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

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December 6, 1994

Rick Olsen, President
Soldier Creek Coal Company
P. O. Box 1029
Wellington, Utah 84542

Re: Mid-Term Review, Soldier Creek Coal Company, Soldier Canyon Mine,
ACT/007/018, Folder #3, Carbon County, Utah

Dear Mr. Olsen;

The Division has completed the Mid-Permit term review for the Soldier Canyon Mine. The major topics reviewed were: Plan Amendments, Bond, #3 Fan Reclamation, and Permit Stipulations. Enclosed is a copy of the review document. Please examine the review document carefully, making particular note of the requirement sections. Soldier Creek Coal Company must complete the requirements as indicated by no later than February 5, 1995.

Please call if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Daron R. Haddock".

Daron R. Haddock
Permit Supervisor

Enclosure

cc: P. Grubaugh-Littig
S. Falvey
P. Baker
W. Western

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Soldier Canyon Mine Midterm Review
Soldier Creek Coal Company
ACT/007/018

This document constitutes the Midterm Review for the Soldier Canyon Mine. The major topics of review were identified in the Division's letter dated August 19, 1994 and are found below in large bold print. Plan deficiencies requiring correction are found at the end of the Bond Review section, the #3 Fan Reclamation section and the Permit Stipulation Section.

Plan Amendments

The following were approved amendments during this permit term:

Coal Handling Facilities 94-A	Approved March 9, 1994
Underground Storage Tank Removal 93-B	Approved Feb. 3, 1994
Response to DO92A Amendment 92-E	Approved December 2, 1993
N93-38-13 Abatement	Approved December 22, 1993
Pond Clean Out Procedure 93-C	Approved December 9, 1993
Permit Transfer	Approved September 14, 1993
Revised Chapter 1 93-A	Approved May 6, 1994
Revised Subsidence Zones	Approved January 21, 1993

Bond Review

Analysis

The reclamation bond at the Soldier Canyon Mine is for \$3,327,909. The direct reclamation costs are \$2,597,007 and the indirect costs are \$640,902.

Earthwork and seeding cost for the refuse site (waste rock disposal) account for \$566,717 of the direct reclamation costs and \$706,649 of the total costs. However, the refuse site was never constructed and the Operator no longer plans to build the facility.

Indirect demolition costs are \$579,480 which includes estimates for structures associated with the wash plant but were never built. The reclamation costs for the foundations, footers and floors, and debris disposal was not included. Usually those costs equal or exceed building demolition costs.

The over bonding for the wash plant compensates for the under bonding for the foundations, footers, floor and disposal costs. The mine appears to have an adequate reclamation bond at this time and no adjustment is needed at this time. When the permit is renewed, the Operator must submit updated bond calculations that include demolition cost estimates for foundations, footers and floor. Disposal costs must also be included in the bond estimate.

The Division informally notified the Operator of the deficiencies in the reclamation bond calculations. He has measured the foundations, floors and footers for most of the buildings as preparation for updating the bond calculations. There is no time frame for when the updated calculations will be submitted to the Division.

Requirements

No adjustment to the reclamation bond is needed at this time, however, the Operator must be required to submit information on the demolition cost associated with demolition of foundations, footers and floor besides disposal fees.

#3 Fan Reclamation

Analysis

Soldier Creek's mining and reclamation plan commits to either develop or reclaim the No. 3 fan site by 1994. They have verbally proposed to postpone reclamation at the fan site indefinitely. This would require a permit change.

Perennial vegetative cover at this site has not been measured, but it is probably less than what could be achieved under optimum circumstances. There are some areas where more perennial vegetation would help to control weeds, and the cut slopes could also be enhanced. With these improvements, the site would be better suited for being in a "temporarily stabilized" condition for a long period.

Soldier Creek should take the following measures to increase the amount and improve the composition of vegetation on the No. 3 fan site:

1. Supplement the 1991 seeding with another seeding of the interim revegetation seed mixture.
2. Attempt to control musk thistle, a state-declared noxious weed that has been found growing in a few places at this site.
3. Try to establish vegetation on the cut slopes by propagating virgin's bower (*Clematis ligusticifolia*) already growing on some of the slopes. Personnel at the Lone Peak State Nursery believe virgin's bower can probably be propagated by hardwood cuttings in the spring. Another option would be to try to collect and plan seed this fall. This plant is a vine that tends to establish well and cover disturbed slopes

Requirements

1. The No. 3 fan site must be reclaimed according to the current plan or in order to postpone reclamation at the No.3 fan site, Soldier Creek must amend the plan. The site requires better stabilization through supplemental interim revegetation.

