



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

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TO: Internal File

FROM: James D. Smith, Sr. Reclamation specialist/Team Lead *JDS*

RE: Underground Abandonment of Longwall Conveyor-Pan Sections, Energy West Mining Company, Deer Creek Mine, C/015/018-AB01F-1

SUMMARY:

On July 16, 2001, Energy West submitted to the BLM a "Lease Term and Condition Modification Request, Removal of Machinery, Federal Lease U-06039." The same day, Energy West notified the Division concerning abandonment of mining equipment in the Deer Creek Mine. The notification included a sketch map identifying the location of the abandoned equipment, a list of the equipment, and a copy of the request to the BLM.

Energy West plans on final coal extraction from 9th East longwall panel by late August or early September 2001. They plan to remove all equipment except for 140 American Longwall (1 m x 1500 mm) conveyor line pans with gob and face side accessories, which consist of toe plates, clevises, cable trays, breby trays, spill plates and dynatrac castings, conveyor chain, and flight bars. It is planned to leave these in available entry crosscuts of the 9th and 10th East gate roads. No hoses, cables, lubricants, or oils of any kind are to be included in the abandoned equipment. Because of the worn condition of the pans and the low prices for scrap steel, Energy West considers it unreasonable and uneconomical to recover them.

Federal Coal Lease U06039 includes stipulations concerning abandonment of mining equipment underground: Section 10 – Delivery of Premises, Removal of Machinery, Equipment, Etc.; and Section 24 - Waste Certification, which documents abandonment of machinery within the federal coal lease. It is PacifiCorp and Energy West's understanding that the longwall units are not subject to the stipulations of the lease.

TECHNICAL MEMO

On December 5, 2001 (received December 7, 2001), the Permittee submitted a new Volume 2 - Part 3, which modifies the MRP to address actual abandonment of specific mining machinery and materials underground and also future abandonment of such items. It also updates or modifies several other sections of the MRP, such as mining projections that include high-ash coal from the Hiawatha Seam in Rilda Canyon and coal from the Blind Canyon Seam in the Mill Fork Lease. This is more than was envisioned when the Division asked the Permittee to submit an amendment to cover the underground equipment issue; however, the necessary information is provided and the other changes do not appear to be substantial or to require extensive review.

Utah Coal Mining Rules require a coal mine operator to demonstrate steps to be taken to minimize disturbance to the hydrologic balance within the permit and adjacent areas and to prevent material damage outside the permit area. The following is a Technical Analysis of probable impacts to the hydrologic balance in the area from the abandonment of this equipment.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

Information on the Rilda Canyon Mine facilities on pages 3-90 through 3-94.2 in the current MRP has been moved to pages 33 through 39 in the new Volume 2, Part 3. A copy of the Rilda Canyon Stream Alteration Permit is in Exhibit A, and the Rilda Canyon Stability Analysis by RB&G is in Exhibit B.

Findings:

The new submittal of Volume 2, Part 3 is complete and adequate to meet the Completeness requirements of the Utah Coal Mining Rules.

ENVIRONMENTAL RESOURCE INFORMATION

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

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

There is no additional hydrologic resource information in this amendment.

Findings:

Hydrologic Resource Information in the current MRP is considered adequate to meet the requirements of the Utah Coal Mining Rules. The Division is not requiring any additional hydrologic resource information for this amendment.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Existing Structures and Facilities Maps

Drawing R6450301-500G shows locations of abandoned equipment in the Deer Creek Mine.

Coal resource and Geologic Information Maps

Drawing R6450301-500G shows sufficient elevation contour information to determine the dip of the coal seam relative to the portals, so that potential for gravity drainage can be evaluated.

Findings:

The proposed amendment meets the minimum requirements of the Maps, Plans, And Cross Sections of Resource Information section of the Coal Mining Rules.

TECHNICAL MEMO

OPERATION PLAN

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 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.

Analysis:

Disposal of noncoal waste

The in-mine abandonment of various types of mining related apparatus has necessitated a change in DOGM policy that now requires that all permittee's submit an amendment to the mining and reclamation plan for the respective mine in which such material is to be abandoned, either temporarily or permanently. This requirement has been established to provide what is felt to be the information necessary for the Division to make a written findings relative to the potential for impact to the hydrologic regime within the associated permit area for the mine.

In preparation of temporary cessation or abandonment of a portion of the mine, mining equipment and extension material to be abandoned in-place or removed will be documented to the BLM and the Division. Appropriate regulatory agencies will be notified prior to abandonment to verify the equipment and material to be left in-place.

