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

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OK

April 3, 2002

Dan Meadors, General Manager
Canyon Fuel Company
HC 35 Box 380
Helper, UT 84526

Re: James Canyon Road & Wells Amendment, Canyon Fuel Company, Skyline Mine,
C/007/005-AM01K, Outgoing File

Dear Mr. Meadors:

The above-referenced amendment has been reviewed. There are deficiencies that must be adequately addressed prior to approval. A copy of our Technical Analysis (TA), which outlines the deficiencies, is enclosed for your information. In order for us to continue to process your application, please respond to these deficiencies by May 3, 2002.

Among other things, this proposed amendment to the Mining and Reclamation Plan (MRP) addresses changes to the Probable Hydrologic Consequences section. Skyline Mine is currently experiencing inflows and pumping of unexpected large volumes of water. There is no indication that these flows will diminish and with continued mining, the flows are expected to increase. The Division is concerned that the situation may have the potential to cause harm to the Hydrologic Balance within, and adjacent to, the permit area. Therefore, we ask you to give your response the highest priority and completely address the deficiencies in the shortest possible time. Our staff realizes the priority and will assist your staff as needed.

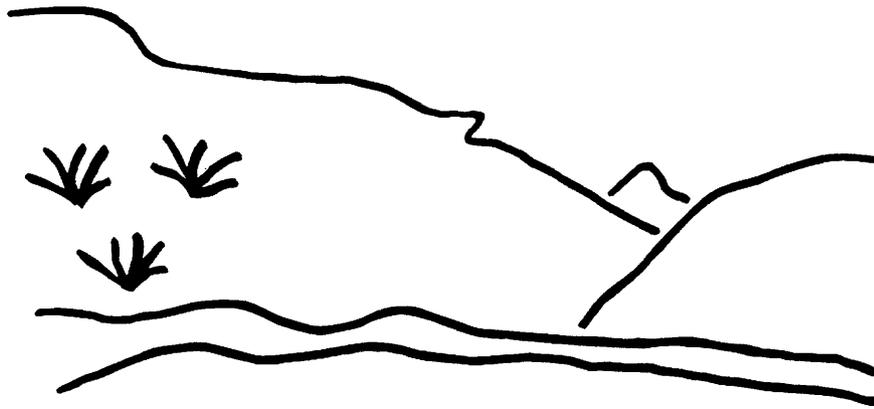
If you have any questions, please call me at (801) 538-5325 or Mike Suflita at (801) 538-5259.

Sincerely,

A handwritten signature in black ink, appearing to read 'Daron R. Haddock', written over a large, faint circular stamp.

Daron R. Haddock
Permit Supervisor

State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Skyline Mine
James Canyon Road & Wells Amendment
C/007/005-AM01K
Technical Analysis
April 1, 2002

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INTRODUCTION

TECHNICAL ANALYSIS

INTRODUCTION

On August 16, 2001 Skyline Mine encountered large groundwater inflows. The inflows were estimated to be about 4,500 gallons per minute (gpm) and required emergency actions to prevent loss of life and equipment. Subsequent pumping and pipelines resulted in expenditures of well over \$ 6 million dollars to keep water from filling the mine. Part of the flooding response was to drill two wells in order to pump water to the surface. The wells pump groundwater only and are not pumping water that has been inside the mine. This was intended to relieve water pressure and decrease water inflow to the mine. The wells are located in James Canyon, on the ground surface above the water inflow location.

Among other things, this proposed amendment to the Mining and Reclamation Plan (MRP) addresses potential impacts of groundwater inflows to the mine. This includes past inflows in addition to the most recent one on August 16, 2001. The Division on November 15, 2001 received the amendment. This Technical Memo is a review of the Hydrologic aspects of the proposed amendment and there are several deficiencies.

It should be noted that the urgency of the situation necessitated two other MRP amendments, which were approved. The first amendment (AM01H) dealt with burial of a pipeline from the James Canyon wells to discharge the well water into Electric Lake. The pipeline is buried adjacent to an old road that runs from the wells down to the lake. The pipeline is to be abandoned at the end of its life and the road has been reclaimed. The second amendment (IB01I-1) dealt with burial of a power line to supply electricity to the wells in James Canyon. The power line is buried adjacent to the same old road as the pipeline; however, it's along the section of road leading from the mountaintop down the road to the wells. This section of road and the power line are still in use.

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April 1, 2002

INTRODUCTION

SUMMARY OF DEFICIENCIES

SUMMARY OF DEFICIENCIES

The Technical Analysis of the proposed permit changes cannot be completed at this time. Additional information is requested of the permittee to address deficiencies in the proposal. A summary of deficiencies is provided below. Additional comments and concerns may also be found within the analysis and findings made in this Draft Technical Analysis. Upon finalization of this review, any deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement action as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

Regulations

- R645-301- 542.300 and R645-301-521.190**, The Permittee must include a scale on Plate 3.4-1 so that the Division can verify that the plate was printed at the correct scale. 49
- R645-301- 542.300 and R645-301-521.190**, The Permittee must show the permitted and disturbed acreages for the James Canyon area including listing the permitted acreages for the James Canyon buried water line, the James Canyon buried power line, and all other areas associated with the James Canyon project. The Permittee must also include the disturbed acreages for the James Canyon project. Those acreages must correlate with the permitted and disturbed acreages listed on Drawing No. 1.6-3 49
- R645-301-121**, Correctly locate the James Canyon pipeline and well in Section 25, T13S, R63 on page 2-63 (a), 2-120 (f), and in Appendix A2 of the Soil Resource Evaluation Report; and 1) Correct Plate 3.4-1 to accurately show the permit area boundary; and 2) Clarify the statement made on page 2-63(b) wherein it is noted "the pipeline and power line from the Questar property to head of James Canyon were reclaimed immediately after construction." .. 9
- R645-301-121.300**, Page 3-72 (c) describes Alternate Sediment Control Area 35 & 36 in a confusing manner. The reclaimed buried pipeline area that is located below the James Canyon wells is quite unlike the active road above the wells. They should each have a separate designation and a separate description. The description should include a design for the ditch carrying the water along the active road. 40
- R645-301-130**, The names of the persons or organizations that collected and analyzed the PHC data and their qualifications must be provided 34
- R645-301-230**, 1) Include in the submittal typical details for power line cable burial and information on topsoil berm protection along the James Canyon road from the Monument Peak road to the drill site, as per U.S. Forest Service letter to Mary Ann Wright of the Division, dated October 15, 2001, signed by Elaine Zieroth, Forest Supervisor. 2) Clearly

SUMMARY OF DEFICIENCIES

indicate the depth of topsoil removal and replacement along the length of the polypipe installation. 3) Provide an explanation for the limited amount of topsoil salvaged and stored for reclamation of the site. 36

R645-301-240, Please provide the average replacement depth for topsoil and subsoil for all locations of the disturbance: staging area, road, well site, and sediment pond. 43

R645-301-244, Please indicate in the plan the date of seeding of the James Canyon road from the drill site down to Electric Lake. 47

R645-301-321.200, Pre-coal mining disturbance vegetation cover, diversity, and productivity adequate to predict the potential for reestablishing vegetation must be provided. 13

R645-301-322.360, A map showing farm fields in Pleasant Valley that could be affected by the high flows in Mud Creek, including information on ownership, size of the operation, the crop grown, the historical yield of that crop and the value of the crop, relationship of the acreage in Pleasant Valley to the total farm acreage as defined by R645-302-323.400. 18

R645-301-333, The application must describe: 1) How the Operator will avoid or minimize disturbance and adverse impacts to fish and related environmental values during coal mining in Eccles and Mud Creek. 2) How enhancement and restoration of Eccles and Mud Creek will be achieved. 3) Protective measures to Eccles and Mud Creek during mining. 34

R645-301-342.100, Fish and wildlife enhancement measures used during reclamation must be described. 42

R645-301-355, The Permittee must commit to using a surface mulch during reclamation in James Canyon. 46

R645-301-355, The Permittee must provide a commitment to remove the waterbars at Phase II bond release or remove the waterbars at reclamation. 47

R645-301-356, The Permittee must provide productivity information, a range rating for the proposed reference area, and diversity standard. The reference to this site being previously mined must be removed. 46

R645-301-553.300, Provide a soil sample of the sediments in the pond prior to reclamation of the site. 37

R645-301-728 and -731, The information provided in the submittal is not adequate for the Division to make the Findings required by the regulations. Therefore, additional information needs to be submitted. The Operator is free to, and is strongly encouraged to investigate in any manner they deem appropriate to understand the flooding and Probable Hydrologic Consequences situation and come up with any needed mitigation plans should they be indicated. In addition to the information requested below, the Operator may wish to provide other equivalent data and analysis. 28

SUMMARY OF DEFICIENCIES

- R645-301-742**, There is no indication of riprap or other erosion control methods at the culvert outlet on the east side of the James Canyon well pad and this must be provided to prevent sediment from being added to James Creek. 40
- R645-302-322.421**. A description of the characteristics of Mud Creek including roughness, slope and vegetation of the channel, and the physical and chemical properties of the subsoil that will endure sustained high water flows..... 18
- R645-302-322.431** The geometry and physical character of Pleasant Valley, expressed in terms of the longitudinal profile and slope of the Valley and the channel, the sinuosity of the channel, the cross-section, slopes and proportions of the channels, flood plains and low terraces, the nature and stability of the stream banks and the vegetation established in the channels and along the stream banks and flood plains. 18
- R645-302-322.432**, The historical nature of surface flows of Mud Creek as shown by the frequency and duration of flows of representative magnitude including low flows and floods. 18
- R645-302-324.300**, 1) A monitoring plan for stream bank erosion control in Mud Creek and 2) Monitoring of the flows in Mud Creek for quantity and quality and at adequate frequency to determine seasonal trends that could affect farming in Pleasant Valley. 18
- R645-302-433**, contributions to base flow in Mud Creek from the subsurface. 18
- R645-728.335, -731, and -731.760**, 1) The Operator must provide a table listing A) the approximate date each mine inflow and pumping began, B) each inflow and pumping rate in gpm, C) source of the water (in-mine location such as 10L, or surface location such as James Canyon wells), D) destination of the pumped water (such as Mine 1 & 3 abandoned workings, Eccles Creek, or Electric Lake), and E) cumulative pumping rate for the whole mine over time. 2) Using data in the above table the Operator, must provide a graph showing the cumulative pumping rate for the whole mine (vertical axis) and dates for those pumping rates (horizontal axis). The text narrative in the history section will need to be consistent with, and clearly explain the table contents and the graph. 3) The Operator must provide one graph showing the drought index and S35-8 spring flow at the same time scale and using a line graph for both parameters. The time period would be from 6/1982 to the present. Then provide a text discussion accurately analyzing what the comparison shows..... 29
- R645-728.335, -731, and -731.760**, 14) The Operator must provide a cross section drawing along the monitoring wells and the James Canyon wells. The drawing should be at least the size of Dwg. No. PHC A-1 and show the elements listed below. Then provide a text discussion accurately analyzing what the cross section shows in terms of groundwater sources for each of the mine inflows. Include potential impacts to the groundwater, springs, and streams due to water inflows to the mine and pumping in James Canyon. A) Include wells W22-2 (W79-22-1&2), W35-1 (W79-35-1A&1B), JC-1, JC-2, and W2-1 (W98-2-1); B) Exaggerated vertical scale with elevations and distances shown on both scales; C) The topographic ground surface shape; D) All geologic formations, including thickness, name, and

SUMMARY OF DEFICIENCIES

other relevant information. Show strike and dip for each formation as it is along the cross section; **E)** All known faults and all inferred/suspected faults; **F)** Coal seams, showing their thickness and name. Number the mines in each seam; **G)** All mine water inflow locations with an approximate horizontal distance from the cross section east or west to actual mine inflow location; **H)** Springs S35-8, S22-1, S26-13, & S34-12, locations with an approximate horizontal distance from the cross section east or west to actual mine inflow location; **I)** All monitoring wells including surface elevation and completion elevation; **J)** Both James Canyon wells including surface elevation and completion elevation; **K)** Approximate potentiometric surface elevation before elevated mine inflows occurred. That is, before January 1999. See the MRP, Dwg. No. 2.3.4-2 and Dwg. No. 2.3.4-1 Fence Diagram: Water Monitoring Wells Skyline Mine, which has water elevations of the wells as of 12/13/91. Include the approximate dates along that surface; **L)** Approximate potentiometric surface, as it exists at the latest well elevation readings. Include the approximate dates along that surface; and **M)** Other elements, features, and information that would help define past and present ground water conditions as they relate to the in-mine flooding situation. 31

