easily be reproducible for subsequent monitoring events, collected width and depth measurements of any pools in the stream and height and depth of any cracks. Additional tools should also be used to observe subsidence crack monitoring such as satellite imagery. In the case of East Fork of Box Canyon, a post-subsidence monitoring report was due 90 days after subsidence was complete. **Past experience has shown that access to the surface is limited to the summer months where access is available to monitor the stream bed surface and observe subsidence cracks. As a result, the mining of the panel will have to be timed such that access to the surface is possible so that the effects from subsidence can be evaluated.**

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

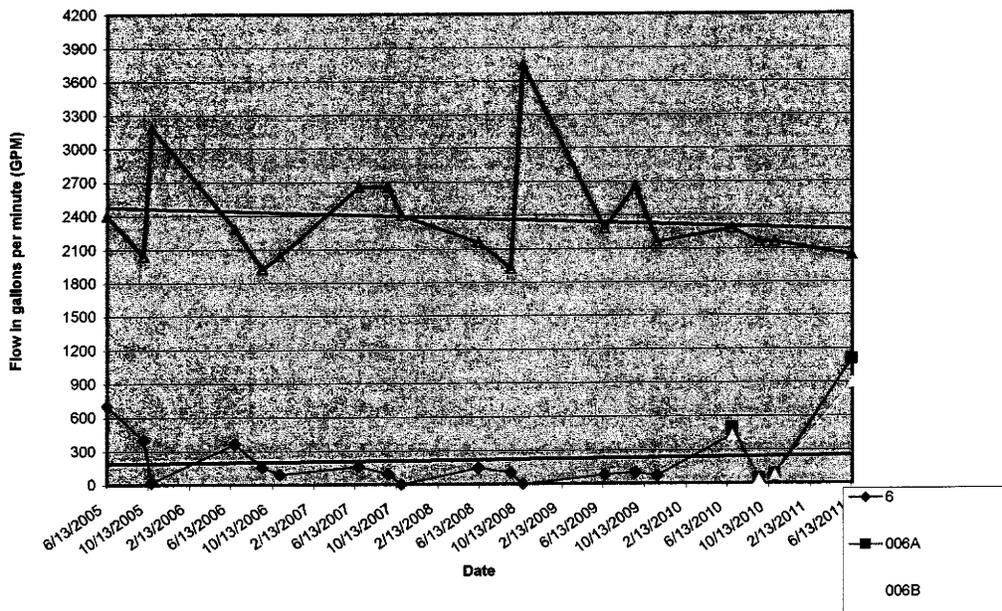
Baseline Information

Currently, there are three surface water sampling locations monitored on a quarterly-basis along the south fork of Quitcupah Creek. Surface water sample location SUFCO 006 has been a historical stream monitoring location since June 1983. Two additional water monitoring points SUFCO 006A and 006B were added to the plan in June 2010. A third surface water sampling location is proposed for addition to the plan SUFCO 006C as part of this submittal. This location is intended to represent the downstream conditions. A mine water discharge outfall (UT-0022918-003A) is located approximately 1.5 miles further downstream and discharges water at an average constant rate of 6.75 cubic feet per second (cfs). Maximum flow rates from the South Fork of Quitcupah Creek reported from data point SUFCO 006 have been reported as 2 cfs (Table 7, Quitcupah/Muddy Creek CHIA Nov 2010). By comparison, the groundwater

TECHNICAL MEMO

discharge from the outfall location discharges at rates 12 times greater than the discharges rates measured upstream at SUFCO 006 (see graph below). Locations of these surface water sample locations are shown on Plate 7-3 of the SUFCO MRP.

Flow data from the S. Fork of Quitchupah



SUFCO has proposed to conduct a pre-subsidence survey of the stream channel over the portion that will overlie the 2R2 panel block A proposed for mining. The survey will consist of a gain/loss evaluation to be conducted on a single day in late summer or early fall. The plan calls for the study to be conducted in *late summer/early fall 2011*. No gain/loss survey was submitted to the Division to date, so it is assumed that this date will need to be corrected based on the timing of any approval of this amendment. The survey will then reoccur two weeks prior to mining and then once every two weeks after subsidence begins. Flow observations are to be collected every other week for at least 12 weeks or as conditions allow once mining beneath the stream channel has occurred. SUFCO plans to perform quarterly monitoring for subsidence outside of the 15 degree angle of draw.

There are no spring sites that are actively monitored by SUFCO in the vicinity of the 2R2 panel (Sections 23, 24, 25, and 26 of T21S R4E). Water Rights have been identified on numerous springs and stockwatering ponds within this area (see map provided by the Division of Water Rights attached to this memo). These water rights are listed in Appendix 7-1 of the SUFCO MRP as being registered to the US Forest Service and all ultimately drain to the Muddy Creek Drainage. A total of 5 springs have been identified in Section 23, two springs in the northeast corner of Section 26 and one spring in the northeast corner of Section 24. None of these springs were discussed in the amendment submitted by SUFCO addressing any proposal to monitor these springs for baseline data requirements. These springs would be located outside of

the 15 degree angle of draw for longwall mining in some instances; however, it has been reported that evidence of fracturing has been documented approximately 200 feet outside the 15 degree angle of draw (CHIA Nov. 2010, page 35). These springs may represent an important component to base flow in Quitchupah Creek and will be very important to target for a baseline monitoring program.