Permit Stipulations

There were 6 special conditions attached by Division Order #92A to the Permit Renewal issued on February 3, 1992. Following is a review of those conditions:

The response to Division Order 92A was made as an amendment to the plan and was assigned the tracking number 92-E. The amendment was approved on December 2, 1993 on the basis that all deficiencies identified in the January 27, 1992 deficiency review had been addressed by the Operator. The approval indicated that unresolved issues identified in subsequent reviews would require further action. This review focuses on those items.

Analysis

- 1) ***R645-100-200 and R645-301-525.270: There are no provisions for permitting of all areas potentially affected by subsidence resulting from approved coal extraction.***

This condition was adequately addressed and considered resolved as of December 2, 1993.

- 2) ***R645-301-536: Exhibit 5-21-1a must be revised to delete the storage of coal mine waste on the surface.***

This exhibit was not changed in Amendment 93-A. Currently the Operator is storing waste rock at the location shown on Exhibit 5-21-1a. The Operator does not have a permanent surface storage area at this time. The Operator has waste material piled at the waste rock location presently. A final storage area should be identified.

- 3) ***Soldier Creek Coal Company must update the title for water right 91-203 to Sunoco and provide the Division with a commitment to protect all water sources to the extent possible. (See January 8, 1992 letter from the Division of Water Rights).***

The Operator does not reflect the proper owner of water right title 91-203 on Table 7.24-2, page 7-8. The Operator has changed owners and the proper water right owner should now be identified. A commitment to protect all water sources to the extent possible could not be located.

However, the Operator does reiterate the regulation objective to minimize disturbance to the hydrologic balance within the permit and adjacent areas in Section 7.50 under Performance Standards.

- 4) ***Soldier Creek Coal Company must provide a commitment in the Mining and Reclamation Plan to coordinate with the Division of Water Rights immediately upon the determination that a water source has been impacted by mining operations. (See January 8, 1992 letter from the Division of Water Rights)***

The Operator makes a statement that any adverse effects to domestic stock and wildlife sources will be mitigated, as described in Section 7.28, on page 7-82. In Section 7.28, page 7-93, the Operator indicates that impacts to perennial springs or seeps will have contingency plans implemented. The contingency plan proposed will coordinate losses of major inflows from Soldier Creek with the regulatory agency. These proposals do not meet the request for notification and coordination of "a water source" impacted by mining. As indicated in the January 8, 1992 letter "diminution or interruption of flows from any source (caused by mining) should be considered significant and be addressed accordingly".

- 5) ***Soldier Creek Coal Company must provide to the Division of Water Rights and the Division of Oil, Gas and Mining, clarification regarding the status of the old borings discussed on page 17 of the Supplemental Hydrogeologic Study by Sergeant, Hauskins, & Beckwith (Appendix I). (See January 8, 1992 letter from the Division of Water Rights)***

The Operator commits to plug cap and seal boreholes and wells as described in Section 6.30, page 6-19 (revised 10/91). Specific mention of the old borings discussed in the supplemental study were identified in Section 7.65, page 19, revised 06/1/93. The Operator should update the plan at the time that monitoring holes SC-2, SC-8 and SC-10 are mined out.

- 6) ***Soldier Creek Coal Company must adequately address all outstanding issues discussed in the Divisions's Technical Deficiency Review Dated January 27, 1992.***

Following is a discussion of and final determination of the status of the items identified in the January 27, 1992 review.

722. Cross Sections and Maps.

4. ***Provide text in the MRP where Appendix 7-I's SHB supplemental report is referenced. Include a summary of what information was changed on Plate 1 and why or, the original plate may be submitted.***

The Operator includes Plate 1 in the September 8, 1992 submittal. The Operator indicates the plate is not revised within the September 8, 1992

submittal. The plate was not reviewed for changes, however the map has a statement that it is updated. According to a phone conversation with Tom Paluso on August 16, 1994 the update consisted of certification only. The Operator is considered to have adequately addressed this deficiency.

6. ***Elevation and depth of well SC-1 must be included on applicable map(s). Text referencing maps of well locations should include all applicable maps.***

The depth of surface wells are shown on Exhibit 7.21-1. According to the Operator's memo received March 29, 1993 drill hole SC-1 was used to determine the separation between Rock Canyon and Sunnyside seams and was not intended to be a water monitoring hole.

The Operator has included a foot note on Exhibit 7.21-3, in the March 29, 1993 submittal. No reference changes were included in text. Although the cross-reference is not specifically referenced in text, a person referencing the map would eventually find the additional map. The Operator is considered to have addressed this deficiency.