R645-728.335, -731, and -731.760, 15) The Operator must provide all information from holes, 74-35-1, 75-34-2, 75-27-1, and 83-22-1, that could aid in determining the geology and groundwater conditions. **16)** The Operator must determine “whether adverse impacts may occur to the Hydrologic Balance” and the effect on “Ground-water and surface-water availability”. This should include an estimate of if and when mine inflows will decrease and to what levels. **17)** The Operator needs to provide water quality data from James, Huntington, Swen’s and Little Swen’s Creeks and the James Canyon wells to compare the water from these sources. **18)** The Operator must implement a method of monitoring the water flow volumes discharged by in-mine pumping into Eccles Creek. The monitoring and tracking should be the same as that done for the James Canyon wells. **19)** The Operator must provide age date testing of the mine inflow waters. This should include all inflow points in the mine (16L, 14L, 9L, & 10L) and the water being pumped from both James Canyon wells (JC-1 & JC-2). **20)** The Operator must provide the Division with all information developed for the James Canyon wells which provide insight to the draw down of the well, transmissivity of the water-bearing strata and fault system, and other information related to groundwater flow at the wells location. **21)** Report all weekly monitoring data on a monthly basis, submitting the data in the first week of the following month. **22)** For all data submittals outlined in this Technical Analysis, provide paper copies of the graphs, charts, and tables AND also provide an electronic copy (magnetic disk or CD) of those data submittals. 31

R645-728.335, -731, and -731.760, 4) The Operator must provide one graph for each of the following springs showing the drought index and spring flow at the same time scale and using a line graph for both parameters. The time period would be from June 1982 to the present. Then provide a text discussion accurately analyzing what the comparison shows. The springs are: S22-11, S26-13, S34-12, 2-413, S15-3, S36-12, and S24-12 29

R645-728.335, -731, and -731.760, 5) The Operator must provide one graph for each of the following wells showing the drought index and water level elevation at the same time scale and using a line graph for both parameters. The time period would be from 6/1982 to the present. Some of the wells do not have records that far back. In those cases, just provide all

SUMMARY OF DEFICIENCIES

the available data. Then provide a text discussion accurately analyzing what the comparison shows. The wells are: W22-2 (W79-22-1 & 2), W26-1 (W79-26-1), W35-1 (W79-35-1A & 1B), W2-1 (W98-2-1), W10-1 (W79-10-1A & 1B), W-14-2 (S79-14-2A & 2B), 99-21-1, 99-28-1, and 20-4-2..... 29

R645-728.335, -731, and -731.760, 6) The Operator must provide weekly monitoring of the water level in the following wells, starting immediately. For all wells that have already been monitored more often than quarterly, provide all monitoring data collected. Plot the water level versus time on a graph for such wells. Also provide a one-time water chemistry analysis of these well waters as defined by Laboratory Measurements on Table 2.3.7-2 Abbreviated Water Quality Analytical Schedule in the MRP. Sample the well water after purging at least three times the well casing volume and not more than five times the well casing volume. Provide Stiff Diagrams based on these chemical analyses. Also provide a text discussion accurately analyzing what the chemical analysis and monitoring shows. The wells are: W22-2 (W79-22-1 & 2), W26-1 (W79-26-1), W35-1 (W79-35-1A & 1B), W2-1 (W98-2-1), and JC-1 & JC-2, both James Canyon wells 29

R645-728.335, -731, and -731.760, 7) The Operator must provide weekly monitoring of spring flow rates for the following springs, starting immediately. For all springs that have already been monitored more often than quarterly, provide all monitoring data collected. Plot the spring flow versus time on a graph for such springs. Also provide one-time water chemistry analysis of these spring waters as defined by Laboratory Measurements on Table 2.3.7-2 Abbreviated Water Quality Analytical Schedule in the MRP. Provide Stiff Diagrams based on these chemical analyses. Also provide a text discussion accurately analyzing what the chemical analysis and monitoring shows. The springs are: S22-11, S26-13, S35-8, S34-12, and 2-413 30

R645-728.335, -731, and -731.760, 8) The Operator must provide one graph showing both the drought index and Burnout Creek flows at the same time scale and using a line graph for both parameters. Then provide a text discussion of accurately analyzing what the comparison shows. **9)** The title of Figure PHC A-5 probably should not contain the letter "M" as there is no such reference in the text. **10)** The Operator needs to provide an additional graph showing the water levels of W2-1 (98-2-1) from October 1998 to the present time. **11)** The Operator needs to provide a graph showing the water levels in all three monitoring wells, W79-35-1A & W79-35-1B, & 98-2-1, from 7/15/1982 to the present. **12)** The discrepancy between the text slope of 0.3 feet per day and the Figure PHC A-5 slope of 0.53 feet per day needs to be resolved. **13)** The Operator must use a consistent naming convention in the text and on all figures and maps to designate all monitoring wells. Preferably, this would include all designations for a well being used each time..... 30



GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The site location falls mostly in Section 25, T.13S, R6E, not section 35 as is noted on pages 2-63 (a), 2-120 (f), and in the Soil Resource Evaluation Report of Appendix A2.

Plate 3.4-1 indicates that the permit and disturbed area boundaries are the same for the length of the James Canyon Road. This is not the case. The permit area is clearly shown on Drawing No. 1.6-3. Most of the road is within the permit area and a "cherry-stem" has been drawn to include a portion of the road extending outwards from the permit area.

On page 2-63(b) it is noted "the pipeline and power line from the Questar property [at the head of Boardinghouse Canyon] to head of James Canyon were reclaimed immediately after construction." The Division understands that the pipeline was buried and reclaimed from the drill site in James Canyon to the mouth of the canyon (Electric Lake) and the power cable was buried in the road from the head of the canyon to the drill site. Please clarify the situation. i.e. was the power cable buried from the Questar property to the head of James Canyon?

Findings:

Information provided with the submittal is not accurate. Prior to approval, provide the following information in accordance with the following:

R645-301-121, Correctly locate the James Canyon pipeline and well in Section 25, T13S, R63 on page 2-63 (a), 2-120 (f), and in Appendix A2 of the Soil Resource Evaluation Report; and 1) Correct Plate 3.4-1 to accurately show the permit area boundary; and 2) Clarify the statement made on page 2-63(b) wherein it is noted "the pipeline and power line from the Questar property to head of James Canyon were reclaimed immediately after construction."

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

Soils analyses and field report of the James Canyon area were conducted after disturbance on the topsoil stored and on the berms along the roadways. Mr. Daniel Larsen, Soil Scientist with Environmental Industrial Services of Helper, Utah, conducted a soil survey in September 2001. Inter-Mountain Laboratories of Sheridan, WY analyzed the soil samples.

Findings:

The information meets the requirements of the Regulations.

ENVIRONMENTAL RESOURCE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

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

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Minimum Regulatory Requirements:

Include a description of the existing, pre-mining environmental resources within the proposed permit area and adjacent areas that may be affected or impacted by the proposed underground mining activities.

Analysis:

During construction of Electric Lake, the James Canyon County road was constructed. The road was reclaimed in 1972 and included construction of water bars every one hundred fifty feet (page 2-63b and 2-120i). The road was vegetated with grasses, rabbit brush and sagebrush. According to the soils report in Appendix A2, the route of the buried pipeline in James Canyon is mostly southern exposure from 9,600 feet down to about 8,560 feet elevation.

The site was redisturbed during August of 2001 for construction of the drill site, burial of power cable to the drill site and burial of water pipeline from the drill site to Electric Lake. The power cable originates from the Questar (gas) property at the head of Boardinghouse Canyon and continues along the Monument Peak Road to the head of James Canyon.

Vegetation and soils analysis of the site were conducted after the disturbance to evaluate the condition of the adjacent land and make presumptions about the disturbed area. Both vegetation and soils reports are in Appendix A2.

Findings:

The information provided is adequate for the General Environmental Resources Information section of the Regulations.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

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

Minimum Regulatory Requirements:

Describe and identify the nature of cultural historic and archeological resources listed or eligible for listing on the National Register of Historic Places and known archeological sites within the proposed permit and adjacent areas. The description shall be based on all available information, including, but not limited to, information from the State Historic Preservation Officer and local archeological, historical, and cultural preservation groups.

Identify and evaluate important historic and archeological resources that may be eligible for listing on the National Register of Historic Places, through the collection of additional information, conduct of field investigations, or other appropriate

analyses.

Analysis:

Montgomery Archaeological Consultants conducted a cultural resources survey of the dewatering drill holes and access road on August 21, 2001. The report did not state that the pipeline route was included in the survey although one aspen art site was documented in this survey adjacent to the pipeline. Chris Hansen, Canyon Fuels, stated on August 24, 2001 that the consultant refers to the pipeline route as the access road.

The James Canyon segment of the county road from Scofield to Fairview was documented as a historic site (42Em2734) along with two aspen art sites (42Em2732 and 42Em2733). The earliest documented date for the James Canyon road was a map dated 1923. The road was decommissioned in 1975 during construction of Electric Lake. The aspen art site adjacent to the road exhibits one carving consisting of "Don Probert 46" and another more recent carving. The three historic sites were recommended as not eligible for the National Register of Historic Places (NRHP) because of lack of artistic elements for the aspen art and lack of retention of structural integrity for the road.

Findings:

Information provided in the application meets the minimum Historic and Archeological Resource Information requirements of the regulations.

VEGETATION RESOURCE INFORMATION

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

Minimum Regulatory Requirements:

Provide a map that delineates existing vegetative types and a description of the plant communities within the area affected by surface operations and facilities and within any proposed reference area. The description shall include information adequate to predict the potential for reestablishing vegetation. The map or aerial photograph is required, sufficient adjacent areas shall be included to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife as identified under the fish and wildlife resource information.

Analysis:

The vegetative communities within the U. P. & L. Tract of the permit area are:

- sagebrush/grass
- riparian
- conifer-timber
- aspen.
- Mountain herbland

An unpaved county road through James Canyon was abandoned in 1972. The abandonment consisted of minor regrading, scarification, installing water bars, and seeding. The

ENVIRONMENTAL RESOURCE INFORMATION

current road and well were constructed in late summer of 2001 under a coal exploration permit issued by BLM. The vegetation along the road prior to redisturbance consisted of grasses, rabbitbrush, and sagebrush (page 2-63b). The description provided is not adequate to predict the potential for reestablishing vegetation and productivity. The Division's Vegetation Information Guidelines describe when and how to conduct studies of vegetation that will be disturbed. Pre-coal mining disturbance vegetation cover, diversity, and productivity must be provided.

Dwg. No. 2.7.1-1a.dwg, UP&L Tract Vegetation Map delineates the vegetative community for the additional permit area.

Findings:

Information provided in the application is not considered adequate to meet the minimum Vegetation Information requirements of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-321.200, Pre-coal mining disturbance vegetation cover, diversity, and productivity adequate to predict the potential for reestablishing vegetation must be provided.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Minimum Regulatory Reference:

The application shall include fish and wildlife resource information for the permit area and adjacent area. The scope and level of detail for such information shall be determined by the Division in consultation with State and Federal agencies with responsibilities for fish and wildlife and shall be sufficient to design the protection and enhancement plan required under the operation and reclamation plan.

Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

- (1) 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, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar State statutes;
- (2) Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or
- (2) Other species or habitats identified through agency consultation as requiring special protection under State or Federal law.

Analysis:

Dr. Clayton White conducted a goshawk survey of Burnout Canyon and adjacent areas in May 2001. No goshawks were found, although goshawks and red-tail hawks have been observed in the area in past years (Appendix Volume A-2). There are goshawks nesting in adjacent drainages.¹

¹ Phone conversation with Rod Player, Forest Service Biologist, on 1/28/02 with Susan White.

The pipeline will be buried upslope from James Creek. The mouth of James Creek is critical to the Yellowstone cutthroat trout spawning. The Permittee has committed to sampling fish and macroinvertebrates in James Creek (page 2-71 and page 2-72). Sampling reportedly began in October 2000. A commitment should be provided to include the results of these studies in the annual report or as an appendix to the MRP. The permit describes the sampling program as follows:

Multi-pass electrofishing to estimate fish populations will be conducted in October for two consecutive years and then every three years thereafter. The fish surveys will be done in the fall. A macroinvertebrate study of James Creeks will be conducted twice a year for two consecutive years and every three years thereafter. The surveys will be done in the spring and fall.

Findings:

Information provided in the application meets the minimum Fish and Wildlife Resource Information requirements of the regulations.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Minimum Regulatory Requirements:

Provide adequate soil survey information on those portions of the permit area to be affected by surface operations or facilities consisting of a map delineating different soils, soil identification, soil description, and present and potential productivity of existing soils.

Where selected overburden materials are proposed as a supplement or substitute for topsoil, provide results of the analysis, trials and tests required. Results of physical and chemical analyses of overburden and topsoil must be provided to demonstrate that the resulting soil medium is equal to or more suitable for sustaining revegetation than the available topsoil, provided that trials and tests are certified by an approved laboratory. These data may be obtained from any one or a combination of the following sources: U.S. Department of Agriculture Soil Conservation Service published data based on established soil series; U.S. Department of Agriculture Soil Conservation Service Technical Guides; State agricultural agency, university, Tennessee Valley Authority, Bureau of Land Management or U.S. Department of Agriculture Forest Service published data based on soil series properties and behavior; or, results of physical and chemical analyses, field site trials, or greenhouse tests of the topsoil and overburden materials (soil series) from the permit area. If the permittee demonstrates through soil survey or other data that the topsoil and unconsolidated material are insufficient and substitute materials will be used, only the substitute materials must be analyzed.