Similar to the springs, two stockwatering ponds were identified in Sections 24 and 25 of T21S R4E and Section 30 of T22S R5S. It is unknown whether these stockwatering ponds are fed by springs or if they are just capturing surface water runoff. These ponds will also be required to be actively monitored as part of a baseline water monitoring program prior to mining.

One groundwater monitoring well is located in the vicinity of the 2R2 Panel proposed for mining. Groundwater monitoring well US-81-4 is located in the northwest corner of Section 25 and screened within the Hiawatha coal seam of the Blackhawk formation. A second well US-81-1 was also drilled within the vicinity of US-81-4; however data has never been produced from it. Baseline groundwater data are available from US-81-4 since 1996. The well produces consistent data averaging a depth to water level in the Hiawatha coal seam of 945 feet.

Baseline Cumulative Impact Area Information

Twenty-eight years worth of data are available from SUFCO 006. According to the CHIA document, measurements of low-flow discharge rates of a stream can be estimated within a standard deviation of approximately 20%. Given that a 28 year body of data exists for this reach of the stream, that standard can be reduced to 15%. Data recorded from SUFCO 0006 could be used to evaluate any drop in low-flow rates using that standard below 15% to assess whether or not surface flow of the stream was affected by mining-induced subsidence.

Baseline data from springs, seeps and stockwatering ponds in the vicinity of the South Fork of Quitchupah Creek is absent. Several springs, seeps and stockwatering ponds do exist in the area based on the adjudication maps provided by the Division of Water Rights (DWRi).

Baseline data from groundwater monitoring wells in the stream channel is absent. The closest monitoring well US-81-4 is located 2,000 feet to the south of the stream channel on the canyon plateau. US-81-4 is screened in the coal seam. Currently no characterization of any aquifers below the stream bed has been investigated in this area. An additional monitoring well in the vicinity of the stream channel would be essential in characterizing any aquifer below the stream bed surface and if any water loss from the perennial stream is affecting the aquifer.

Probable Hydrologic Consequences Determination

TECHNICAL MEMO

A Probable Hydrologic Consequences (PHC) was not submitted as part of this amendment. The MRP contains a PHC for the overall lease area beginning with Appendix 7-17 prepared by Mayo and Associates in 1997. Additional lease tract-specific PHC's can be found in subsequent appendices within the SUFCO MRP. For example, a PHC was developed for longwall mining in the 3 Left Panel Modification Area (Appendix 7-19) for the undermining of Box Canyon, but a PHC developed for the Quitchupah tract was not listed in the MRP.

The PHC for the 3 Left Modification Panel area outlined the risks of significant disruption to the hydrologic balance of Box Canyon. Baseline and operational data were presented in the report along with discharge and solute composition of the surface and groundwater properties in the vicinity of Box Canyon. A discussion of the geologic surface of the stream bed in the affected area was presented. A PHC complete with a full characterization of groundwater and surface water systems for the South Fork of Quitchupah Creek needs to be developed prior to the undermining of the South Fork of Quitchupah Creek via longwall mining.

Groundwater Monitoring Plan

The amendment submitted by SUFCO addressed the monitoring of the South Fork of Quitchupah Creek only presented as an update to pages 7-51G through I and JA in the MRP. No discussion of groundwater monitoring wells, springs, or seeps or any type of monitoring plan was submitted.

Surface-Water Monitoring Plan

The plan submitted by SUFCO as part of this amendment proposes a more intensive monitoring and mitigation plan to monitor flows, subsidence cracks and repair of the cracks. The plan calls for frequent inspection of the stream channel as longwall mining progresses and the addition of a new surface water monitoring point along Quitchupah Creek SUFCO 006C. However, past experience has shown that access to the surface is limited to the summer months where access is available to monitor the stream bed surface and observe subsidence cracks. As a result, the mining of the panel will have to be timed such that the effects from subsidence can be observable and that access to the surface is possible.

State-Appropriate Water Supply

On December 8, 2011, the Division received a response to a request for comments pertaining to this amendment from the Utah Division of Water Rights. The letter indicated that DWRi completed a review of the water rights near the proposed mine workings and provided a map of the water rights identified. The letter indicated that Quitchupah Creek and its associated drainage basin upstream from the major irrigation water uses are considered a fully appropriated water body. Point to point stock watering rights have also been identified in the subject area along the reach of stream identified on the map provided by DWRi. This means that water rights

established on the stream generally exceed in flow and volume the available water supply during most of the irrigation season. All surface and groundwater within the drainage that supplies Quitchupah Creek is considered State-appropriated and will be required to satisfy downstream water rights.

On December 6, 2011, in a response to a request from the Division to comment on the proposed amendment to undermine the South Fork of Quitchupah Creek, the Forest Service (USFS) submitted a comment letter expressing concern over the statements made regarding if the mine is unsuccessful in restoring flow after two spring runoff periods and that Canyon Fuel Company will initiate "additional planning and analysis with the Forest Service". The USFS' position is that a solid mitigation plan should be hashed out prior to any water loss or riparian habitat loss. For example, the mitigation plan for North Water Spring in the Pines tract took approximately 6 years to resolve.