724. Baseline Information.

1. ***Text and Exhibit 7.21-1 still do not indicate whether or not there are water rights between Anderson Reservoir and the Price River.***

Should the Applicant propose new lease areas, additional rights must be identified. The Division indicated it would be necessary to re-analyze the area of impact during the waste rock site expansion review. The Operator currently does not know when the waste rock site will be pursued further (ref. January 14, 1993 Memo).

2. ***Provide a discussion summarizing seasonal use and seasonal quantity. The seasonal quantity would include analysis of seasonal baseline flows. Current operational flows may also provide useful information.***

In the September 8, 1992 submittal, the Operator has dropped water rights which the Operator considered to be outside the area of impact. The current search area is within one mile of the LOM boundary of the Soldier Creek Mine (May 7, 1993 Submittal).

The May 7, 1993 submittal indicates that Table 7.24-2 and Exhibit 7.21.2 are updated. The table includes the period and quantity of use of various water

rights. Also the text of the permit document has been modified to describe seasonal use of rights.

Qualitative summaries of seasonal fluctuations of quantity are presented in the applicable section of the MRP. The Operator states that quantitative summaries of the discharge fluctuations are presented in Appendix 7-I. See Table 7.24-4.

The Operator is considered to have adequately addressed this deficiency at this time.

724.600. Survey of Renewable Resource Lands.

2. *The Operator must include a map survey showing the potential recharge areas in the permit boundary.*

The Applicant states that recharge areas in the Book Cliff occur directly through streamflow and direct infiltration into sandstone outcrops and alluvium. The Operator references geologic map Exhibit 6.22-7 as the survey showing the potential recharge locations in the permit area.

In Section 6.42, page 6-7, the Operator indicates no major faulting has been identified in the LOM area but, fractures appear parallel to the strike of the Book Cliffs Escarpment. The Operator indicates most fractures are not appreciably open or extensively connected. However, the Operator does indicate bedding contacts and joints are higher permeabilities page 7-19 (revised 6/1/93).

The underground mining map and text within Chapter 7 indicates a significant fracture, relative to the mined area, was intercepted during mining. This area has resulted in-mine flows, yet this structure is not addressed as a potential recharge zone. The Operator has indicated that the fracture does not appear to be directly tied to the surface because of the presence of methane gas. The presence of the gas may substantiate that a large direct opening is not present. However, increased recharge may occur through indirect jointing and fractures in the area. The referenced map shows some minor fractures (not those encountered during mining): however, the Operator has not suggested fractures as potential recharge features.

724.700. Meet the AVF requirements of R614-302-320.

1. *The Operator must incorporate AVF information from the current MRP that*

supports the original determination made by the Division.

The Operator has provided revised information on pages 9-1 through 9-8 (rev. 9/8/92). The Operator indicates that segments of drainage contain discontinuous patches of unconsolidated alluvial deposits which are not mapped (page 9-1). There are no man caused flood irrigation or sub-irrigation areas within the LOM area (page 9-2). Flood irrigation may be possible on small areas within the LOM but, these areas are not practicable for irrigation. South of the proposed LOM area along Soldier Creek an AVF determination was made by DOGM "Based on hydrologic data from the Soldier Canyon permit document, no significant reduction in the water supply is anticipated since surface water will not be removed from Soldier Creek for any industrial use..."

Information contained on pages 9-1 through 9-3 is taken from the February 4, 1987 permit document, Volume 2, Section 3.8. The permit approval indicates that no lands designated as alluvial valley floors occur on the permit area. The attached CHIA indicates a negative determination based on the studies conducted by Sunedco Coal Company in the approved Sage Point Dugout Canyon mine plan. Specifically, the unconsolidated stream lain deposits, and insufficient water quantities available to support agricultural activities within the mine plan area, lead to a negative determination. Letters of prime farmland determinations previously contained in Section 3.9 were found in Appendix A. A potential AVF was identified downstream of the mine site.

Although surface water is not being removed for industrial use, the timing of discharge and quantity of discharge has changed through mining activities. This creates an increased flow during the summer season while the mine is in operation. Following mining, flows may be considerably diminished for a time period until the mine recharges to a level where natural discharge again occurs. The potential to change seasonal flow regimen is high. The water discharged from the mine reports to the Anderson Reservoir, a man-made impoundment used for irrigation waters. Prior to approval of the waste rock site the Division will be required to make an AVF determination.

726. Modeling.

- 1. The Operator shall clarify the text of the application to identify all modeling used and presented in the MRP.***

Section 7.26 was modified to reflect modeling used. The Applicant references numerical simulation model GWSIM-II. The Operator is considered to have

adequately addressed this deficiency.