Analysis:

In a telephone conversation on October 5, 2001, with Gary Taylor, Environmental Coordinator for the Skyline Mine, Priscilla Burton verified that for the stretch of Forest Service road outside of the mine's disturbed area boundary and to the well site:

1. There was no topsoil.
2. There was no topsoil salvage.
3. There was no topsoil redistribution.

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Consequently, soil survey information provided in Appendix 2 of Chapter 2 is for the half-mile section of reclaimed road in James Canyon where the 16-inch poly pipe has been buried and for the well site. Mr. Dan Larsen, Soil Scientist, with EIS Environmental and Engineering Consultants, Helper, Utah, September 2001, has provided a soil description and field notes for the well site location, and brief notes for the rest of the reclaimed road, supported by hand-dug excavations. Laboratory analysis was conducted on five composite samples collected from soil representing each of the identified soil types and the stockpiled topsoil and subsoil at the well site.

The survey indicates that soils supporting the Aspen/Grass/Forb vegetation type (A) had a topsoil layer that was 16 – 24 inches in depth, very dark brown color and a texture of sandy loam or loam with a granular structure. The subsoil had 15 – 30 percent rock fragments in the gravel and cobble size and was brown to yellowish brown in color, 20 – 40 inches thick. Below this, a dark grayish-brown to brown clay loam soil with blocky structure was encountered. These are Pachic Palecryolls and Pachic Haplocryolls.

Soils supporting sagebrush (S) were found at the lower elevations and were generally loam soils with a brown topsoil horizon of 6 – 12 inches in thickness. The soils were formed from sandstone and shale with deeper subsoils (to forty inches) forming in the colluvial deposits. Generally, these soils are shallower than the soils that support aspen growth.

An inclusion of calcareous tufa (T) was identified for a 100 feet along the pipeline route, near a spring, approximately ¼ southwest of the drill pad. The Tufa soils had the following characteristics: a 7 – 12 inch dark brown surface layer overlying white subsoil grading to rock at about 20 – 24 inches.

Findings:

The information provided is adequate for the Environmental Soil Resources Information section of the Regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320

Minimum Regulatory Requirements:

This section applies to surface coal mining and reclamation operations on areas or adjacent to areas including alluvial valley floors in the arid and semiarid areas west of the 100th meridian.

Alluvial valley floor determination

Permit applicants who propose to conduct surface coal mining and reclamation operations within a valley holding a stream or in a location where the permit area or adjacent area includes any stream, in the arid and semiarid regions of the United States, as an initial step in the permit process, may request the Division to make an alluvial valley floor determination with respect to that valley floor. The applicant shall demonstrate and the Division shall determine, based on either available data or field studies submitted by the applicant, or a combination of available data and field studies, the presence or absence of an alluvial valley floor. Studies shall include sufficiently detailed geologic, hydrologic, land use, soils, and vegetation data and analysis to demonstrate the probable existence of an alluvial valley floor in the area. The Division may require additional data collection and analysis or other supporting documents, maps, and illustrations in order to make the determination.

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The Division shall make a written determination as to the extent of any alluvial valley floors within the area. The Division shall determine that an alluvial valley floor exists if it finds that unconsolidated streamlaid deposits holding streams are present; and there is sufficient water available to support agricultural activities as evidenced by the existence of current flood irrigation in the area in question; the capability of an area to be flood irrigated, based on evaluations of streamflow, water quality, soils, and topography; or, subirrigation of the lands in question derived from the ground-water system of the valley floor.

If the Division determines in writing that an alluvial valley does not exist pursuant to the requirements of this section, no further consideration of this section is required.

Applicability of statutory exclusions

If an alluvial valley floor is identified and the proposed surface coal mining operation may affect this alluvial valley floor or waters that supply the alluvial valley floor, the applicant may request the Division, as a preliminary step in the permit application process, to separately determine the applicability of the statutory exclusions set forth in this section. The Division may make such a determination based on the available data, may require additional data collection and analysis in order to make the determination, or may require the applicant to submit a complete permit application and not make the determination until after the complete application is evaluated.

An applicant need not submit the information required and the Division is not required to make the findings required of this section when the Division determines that one of the following circumstances, heretofore called statutory exclusions, exist:

1. The premining land use is undeveloped rangeland that is not significant to farming;
2. Any farming on the alluvial valley floor that would be affected by the surface coal mining operation is of such small acreage as to be of negligible impact on the farm's agricultural production. Negligible impact of the proposed operation on farming will be based on the relative importance of the affected farmland areas of the alluvial valley floor area to the farm's total agricultural production over the life of the mine; or,
3. The circumstances set forth in Section 822.12(b)(3) or (4) of this Chapter exist.

For the purpose of this section, a farm is one or more land units on which farming is conducted. A farm is generally considered to be the combination of land units with acreage and boundaries in existence prior to August 3, 1977, or if established after August 3, 1977, with those boundaries based on enhancement of the farm's agricultural productivity and not related to surface coal operations.

(c) Summary denial. If the Division determines that the statutory exclusions are not applicable and that any of the required findings of Paragraph (e)(2) of this section cannot be made, the Division may, at the request of the applicant:

(1) Determine that mining is precluded on the proposed permit area and deny the permit without the applicant filing any additional information required by this section; or

(2) Prohibit surface coal mining and reclamation operations in all or parts of the area to be affected by mining.

(d) Application contents for operations affecting designated alluvial valley floors. (1) If land within the permit area or adjacent area is identified as an alluvial valley floor and the proposed surface coal mining operation may affect an alluvial valley floor or waters supplied to an alluvial valley floor, the applicant shall submit a complete application for the proposed surface coal mining and reclamation operations to be used by the Division together with other relevant information as a basis for approval or denial of the permit. If an exclusion of Paragraph (b)(2) of this section applies, then the applicant need not submit the information required in Paragraphs (d)(2)(ii) and (iii) of this section.

(2) The complete application shall include detailed surveys and baseline data required by the Division for a determination of--

(i) The essential hydrologic functions of the alluvial valley floor which might be affected by the mining and reclamation process. The information required by this subparagraph shall evaluate those factors which contribute to the collecting, storing, regulating and making the natural flow of water available for agricultural activities on the alluvial valley floor and shall include, but are not limited to:

(A) Factors contributing to the function of collecting water, such as amount, rate and frequency of rainfall and runoff, surface roughness, slope and vegetative cover, infiltration, and evapotranspiration, relief, slope and density of drainage channels;

(B) Factors contributing to the function of storing water, such as permeability, infiltration, porosity, depth and direction of ground water flow, and water holding capacity;

(C) Factors contributing to the function of regulating the flow of surface and ground water, such as the longitudinal profile and slope of the valley and channels, the sinuosity and cross-sections of the channels, interchange of water between streams and associated alluvial and bedrock aquifers, and rates and amount of water supplied by these aquifers; and

(D) Factors contributing to water availability, such as the presence of flood plains and terraces suitable for agricultural activities.

(ii) Whether the operation will avoid during mining and reclamation the interruption, discontinuance, or preclusion of farming on the alluvial valley floor;

(iii) Whether the operation will cause material damage to the quantity or quality of surface or ground waters supplied to the alluvial valley floor;

(iv) Whether the reclamation plan is in compliance with requirements of the Act, this Chapter, and regulatory program; and

(v) Whether the proposed monitoring system will provide sufficient information to measure compliance with Part 822 of this Chapter during and after mining and reclamation operations.

(e) Findings. (1) The findings of Paragraphs (e)(2)(i) and (ii) of this section are not required with regard to alluvial valley floors to which are applicable any of the exclusions of Paragraph (b)(2) of this section.

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(2) No permit or permit revision application for surface coal mining and reclamation operations on lands located west of the 100th meridian west longitude shall be approved by the Division unless the application demonstrates and the Division finds in writing, on the basis of information set forth in the application, that

- (i) The proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor;
- (ii) The proposed operations will not materially damage the quantity or quality of water in surface and underground water systems that supply alluvial valley floors; and
- (iii) The proposed operations will comply with Part 822 of this Chapter and the other applicable requirements of the Act and the regulatory program.

Analysis:

Alluvial Valley Floor Determination

The Division's March 1984 Technical Analysis written for the Valley Camp Mine (ACT/007/001) provides a summation of the history of the alluvial valley floor determination. In 1984, the Division stated that Whisky Canyon and Pleasant Valley above the Utah No. 2 facilities (White Oak Loadout) were observed by the Office of Surface Mining in August of 1983 to be too narrow for flood irrigation or subirrigation agricultural activities. Also in 1984, it was noted that the pastures below the Utah No. 2 Mine (White Oak Loadout) are flood irrigated and the grasses on the valley bottom may be subirrigated. Map R645-301-411.100 Premining Land Use Map shows the land use down stream of the Belina Mine Complex. Shown on this map, are two pastures along Mud Creek in Pleasant valley below the Utah No. 2 Mine (White Oak Load Out).

Skyline Mine's discharge waters empty into Eccles Creek and then into Mud Creek. Mud Creek flows through Pleasant Valley, an alluvial valley floor. No permit or permit change application for coal mining and reclamation operations in Utah will be approved (R645-302-323.100) unless the Division finds in writing, on the basis of the information set forth in the application that (R645-302-232.120) the proposed operations would not materially damage the quantity and quality of water in surface and underground water systems that supply those alluvial valley floors which are outside the permit area of an existing or proposed coal mining and reclamation operation (R645-302-323.122). The significance of the impact to farming will be based upon loss of production and income (R645-302-323.200). Material damage to the quality of waters will be determined by concentration of total dissolved solids (R645-302-323.310) and reduction in the area available to agriculture as a result of flooding or increased saturation of the root zone (R645-302-323.324).

Coal mining may interrupt farming on an alluvial valley floor where the acreage impacted is so small as to be negligible to the farm's total agricultural production (R645-302-324.222).

Findings:

In accordance with R645-302-321.300, the Division finds that Eccles Creek does not lie within the Alluvial Valley Floor, but that Mud Creek does. Furthermore, the Division finds as per R645-302-322.100 that the sustained high flows in Mud Creek most probably affects the alluvial valley floor downstream of the White Oak Loadout. Consequently, this application must provide the information required under R645-302-322, Application Contents for Operations

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Affecting Designated Alluvial Valley Floors, such that the Division will be able to make the findings required by R645-302-323.122, a determination that the Skyline mining operation will not interrupt, discontinue or preclude farming in Pleasant Valley downstream of the mining activity and outside of the permit area or that the impact is negligible to a farm's total agricultural production (R645-302-324.222).

The proposed amendment does not meet regulatory requirements. Prior to approval, the Permittee must provide the following information in accordance with:

R645-301-322.360, A map showing farm fields in Pleasant Valley that could be affected by the high flows in Mud Creek, including information on ownership, size of the operation, the crop grown, the historical yield of that crop and the value of the crop, relationship of the acreage in Pleasant Valley to the total farm acreage as defined by R645-302-323.400.

R645-302-322.421. A description of the characteristics of Mud Creek including roughness, slope and vegetation of the channel, and the physical and chemical properties of the subsoil that will endure sustained high water flows.

R645-302-322.431 The geometry and physical character of Pleasant Valley, expressed in terms of the longitudinal profile and slope of the Valley and the channel, the sinuosity of the channel, the cross-section, slopes and proportions of the channels, flood plains and low terraces, the nature and stability of the stream banks and the vegetation established in the channels and along the stream banks and flood plains.

R645-302-322.432, The historical nature of surface flows of Mud Creek as shown by the frequency and duration of flows of representative magnitude including low flows and floods.

R645-302-433, contributions to base flow in Mud Creek from the subsurface.

R645-302-324.300, 1) A monitoring plan for stream bank erosion control in Mud Creek and 2) Monitoring of the flows in Mud Creek for quantity and quality and at adequate frequency to determine seasonal trends that could affect farming in Pleasant Valley.

HYDROLOGIC RESOURCE INFORMATION

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

Minimum Regulatory Requirements:

Probable hydrologic consequences determination.

- 1.) The application shall contain a determination of the probable hydrologic consequences (PHC) of the proposed operation based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.
- 2.) The PHC determination shall be based on baseline hydrologic, geologic, and other information collected for the permit application and may include data statistically representative of the site.
- 3.) The PHC determination shall include findings on: whether adverse impacts may occur to the hydrologic balance; whether acid-forming or toxic-forming materials are present that could result in the contamination of surface or ground water supplies; and, what impact the proposed operation will have on sediment yield from the disturbed area; acidity, total suspended and dissolved solids, and other important water quality parameters of

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- local impact; flooding or streamflow alteration; ground water and surface water availability; and other characteristics as required.
- 4.) An application for a permit revision shall be reviewed by the Division to determine whether a new or updated PHC shall be required.

Ground-water monitoring plan.