As expressed in the USFS letter, if any mitigation measures that prove unsuccessful in restoring flows to springs, seeps, or the stream, than a mitigation plan needs to be outlined in the PHC that will be prepared for the area. The plan will outline how the mine intends to provide an alternative water source to replace State-appropriated water needed to satisfy downstream users.

Water-Quality Standards and Effluent Limitations

The monitoring plan proposed by SUFCO included flow only measurements of the stream two weeks before and every two weeks after subsidence begins. During the undermining of Box Canyon in 2004, some water quality concerns arose from the surface water and rock interactions in areas of subsidence cracks where newly exposed fresh rock was making contact with the water and causing some elevated concentrations of iron.

Stream Buffer Zones

The exception to the stream buffer zone rule will be applied in this case. The rule does not allow any land disturbance within 100 feet of a perennial stream to be disturbed by coal mining activities unless the Division specifically authorizes mining and reclamation through a stream. The Division has issued a prior approval to undermine the East Fork of Box Canyon on September 30, 2003 allowing for undermining on the condition that the monitoring and mitigation plan submitted by the mine was adhered to. Any mitigation such as the sealing of any subsidence-related cracks will require a Stream Alteration permit issued by the Army Corps of Engineers. SUFCO has committed to applying for this permit in the amendment submitted.

Findings:

TECHNICAL MEMO

[R645-301.724.100]: There are no groundwater monitoring wells in the canyon where the South Fork of Quitchupah Creek flows. As a result, baseline data from the nearest perched aquifers (if any) closest to the surface is absent. A groundwater well in the vicinity of the stream channel is essential for characterizing baseline groundwater conditions. The additional well in the stream channel will also be instrumental in measuring any losses of perennial flow from the stream that could migrate from fractures in the surface to any groundwater system below. A rise in the groundwater water table will provide important data to help better mitigate effects from loss of surface flow. Furthermore, based on the orientation of the proposed 2R2 panel and the panel adjacent south, it appears that groundwater monitoring well US-81-4 will be destroyed eventually by longwall mining. Please advise the Division if there is a plan to eliminate this well via mining and provide a proposed location for a replacement well.

[R645-301-724.100]: Geologic resources, baseline and operational data should be included in the Probable Hydrologic Consequences (PHC) report prepared for the South Fork of Quitchupah Creek along with discharge and solute composition of the surface and groundwater properties of all hydrologic resources in the area. Currently, a lack of baseline data from springs, seeps, stock watering ponds and groundwater monitoring wells exists in the area. The locations of the water rights from springs, point to point diversions and stockwatering ponds identified on the adjudication map provided by the Division of Water Rights (DWRi) require field verification with other interested stakeholders such as the US Forest Service, DWRi, the Division and mine personnel. A consensus should be reached among all stakeholders which groundwater resources and ponds should be targeted for an active baseline water monitoring program. An interagency field reconnaissance will need to be scheduled in the summer of 2012 to identify critical groundwater and stockwater resources in the area.

[R645-301-728.100]: A PHC needs to be developed by the operator for the proposed longwall mining below the South Fork of Quitchupah Creek. Similar to the PHC for the 3 Left Modification Panel found in Appendix 7-19 of the SUFCO Mining and Reclamation Plan, full characterization of groundwater and surface water systems for the South Fork of Quitchupah Creek needs to be developed prior to the undermining of the South Fork of Quitchupah Creek via longwall mining. The PHC will outline the risks of significant disruption to the hydrologic balance to the hydrologic resources within the area of the South Fork of Quitchupah as well as any nearby springs, seeps and stockwatering ponds found in the area.