The amendment contains lists of equipment and extension material already abandoned, including that described in the "Lease Term and Condition Modification Request, Removal of Machinery" submitted to the BLM on July 26, 2001 (which instigated the submittal of this amendment). The 2000 Annual Report contains some additional details on equipment already abandoned in the mine.

Section R645-731-100 - Hydrologic Balance Protection on page 172 of Volume 9 of the current MRP briefly discusses the permittee's commitment to conduct the underground mining activities in order to minimize potential impacts to surface and ground water resources.

The coal seams in which the Deer Creek Mine was developed dip away from the portals, which are located in small drainages that report to Cottonwood and Huntington Creeks. Any ground water that accumulates in-mine will have a tendency to flow down dip away from the sealed portals located at the outcrop. Therefore, the discharge of mine water from the seals into Cottonwood or Huntington Creek is unlikely. There will be no effect on the surface hydrologic regime.

Coal mine waste

Hydrologic Drainage Calculations for the Waste Rock Disposal area are summarized on page 79, where reference is made to Table 6.4 and Exhibit VII: both these are in Exhibit D in the revision of Part 3. The time-of-concentration chart from Barfield is no longer labeled Exhibit VII, so the identity of this chart needs to be clarified on page 79.

Findings:

The proposed amendment does not meet the minimum requirements for Operation Information for Spoil and Waste Materials of the Coal Mining Rules. Prior to approval, the permittee must provide the following in accordance with:

R645-301-536, The time-of-concentration chart from Barfield in Exhibit D is no longer labeled Exhibit VII, so the identity of this chart needs to be clarified on page 79.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 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.

Analysis:

General

The Division prepared a Cumulative Hydrologic Impact Assessment (CHIA) for East Mountain, which includes the Deer Creek Mine, in 1994. Abandonment of equipment underground was not covered in that CHIA.

Consequences from abandoned mining machinery and fluids were not included in the Probable Hydrologic Consequences (PHC) determination in the Deer Creek Mine MRP. The PHC identifies water encountered in the mine as "inactive", that is having little communication with the surface and not subject to annual recharge events. The Division cannot currently determine whether or not it is likely that the areas where these pans are to be abandoned will be flooded.

Utah Coal Mining Rules require a coal mine operator to demonstrate steps to be taken to minimize disturbance to the hydrologic balance within the permit and adjacent areas and to prevent material damage outside the permit area.

TECHNICAL MEMO

Acid and toxic-forming materials

The current Deer Creek Mine MRP contains commitments on page 3-67.1 concerning annual sampling of roof, floor, and mid-seam material, the analyses of these samples for acid- and toxic-forming materials, and the inclusion of the analysis results and maps of the sampling locations in the annual reports. The revised Volume 2, Part 3 does not mention any of this.

Exhibit C contains a summary of the analyses up through 1999. The analysis information and maps could not be found in the 2000 Annual Report.

Gravity discharges

Drawing R6450301-500G shows sufficient elevation contour information to determine the dip of the coal seam relative to the portals, so that potential for gravity drainage can be evaluated.

The coal seams in which the Deer Creek Mine was developed dip away from the portals, which are located in small drainages that report to Cottonwood and Huntington Creeks. Any ground water that accumulates in-mine will have a tendency to flow down dip away from the portals. Therefore, the discharge of mine water from the portals into Cottonwood or Huntington Creek is unlikely. There will be no effect on the surface hydrologic regime.

Water quality standards and effluent limitations

The Division prepared a Cumulative Hydrologic Impact Assessment (CHIA) for East Mountain, which includes the Deer Creek Mine, in 1994. Abandonment of equipment underground was not covered in that CHIA.

Consequences from abandoned mining machinery and fluids were not included in the Probable Hydrologic Consequences (PHC) determination in the Deer Creek Mine MRP. The PHC identifies water encountered in the mine as "inactive", that is having little communication with the surface and not subject to annual recharge events. DOGM cannot currently determine whether or not it is likely that the areas where these pans are to be abandoned will be flooded.

- Conditions in abandoned mines in the Wasatch Plateau are not conducive to oxidation or other chemical reactions.
- Recorded pH values for ground waters at the PacifiCorp Mines range from 6.5 to 9.7, but are typically neutral to slightly alkaline.
- With time, oxygen would be absent or at low concentration both in the air and waters of the abandoned mine. Other oxidizing agents would not typically be found in an abandoned mine.

- The cool temperatures in the abandoned mine would tend to retard rather than accelerate most chemical reactions.