- 1.) The application shall include a ground-water monitoring plan based upon the PHC determination and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the ground water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance. It shall identify the quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At a minimum, total dissolved solids or specific conductance corrected to 25 C, pH, total iron, total manganese, and water levels shall be monitored and data submitted to the Division at least every 3 months for each monitoring location. The Division may require additional monitoring.
- 2.) If an applicant can demonstrate by the use of the PHC determination and other available information that a particular water-bearing stratum in the proposed permit and adjacent areas is not one which serves as an aquifer which significantly ensures the hydrologic balance within the cumulative impact area, then monitoring of that stratum may be waived by the Division.

Surface-water monitoring plan.

- 1.) The application shall include a surface-water monitoring plan based upon the PHC determination and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance, as well as the effluent limitations found at 40 CFR Part 434.
- 2.) The plan shall identify the surface-water quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At all monitoring locations in streams, lakes, and impoundments that are potentially impacted or into which water will be discharged and at upstream monitoring locations, the total dissolved solids or specific conductance corrected to 25 C, total suspended solids, pH, total iron, total manganese, and flow shall be monitored. For point-source discharges, monitoring shall be conducted in accordance with 40 CFR Parts 122, 123, and 434 and as required by the National Pollutant Discharge Elimination System permitting authority.
- 3.) The monitoring reports shall be submitted to the Division every 3 months. The Division may require additional monitoring.

Analysis:

Probable Hydrologic Consequences Determination

Division Analysis of Situation

Flooding at Skyline Mine is unique compared to other groundwater inflows at Utah mines. Therefore, the Division took the initiative to begin investigating the situation before this amendment was received. The investigation used information provided in meetings with the Operator, several government sources of hydrologic information, as well as information provided in this proposed amendment. Ground water and surface water were both considered. The intent was to look at the order of magnitude of the situation with reference to the Probable Hydrologic Consequences. Further, the Division is responsible to provide a Cumulative Hydrologic Impact Assessment (CHIA). Anticipating the situation might affect the CHIA, the Division felt justified in pursuing such investigation.

Volume of Groundwater Extracted. The proposed amendment indicates the volume of Electric Lake is 31,500 acre-feet. This figure was previously obtained from Utah Power & Light along with additional information. There is water in the lake that cannot be removed, and this

volume is termed "dead storage". When the dead storage is factored in, U P & L considers the "active storage" of the lake to be 30, 000 acre-feet. While this will vary with annual precipitation, this is the volume typically available for water users below the lake, every year.

Immediately after August 16, 2001, total pumping from the mine was about 8,700 gpm. Presently that has stabilized at about 8,470 gpm. This includes 6,000 gpm into Eccles Creek and 2,470 gpm into Electric Lake. When this total is converted to acre-feet per year the result is 13, 663 ac-ft/ yr. **At this pumping rate, the mine is withdrawing enough groundwater to fill 46% of Electric Lake every year.** ($13,663/30,000 = 0.46$) Since the inflows and pumping will continue for many years, possibly decades over the life of the mine, a great deal of water is involved. Regulations require a determination of possible impacts there may be to springs and streams in the area. For reference, a preliminary estimate of the surface area from which groundwater is being pumped is 4 miles by 4 miles or 16 square miles.

Comparison to Other Mines. Underground mines do NOT want to intercept water. To do so interrupts mining operations and costs time and money to remove the water. Mines do all they can to predict and avoid groundwater. Also, water inflow rates change considerably with time as the mining proceeds into different underground areas. The large inflows to this mine were certainly a surprise and it's believed they could not have been predicted. It was considered appropriate to put into perspective the Skyline Mine inflows as compared to other mines. Typically, underground mines in Utah produce on the order of hundreds of gallons per minute. The following table illustrates the pumping rates of some of the larger water-producing mines in Utah. While they vary with time, these are ongoing or average rates. These rates are compared to the 8,470 gpm currently pumped by Skyline Mine. The point is to demonstrate the water inflows to Skyline Mine are considerably higher than those experienced at any other Utah mine and are probably a record for such inflows.

Mine Name	Approximate Pumping Rate	Skyline Pumping (8,470gpm) is This Many Times Greater
SUFCO	2,430 gpm	3.5 X
Deer Creek	1,500 gpm	5.7 X
Emery Deep	418 gpm	20.3 X
Hiawatha	300 gpm	28.2 X
Cottonwood	250 gpm	33.9 X
Bear Canyon	40 gpm	211.8 X

Stream flow. Eccles Creek is a tributary of Mud Creek. The natural flows in both streams were determined and compared to flows being pumped from Skyline Mine into both streams. U.S. Geological Survey (USGS) records are available for Mud Creek from 1991 to 2000. The mean flow volume of Mud Creek, just below Winter Quarters Canyon, Scofield, UT is 9,120 acre-feet per year. The recording station is located about 1 ½ miles upstream from where Mud Creek enters Scofield Reservoir. The years of record are generally in a wet to very wet weather regime as shown by the Palmer Hydrologic Index for the same 1991 to 2000 time period. Therefore, that flow was reduced 5% to more accurately reflect average conditions. For

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the purposes of this analysis, Mud Creek flows of 8,664 acre-feet per year are used. (0.95 X 9,120 = 8,664)

The only U.S. Geological Survey records available for Eccles Creek were for the years 1980 to 1984. These records were not used since they are not the same time period, are half the length of Mud Creek records, and occur during the most prolonged and most wet period of time since records were begun in 1895. Thus, they are not representative of typical flows and it would not be appropriate to compare these records to those for Mud Creek. Since Eccles Creek is a tributary to Mud Creek, and their watershed drainage characteristics are similar, their drainages areas were compared. USGS records indicate the Mud Creek drainage above the recording station is 29.1 square miles. Using topographic maps it was determined that the Eccles Creek drainage is about 5.3 square miles or 18% ($5.3/29.1 = 0.18$) of the drainage area of Mud Creek. Thus, the stream flow in Eccles Creek would be about 1,587 acre-feet per year. (0.18 X 8,664 = 1,587)

Converting acre-feet per year to gallons per minute shows the mean or average flows to be: Mud Creek 5,371 gpm and Eccles Creek 984 gpm. These flows can be visualized as the constant flow all year long if the naturally varying flows were evened out over the whole year. These flows are compared to the 6,000 gpm pumped from Skyline Mine. Since the pumped quantities are in addition to natural flows, the two are added together.

Stream	Mean Natural Flow	Mean Natural Flow + Mine Pumping	Times Greater Than Natural Flow
Eccles Creek	984 gpm	6,984 gpm	7.1 X
Mud Creek	5,371 gpm	11,371 gpm	2.1 X

With the flow in Eccles Creek 7.1 times the natural flow, stream erosion rates will be much greater than natural rates. While the stream is naturally armored and withstands spring flood flows larger than the combination of mean natural flows and mine pumping, those flows only last about 30- 40 days. The pumped flows continue every day of the year and are added to both high spring runoff and low summer flows. For reference, Eccles Creek slopes about 5% below the mine, and it's about 2.5 miles from the mine to the mouth of Eccles Creek at Mud Creek.

Similarly, with the flow in Mud Creek 2.1 times the natural flow, stream erosion rates would be greater than natural rates. This stream is NOT armored and flows through farmlands having silt soils. The stream meanders a great deal and is quite susceptible to erosion. Importantly, as indicated in the other sections of this Technical Analysis, the Mud Creek valley below the White Oak mine loadout has been determined to be an Alluvial Valley Floor. The Office of Surface Mining made this determination in 1984. Further, this valley is also determined to be Prime Farmland. While the stream withstands spring flood flows larger than the combination of mean natural flows and mine pumping, those flows only last about 30- 40 days. The pumped flows continue every day of the year and are added to both high spring runoff and low summer flows. For reference, Mud Creek slopes about 1% below Eccles Creek, and it's about 2.9 miles from the mouth of Eccles Creek to the gauging station below Winter Quarters

Creek.

The mine Operator is responsible to quantify and prevent potential damage to streams outside the Permit area. The mine-pumped waters should be controlled to prevent such damage. A buried pipeline was used in James Canyon to prevent damage to that stream. Similarly, the amendment indicates, "Several tens of miles of 12 to 22-inch HDPE pipe were laid within the mine to pump water to other active and inactive workings as well as to the surface and Eccles Creek." All this suggests a pipeline be used to carry the pumped water from the mine to Scofield Reservoir. Just as pipelines are used to protect the mine and its resources, such a pipeline would protect Eccles Creek and Mud Creek. Piping the mine-pumped water would allow only natural flows in the stream. For reference, the total distance from the mine to Scofield Reservoir along the road is about 6.8 miles.

Electric Lake. A lengthy and in-depth analysis was made to try to establish whether the mine inflow waters were coming from Electric Lake. The point at which water entered the mine on August 16, 2001 is about 2,300 feet east of the east shoreline of Electric Lake. Such a large water body close to the mine naturally led to such an investigation.

Since the major inflow of 4,500 gpm began on 8/16/01, the time of study was 6/7/2001 to 9/6/2001. The end date was the time of the study. Water surface elevation was compared to lake discharge flows over that time period. The mine discharge was then plotted on the same graph as the above parameters. A cross section from the lake to the wells in James Canyon was drawn to illustrate the physical aspects of the situation. Water surface elevation and lake discharge data was derived from spreadsheets provided by Utah Power & Light; their assistance is greatly appreciated. Although considerable time and effort were expended, the conclusion of the study was, "The overall conclusion of this analysis, both review of curves and slope analysis, appears to be that there's no definitive evidence one way or the other. That is, there's no evidence to suggest or conclude that Skyline Mine flooding IS or IS NOT affecting the rate at which the water surface of Electric Lake declines. As of 9/10/01." This analysis was shared with all stakeholders including the mine Operator, U P & L, water users, and the Forest Service.

Since the analysis results were inconclusive, a method was developed to continue the study. This involved comparing total water volumes in and out of the lake to the total water volume decrease in the lake over the same time period. This would be a kind of "account balance" of water for the lake. It would involve all stream inflows, rainfall, lake discharge, and evaporation. If the account did not balance, this would show a volume of water was unaccounted for and this could be compared to the water volume that came into the mine. Since the Division has limited resources, and several other projects were delayed to get as far as we did in the analysis, the Division did not continue the study. The Division suggested and encouraged Utah Power and Light and the mine Operator continue with the "account balance" analysis. So far, they have not.

Summary. The Division analysis of the above categories indicates, 1) Significant quantities of groundwater are being withdrawn and impacts inside and outside the permit area are unknown, 2) The pumping flows from the mine probably sets a record for Utah coal mines, 3) Mine-pumped water flows in Eccles Creek and Mud Creek pose a risk of damage to those

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streams, and 4) Whether mine inflows are derived from Electric Lake has not been proved or disproved. All of these suggest the situation has the potential to cause harm to the Hydrologic Balance within, and adjacent to, the permit area.

Division Analysis of This Amendment

An Addendum to the PHC, November 2001 is part of the submittal. Also included is Dwg. No. PHC A-1, James Canyon Wells and Monitoring Well Locations. Generally speaking, the addendum is inadequate for the Division to make the Findings required by the regulations. Details of the inadequacies are provided below. Please reference the entire R645-301-728 Probable Hydrologic Consequences (PHC) Determination. In addition, the Division made several calculations independent of this submittal that suggest the situation has the potential to cause harm to the Hydrologic Balance within, and adjacent to, the permit area. See the previous section of this Technical Analysis. Therefore, the Division will require the Operator to provide additional information in several areas. Details of the additional information are provided below. The basis for these Division requirements is contained in three regulations. R645-301-728.335 states "The PHC determination will include findings on: Other characteristics as required by the Division." Similarly, R645-301-731 states, "The Division may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented." Also, R645-301-731.760 states, "Cross Sections and Maps. Each application will contain for the proposed permit area: Other relevant cross sections and maps required by the Division..."

By making these requirements the Division is not suggesting the Operator limit or in any way confine their analysis and evaluation of the flooding situation. The Division is confident in the Operator's abilities and understands they have the best and most in-depth understanding of their mine. Skyline Mine has a very good record of regulatory compliance and the Division expects that to continue. The Operator is strongly encouraged to investigate in any manner they deem appropriate to understand the situation and come up with any needed mitigation plans should they be indicated.

The PHC Addendum begins with a History of Recent Inflows section. The discussion covers the beginning of mine inflows in March 1999 and continues to the latest inflow in August 2001. Locations of the inflows are provided as well as the rates of inflow. Unfortunately the narrative is rather confusing and the Division was not able to sort out just what happened and when. It's not possible to accurately determine just what the flows were on a given date, origin of the flows, nor where those flows were discharged. The Operator must provide a table listing 1) the approximate date each mine inflow and pumping began, 2) each inflow and pumping rate in gpm, 3) source of the water (in-mine location such as 10L, or surface location such as James Canyon wells), 4) destination of the pumped water (such as Mine 1 & 3 abandoned workings, Eccles Creek, or Electric Lake), and 5) cumulative pumping rate for the whole mine over time. The time period covered includes the same time period as the proposed amendment, from before January 1999 to the present. This chart would be similar to the one provided in the amendment for the pumping of water from the James Canyon wells into Electric Lake. Using data in the above table, the Operator, must provide a graph showing the cumulative pumping rate for the whole mine (vertical axis) and dates for those pumping rates (horizontal axis). The text narrative

in the history section will need to be consistent with, and clearly explain the table contents and the graph.