728. PHC determination

1. *The Spring identified as #7 on Exhibit 7.21-1 is in an area of possible subsidence from longwall mining, yet is not being monitored.*

The Operator no longer proposes to longwall mine this area. Should the Operator again pursue longwall mining in this area, or have a potential for subsidence from room and pillar mining the plan should be reviewed to consider this spring for PHC and monitoring needs.

2. *The in-mine consumptive use needs to be updated to project current and proposed conditions. Actual volumes of water discharged from within the mine to Soldier Creek must be quantified and included in analysis of ground water losses due to mining the area.*

Figure 7.28-1 through 7.28-26 have been included to graphically detail quantity and quality of ground water intercepted by the mine over recent years.

In mine consumptive use is predicted in Section 7.28, page 7-98, revised 6/1/93. The Operator estimates a maximum 50.5 AF could be added annually to coal produced assuming maximum production of 3,009,000 tons, an inherent coal moisture of 4% and run of mine moisture 6.28%. The Operator estimated annual loss due to evaporation at 37.5 AF is based on 1,500,000 ft³/min entering the mine at 46% humidity and leaving the mine at 67% humidity. The maximum annual consumption of water is estimated to be 88.0 AF.

The Operator has not described the basis for the value used to estimate air entering the mine. Values such as water added to coal is estimated as a maximum value however, the value estimated for evaporation is less than maximum since the value was exceeded in 1991 with 45 AF of evaporation. Additionally, existing data for the run of mine moisture has been higher than the values used in this "maximum" estimate. The Operator appears to be mixing maximum and average values to arrive at a maximum estimate. However, the Operator's final estimate of 88.0 AF is a conservative estimate simply because the existing coal removal rate is much lower than what is proposed. The Operator should be aware of the inconsistency in the method used and be aware that the estimation is approaching the limit of the quantity of use for the ground water right 91-203 (assuming the quantity of use is 0.25

AF per day, see Table 7.42-2).

The Operator has included water discharged from the mine annually, from 1985 through 1991, in Figure 7.28-1. The total water discharged from 1985 through 1993, as determined from annual reports, is approximately 4,487 AF.

3. ***Figures used to arrive at all estimates should be clearly presented in the appendix or text of the MRP.***

The Operator's response memo states that Figures 7.28 -1 through 7.28-26, Appendix 6-B and Appendix L, have been added to the MRP to supplement the PHC information.

Appendix 6-B includes monitoring well geologic logs. Appendix L includes hydrologic data prepared for the Sagepoint/Dugout Canyon application and includes aquifer properties and ground water data evaluation including a falling head test.

Ground water storage for the Blackhawk formation is estimated to be 490,000 AF over the LOM area. This analysis is based on an LOM area of 4,900 acres, an average saturated thickness of 1,000 feet and a storage coefficient of 0.10. The Operator estimates the quantity of recharge over the LOM area using 10.35 mi² (pg.7-25) and later calculates the LOM area as 7.66 mi² or 4,900 acres (pg. 7-34). The areas used to describe the system should be consistent throughout the plan.

Impacts, as described under Ground Water Discharge (pg.7-34), should be determined based on hydrogeologic sub-basins. The hydrologic sub-basin may be determined through stratigraphy of drilling and well logs and geologic controls as presented in Exhibit 6.22-6. As the life of mine area increases with lease additions impacts to specific drainages should be quantified. Currently the Operator has adequately described the potential impacts in site specific terms according to the information in Exhibit 6.22-6. However, if the Operator mines beyond the Soldier Creek geohydrologic basin additional baseline information could be necessary. The Division should address the needs for this information based during CHIA updates, or at the addition of new lease areas.

4. ***Include Probable Hydrological Consequence based on flooding including the potential of sediment contributions to streamflow.***

In the section, Flooding or Streamflow Alteration, page 7-103 and 7-104, revised 6/1/93, the Operator states the natural channel of Soldier Creek has the

capacity to pass the peak flow greater than the 100-year, 6-hour event. The probability that an occurrence exceeding the design event in 30-years Life of Mine is 26%, and such an event would increase sediment loading slightly but be temporary in nature. Impacts to downstream resources are expected to be minimal because of the lack of development and utilities. Exceptions are power lines to the mine and an agricultural area 4 miles downstream.

Following reclamation interim sediment-control measures and maintenance of the reclaimed area will preclude deposition of significant amounts of sediment in downstream channels following reclamation. Thus maintaining the hydraulic capacity of the channel and precluding adverse flooding impacts.

The Operator is considered to have adequately addressed this deficiency at this point in time. However, additional information may be requested as issues arise through updated CHIA determinations.