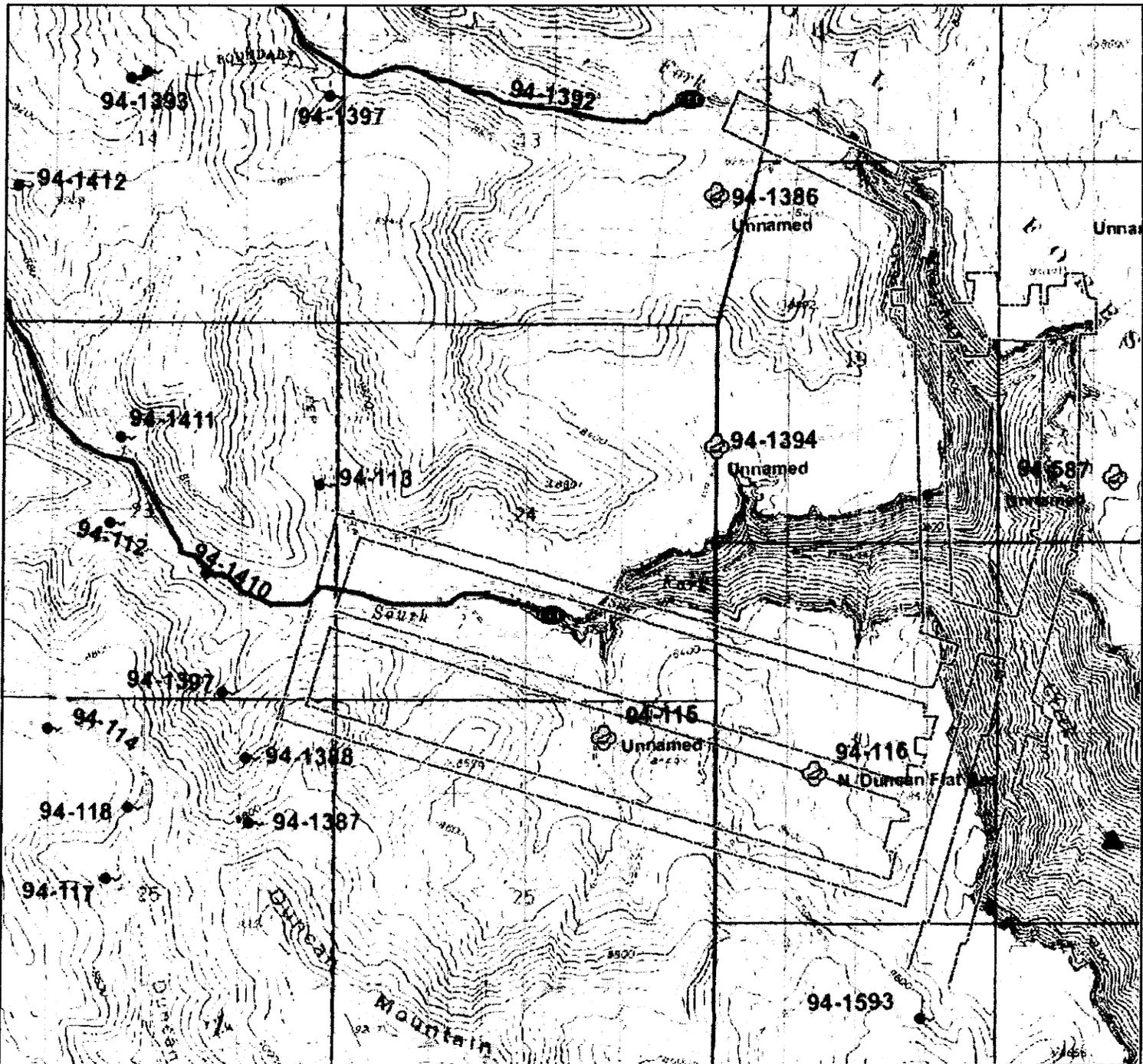
[R645-301.731.224.1]: Quarterly laboratory analytical data will be collected on the stream samples SUFCO 006, as defined in the water monitoring protocol of the MRP on page 7-41. However, additional surface water samples should be collected for total iron if a visible iron precipitate is noted within the stream channel or originating from the springs and seeps.

[R645-301.731.530]: It is in the best interest of the mine operator, as well as the regulatory management agencies involved to have a well-defined water replacement contingency plan in place prior to the onset of mining under the S. Fork of Quitchupah Creek. This

mitigation plan can be incorporated into the PHC prepared for the S. Fork of Quitchupah Creek. Comment letters received from DWRi declared that all surface and groundwater within the drainage that supplies Quitchupah Creek is considered State-appropriated and will be required to satisfy downstream water rights. A comment letter response from the USFS expressed concern over the statements made regarding if the mine is unsuccessful in restoring flow after two spring runoff periods and that Canyon Fuel Company will initiate "additional planning and analysis with the Forest Service". The USFS' position is that a solid mitigation plan should be hashed out prior to any water loss or riparian habitat loss.

RECOMMENDATIONS:

Approval of the amendment is not recommended until the above deficiencies are satisfied.



State of Utah Appropriated Water Rights

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> Spring Underground Water Well Seep, Stream, Creek Lake, Pond, Res. | <ul style="list-style-type: none"> Stock Point to Point Sufco_mine_working Water Shed Boundaries (AGRC) Section Line 40 Acre Parcel (Approx) | <ul style="list-style-type: none"> Downstream Surface Rights-
94-1183, 1184, 1178, 1190,
1179, 1191, 1883, 1887, 1888,
1895, 1896, 189 |
|---|--|--|



1:18,000
Date: 12/12/2011
Printed By: Dave Horsley



TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

December 13, 2011

TO: Internal File

THRU: April Abate, Lead

FROM: Ingrid Campbell, Environmental Scientist

RE: South Fork Quitchupah 2R2S, Canyon Fuel Company, SUFCO Mine, Permit # C/041/0002 and Project #3950

SUMMARY:

On November 4, 2011, the Division received an application from Canyon Fuel Company (CFC) to amend the current SUFCO mine monitoring and mitigation plan for undermining the South Fork of the Quitchupah stream channel. CFC requested that the Division expedite the review in order to mine the area by December 30, 2011. The application includes proposed amendments to Chapters 4, 5, 7 and the confidential binder as well as plates 5-10AC, 5-10A and C.

This application is not recommended for approval at this time. Prior to final approval, the permittee must submit the following in accordance with:

R645-300-113 and R645-301-333: The Fish and Wildlife Service should be consulted on the undermining of the South Fork of the Quitchupah. The permittee should address the requirements of the Fish and Wildlife Service's Colorado Fish Recovery Program.

R645-301-321: Please provide a monitoring plan for the riparian vegetation along the South Fork of Quitchupah creek that could be impacted from mining through loss of water or subsidence cracks.

R645-301-322.210: Please provide an updated list and investigation of effect of mining on listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the Endangered Species Act of 1973 and species or habitats protected by similar states statutes.