The second section of the addendum is Effects on Ground Water. The section begins with a discussion of spring S35-8, which is located about 3,800 feet North of the James Canyon wells. (See Dwg. No. 2.3.6-1, Location of Hydrologic Monitoring Stations and Dwg. No. PHC A-1, James Canyon Wells and Monitoring Well Locations.) The amendment states, "Specifically, quarterly flow monitoring of seeps and springs in both the James Canyon and Burnout Canyon areas indicate the significant inflows of ground water to the mine and pumping of the wells in James Canyon has not had an observable effect on ground water discharges in these areas." It is not possible to determine that based on the information presented. The discussion to substantiate this centers around comparison of the Palmer Hydrologic Drought Index for the area (Figure PHC A-2) and the flow rate of spring S35-8 (Figure PHC A-1, Spring S35-8). It's very difficult to compare the two graphs since they are on different pages, at different scales, and one is a line graph while the other is a bar chart. Figure PHC A-1 scale is 1 year = 0.41 inch while Figure PHC A-2 scale is 1 year = 0.29 inch. The Operator must provide one graph showing the drought index and S35-8 spring flow at the same time scale and using a line graph for both parameters. The time period would be from 6/1982 to the present. Then provide a text discussion accurately analyzing what the comparison shows.

There are several springs and wells in the mine's Groundwater Monitoring Plan which are likely to shed light on the response of groundwater due to flooding in the mine. Some of these are located along the north-south trending fault complex where all four major water inflows to the mine are located. Others are located west of the permit area in the Flat Canyon Tract where future mining is anticipated. Still others are east of the mine inflow areas. Since only one of the springs has data presented, the Operator must provide one graph for each of the following springs showing the drought index and spring flow at the same time scale and using a line graph for both parameters. The time period would be from June 1982 to the present. Then provide a text discussion accurately analyzing what the comparison shows.

- S22-11
- S26-13
- S34-12
- 2-413
- S15-3
- S36-12
- S24-12

The Operator must provide one graph for each of the following wells showing the drought index and water level elevation at the same time scale and using a line graph for both parameters. The time period would be from June 1982 to the present. Some of the wells do not have records that far back. In those cases, just provide all the available data. Then provide a text discussion accurately analyzing what the comparison shows.

- W22-2 (W79-22-1 & 2)

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- W26-1 (W79-26-1)
- W35-1 (W79-35-1A & 1B)
- W2-1 (W98-2-1)
- W10-1 (W79-10-1A & 1B)
- W-14-2 (S79-14-2A & 2B)
- 99-21-1
- 99-28-1
- 20-4-2

Quarterly monitoring does not provide sufficient data to detect possible impacts to the groundwater from in-mine flows. The 3-month time interval between samples is just too long. There are several springs and wells in the mine's Groundwater Monitoring Plan which are likely to shed light on the response of groundwater due to flooding in the mine. For example, springs S34-12 and 2-413 are closer to the mine inflow area in 10L than is S35-8, and they're east and west of the fault complex believed to be conducting the water. The only spring reported so far is S35-8, and it's on a quarterly basis. Reviewing Dwg. No. 2.3.6-1, Location of Hydrologic Monitoring Stations and locating where the water inflows to the mine have occurred shows several monitoring wells and springs should be monitored on a weekly basis. Chemical testing of the wells and springs water should give an indication of the formations through which the water has been flowing.

The Operator must provide weekly monitoring of the water level in the following wells, starting immediately. For all wells that have already been monitored more often than quarterly, provide all monitoring data collected. Plot the water level versus time on a graph for such wells. Also provide a one-time water chemistry analysis of these well waters as defined by Laboratory Measurements on Table 2.3.7-2 Abbreviated Water Quality Analytical Schedule in the MRP. Provide Stiff Diagrams based on these chemical analyses. Sample the well water after purging at least three times the well casing volume and not more than five times the well casing volume. Also provide a text discussion accurately analyzing what the chemical analysis and monitoring data shows.

- W22-2 (W79-22-1 & 2)
- W26-1 (W79-26-1)
- W35-1 (W79-35-1A & 1B)
- W2-1 (W98-2-1)
- JC-1 & JC-2, both James Canyon wells

The Operator must provide weekly monitoring of spring flow rates for the following springs, starting immediately. For all springs that have already been monitored more often than quarterly, provide all monitoring data collected. Plot the spring flow versus time on a graph for the springs. Also provide one-time water chemistry analysis of these spring waters as defined by Laboratory Measurements on Table 2.3.7-2 Abbreviated Water Quality Analytical Schedule in the MRP. Provide Stiff Diagrams based on these chemical analyses. Also provide a text discussion accurately analyzing what the chemical analysis and monitoring data shows.

- S22-11
- S26-13
- S35-8
- S34-12
- 2-413

The next part of the Effects on Ground Water section discusses flows in Burnout Creek and compares them to the drought index. It's very difficult to compare the two graphs since they are on different pages, at different scales, and one is a line graph while the other is a bar chart. The Operator must provide one graph showing both the drought index and Burnout Creek flows at the same time scale and using a line graph for both parameters. Then provide a text discussion of accurately analyzing what the comparison shows.

Also included in the Addendum is FIGURE PHC A-4, BURNOUT CANYON WELLS, W79-35-1A & W79-35-1B, which shows the water levels versus time for the two wells. Also included is FIGURE PHC A-5, MONITOR WELL 98-2-1M, which shows the water level versus time for that well. The title of Figure PHC A-5 probably should not contain the letter "M" as there is no such reference in the text. Also, the text describes the water levels in W2-1 (98-2-1) beginning in October 1998 while FIGURE PHC A-5, MONITOR WELL 98-2-1M shows the well water elevations beginning on 5/29/01. The Operator needs to provide an additional graph showing the water levels of W2-1 (98-2-1) from October 1998 to the present time. While the two graphs of the monitoring wells provide good information, it's important to simultaneously show how the water levels in all three monitoring wells vary with time. The Operator needs to provide a graph showing the water levels in all three monitoring wells from 7/15/1982 to the present. The discussion on page PHC A-10 indicates, "the water level in W2-1 is dropping at a rate of approximately 0.3 feet per day." Examination of FIGURE PHC A-5, MONITOR WELL 98-2-1M shows the rate to be 0.53 feet per day. The discrepancy between the text slope of 0.3 feet per day and the Figure PHC A-5 slope of 0.53 feet per day needs to be resolved.

The next part of the Effects on Ground Water section, pages PHC A-7 & PHC A-8, is a lengthy text description of the monitoring wells, initial and subsequent water levels in those wells, the geologic formations and characteristics, fault systems, water inflow locations to the mine, and several other characteristics of the situation. Similarly, page PHC A-2 has text describing the same features related to the wells in James Canyon. The use of text only to describe the physical layout of these characteristics is simply too confusing. It's not possible to see any item in relation to other items, much less reason out any connection or cause and effect to the relationships. Also, various portions of the text and the figures use different designations for the same well. This adds to the confusion. The Operator must use a consistent naming convention in the text and on all figures and maps to designate all monitoring wells. Preferably, this would include all designations for a well being used each time.

Monitoring wells W2-1 and W79-35-1 A & B, and the James Canyon wells lay along a straight line that runs north-south between them. Further, they are coincident with known and projected fault systems believed to be conducting the water. Comparing the text and Dwg. No. PHC A-1 shows the location of the four mine water inflow points all lie along that line and its

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extension to the north-northwest. Given the above considerations, the Operator must provide a cross section drawing along the monitoring wells and the James Canyon wells. The drawing should be at least the size of Dwg. No. PHC A-1 and show the elements listed below. Then provide a text discussion accurately analyzing what the cross section shows in terms of groundwater sources for each of the mine inflows. Include potential impacts to the groundwater, springs, and streams due to water inflows to the mine and pumping in James Canyon.

- Make the cross-section along lines connecting wells W22-2 (W79-22-1&2), W35-1 (W79-35-1A&1B), JC-1, JC-2, and W2-1 (W98-2-1)
- Exaggerated vertical scale with elevations and distances shown on both scales.
- The topographic ground surface shape.
- All geologic formations, including thickness, name, and other relevant information. Show strike and dip for each formation as it is along the cross section.
- All known faults and all inferred/suspected faults.
- Coal seams, showing their thickness and name. Number the mines in each seam.
- All mine water inflow locations with an approximate horizontal distance from the cross section east or west to actual mine inflow location. Include inflow elevations in the mine.
- Springs S35-8, S22-1, S26-13, & S34-12, locations with an approximate horizontal distance from the cross section east or west to the actual spring location
- All monitoring wells including surface elevation and completion elevation.
- Both James Canyon wells including surface elevation and completion elevation.
- Approximate potentiometric surface elevation before elevated mine inflows occurred. That is, before January 1999. See the MRP, Dwg. No. 2.3.4-2 and Dwg. No. 2.3.4-1 Fence Diagram: Water Monitoring Wells Skyline Mine, which has water elevations of the wells as of 12/13/91. Include the approximate dates along that surface
- Approximate potentiometric surface, as it exists at the latest well elevation readings. Include the approximate dates along that surface.
- Other elements, features, and information that would help define past and present ground water conditions as they relate to the in-mine flooding situation.

Dwg. No. PHC A-1, James Canyon Wells and Monitoring Well Locations shows numerous green circles that lie along the cross section described above. They have designations such as 74-35-1, 75-34-2, 75-27-1, and 83-22-1 and are believed to be exploration holes. The Operator must provide all information from these holes that could aid in determining the geology and groundwater conditions.

Pages 2.99 (a) and PHC A-14 of the amendment indicates the wells in James Canyon “may be operated for the life of the mine”. Further, it states, “the wells may be operated ... until the potentiometric surface of the aquifer has dropped below the mined coal seams.” Otherwise the amendment contains no indication if or when water pumping from the mine and James Canyon will end. As indicated by the Division Analysis of Situation described earlier, very large quantities of water are involved and there is potential for damage to the Hydrologic Balance. As required by regulation, the Operator must determine “whether adverse impacts may occur to the Hydrologic Balance” and the effect on “Ground-water and surface-water availability”. This should include an estimate of if and when mine inflows will decrease and to what levels.

The amendment includes an excellent record of the waters pumped from the two wells in James Canyon. Table PHC A-1 lists the Day (Date) Hours, GPM, Daily Gallons, Cumulative Gallons, and Cumulative Acre-Feet for those wells. Unfortunately, no such record is available for the discharges being made into Eccles Creek. In order to have a complete record of water volumes discharged by the mine, the Operator must implement a method of monitoring the water flow volumes discharged by in-mine pumping into Eccles Creek. The daily monitoring and tracking should be the same as that done for the James Canyon wells.

Page PHC A-12 and 13 indicate, "The quality of the (James Canyon well) water is similar to the water of James, Huntington, Swen's and Little Swen's Creeks, the major tributaries to Electric Lake." No data is provided to substantiate this statement. The Operator needs to provide water quality data to compare the water from these sources.

During meetings with the Division, the Operator committed to test the mine inflow waters to determine their age. That is, to determine whether they were of geologically old origin or recent meteoric origin. This will provide an indication of the source of the inflow waters. Later conversations indicated such tests were performed. No water age data was included in the amendment. The Operator must provide age date testing of the mine inflow waters. This should include all inflow points in the mine (16L, 14L, 9L, & 10L) and the water being pumped from both James Canyon wells (JC-1 & JC-2).

Before drilling the wells in James Canyon the Operator had to make preliminary calculations to determine the size of the well casing and the pump capacity. Often wells are subjected to drawdown tests to confirm the pumps are working as intended. The Operator must provide the Division with all information developed for the James Canyon wells which provide insight to the drawdown of the well, transmissivity of the water-bearing strata and fault system, and other information related to groundwater flow at the wells location.

Findings:

The proposed amendment does not meet regulatory requirements. Accordingly, the Permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

R645-301-728 and -731, The information provided in the submittal is not adequate for the Division to make the Findings required by the regulations. Therefore, additional information needs to be submitted. The Operator is free to, and is strongly encouraged to investigate in any manner they deem appropriate to understand the flooding and Probable Hydrologic Consequences situation and come up with any needed mitigation plans should they be indicated. In addition to the information requested below, the Operator may wish to provide other equivalent data and analysis.