Assuming the mine was to flood and the abandoned equipment was to be covered with water, several probable results and impacts can be evaluated.

- Flooding of the abandoned mine might be relatively rapid, but once flooded, flow of ground water into, through, and out-of the void spaces of the mine should be slow.
- If steel or other metals in the equipment were to oxidize, it would be at a very slow rate and the amount of iron and other metals added to the ground water at any one time would be very small.
- Oxides of most metals are insoluble or slightly soluble in water with a neutral pH (anions in solution in the water could increase solubility, but this is not anticipated based on typical ground-water chemistries of the region), especially at temperatures expected in the mine, so once formed, metal oxides would tend to precipitate as solids within the mine rather than flow in solution in the ground water. If any metal were to go into solution, concentrations would be highest near the equipment, but the volume of water in the flooded mine would dilute concentrations outside the immediate vicinity of the equipment.
- Drawing R6450301-500G shows sufficient elevation contour information to determine the dip of the coal seam relative to the portals so that potential for gravity drainage can be evaluated. Structural dip is to the west or northwest; therefore, movement of water both within the abandoned workings and in the enclosing strata is away from the Deer Creek Mine portals, which are located in small drainages that report to Cottonwood and Huntington Creeks, and discharge of mine water from the portals into Cottonwood or Huntington Creek is unlikely. There will be no effect on the surface hydrologic regime.
- Because of dilution and dispersion, natural seasonal fluctuations, and the limits of accuracy of analytical methods, changes in water quality from the abandonment of this equipment would not be expected to be large enough to be detected at springs, wells, or ground-water base flow to streams.

If the abandoned equipment is not covered with water as the mine floods, metals might oxidize at a faster rate. Even though possibly occurring over a shorter time period, the probable impacts would be negligible to nonexistent because there would be no water to convey potential contaminants to ground or surface waters.

TECHNICAL MEMO

Ferrous metals

Considerable tonnages of ferrous materials, such as steel roof bolts and wire mesh used for roof-support and steel-covered longwall support cans, is routinely abandoned in underground coal mines because the materials cannot be removed without endangering the lives of miners. At the Genwal Crandall Canyon Mine located just north of the PacifiCorp mines, room-and-pillar mining requires approximately 400 tons of steel be placed and abandoned underground to produce each million tons of coal; however, longwall mining, as at Deer Creek, uses steel at a considerably lower rate because less roof is supported. (From 1996 to 1999, production at Deer Creek was on the order of 4 million tons/year.) In comparison to the amount of steel routinely abandoned during underground mining operations, the additional ferrous metal in the shields, conveyors, and pipes is not significant.

Lubricants and Oils

According to the cover letter dated July 16, 2001, no hoses, cables, lubricants, or oils of any kind are to be included in the equipment abandoned in the 9th East submains. However, materials and equipment abandoned in other areas might include or contain these.

Equipment used underground can contain emulsified hydraulic fluid (95 percent water and 5 percent oil), gear oil, ATF or similar fluid, and grease, which could eventually enter the hydrologic system if not removed from the mine. Oxidation of metals will eventually release small residual amounts of these materials, but even these small releases will be spread over a long time, so the potential for impact to the hydrologic system is either non-existent or negligible. Material Safety Data Sheets (MSDS) for the hydraulic fluid and greases have been included in the 2000 Annual Report.

Polymers, Resins, Plastics and Rubber

According to the cover letter dated July 16, 2001, no hoses or cables of any kind are to be included in the equipment abandoned in the 9th East submains. However, materials abandoned in other areas might include these types of organic-based compounds.

Such materials contain polymers, resins, and other organic compounds that generally have long-term stability, especially when not exposed to ultraviolet light. Products used in the manufacture of these materials often remain in very small, often undetectable, residual amounts. Generally, only small quantities of such materials are left underground; considering this with other factors already discussed, the potential for impact to the hydrologic system from these materials is negligible.

Findings:

The proposed amendment does not meet the minimum requirements of Operation Plan Hydrologic Information of the Coal Mining Rules. Prior to approval, the permittee must provide the following in accordance with:

R645-301-536, -731.310, The current Deer Creek Mine MRP contains commitments on page 3-67.1 concerning annual sampling of roof, floor, and mid-seam material, the analyses of these samples for acid- and toxic-forming materials, and the inclusion of the analysis results and maps of the sampling locations in the annual reports. The revised Volume 2, Part 3 does not mention any of this. These commitments need to be restored, or their omission justified.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mine workings maps

Drawing R645-301-500G, which shows the locations of the abandoned equipment, has been added to the MRP.