R645-301-322.220, -333,-358, and 358.400: Please provide a commitment to provide alternate sources of water for wildlife via “development of springs, wells or guzzlers at strategic locations”, as suggested by the Smith and Pritchett Report in Appendix 3-3 and page 3-40 of the MRP, in the case that water is lost due to undermining the South Fork of Quitchupah Creek. This commitment would have to be implemented immediately upon discovery of water loss, which may be prior to long term plans of water restoration development approval.

R645-301-322: Please provide a monitoring plan for aquatic wildlife prior to undermining to assess potential degradation impacts as suggested in the Smith and Pritchett Report Appendix 3-3 page 45.

R645-301-358: Annual raptor surveys must be conducted over areas that mining could disturb nests or nesting raptors including subsidence areas and surface disturbance areas. The survey conducted in 2011 does not include areas over projected mine panels. The 2012 annual raptor survey must include areas over projected panels for the 2012 mining year.

R645-301-411: A monitoring and mitigation plan must be developed for the protection of site 42SV3464 as suggested by the Canyon Environmental Report No. 110122. The plan must be developed prior to undermining the South Fork of Quitchupah Creek and prepared in consultation with the US Forest Service, the Division and the State Historic Preservation Office. The MOU in appendix 4-5 does not currently include this site.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Analysis:

CFC made changes to the SUFCO MRP, Chapter 4 page 4-12 to include a summary of the cultural and historic information for the South Fork of the Quitchupah Area. The summary indicates that two sites are recommended eligible for the National Register of Historic Places. There is a brief description of the shelter that may be impacted from undermining.

The actual report is located in the amendment for incorporation into Appendix 4-2 of the confidential folder of the MRP. The report is titled, "Cultural Resource Inventory of the Proposed Quitchupah Plateau Mine Expansion Sections 6 and 7, T37S R16E, SLB&M, Sevier County, Utah" Report No. 110122. Christopher T. Jensen of Canyon Environmental prepared the report on August 22, 2011 with Public Lands Policy Coordination Office Permit Number 177 and State of Utah Antiquities Project Permit Number U-11-YN-0695f.

The report included a class I file search in June at the State of Utah Historic Preservation Office. Three cultural resource sites were identified within a .5 mile radius of the proposed project site. One site, 42SV2690 was identified in the project area.

The report also included a class III cultural resource survey conducted on June 13-14, 2011 in Section 24 of T21S R4E of 160 acres of land in the Fishlake National Forest. The survey was conducted using parallel transects spaced no more than 10 m apart. Mr. Jensen identified one previously recorded cultural resource site (42SV2690), and three new sites (42SV3462, 42SV3463, and 42SV3464) within the survey area. Sites 42SV2690 and 42SV3464 were recommended as eligible for listing in the National Register of Historic Places.

Mr. Jensen determined that undermining site 42SV2690, a large lithic scatter, will not impact the site. However, site 42SV3464, a rock shelter and associated lithic scatter, could be impacted

TECHNICAL MEMO

from undermining. Therefore, the following recommendations were included in order to mitigate the potential adverse effects:

- Long term, periodic monitoring of subsidence activities in the immediate area that is proposed to be undermined;
- Direct, periodic monitoring of the shelter and documentation of subsidence activities as they may or may not affect the site;
- The development of a treatment and mitigation plan to determine possible future steps in the event that subsidence is found to cause structural damage or failure of the shelter.

The application does not include a monitoring and mitigation plan as suggested above by Canyon Environmental. Prior to approval of undermining, CFC must develop and submit a plan to the Division.

In addition to the above mitigation recommendations for site 42SV3464, Canyon Environmental recommended that further precautions be taken by CFC to minimize potential damage to cultural resources. These recommendations include the following:

- The operator and its contractors inform their employees about Federal regulations intended to protect cultural resources. All personnel would be informed that collecting artifacts, including arrowheads, is a violation of Federal Law.
- If cultural resources are uncovered during surface-disturbing activities, the operator and its contractors would suspend all operations at the site and the discovery would be immediately reported to the Authorized Officer, who would arrange for a determination of significance in consultation with the USHPO, and if necessary, recommends recovery and avoidance plan.
- All vehicular traffic, personnel and equipment movement, and construction activities should be confined to the locations surveyed for cultural resources as referenced in this report, and to the existing roadways and/or inventoried access routes.

An MOU between the USDA-Manti-LaSal National Forest, the Utah State Historic Preservation Officer, Canyon Fuel Company and the Division regarding the cultural resources protection and consultation at the SUFCO mine is located in Appendix 4-5, Volume 6. This MOU states that the Forest Service will be the lead agency to contact and coordinate between the Division, tribes and SHPO. The FS is also responsible to assure that all evaluation and monitoring of subsidence effects will follow the process outlined in the MOU. Attachment B of this report is a list of sites to be monitored. Site 42SV3464 is not listed on the attachment. The US Forest Service, Fishlake National Forest Office submitted comments to the Division on December 7, 2011. The FS indicated that the permittee must immediately develop a protection and monitoring plan that must be approved by SHPO prior to undermining.