R645-728.335, -731, and -731.760, 1) The Operator must provide a table listing **A)** the approximate date each mine inflow and pumping began, **B)** each inflow and

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pumping rate in gpm, C) source of the water (in-mine location such as 10L, or surface location such as James Canyon wells), D) destination of the pumped water (such as Mine 1 & 3 abandoned workings, Eccles Creek, or Electric Lake), and E) cumulative pumping rate for the whole mine over time. 2) Using data in the above table the Operator, must provide a graph showing the cumulative pumping rate for the whole mine (vertical axis) and dates for those pumping rates (horizontal axis). The text narrative in the history section will need to be consistent with, and clearly explain the table contents and the graph. 3) The Operator must provide one graph showing the drought index and S35-8 spring flow at the same time scale and using a line graph for both parameters. The time period would be from 6/1982 to the present. Then provide a text discussion accurately analyzing what the comparison shows

R645-728.335, -731, and -731.760, 4) The Operator must provide one graph for each of the following springs showing the drought index and spring flow at the same time scale and using a line graph for both parameters. The time period would be from June 1982 to the present. Then provide a text discussion accurately analyzing what the comparison shows. The springs are: S22-11, S26-13, S34-12, 2-413, S15-3, S36-12, and S24-12

R645-728.335, -731, and -731.760, 5) The Operator must provide one graph for each of the following wells showing the drought index and water level elevation at the same time scale and using a line graph for both parameters. The time period would be from 6/1982 to the present. Some of the wells do not have records that far back. In those cases, just provide all the available data. Then provide a text discussion accurately analyzing what the comparison shows. The wells are: W22-2 (W79-22-1 & 2), W26-1 (W79-26-1), W35-1 (W79-35-1A & 1B), W2-1 (W98-2-1), W10-1 (W79-10-1A & 1B), W-14-2 (S79-14-2A & 2B), 99-21-1, 99-28-1, and 20-4-2

R645-728.335, -731, and -731.760, 6) The Operator must provide weekly monitoring of the water level in the following wells, starting immediately. For all wells that have already been monitored more often than quarterly, provide all monitoring data collected. Plot the water level versus time on a graph for such wells. Also provide a one-time water chemistry analysis of these well waters as defined by Laboratory Measurements on Table 2.3.7-2 Abbreviated Water Quality Analytical Schedule in the MRP. Sample the well water after purging at least three times the well casing volume and not more than five times the well casing volume. Provide Stiff Diagrams based on these chemical analyses. Also provide a text discussion accurately analyzing what the chemical analysis and monitoring shows. The wells are: W22-2 (W79-22-1 & 2), W26-1 (W79-26-1), W35-1 (W79-35-1A & 1B), W2-1 (W98-2-1), and JC-1 & JC-2, both James Canyon wells

R645-728.335, -731, and -731.760, 7) The Operator must provide weekly monitoring of spring flow rates for the following springs, starting immediately. For all springs that have already been monitored more often than quarterly, provide all

monitoring data collected. Plot the spring flow versus time on a graph for such springs. Also provide one-time water chemistry analysis of these spring waters as defined by Laboratory Measurements on Table 2.3.7-2 Abbreviated Water Quality Analytical Schedule in the MRP. Provide Stiff Diagrams based on these chemical analyses. Also provide a text discussion accurately analyzing what the chemical analysis and monitoring shows. The springs are: S22-11, S26-13, S35-8, S34-12, and 2-413

R645-728.335, -731, and -731.760, 8) The Operator must provide one graph showing both the drought index and Burnout Creek flows at the same time scale and using a line graph for both parameters. Then provide a text discussion of accurately analyzing what the comparison shows. **9)** The title of Figure PHC A-5 probably should not contain the letter "M" as there is no such reference in the text. **10)** The Operator needs to provide an additional graph showing the water levels of W2-1 (98-2-1) from October 1998 to the present time. **11)** The Operator needs to provide a graph showing the water levels in all three monitoring wells, W79-35-1A & W79-35-1B, & 98-2-1, from 7/15/1982 to the present. **12)** The discrepancy between the text slope of 0.3 feet per day and the Figure PHC A-5 slope of 0.53 feet per day needs to be resolved. **13)** The Operator must use a consistent naming convention in the text and on all figures and maps to designate all monitoring wells. Preferably, this would include all designations for a well being used each time

R645-728.335, -731, and -731.760, 14) The Operator must provide a cross section drawing along the monitoring wells and the James Canyon wells. The drawing should be at least the size of Dwg. No. PHC A-1 and show the elements listed below. Then provide a text discussion accurately analyzing what the cross section shows in terms of groundwater sources for each of the mine inflows. Include potential impacts to the groundwater, springs, and streams due to water inflows to the mine and pumping in James Canyon. **A)** Include wells W22-2 (W79-22-1&2), W35-1 (W79-35-1A&1B), JC-1, JC-2, and W2-1 (W98-2-1); **B)** Exaggerated vertical scale with elevations and distances shown on both scales; **C)** The topographic ground surface shape; **D)** All geologic formations, including thickness, name, and other relevant information. Show strike and dip for each formation as it is along the cross section; **E)** All known faults and all inferred/suspected faults; **F)** Coal seams, showing their thickness and name. Number the mines in each seam; **G)** All mine water inflow locations with an approximate horizontal distance from the cross section east or west to actual mine inflow location; **H)** Springs S35-8, S22-1, S26-13, & S34-12, locations with an approximate horizontal distance from the cross section east or west to actual mine inflow location; **I)** All monitoring wells including surface elevation and completion elevation; **J)** Both James Canyon wells including surface elevation and completion elevation; **K)** Approximate potentiometric surface elevation before elevated mine inflows occurred. That is, before January 1999. See the MRP, Dwg. No. 2.3.4-2 and Dwg. No. 2.3.4-1 Fence Diagram: Water Monitoring Wells Skyline Mine, which has water elevations of the wells as of 12/13/91.

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Include the approximate dates along that surface; **L)** Approximate potentiometric surface, as it exists at the latest well elevation readings. Include the approximate dates along that surface; and **M)** Other elements, features, and information that would help define past and present ground water conditions as they relate to the in-mine flooding situation.

R645-728.335, -731, and -731.760, 15) The Operator must provide all information from holes, 74-35-1, 75-34-2, 75-27-1, and 83-22-1, that could aid in determining the geology and groundwater conditions. **16)** The Operator must determine “whether adverse impacts may occur to the Hydrologic Balance” and the effect on “Ground-water and surface-water availability”. This should include an estimate of if and when mine inflows will decrease and to what levels. **17)** The Operator needs to provide water quality data from James, Huntington, Swen’s and Little Swen’s Creeks and the James Canyon wells to compare the water from these sources. **18)** The Operator must implement a method of monitoring the water flow volumes discharged by in-mine pumping into Eccles Creek. The monitoring and tracking should be the same as that done for the James Canyon wells. **19)** The Operator must provide age date testing of the mine inflow waters. This should include all inflow points in the mine (16L, 14L, 9L, & 10L) and the water being pumped from both James Canyon wells (JC-1 & JC-2). **20)** The Operator must provide the Division with all information developed for the James Canyon wells which provide insight to the draw down of the well, transmissivity of the water-bearing strata and fault system, and other information related to groundwater flow at the wells location. **21)** Report all weekly monitoring data on a monthly basis, submitting the data in the first week of the following month. **22)** For all data submittals outlined in this Technical Analysis, provide paper copies of the graphs, charts, and tables AND also provide an electronic copy (magnetic disk or CD) of those data submittals.



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FISH AND WILDLIFE INFORMATION

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

Minimum Regulatory Requirements:

Protection and enhancement plan

Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface coal mining and reclamation operations and how enhancement of these resources will be achieved where practicable. This description shall apply, at a minimum, to species and habitats identified. The description shall include: protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, and the monitoring of surface water quality and quantity; and, enhancement measures that will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the placement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

Each operator shall, to the extent possible using the best technology currently available: ensure that electric powerlines and other transmission facilities used for, or incidental to, underground mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Division determines that such requirements are unnecessary; locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law; design fences, overland conveyors, and other potential barriers to permit passage for large mammals except where the Division determines that such requirements are unnecessary; and, fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

Wetlands and habitats of unusually high value for fish and wildlife

The operator conducting underground mining activities shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Underground mining activities shall avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Analysis:

Protection and Enhancement Plan

The recommended seasonal buffer for the goshawk and red-tailed hawk is March 1 to August 15. Assuming operations continue as reported no protection plan will be required in James Canyon further than keeping the road gated and locked (page 2-99(a)) to restrict public access. The Forest Service has stated keeping the gate locked is sufficient to protect raptor nests in near by canyons.

The MRP (page 2-71) commits to conducting macroinvertebrate studies and fish studies in James Creek for 2 years beginning in October 2000 and then every three years thereafter. This should identify any slow degradation of the creek due to sedimentation, should it occur.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

The MRP states that low flows in Eccles Creek are often 2 cfs in late summer and fall and high flows seldom exceed 50 cfs (page 2-65). Current discharges are 13 to 20 cfs into Eccles

Creek. Eccles Creek is a tributary to Mud Creek and Mud Creek flows directly into Scofield Reservoir. Scofield Reservoir is: 1) A culinary water source, 2) One of the top four trout fishing lakes in Utah, and 3) Has over a one million dollar recreational fishing value².

An addendum to the PHC dated November 2001 (author's not provided) states (page PHC A-15) that, "Significant erosion has not been noted in the stream channel. However, if the high discharge volumes continue, erosion of the stream channel will occur at a rate faster than would occur without the mine water discharge. Since the stream channel is well armored and vegetated, increased bank erosion should still occur only at a very slow rate. The Mud Creek channel will need to be monitored closely for increased rates of erosion. Mitigation efforts may be required for both streams if significant erosion is observed".

Determining the rate and extent of bank erosion in Eccles and Mud Creek due to the mine water discharge will be difficult. Staffs at DWR have also expressed concern that increase flow will cause further stream bank erosion in Mud Creek. The application must describe:

1. How the Operator will avoid or minimize disturbance and adverse impacts to fish and related environmental values during coal mining in Eccles and Mud Creek.
2. How enhancement and restoration of Eccles and Mud Creek will be achieved.
3. Protective measures to Eccles and Mud Creek during mining.

Findings:

Information provided in the application is not considered adequate to meet the minimum Fish and Wildlife requirements of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-130, The names of the persons or organizations that collected and analyzed the PHC data and their qualifications must be provided

R645-301-333, The application must describe: 1) How the Operator will avoid or minimize disturbance and adverse impacts to fish and related environmental values during coal mining in Eccles and Mud Creek. 2) How enhancement and restoration of Eccles and Mud Creek will be achieved. 3) Protective measures to Eccles and Mud Creek during mining.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR 817.22; R645-301-230.

Minimum Regulatory Requirements:

Topsoil removal and storage

All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. Where the topsoil is of insufficient quantity or of poor quality for sustaining vegetation, the selected overburden materials approved by the Division for use

² E-mail from Louis Berg to Susan White dated February 4, 2002.

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as a substitute or supplement to topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. If topsoil is less than 6 inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

The Division may choose not to require the removal of topsoil for minor disturbances which occur at the site of small structures, such as power poles, signs, or fence lines; or, will not destroy the existing vegetation and will not cause erosion.

All materials shall be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

Selected overburden materials may be substituted for, or used as a supplement to, topsoil if the operator demonstrates to the Division that the resulting soil medium is equal to, or more suitable for sustaining vegetation than, the existing topsoil, and the resulting soil medium is the best available in the permit area to support revegetation.

Materials removed shall be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas. Stockpiled materials shall: be selectively placed on a stable site within the permit area; be protected from contaminants and unnecessary compaction that would interfere with revegetation; be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and, not be moved until required for redistribution unless approved by the Division.

Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials would be detrimental to the quality or quantity of those materials, the Division may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that: such action will not permanently diminish the capability of the topsoil of the host site; and, the material will be retained in a condition more suitable for redistribution than if stockpiled.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the above requirements if it finds that such subsoil layers are necessary to comply with the revegetation.

Analysis:

Removal and Storage

Drawing #1.6-3 shows the site location. Plate #3.4-1 shows the location of the well site and topsoil storage pile along the road.

The power cable is buried in the road in James Canyon in the SW1/4 SE1/4 of Section 25, T13 South R6 East. The present configuration of the road is 19 feet wide with ditches on both sides. The ditches have 1:1 side slopes. There is four inches of road base on the roads (IB01I-1). The power line was buried 30 – 40 inches deep, in an eight-inch wide trench (page 2-120 j). Power cable was laid in the bottom of the trench and the trench was backfilled.

The buried power line runs from the power pole for a distance of 4,400 feet along the James Canyon road (page 3-63a)) to the well site (a total distance of approximately 1.2 miles). DWG 1.6-3 indicates that a portion of the James Canyon road was not initially in the permit area, but was incorporated into the permit area as a result of this activity.

Stipulations were placed on the power cable installation and burial by the U.S. Forest Service in a letter to Mary Ann Wright of the Division, dated October 15, 2001, and signed by Elaine Zieroth, Forest Supervisor. For the portion of the power cable burial falling within the mine permit boundary, the following soils issues were stipulated by the Forest Service:

- typical details showing the depth of burial and trench relative to the road,
- plan for protecting the topsoil berm on the outer edge of the road, and

- seeding of the topsoil berm and cutslope of the road prior to winter.