5. *Provide the Probable Hydrologic Consequences on the Price River and Castle Gate formation.*

A discussion of the PHC on the Price River formation and North Horn formation was found on page 7-90, revised 6/1/93. The Operator's references indicate the regional aquifer exists above the minable coal seams (pg 7-28). The Price River formation and Castlegate member probably have occurrences of water in perched aquifers of limited extent. Based on the low hydraulic conductivity and separation of workings from the overlying water bearing member there is a low probability that water would be intercepted by mining operations according to the Operator. On the other hand, the Operator states the Northhorn and Price River formation are stratigraphically closer to the proposed underground mining activity. The impact would be greater to the flow from these formations than the Flagstaff limestone (page 7-92, 6/1/93 submittal). The Operator is considered to have addressed this deficiency unless further issues arise through review and data analysis.

R645-301-730 Operation Plan

1. *A copy of the NPDES permit is not in the MRP where it can be reviewed by the Division and potentially affected parties, before operations sending industrial wastes to the pond commence.*

The UPDES/NPDES permit was incorporated in Section 5 illustration 5.26-1 and was incorporated on December 1, 1993.

2. *The information in the reply to the original deficiency, found on page 6 of the Technical Deficiency Review Outline, should be incorporated into the MRP.*

The Operator indicated discharge to the sediment pond, from the proposed preparation plant, would be allowed during emergencies and DWQ would need to be notified of the discharges. This information was included in Section 5.26.22 (1.3), page 5-36, revised 3/31/93. Additional references are contained in the UPDES permit page 21, item J and page 18, item J. The Operator has decided not to develop the preparation plant at this time. At such time as the Operator pursues development this issue may be revisited per additional monitoring and notification requirements and/or lining the pond with clay.

731.200 Ground Water Monitoring

1. *The Operator must define "significant" measurable flow and provide justification for the definition.*

The Operator has proposed three in-mine monitoring scenarios; assessment of inflows throughout the year, a complete fall inventory, and sampling for inflows greater than 50 GPM. The Operator suggested the change, from the previous quarterly in-mine monitoring for flows of 5 GPM or greater, following a decrease in coal production at the mine. The Operator did provide some information in figures to show the pattern of measured flows and changes in total dissolved solids over time. However, a relationship between existing data, the proposed monitoring plan, and the potential hydrologic impacts was not developed.

The monitoring "assessment" to take place throughout the year during the mining process was not specific as to the degree of the assessment; i.e., what parameters will be monitored/described. The Operator should identify what information will be provided for the assessment of mining progress inventory. At a minimum the description should include type of inflow source(s), quantity and quality of flows.

Monitoring for "unusual flows" - those flows that are of greater volume than the general run-of-mine in-flows, and/or flows which come from a reasonably discreet source area; generally not influenced by waters used in mining process, are not monitored through the proposed program. These sources are potentially connected to perched aquifers which issue as a spring(s). These flows should be quantitatively and qualitatively described to identify the nature/characteristics of the source aquifer.

The Operator states that once mining in a given area is completed access is

generally eliminated. The proposed annual inventory could potentially miss flows from the areas closed following mining. If data were gathered at the initial interception of the source and flow data prior to closure of the area, fewer potential interferences and mixed sources would be sampled. Water coming from the working face or roof, not extensively influenced by water moving along the floor or in the mining process, could be quantitatively identified during the assessment monitoring phase by looking at variation between conductivity and pH. If these parameters suggest a different source further analysis could be performed.

The proposed annual monitoring plan will provide good, general in-mine sources, and will quantify some flows that contribute to the general mine discharge. This proposal will show annual changes for composite sources and a few of the deereet point sources but will not describe seasonal variation. The Operator should describe how the proposed time of sampling is adequate to determine seasonal variations in in-flow. For example, the Operator could use the existing data and discuss variation in flows that may be due to recharge functions to support the proposed analysis. A quarterly analysis of totalized monthly flows discharged from the mine would be helpful in describing seasonal changes.

The Operator has not demonstrated that water quality samples for flows of 50 GPM or greater are adequate to determine the potential hydrologic impacts from the mine. The Operator should provide supporting information from existing and past in-mine monitoring sites to demonstrate that flows of 50 gpm will describe all potentially impacted sources identified in the PHC (perched formation as well as fracture). The Operator should have an initial monitoring plan at interception of significant flows prior to developing a long term plan. The Operator should commit to a minimum time period in which to notify the Division and other agencies.

Initially the proposed increased flow parameter was linked to the rate of production, a change in production should be included as a trigger mechanism to return to previous flow sampling criteria. However, if the Operator responds adequately to these deficiencies the result will be a plan that more adequately describes the in-mine flows.