Findings:

The information provided in this application is not considered adequate to meet the minimum regulatory requirements for this section. Prior to approval, the Permittee must submit the following in accordance with:

R645-301-411: A monitoring and mitigation plan must be developed for the protection of site 42SV3464 as suggested by the Canyon Environmental Report No. 110122. The plan must be developed prior to undermining the South Fork of Quitchupah Creek and prepared in consultation with the US Forest Service, the Division and the State Historic Preservation Office. The MOU in appendix 4-5 does not currently include this site.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Analysis:

CFC did not submit any new information pertaining to vegetation with the amendment. Plate 3-1v8, Plant Communities and Sampling Area, is included in the Plates Volume I of the MRP. According to this map, the South Fork Quitchupah Creek area includes Douglas Fir-Spruce-limber Pine, Pinyon-Juniper- Mountain Mahogany, and sagebrush-grass plant communities. No sampling areas were located near the South Fork Quitchupah.

The Aquatic Resource Report (Appendix 3-3) prepared by Dr. Richard Wingett, includes a resource description of South Fork Quitchupah Creek (table 7, page 27) conducted in 1980. The table describes the South Fork Quitchupah Creek's, left and right bank vegetative cover, stability, class, gradient, ungulate damage and riparian zone length. This provides a baseline inventory of the stream's riparian vegetation. CFC did not provide an update to this data which may be dated.

Undermining should have a minimal impact to vegetation (See Smith and Pritchett Report in Appendix 3-3, 1980).

The Fishlake and Manti La Sal National Forest provided comments on this application to the Division on December 7, 2011. The FS indicated that, "The Forest Land and Resource Management Plan (LRMP) designates use in the area for emphasis on livestock grazing and management indicator species habitat. Protection of riparian habitat is also a priority. In order to adequately protect the riparian habitat, a monitoring plan must be established to insure that mining does not negatively impact the vegetation.

Findings:

TECHNICAL MEMO

The information provided is not considered adequate to meet the minimum regulatory requirements for this section. Prior to approval, the Permittee must submit the following in accordance with:

R645-301-321: Please provide a monitoring plan for the riparian vegetation along the South Fork of Quitchupah creek that could be impacted from mining through loss of water or subsidence cracks.

OPERATION PLAN

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and Enhancement Plan

CFC did not submit any new information pertaining to fish and wildlife with the amendment.

A wildlife assessment was conducted in 1980 by H. Duane Smith and Clyde Pritchett. The assessment is located in Appendix 3-3 of Volume 5 of the MRP. The area of study, shown on Figure 1 of the report, includes the south fork of Quitchupah Creek. The amendment area is near elk calving grounds and located in elk winter range and big game migration routes. Page 43 of the report explains possible impacts from subsidence to wildlife. The long-wall and room and pillar mining techniques proposed in 1980 would minimize surface impacts and impacts to wildlife. Undermining this area should not have an impact on big game; however, if water loss occurs due to undermining, big game could be impacted. CFC included a subsidence monitoring and mitigation plan in this amendment. Page 5-39E of the amended MRP pages states, "if mitigation measures by SUFCO personnel and their consultants and contractors, are not successful in restoring flows after two spring runoff periods, Sufco will initiate additional analysis and planning with the Forest Service. Wildlife could be greatly impacted by the loss of water in this area for two years. Therefore, CFC must plan an alternate source of water for wildlife during their plans to replace water.

The report also suggests, on page 56, that water is the most limiting resource, and it would be advantageous of the mining company to install additional permanent water via development of springs, wells or guzzlers at strategic locations within the lease area.

Robert N. Winget of Environmental consultants conducted Aquatic macroinvertebrate surveys of Quitchupah Creek in 1980-1982. The results indicated a stressed condition due to low water flows, sedimentation and poor water quality but noticeably improved by 1982. Winget summarized the condition of the stream as having marginal quality for both habitat and water quality due to highly variable flows, chronic grazing and naturally alkaline waters. Winget concluded that the stream was not suitable for developing fisheries. On page 16 of this report, Winget states that possible project impacts are mainly subsidence related and entail a reduction of stream flows. He reiterated that the stream section has no fisheries value but is important as a watering source for wildlife and domestic animals and a source of aquatic organisms for downstream North Fork Quitchupah Creek.

Page 45 of the Smith and Pritchett report states that, "prior to and as mining progresses these aquatic and aquatic dependent resources should be monitored to assess potential degradation impacts....surface water equivalents should be permanently provided to maintain the integrity of any areas and populations so impacted".

Plates Volume I of the MRP includes Plate 3-2v6, "Elk Range", last incorporated on February 1, 2011. According to this plate, the south fork Quitchupah area includes limited priority Elk winter range, and some adjacent Critical Elk Calving areas.

Endangered and Threatened Species

A list of Endangered and Threatened species is located in the MRP volume 1, Chapter 3, Environmental Description, page 3-15. This list is from January 2005 and is currently outdated. It does not explain whether the species on the list can be found in the permit area. A disclaimer on page 3-14 A states that an explanation of endangered and threatened species on certain parts of the permit area can be found in the appendices section of Chapter 3. None of these appendices address the Quitchupah lease specifically.

The original addition of the Quitchupah lease in the 1980's was approved under the assumption that the south fork of Quitchupah creek would not be undermined. A barrier panel was to be left in place. Therefore, the original analysis and consultation with the Fish and Wildlife Service did not cover this scenario. The Fish and Wildlife Service should be consulted on the undermining of the South Fork of the Quitchupah. The permittee should address the requirements of the Fish and Wildlife Service's Colorado Fish Recovery Program.