The submittal describes the trench, but does not include typical details, or information on topsoil berm protection. Page 4-30 states, "soil was removed from the road surface and pushed to the side for use as a temporary berm." The topsoil was stored in a berm approximately 2 feet four inches high (as shown in cross-sections on pages 3-63 c -f) along the outslope of the road, seeding of the berm was not mentioned. During reclamation of the road (page 4.30a) the berm will become the topsoil, so protection during operations is quite critical.

The 16-inch polypipe is buried for a distance of about a half-mile along the James Canyon road from the drill site to the dewatering site at Electric Lake. The Permittee verbally³ indicated that there might be up to eighteen inches of topsoil salvaged in places and only four inches in others and that instructions to the equipment operator would be to salvage all soils down to the cobbly/massive layer. Development of the well site is described on page 3-63 (a). The site includes a drill pad (100' X 200'), sediment pond, undisturbed drainage ditch and 18-inch culvert. Two water wells were drilled, JC-1 and JC-2.

The plan indicates that the Permittee stripped the top few inches of soil on the flat portions of the road (page 2-120 j). The subsoil was removed to a depth of three feet. The soil survey (Appendix 2) reports that in the vicinity of the well site, the topsoil is between 16 and 24 inches in depth (Aspen soil). For the 20,000 square foot area of the well site, there would have been approximately 30,000 to 40,000 cubic feet of available topsoil or approximately 1,000 cubic yards of topsoil salvaged and stored on site. However, the plan reports that 100 yards of topsoil is stored at the staging area in a pile that is 50'x11'x5' deep (page 2-120 f). That is only ten percent of the available topsoil. No explanation for the reduced amount of topsoil has been provided. The Division would assume that the reduction in material is due to the previous disturbance of the site, however, the soil survey was conducted on the disturbed soils, so that can not be the explanation.

Findings:

Information provided with the submittal is not adequate for the purposes of Operations Topsoil and Subsoil handling requirements of the Regulations. Prior to approval, the Permittee must provide the following information in accordance with:

- R645-301-230, 1)** Include in the submittal typical details for power line cable burial and information on topsoil berm protection along the James Canyon road from the Monument Peak road to the drill site, as per U.S. Forest Service letter to Mary Ann Wright of the Division, dated October 15, 2001, signed by Elaine Zieroth, Forest Supervisor. **2)** Clearly indicate the depth of topsoil removal and replacement along the length of the polypipe installation. **3)** Provide an explanation for the limited amount of topsoil salvaged and stored for reclamation of the site.

³ Personal Communication on 9/25/01 with Chris Hansen, Environmental Coordinator for the Skyline Mine.

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SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Minimum Regulatory Requirements:

Impounding structures

New and existing impounding structures constructed of coal mine waste or intended to impound coal mine waste shall meet the requirements for coal mine waste.

Coal mine waste shall not be used for construction of impounding structures unless it has been demonstrated to the Division that the stability of such a structure conforms to the requirements of this part and that the use of coal mine waste will not have a detrimental effect on downstream water quality or the environment due to acid seepage through the impounding structure. The stability of the structure and the potential impact of acid mine seepage through the impounding structure shall be discussed in detail in the design plan submitted to the Division.

Each impounding structure constructed of coal mine waste or intended to impound coal mine waste shall be designed, constructed, and maintained in accordance with the requirements for temporary impoundments. Such structures may not be retained permanently as part of the approved postmining land use.

Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of 30 CFR Sec. 77.216(a) shall have sufficient spillway capacity to safely pass, adequate storage capacity to safely contain, or a combination of storage capacity and spillway capacity to safely control, the probable maximum precipitation of a 6-hour precipitation event, or greater event as specified by the Division. Spillways and outlet works shall be designed to provide adequate protection against erosion and corrosion. Inlets shall be protected against blockage.

Runoff from areas above the disposal facility or runoff from the surface of the facility that may cause instability or erosion of the impounding structure shall be diverted into a stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour design precipitation event.

Impounding structures constructed of or impounding coal mine waste shall be designed and function so that at least 90 percent of the water stored during the design precipitation event can be removed within a 10-day period.
Burning and burned waste utilization

Coal mine waste fires shall be extinguished by the person who conducts the surface mining activities, in accordance with a plan approved by the Division and the Mine Safety and Health Administration. The plan shall contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, shall be involved in the extinguishing operations. No burning or unburned coal mine waste shall be removed from a permitted disposal area without a removal plan approved by the Division. Consideration shall be given to potential hazards to persons working or living in the vicinity of the structure.

Analysis:

Impounding Structures

A sediment pond was constructed at the drill site. The pond would have served to capture the drilling fluids produced during well development.

Findings:

Information provided with the submittal is not adequate for the purposes of Operations Spoil and Waste Materials handling requirements of the Regulations. Prior to approval, the Permittee must provide the following information in accordance with:

R645-301-553.300, Provide a soil sample of the sediments in the pond prior to reclamation of the site.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Minimum Regulatory Requirements:

Diversions: General

With the approval of the Division, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the Division.

The diversion and its appurtenant structures shall be designed, located, constructed, and maintained to: be stable; provide protection against flooding and resultant damage to life and property; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, comply with all applicable local, State, and Federal laws and regulations.

Temporary diversions shall be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored. Before diversions are removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required.

A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat. The Division may specify additional design criteria for diversions.

Diversions: Perennial and intermittent streams

Diversion of perennial and intermittent streams within the permit area may be approved by the Division after making the finding relating to stream buffer zones that the diversions will not adversely affect the water quantity and quality and related environmental resources of the stream. The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion. The design and construction of all stream channel diversions of perennial and intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards and any design criteria set by the Division.

Diversions: Miscellaneous flows

Diversion of miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the Division. Miscellaneous flows shall include ground-water discharges and ephemeral streams. The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the general performance standards of this section. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

Sediment control measures

Appropriate sediment control measures shall be designed, constructed, and maintained using the best technology currently available to: prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area; meet the more stringent of applicable State or Federal effluent limitations; and, minimize erosion to the extent possible.

Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas shall reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include

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but are not limited to: disturbing the smallest practicable area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation; stabilizing the backfilled material to promote a reduction of the rate and volume of runoff; retaining sediment within disturbed areas; diverting runoff away from disturbed areas; diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion; using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment; treating with chemicals; and, treating mine drainage in underground sumps.

Siltation Structures: Sedimentation ponds

Sedimentation ponds, when used, shall: be used individually or in series; be located as near as possible to the disturbed area and out of perennial streams unless approved by the Division; and, be designed, constructed, and maintained to:

- 1.) Provide adequate sediment storage volume;
- 2.) Provide adequate detention time to allow the effluent from the ponds to meet State and Federal effluent limitations;
- 3.) Contain or treat the 10-year, 24-hour precipitation event ("design event") unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and on a demonstration by the operator that the effluent limitations will be met;
- 4.) Provide a nonclogging dewatering device adequate to maintain the required time;
- 5.) Minimize, to the extent possible, short circuiting;
- 6.) Provide periodic sediment removal sufficient to maintain adequate volume for the design event;
- 7.) Ensure against excessive settlement;
- 8.) Be free of sod, large roots, frozen soil, and acid- or toxic-forming coal-processing waste; and
- 9.) Be compacted properly.

A sedimentation pond shall include either a combination of principal and emergency spillways or a single open-channel spillway configured as specified in this section, designed and constructed to safely pass the applicable design precipitation event. The Division may approve a single open-channel spillway that is: of nonerodible construction and designed to carry sustained flows; or earth- or grass-lined and designed to carry short-term infrequent flows at non-erosive velocities where sustained flows are not expected.

The required design precipitation event for a sedimentation pond meeting the spillway requirements of this section is: for a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 100-year 6-hour event, or greater event as specified by the Division; or, for a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as specified by the Division.

In lieu of meeting the above spillway requirements, the Division may approve a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or, as applicable, a qualified registered professional land surveyor that; the sedimentation pond will safely control the design precipitation event; the water from which shall be safely removed in accordance with current, prudent, engineering practices; and, such a sedimentation pond shall be located where failure would not be expected to cause loss of life or serious property damage. If the sediment pond is located where failure would be expected to cause loss of life or serious property damage, a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event may be allowed if, in addition to the design event, is: in the case of a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the Division; or, in the case of a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Division.

Analysis:

Diversions

The undisturbed drainage ditch above the drill pad is designed using the appropriate 10-year, 6-hour storm. It has 2:1 side slopes and 0.30 foot of freeboard. With a water velocity below 5 feet per second, it does not require riprap. The 18-inch culvert at the east end of the drill pad was designed to handle the same storm. The ditch flows into the culvert. There is no indication of riprap or other erosion control methods at the culvert outlet and this must be provided to prevent sediment from being added to James Creek.

Sediment Control Measures

Page 3-72 (c) describes Alternate Sediment Control Area 35 & 36 in a confusing manner. The reclaimed buried pipeline area below the James Canyon wells is quite unlike the active road above the wells. They should each have a separate designation and a separate description. The description should include a design for the ditch carrying the water along the active road.

Sedimentation Ponds

The sediment pond at the lower end of the drill pad has been designed as a full-containment pond. The 10-year, 24-hour design storm is appropriate. It has a volume of 0.08 acre-feet while the pond has a capacity of 0.24 acre-feet. The pond is fully lined with a sheet material.

Findings:

The proposed amendment does not meet regulatory requirements. Accordingly, the Permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

R645-301-742, There is no indication of riprap or other erosion control methods at the culvert outlet on the east side of the James Canyon well pad and this must be provided to prevent sediment from being added to James Creek.

R645-301-121.300, Page 3-72 (c) describes Alternate Sediment Control Area 35 & 36 in a confusing manner. The reclaimed buried pipeline area that is located below the James Canyon wells is quite unlike the active road above the wells. They should each have a separate designation and a separate description. The description should include a design for the ditch carrying the water along the active road.

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GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Minimum Regulatory Requirements:

Provide a plan for the reclamation of the lands within the proposed permit area, showing how the applicant will comply with the regulatory program and the environmental protection performance standards. The plan shall include, at a minimum, contain the following information for the proposed permit area: a detailed timetable for the completion of each major step in the reclamation plan; a detailed estimate of the cost of the reclamation of the proposed operations required to be covered by a performance bond, with supporting calculations for the estimates; a plan for backfilling, soil stabilization, compacting, and grading, with contour maps or cross sections that show the anticipated final surface configuration of the proposed permit area; a plan for redistribution of topsoil, subsoil, and other material along with a demonstration of the suitability of topsoil substitutes or supplements shall be based upon analysis of the thickness of soil horizons, total depth, texture, percent coarse fragments, pH, and areal extent of the different kinds of soils; other chemical and physical analyses, field-site trials, or greenhouse tests if determined to be necessary or desirable to demonstrate the suitability of the topsoil substitutes or supplements may also be required; a plan for revegetation including, but not limited to, descriptions of the schedule of revegetation, species and amounts per acre of seeds and seedlings to be used, methods to be used in planting and seeding, mulching techniques, irrigation, if appropriate, and pest and disease control measures, if any, measures proposed to be used to determine the success of revegetation, and, a soil testing plan for evaluation of the results of topsoil handling and reclamation procedures related to revegetation; a description of the measures to be used to maximize the use and conservation of the coal resource; a description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of accordingly and a description of the contingency plans which have been developed to preclude sustained combustion of such materials; a description, including appropriate cross sections and maps, of the measures to be used to seal or manage mine openings, and to plug, case, or manage exploration holes, other bore holes, wells, and other openings within the proposed permit area; and, a description of steps to be taken to comply with the requirements of the Clean Air Act, the Clean Water Act, and other applicable air and water quality laws and regulations and health and safety standards.

Analysis:

As per the (undated) Addition to the U.S. Department of Agriculture Forest Service Special Use Permit dated October 21, 1976, the road surface from well site to Electric Lake was restored to its pre-trench condition. During final reclamation, the trench will be excavated for a distance of 100 feet (at both ends) and the pipe will be plugged at both ends with cement. Soil excavated from the trench will be replaced so that the surface soil is on top again.

Findings:

The Permittee has met the minimum requirements for this section.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

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

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Minimum Regulatory Requirements:

Where wetlands and habitats of unusually high value for fish and wildlife occur, the operator conducting underground mining activities shall provide a description of the measures taken to avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Designs and plans for underground mining activities shall include measures to avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas shall be selected on the basis of the following criteria:

- 1.) Their proven nutritional value for fish or wildlife.
- 2.) Their use as cover for fish or wildlife.
- 3.) Their ability to support and enhance fish or wildlife habitat after the release of performance bonds. The selected plants shall be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

Where cropland is to be the postmining land use, and where appropriate for wildlife- and crop-management practices, the operator shall intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals.