2. ***The Operator will re-asses proposed well monitoring sites to assure compliance of monitoring potentially impacted aquifers identified by the PHC and meeting other applicable R645 ground water regulations.***

The aquifer below the lowest seam to be mined does not have a series of wells to describe this system. The Sergent Hauskins & Beckwith report of October

1985 was provided to determine hydrogeologic conditions below the Gilson coal seam. Within the LOM there was no development of groundwater in the perched or regional aquifers other than within the mine workings (Section 7.24.1 page 7-4 revised 6/1/93). Wells drilled in the Blackhawk below the Gilson seam were 3.3×10^{-6} to 1.7×10^{-7} cm /sec. With the exception of the 9.5 foot sandstone unit under artesian pressure and Hydraulic conductivity of 1.5×10^{-3} cm/sec.

Spring 6, which emanates from the Aberdeen tongue below the coal seams and surfaces in Dugout Canyon, is not expected to be impacted according to the Operator because it is two miles away. The proximity of the spring to the mined area only has a bearing on impact through time of impacts to reach the spring based on hydraulic conductivity, unless the spring is outside the hydrogeologic basin. If this spring issues from a fracture or bedding plane the potential for impact is higher. The spring's characteristics and hydrogeologic basin may support the Operator's position that this spring would not be impacted. However, that information is not presented. If the spring's recharge area includes the mined area the spring could be impacted by water quality and quantity with a likely increase in flow and TDS as a function of in mine sumps and mining operations. The Operator should discuss the area of recharge to this spring using hydrogeologic structures from drill logs to support their conclusion of no impact.

Increased monthly sampling was recommended in the March 29, 1994 inspection for Well 6-1 but, was not conducted. This particular well monitors a 200 foot zone in the Sunnyside and Rock Canyon seams where mining has occurred. Well 6-1, was found to be dry at 475 feet on June 3, 1994. The Operator performed a second measurement on August 15, 1994, but was again unable to reach the bottom of the well with the water level sounder. Mud, present on the wire and weight, indicate a well failure. The locking cap/cover is missing from the well and therefore no longer meets the administrative rules for water well drillers. Use of a water well must comply with the provisions of the division of water rights rules for water wells. This well is no longer properly maintained. The Operator should, either properly redevelop the well, or follow the requirements for well closure as required by R645-301-731.215. Redevelopment of this well could provide information during the post reclamation phase to determine recharge to the aquifer.

The Operator is pursuing water quality baseline monitoring on the Alkali lease area. The Operator now only has two wells in the mined vicinity: however, no wells are proposed for the new Alkali lease area. There is concern the Operator may not have adequate ground water information for the new lease area with the two existing monitoring wells. The Operator should analyze

available drill logs for the proposed lease area as, an analysis of the drill logs and assess whether additional wells are necessary to describe the ground water for the proposed LOM area.

On pg. 7-35 the Operator indicates no conclusive argument is available for explaining the water level fluctuations identified in wells 5-1, 32-1, and 6-1, and 10-2. Three potential reasons were sighted. First, the potential of variation due to recharge response. Second, the potential of variation due to the interbedded nature of the formation. Third, the wells have not reached equilibrium condition due to hydraulic testing method. However, the Operator has not discussed the relationship of the wells to the fracture and mining activities.

Information provided by Dave Spillman through phone conversations indicates the Operator provided a polyurethane grout from the Sunnyside seam down to the Blackhawk seam where the fracture was originally intercepted. The purpose in sealing the fracture was to seal off methane to allow the Operator to retrieve the coal reserves. In May through June of 1991 the Operator used an estimated 43 thousand lbs of grout in the fracture of the main first east of the Sunnyside seam. In December through January of 1991 in the main north another 43 thousand lbs of grout was used to seal the fracture. The fracture is assumed to be a strike slip according to Dave Spillman as no vertical displacement is evident.

It is interesting to note that the increasing water elevation in well 32-1, leveled off during the grouting period and then continued to increase. This well is located below the seam to be mined and may be connected to mine-water sources through the fracture. Should the well elevation begin to level off at the elevation of the in-mine sumps the hypothesis that there is a connection to mining would be supported.

The Operator should include a discussion in the monitoring plan for Well 6-1. The Operator's present plan indicates drill hole 6-1 is expected to remain as a viable water monitoring point beyond the originally proposed 1993 longwall extraction page 7-190, revised 6/1/93. The Operator commits to a reassessment of well monitoring sites in conjunction with the re-evaluation of the long term mine plan. The Operator should meet this commitment as a part of this review. A summary analysis of all data should be preformed for well 6-1.