Findings:

The proposed amendment meets the minimum requirements of the Maps, Plans, and Cross Sections of Mining Operations section of the Coal Mining Rules.

RECLAMATION PLAN

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

During temporary cessation, all portals will be sealed according to MSHA regulations and as specified in 30CFRPart75.335, or as specified in the approved ventilation plan.

TECHNICAL MEMO

Findings:

The proposed amendment meets the minimum requirements of the Reclamation Plan Mine Openings section of the Coal Mining Rules.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Gravity discharges

During temporary cessation, all portals will be sealed according to MSHA regulations and as specified in 30CFRPart75.335, or as specified in the approved ventilation plan. Drawing R6450301-500G shows sufficient elevation contour information to determine the dip of the coal seams relative to the portals, so that potential for gravity drainage can be evaluated.

The coal seams in which the Deer Creek Mine was developed dip away from the portals, which are located in small drainages that report to Cottonwood and Huntington Creeks. Any ground water that accumulates in-mine will have a tendency to flow down-dip away from the sealed portals located at the outcrop. Therefore, the discharge of mine water from the seals into Cottonwood or Huntington Creek is unlikely. There will be no effect on the surface hydrologic regime.

Water quality standards and effluent limitations

The in-mine abandonment of various types of mining related apparatus has necessitated a change in DOGM policy that now requires that all permittee's submit an amendment to the mining and reclamation plan for the respective mine in which such material is to be abandoned, either temporarily or permanently. This requirement has been established to provide what is felt to be the information necessary for the Division to make a written findings relative to the potential for impact to the hydrologic regime within the associated permit area for the mine.

Section R645-731-100 - Hydrologic Balance Protection on page 172 of Volume 9 of the current MRP briefly discusses the permittee's commitment to conduct the underground mining activities in order to minimize potential impacts to surface and ground water resources.

The coal seams in which the Deer Creek Mine was developed dip away from the portals, which are located in small drainages that report to Cottonwood and Huntington Creeks. Any

ground water that accumulates in-mine will have a tendency to flow down dip away from the sealed portals located at the outcrop. Therefore, the discharge of mine water from the seals into Cottonwood or Huntington Creek is unlikely. There will be no effect on the surface hydrologic regime.

Findings:

The proposed amendment meets the minimum requirements of the Reclamation Plan Hydrologic Information section of the Coal Mining Rules.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

Analysis:

PacifiCorp will notify the Division of the date of temporary cessation of coal mining. The notice will include a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area, the reclamation schedule, a description of environmental monitoring. Water conveyance structures are to be maintained as specified in the MRP. All portals will be sealed according to MSHA regulations and as specified in 30CFRPart75.335, or as specified in the approved ventilation plan. The permittee does not identify or refer to any backfilling, regrading, or revegetation activities that will continue during the temporary cessation.

In preparation of temporary cessation or abandonment of a portion of the mine, mining equipment and extension material to be abandoned in-place or removed will be documented to the BLM and the Division. Appropriate regulatory agencies will be notified prior to abandonment to verify the equipment and material to be left in-place.

The amendment contains lists of equipment and extension material already abandoned, including that described in the "Lease Term and Condition Modification Request, Removal of Machinery" submitted to the BLM on July 26, 2001 (which instigated the submittal of this amendment).

Findings:

The proposed amendment meets the minimum requirements of the Reclamation Plan Cessation of Operations section of the Coal Mining Rules.

TECHNICAL MEMO

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Reclamation surface and subsurface manmade features maps

Drawing R645-301-500G, which shows the locations of the abandoned equipment, has been added to the MRP.

Findings:

The proposed amendment meets the minimum requirements of the Maps, Plans, And Cross Sections of Mining Reclamation section of the Coal Mining Rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

The Division prepared a Cumulative Hydrologic Impact Assessment (CHIA) for East Mountain, which includes the Deer Creek Mine, in 1994. The proposed permit revision has been reviewed by the Division, and the Division has determined that the current CHIA is sufficient to determine, for purposes of permit approval, that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area, and will not involve operations outside of the cumulative impact area as defined in the CHIA.

RECOMENDATIONS:

The Division should approve this amendment of Part 3 of the Deer Creek Mine MRP. This amendment modifies the MRP to address actual abandonment of specific mining machinery and materials underground and also future abandonment of such items. Monitoring of surface and ground waters is to continue as described in Volume 9 - Hydrology of the Trail Mountain, Cottonwood/Wilberg, and Des-Bee-Dove Mines.