Where residential, public service, or industrial uses are to be the postmining land use and where consistent with the approved postmining land use, the operator shall intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

Analysis:

Fish and Wildlife enhancement measures during reclamation for the James Canyon road, pipeline, and well are not addressed. Enhancement measures could include shrub plantings or other methods of enhancement. The State's Lone Peak Nursery custom grows specific species provided sufficient lead time. Information can be obtained from: http://www.nr.utah.gov/slf/Forestry%20Fire%20&%20State%20Lands_files/lonepeak/Home2.htm
Bitterroot Restoration at: http://www.revegetation.com/BRIWeb/plant_prop.html also contract grows plants.

Because the pipeline burial reclamation was done prior to resolution of the deficiencies, no surface mulch was used. Since James Canyon is critical breeding habitat for the Yellowstone cutthroat this area will need to be observed in the spring and remedial action taken if erosion is noticed. Surface mulch must be used in reclamation of the road and pipeline.

Findings:

Prior to approval, the Permittee must provide the following information in accordance with:

R645-301-342.100, Fish and wildlife enhancement measures used during reclamation must be described.

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TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR 817.22; R645-301-240.

Minimum Regulatory Requirements:

Redistribution

Topsoil materials shall be redistributed in a manner that: achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems; prevents excess compaction of the materials; and, protects the materials from wind and water erosion before and after seeding and planting.

Before redistribution of the material, the regarded land shall be treated if necessary to reduce potential slippage of the redistribution material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

The Division may choose not to require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or of roads if it determines that placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation, and, such embankments will be otherwise stabilized.

Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the vegetative cover.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, removed and segregated, stockpiled, be redistributed as subsoil in accordance with the requirements of the above if it finds that such subsoil layers are necessary to comply with the revegetation requirements.

Analysis:

Redistribution

The reclamation plan for the James Canyon Road and Drill Pad is outlined on page 4-30a:

- The topsoil (berm) will be "set aside."
- The gravel road surface will be pushed to the inside of the road cut.
- The road outslope of the road will be pulled up onto the road.

The average depth of topsoil and subsoil replacement is not indicated.

Findings:

Information provided with the submittal is not adequate for the purposes of Operations Topsoil and Subsoil handling requirements of the Regulations. Prior to approval, the Permittee must provide the following information in accordance with:

R645-301-240, Please provide the average replacement depth for topsoil and subsoil for all locations of the disturbance: staging area, road, well site, and sediment pond.

REVEGETATION

Regulatory Reference: 30 CFR 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Minimum Regulatory Requirements:

Revegetation: General requirements

The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is: diverse, effective, and permanent; comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division; at least equal in extent of cover to the natural vegetation of the area; and, capable of stabilizing the soil surface from erosion.

The reestablished plant species shall: be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and, meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The Division may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

When the Division approves a cropland postmining land use, the Division may grant exceptions to the requirements related to the original and native species of the area. Areas identified as prime farmlands must also meet those specific requirements as specified under that section.

Revegetation: Timing

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

Revegetation: Mulching and other soil stabilizing practices

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Division may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

Revegetation: Standards for success

Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements for Revegetation. Standards for success and statistically valid sampling techniques for measuring success shall be selected by the Division and included in an approved regulatory program.

Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when it is not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., a one-sided test with a 0.10 alpha error).

Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

- 1.) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 2.) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 3.) For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows: minimum stocking and planting arrangements shall be specified by the

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Division on the basis of local and regional conditions and after consultation with and approval by the State agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may occur on either a programwide or a permit-specific basis; trees and shrubs that will be used in determining the success of stocking and the adequacy of the plant arrangement shall have utility for the approved postmining land use. Trees and shrubs counted in determining such success shall be healthy and have been in place for not less than two growing seasons. At the time of bond release, at least 80 percent of the trees and shrubs used to determine such success shall have been in place for 60 percent of the applicable minimum period of responsibility; and, vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

For areas previously disturbed by mining that were not reclaimed to the requirements of the performance standards and that are remined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the Division.

In areas of more than 26.0 inches of annual average precipitation, the period of responsibility shall continue for a period of not less than five full years. Vegetation parameters identified for grazing land or pasture land and cropland shall equal or exceed the approved success standard during the growing seasons of any two years of the responsibility period, except the first year. Areas approved for the other uses shall equal or exceed the applicable success standard during the growing season of the last year of the responsibility period.

In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than 10 full years. Vegetation parameters shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

The Division may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, provided it obtains prior approval from the Director as a State Program Amendment that the practices are normal husbandry practices, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal husbandry practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding, and transplanting specifically necessitated by such actions.

Analysis:

General Requirements

A seed mixture for the James Canyon was developed in coordination with the Forest Service (page 2-63(d)). It is crucial that the Permittee be vigilant with a weed control program. The Weed Web at: <http://extension.usu.edu/coop/ag/crops/weedweb/index.htm> provides current information for weed control programs.

Timing

Final seeding of the buried pipeline was completed in November 2001. Seeding of other areas in James Canyon will be done in the fall. The power line trench was compacted and graded in the fall and no seeding was required. The fall is considered the normal time of seeding for this area.

Mulching and Other Soil Stabilizing Practices

Soil preparation will include surface roughening. Extreme surface roughening should stabilize the soil surface or limit sediment runoff to the bottom of each basin. Because James

Canyon is critical habitat for the Yellowstone cutthroat, a surface mulch should be used to control any possible sedimentation.

Standards for Success

The application provides a reference area for the James Canyon disturbance but fails to make a demonstration that the reference area is equal to or exceeds the vegetation cover, diversity, density and/or productivity of the disturbed area. This site was not previously disturbed by coal mining activities and will not be exempted from productivity, diversity or any other performance standards. The revegetation standard is based on a reference area yet the application states a standard of 58 percent. This should be removed and stated that the cover of the reference area at the time of bond release will be used. The bond releases standard is total cover of the reference area and not just understory cover. Productivity of the area must be stated. An estimate from the National Resource Conservation Service (NRCS) has been accepted in the past for vegetation production estimates.

Findings:

Information provided in the application is not considered adequate to meet the minimum Revegetation requirements of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-355, The Permittee must commit to using a surface mulch during reclamation in James Canyon.

R645-301-356, The Permittee must provide productivity information, a range rating for the proposed reference area, and diversity standard. The reference to this site being previously mined must be removed.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR 817.95; R645-301-244.

Minimum Regulatory Requirements:

All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved postmining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

Analysis:

Waterbars are not a Best Management Practice for operational activities because they require maintenance and removal when the operation is concluded. The use of waterbars in reclamation is not appropriate. Mine sites in Utah have successfully used an extreme surface roughening technique instead of waterbars. The roughening process can occur during topsoil

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placement or while incorporating organic materials (i.e. hay). Surface roughening also eliminates trespass off road vehicle use. Proper roughening is described in the technique sheets in the Division's reclamation manual, The Practical Guide to Reclamation in Utah, found at: ftp://dogm.nr.state.ut.us/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.PDF. The technique sheets are also useful to give to equipment operators to illustrate the degree of roughness required.

Page 2-120 (j) states that the James Canyon road was roughened from the drill site down to Electric Lake with gouges made by a track hoe. Water bars were re-constructed and silt fences were positioned at the outflow of each water bar (page 3-63 b). The road was re-seeded. The date of seeding was not indicated.

The James Canyon road disturbance is considered ASCA #34 and 35 (page 3-72 C). Silt fences will be maintained three times a year until vegetation is adequate to control erosion (page 3-64).

Findings:

Before approval, the Permittee must provide the following in accordance with:

R645-301-355, The Permittee must provide a commitment to remove the waterbars at Phase II bond release or remove the waterbars at reclamation

R645-301-244, Please indicate in the plan the date of seeding of the James Canyon road from the drill site down to Electric Lake.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the reclamation activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The permit application must include as part of the reclamation plan information, the following maps, plans and cross sections:

Bonded area map

The permittee shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the Division an additional bond or bonds to cover such increments. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

Reclamation backfilling and grading maps

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Contour maps and cross sections to adequately show detail and design for backfilling and grading operations during reclamation. Where possible, cross sections shall include profiles of the pre-mining, operations, and post-reclamation topography. Contour maps shall be at a suitable scale and contour interval so as to adequately detail the final surface configuration. When used in the formulation of mass balance calculations, cross sections shall be at adequate scale and intervals to support the mass balance calculations. Mass balance calculations derived from contour information must demonstrate that map scale and contour accuracy are adequate to support the methods used in such earthwork calculations. Detailed cross sections shall be provided when required to accurately depict reclamation designs which include, but are not limited to: terracing and benching, retained roads, highwall remnants, slopes requiring geotechnical analysis, and embankments of permanent impoundments.

Final surface configuration maps

Sufficient slope measurements to adequately delineate the final surface configuration of the area affected by surface operations and facilities, measured and recorded according to the following: each measurement shall consist of an angle of inclination along the prevailing slope extending 100 linear feet above and below or beyond the coal outcrop or the area disturbed or, where this is impractical, at locations specified by the Division; where the area has been previously mined, the measurements shall extend at least 100 feet beyond the limits of mining disturbances, or any other distance determined by the Division to be representative of the post-reclamation configuration of the land; and, slope measurements shall take into account variations in slope, to provide accurate representation of the range of slopes and reflect geomorphic differences of the area disturbed through reclamation activities.

Certification Requirements.

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Bonded Area Map

The bonded area is usually the same as the disturbed area boundaries. Because the disturbed area boundary is long and narrow the Division will waive the usual requirement to have the map at a scale of 1" = 100' or greater.

The disturbed area for the James Canyon site is shown on Plate 3.4-1, James Canyon Disturbed Area Map. The map is at a scale of 1" = 300', however the map does not have a bar scale. The Division wants to have a bar scale to verify that the drawing was printed at the correct scale.

On Drawing No. 1.6-3, the Permittee list the permitted and disturbed areas and acreages for the Skyline Mine. List on the drawing are the following for the James Canyon acres:

- James Canyon buried water line 0.04 permitted acres
- James Canyon buried power line 0.30 permitted acres
- James Canyon water well 9.65 disturbed acres.

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The Division wants to know why the Permittee listed 0.34-permitted acres for the James Canyon area but list 9.65 acres for the James Canyon disturbed area. The length and width of the disturbed area for the water line in the James Canyon area is approximately 3,600 feet long and 50 feet wide. The total area is 180,000 square feet or 4.13 acres.

Reclamation Backfilling and Grading Maps

Usually the Division requires that the Permittee provide maps and cross sections for the disturbed area boundaries that are at a scale of 1 inch = 100 feet. Because the site is very long and narrow and disturbance will be limited to installation of the pipeline the Division will not require detailed maps and cross sections for the site.

Drawing No. 1.6-3, Skyline Mines Permit Area Map, show the location of the pipeline and the associated trail. On Page 3-80 (b), the Permittee show a typical cross section for the site. Both the cross-sections and map were certified. The maps are adequate for the Division to analyze the reclamation plan

Final Surface Configuration Maps

Because the disturbed area is long and narrow and most of the disturbance is confined to reclaiming the road, the Division will not require any detailed surface configuration maps. In general the road should be reclaimed the pre disturbance topography.

Findings:

The information provided in the PAP is not considered adequate to meet the minimum requirements of this section of the regulations. Before approval, the Permittee must provide the following in accordance with:

R645-301- 542.300 and R645-301-521.190, The Permittee must include a scale on Plate 3.4-1 so that the Division can verify that the plate was printed at the correct scale.

R645-301- 542.300 and R645-301-521.190, The Permittee must show the permitted and disturbed acreages for the James Canyon area including listing the permitted acreages for the James Canyon buried water line, the James Canyon buried power line, and all other areas associated with the James Canyon project. The Permittee must also include the disturbed acreages for the James Canyon project. Those acreages must correlate with the permitted and disturbed acreages listed on Drawing No. 1.6-3

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR 800; R645-301-800, et seq.

Minimum Regulatory Requirements:

Determination of bond amount

The amount of the bond required for each bonded area shall: be determined by the Division; depend upon the requirements of the approved permit and reclamation plan; reflect the probable difficulty of reclamation, giving consideration to such factors as topography, geology, hydrology, and revegetation potential; and, be based on, but not limited to, the estimated cost submitted by the permit applicant.

The amount of the bond shall be sufficient to assure the completion of the reclamation plan if the work has to be performed by the Division in the event of forfeiture, and in no case shall the total bond initially posted for the entire area under 1 permit be less than \$10,000.

An operator's financial responsibility for repairing material damage resulting from subsidence may be satisfied by the liability insurance policy required in this section.

Analysis:

Determination of Bond Amount

The Division reviewed the reclamation cost estimate submitted by the Permittee. The Division determined that the reclamation cost for the James Canyon area is \$7010. The USFS also has a \$10,000 bond for the James Canyon area. The Division currently has a \$5,076,000 bond for the Skyline mine. The addition bond increase is considered minor enough to be ignored at this time. The Division is in the process of revising the Skyline mine as part of the permit renewal. A complete review of the bond will occur during the renewal process.

Findings:

The Permittee met the minimum requirement for this section.

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