The Operator has provided Figure 7.31-9 for well 6-1. The scale used to present the information is inadequate. The Operator should present a scale in feet rather than thousands of feet. The Operator shows additional well

information on Figure 7.24.7. The label incorrectly describes the information presented. The Operator provides the depth to water from the well casings **not** the water level elevation. Because the elevations have no relative base elevation, the presentation of data is misleading.

On page 7-82 the Operator states the regional aquifer in the Blackhawk is low yielding. However, this does not describe the site specific hydrology of the area. From the available water quality data the local hydrology of the Flagstaff and North horn do not appear to have better water-holding characteristics. The Operator should update this section to provide a accurate description of the local or site specific hydrology. (The actual yield from the mined area should be presented).

731.220. Surface Water Monitoring.

- 1. Include analysis for surface water quality according to use in an extended annual parameter list or, demonstrate that the potential for those contaminates do not exist from mining activities.***

Table 7.24-7, page 7-20 includes selected Utah Division of Health numerical standards.

The Operator provided a 5 year extended parameter list in Table 7.31-3. A commitment to complete this list in the quarter prior to the 5 year renewal due date is found in Section 7.31.2.2, page 7-136 revised 6/1/93.

The Operator is considered to have addressed this deficiency. Additional monitoring may be required as conditions change at the site.

- 2. Since the Operator does not propose to monitor the sites G-3 and G-4. Provide a monitoring plan, or sufficient information that will demonstrate that surface flow is not intercepted by the fracture and is separate from in-mine water flows.***

Currently approved surface water monitoring points include G-1, G-2 and G-5. This was authorized in the February 4, 1987, Five Year Permit Approval. Sites G-1 and G-2 were included to replace site G-4. Site G-3 has never been monitored in conjunction with the Soldier Creek Canyon Mine (the site does provide baseline information). Pages 7-93 and 7-97 have been revised to clarify the surface water monitoring points. (September 8, 1993)

In Section 7.28, page 7-91, the Operator indicates the natural base flow of

Soldier Creek may be lessened by the interception of water in the Blackhawk. The Operator suggests sites G-1 and G-2, in the head water area, accommodate the expanded boundaries. It is reasonable to measure the sites located in these areas due to the prevailing direction of ground water movement and base flow contributions. In order to determine potential impacts it would be prudent to maintain sites above and below the region of the fracture zone or zones where the mine is receiving inflows below streams. Location of loss of baseline flow from subsidence or fracture losses would not be discernable with the current monitoring plan. The lower monitoring point may identify potential impacts in decreased base flow by adjusting for mine water discharge. However, it would require additional monitoring to locate the impacted section.

Significant inflows are occurring in the mine along the fracture. The fracture appears to lie under the Soldier Creek and Pine Creek streams. The Operator indicates there is no evidence the fracture extends significantly beyond (above) the Blackhawk formation. However, the fracture may have created a zone of jointing associated with the fracture creating a significant recharge zone or section of losing stream. The Operator refers to Section 7.31.2 for contingency monitoring of stream losses. The only contingency monitoring found in this section is related to inflows greater than 50 GPM. The plan at that time is to notify the Division to develop a plan. However, this plan does not cover changes in flow due to stream losses as a result of a drain on the system; i.e., the ground water voids never fill therefore the stream is constantly a losing stream where as it may have fluctuated seasonally as gaining reach previously. Stream losses spread over a larger area (not direct interception) would not be identified by the proposed method.

The Operator states efforts will be made to sample sites G-1, and G-2 prior to sampling G-5. "Where possible, attempts will be made to sample the surface water stations on the same day", Table 7.31-1. Previous data was seldom sampled on the same day and therefore it would be difficult to make any statement to changes that may have occurred to date.

R645-301-731.300 Acid and Toxic Forming Materials

- 1. Information on identification and permanent disposal of acid and toxic forming waste is in the MRP but is scattered and not concise.*
- 2. Plans for protecting hydrologic resources from acid and toxic drainage from the temporary storage site are not clear and concise.*

Section 7.31.3 the Operator merely repeats the regulatory requirements but does not provide the site specific information required by R645-301-731. Location of references to specifics, such as, but not limited to sediment pond waste removal, should be listed in this section. Drainage around the temporary storage site was not presented by the Applicant.

REMAINING DEFICIENCIES and REQUIREMENTS

Proposals such as the waste rock site, coal washing facilities and longwall mining are no longer being pursued by the Operator within the scope of the 5 year plan. Information in the plan is therefore not representative of existing site conditions and is not current and concise information as required by R645-301-121. The Operator has not received approval for many of the proposed activities at this time. The Operator should remove all "proposed" operations that will not be pursued within this or the upcoming permit term. Additionally, a permanent wasterock site, currently approved according to the R645 requirements, should be provided by the Operator until approval of the proposed waste rock site is granted.