The Fishlake National Forest has a Threatened and Endangered Species plan on page II-33 within the forest plan found online at:

TECHNICAL MEMO

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5115591.pdf. The plan lists threatened, endangered and sensitive species (although outdated) that could be found in the forest as the following: Bald Eagle, peregrine falcon, utah prarie dog, northern flying squirrel, merlin, mountain bluebird, western bluebird, bonnevillie cutthroat trout, and Utah mountain kingsnake. Some of these species can be found to nest in or inhabit parts of the forest, but exact locations are not outlined. The plan also identifies threatened, endangered and sensitive plant species in the Tushar and Monroe mountains.

Bald and Golden Eagles

An Avian and special status species inventory for the proposed 2011 Utah coal Properties exploration area was submitted to the Division in July of 2011 as part of task 3878, NOI for minor coal exploration. The inventory was conducted by Craig Brown of Tetrattech on June 24, 2011. The inventory included northern goshawks, nesting raptors, and special status species as well as incidental flora and fauna observations of management indicator species (elk calving and mule deer fawning) within the Fishlake National Forest. No map accompanies the report. The south fork of Quitchupah area in this amendment is located in Section 24 of T21S R4E. The survey covers sections 9 and 17 of T22S R4E, which is quite a distance away from the area this amendment addresses.

According to the 2011 raptor survey data, two red-tailed hawk nests are located near the South Fork of Quitchupah creek but not directly over the projected panels. The nests were last surveyed in 2008 and were found to be inactive or not found. The area has not been surveyed since 2008.

Page 3-9 of the MRP states that an environmental assessment of the Quitchupah Lease area was performed by the FS and BLM and 6 golden eagle nests were located.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

The application does not include a discussion of the impacts of undermining on the riparian area of the South Fork of Quitchupah Creek, a habitat of high value for fish and wildlife. Similar areas within the permit area that were undermined, including the East Fork of Box Canyon, have extensive discussion on the impacts and mitigation efforts from undermining in Chapter 3 of the MRP.

Findings:

The information provided is not considered adequate to meet the minimum regulatory requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-300-113 and R645-301-333: The Fish and Wildlife Service should be consulted on the undermining of the South Fork of the Quitchupah. The permittee should address the requirements of the Fish and Wildlife Service's Colorado Fish Recovery Program.

R645-301-322.210: Please provide an updated list and investigation of effect of mining on listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the Endangered Species Act of 1973 and species or habitats protected by similar states statutes.

R645-301-322.220, -333,-358, and 358.400: Please provide a commitment to provide alternate sources of water for wildlife via "development of springs, wells or guzzlers at strategic locations", as suggested by the Smith and Pritchett Report in Appendix 3-3 and page 3-40 of the MRP, in the case that water is lost due to undermining the South Fork of Quitchupah Creek. This commitment would have to be implemented immediately upon discovery of water loss, which may be prior to long term plans of water restoration development approval.

R645-301-322: Please provide a monitoring plan for aquatic wildlife prior to undermining to assess potential degradation impacts as suggested in the Smith and Pritchett Report Appendix 3-3 page 45.

R645-301-358: Annual raptor surveys must be conducted over areas that mining could disturb nests or nesting raptors including subsidence areas and surface disturbance areas. The survey conducted in 2011 does not include areas over projected mine panels. The 2012 annual raptor survey must include areas over projected panels for the 2012 mining year.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The south fork of Quitchupah Creek is located in the Fishlake National Forest and is subject to the Land and Resource Management Plan prepared by the FS. The plan can be accessed online at : http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5115591.pdf. According to the plan, the main forest uses are Recreation, and Fish and Wildlife, timber, mineral extraction and grazing.

Two categories of Management Indicator Species (MIS) groups have been identified in the Fishlake National Forest for viable population maintenance, Ecological Indicators and High Interest indicators. The ecological indicator species group includes goshawk, cavity nesters,

TECHNICAL MEMO

riparian dependent guild, sage nesters, macroinvertebrates and resident trout. The high interest species group includes elk, mule deer, Bonneville cutthroat trout and Rydberg's milkvetch. The purpose for protection of these two categories is to ensure high habitat quality and protection for all forest species. Habitat for the listed species is generally similar to habitat for other forest species.

The FS provided the Division with comments on December 7, 2011. In their comments, the FS indicated that they designated the area in question for use as grazing and management indicator species habitat. They also emphasized that protection of the riparian habitat was important.

Findings:

The information provided is considered adequate to meet the minimum regulatory requirements for this section.

RECOMMENDATIONS:

This application is not recommended for approval at this time.

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

December 20, 2011

TO: Internal File

THRU: April Abate, Hydrologist and Team Lead

FROM: James Owen, Engineer

RE: South Fork Quitchupah 2R2S, Canyon Fuel Company, LLC, Sufco Mine, C/041/0002, Task #3950

SUMMARY:

On November 4, 2011, the Utah Division of Oil Gas & Mining received an application for an amendment to the Mining & Reclamation Plan (MRP) of Canyon Fuel Company's (CFC) Sufco Mine. The application seeks approval to modify the current monitoring and mitigation plan for undermining the South Fork of Quitchupah stream channel.