The following were determined incomplete responses to D.O. 92-A:

1. A permanent wasterock site, currently approved according to the R645 requirements, should be provided by the Operator until approval of the proposed waste rock site is granted.
2. Table 7.24-2 page 7-8 does not reflect Sunoco as owner of water right title 91-203. The Operator has since changed owners and the proper water right owner should now be identified. The Operator did not meet the requirements of D.O. 92-A #3, as required by R645-300-143. The Operator has not met the requirements of R645-301-724.100. (See January 8, 1992 letter from the Division of Water Rights.)
3. The Operator did not meet the requirements of D.O. 92-A #4, as required by R645-300-143. The Operator has not met the requirements of R645-301-724.100. Soldier Creek Coal Company must provide a commitment in the Mining and Reclamation Plan to coordinate with the Division of Water Rights immediately upon the determination that a water source has been impacted by mining operations. (See January 8, 1992 letter from the Division of Water Rights.)
4. The following are inadequate response to the requirements of Condition 6.
 - a) The Operator must include a map survey showing the potential recharge areas in the permit. Fracture zones identified in the mining process

should be identified and referenced as potential recharge zones as required by R645-301-724.600, Survey of Renewable Resource Lands.

- b) The LOM area when used should be used consistently throughout the plan; see pages 7-25 and 7-34. Provide consistent representative information for the estimated groundwater storage and recharge in LOM area and hydrogeologic basins.
 - c) The monitoring "assessment", to take place throughout the year during the mining process, was not described as to the degree of the assessment; i.e., what parameters will be monitored/described this proposal does not meet the requirements of R645-301-731.210 and R645-301-730.
 - d) The following potential hydrologic impacts are not assessed through the existing in-mine monitoring plan and therefore the Operator does not meet the requirements of R645-301-731.211.
 - i. The interception of perched aquifers which issue as a spring would not be monitored through the proposed in-mine monitoring schedule. The proposed annual inventory potentially misses "unusual" in-flows if an area is closed prior to completing the inventory. A qualitative analysis to identify the source characteristic of the intercepted aquifer would be unavailable.
 - ii. The Operator has not described how the proposed annual sampling plan is adequate to determine seasonal variations in-flow thus potential impacts on the hydrologic balance, including variations due to recharge functions.
 - iii. The Operator has not demonstrated that flows of 50 GPM will adequately monitor for all potential impacts as required under R645-301-731.210. The Operator has not described how the proposal will meet the quality and quantity and frequency sampling requirements. The Operator should commit to a minimum time period in which to notify the Division and other agencies of these high magnitude inflows.
5. The Operator does not have a series of wells to describe the aquifer below the lowest seam to be mined. However, Spring 6 emanates from the Aberdeen tongue below the coal seams in Dugout Canyon and may describe this system. The Operator should discuss the area of recharge to this Spring 6 using site

specific information as required by R645-301-731 and R645-301-731.211. Hydrogeologic structures from drill logs, and/or relative location and flow direction may support the conclusion that this spring will not be impacted.

6. The Operator should either properly redevelop the Well 6-1 or follow the requirements for well closure as required by R645-301-731.215. Redevelopment is required for the Operator to maintain this well as is proposed in the current mine plan. This well could provide important information through bond release to determine flooding of the mine workings.
7. The Operator has provided Figure 7.31-9 for Well 6-1. The scale used to present the information is inadequate. The Operator should present a scale in feet rather than thousands of feet to provide a clear figure per R645-301-121.
8. The figure heading, in Figure 7.24.7, incorrectly describes the information presented. The Operator provides the depth to water from the well casings not the water level elevation as indicated. Because the elevations have no relative base elevation the presentation of data is unclear. The Operator has not met the requirements of R645-301-121.

Additional Requirements:

- 1) The Operator's present plan indicates drill hole 6-1 is expected to remain as a viable water monitoring point beyond the originally proposed 1993 longwall extraction. The Operator committed to reassessing well monitoring sites in conjunction with the re-evaluation of the long-term mine plan. The Operator is not conducting the operations according to the approved permit R645-300.142. Therefore, reassessment should be completed at this time.
- 2) Information in the plan is not current and concise information as required by R645-301-121. According to discussion with the Operator, proposed waste rock site, longwall mining, and processing plant operations identified in the current plan will not be pursued within the upcoming permit term. The Operator should update the plan to identify the proposed dates of the Fan Portal Area, the waste rock site and the preparation plant construction per R645-301-526.113. The Operator should update the proposed mine sequence and timing due to the change in the proposed longwall mining operations.