This memo addresses the application's compliance with the engineering (R645-301-500) section of the Utah Coal Mining Rules. The following deficiency was identified:

- **R645-301.525.500** On page 5-39E of the application, CFC states that if mitigation measures by Sufco personnel, and their consultants and contractors, are not successful in restoring flows after two spring runoff periods, Sufco will initiate additional analysis and planning with the Forest Service. In accordance with the Utah Coal Mining Rules as well as the requests from the US Forest Service, the applicant must include with this application a definite contingency plan for the event that mitigation measures are not successful. The Division and USFS seek to avoid a situation where the currently planned mitigation measures are unsuccessful and there is no "backup" plan in place.

TECHNICAL MEMO

TECHNICAL ANALYSIS:

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

With the proposed amendment, portions of the South Fork of Quitchupah will be undermined and subsided as longwall panel 2R2S is extracted. Plate 5-10Av10 (Potential Subsidence Limits Quitchupah Tract) was included with the submittal and details the panel location as well as expected subsidence limits. CFC states that a monitoring and mitigation plan that is more intensive than the general MRP area is being 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.

Prior to the initiation of undermining and subsidence, CFC commits to conducting a pre-subsidence survey of the stream channel in the portion of South Fork of Quitchupah that flows over the 2R2S panel 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 commits to attempt, as part of this second survey, to occupy the same monitoring sites in the panel area as those chosen in the initial survey.

CFC states that 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 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.

The Division initiated an in-depth analysis of CFC past subsidence at the Sufco Mine. Based on past reported subsidence contours, CFC is mining at a critical width, which is the minimum width that needs to be mined before the maximum possible subsidence is observed at

the center of the subsidence trough, which has limits defined by the angle of draw boundaries. CFC is extracting in such a way that increases recovery and focuses subsidence down the center of the longwall panel. CFC has reported that subsidence they have encountered has been within the outer portions of the head and tail gates. Therefore, records show they are keeping subsidence within their expected angle of draw.

The angle of draw is determined by mining method, seam thickness, seam depth (depth of cover), dip of seam, nature of overburden (geology), natural faults & fractures, in situ stresses, etc. State Coal Mining Rules 525.541 and 525.542 allow for an operator to vary from the standard 30 degree assumption based on geo-technical analysis, which CFC has in its MRP (not included with the amendment). CFC does not expect subsidence related impacts to qualify to be considered material damage

On page 5-39D of the application, CFC states that 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. CFC commits to 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 diverting using native materials (or a designed flume or pipe 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. 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, arrangements will be made to get a contractor selected after consultation with the Forest Service to the site as soon as possible.

CFC states that 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.

On page 5-39E of the application, CFC states that if mitigation measures by Sufco personnel, and their consultants and contractors, are not successful in restoring flows after two

TECHNICAL MEMO

spring runoff periods, Sufco will initiate additional analysis and planning with the Forest Service.

After receiving the application, the Division received comments on the amendment from the US Forest Service (USFS). The comments were received jointly from the Fish Lake and Manti-Lasal National Forest Offices. USFS representatives commented that a "resolution of the potential issues and acceptable mitigation for loss of water in quantity and quality must be defined prior to their loss." The USFS suggested that changes to the contingency plans and a description of the level of water loss restoration should be identified.

- **R645-301.525.500** On page 5-39E of the application, CFC states that if mitigation measures by Sufco personnel, and their consultants and contractors, are not successful in restoring flows after two spring runoff periods, Sufco will initiate additional analysis and planning with the Forest Service. In accordance with the Utah Coal Mining Rules as well as the requests from the US Forest Service, the applicant must include with this application a definite contingency plan for the event that mitigation measures are not successful. The Division and USFS seek to avoid a situation where the currently planned mitigation measures are unsuccessful and there is no "backup" mitigation plan in place.

CFC states that 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. 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 commits to 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 USFS 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.

CFC states that short segments of Cowboy Creek could be subsided in the SITLA Muddy Tract. If this is anticipated to occur, CFC 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 is required, methods similar to those proposed and implemented in the East Fork of Box Canyon as described above could be used.

On page 5-40 of the application, CFC states that one area (5 North panels) of the mine experienced pillar failure when the area was flooded with water after mining of the panels had been completed. This particular area was mined using a double pass technique and the mining height was from 14 to 18 feet. The resulting pillars varied from 25 feet x 25 feet to 40 feet x 40 feet. The underlying floor was a weak mudstone that lost its cohesive strength when wet. When the 1 R5N and 2R5N panels were flooded the underlying mudstone became saturated and lost its cohesive strength. This allowed the pillars in the area with SF < 2.5 to fail, because frictional confinement on the bottom of the pillar was lost. To prevent reoccurrence, the applicant commits to not flood areas of the mine that have small pillars and a weak mudstone floor in areas where subsidence is to be prevented.

CFC commits to comply with all provisions of the approved subsidence control plan and will plan mining operations so that no material damage occurs as a result of subsidence in the lease area. However, should material damage occur, CFC will correct any material damage resulting from subsidence caused to surface lands to the extent technologically and economically feasible by restoring the land to a condition capable

Findings:

Contents and information provided are not sufficient enough to meet the minimum requirements of this section of the Utah Coal Mining Rules.

RECOMMENDATIONS:

Approval is not recommended at this time. Deficiencies must be addressed.