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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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February 4, 1999

TO: File

THRU: Daron Haddock, Permit Supervisor

FROM: Sharon Falvey, Reclamation Hydrologist

RE: Permit Application Package, West Ridge Resources, Inc., West Ridge Mine, PRO/007/041-98-1, Folder #2, Carbon County, Utah.

SUMMARY:

West Ridge Resources, Inc., has submitted a permit application package to mine coal in the Book Cliffs north of East Carbon and proposes locating the surface facilities in C Canyon. The application includes an experimental practice to bury rather than salvage topsoil within the disturbed area. The applicant submitted a final version of the plan to address the issues identified in various Technical Analysis. Significant changes were made to the sedimentation pond and operations pad drainage in the January 1999 submittal. Deficiencies were presented in a January 27, 1999 meeting with Andelex and were addressed in this final submittal.

ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.18; R645-301-724.

Analysis:

Information on climatic resources can be found in chapters, 2, 4, and 7 and are summarized in the following paragraphs. This site is located within the Region 6 and Region 7, Palmer Hydrologic Drought Index boundaries. A precipitation gauge was installed in 1998 and data from the 1998 season is presented in the plan.

The mean annual air temperature is 45 to 47 degrees F and the average frost free period is 80 to 120 days. Average annual precipitation is 12-14 inches with the majority occurring from

October to March (chapter 2, pg. 2-1).

Daily Climatic information is collected at the National Weather Service Station in Sunnyside, Utah. Average annual precipitation is about-13 inches at the Sunnyside, Utah station. Snow accumulations ranged from 0-21 inches at Whitmore Canyon (6,750 ft). Pan evaporation for this site is 0.69 (chapter 4). Average annual wind speed in Dragerton, Utah south east of the site are 6.2 mph and predominately flow from the north-north east (section 724.412).

Findings:

The applicant has met the minimum regulatory requirements for this section.

OPERATION PLAN

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:

Acid and toxic-forming materials.

Hydrocarbons:

The Spill Prevention and Control Countermeasure Plan is included in Appendix 5-6 and, it describes the steps to be taken to minimize disturbance to the hydrologic balance intended to meet applicable federal and Utah water quality laws and regulations regarding hydrocarbons. The applicant provides adequate information about hydrocarbons used at the minesite from which the probable hydrologic impacts can be determined.

Other Chemicals

A commitment to handle and properly dispose of all noncoal mine waste defined as "hazardous" Under the Resource Conservation and Recovery act and 40 CFR part 261 is provided in section 528.33. Longwall mining fluid emergency spill plan is addressed and a list

of chemicals to be used at the mine is included in section 731.300. Gravel areas will be sprayed with a chemical surface stabilizer such as potassium chloride, or water control (Chapter 4, pg 4-8). The applicant provides adequate information about chemicals used at the minesite from which the probable hydrologic impacts can be determined.

Gravity discharges.

No gravity discharges are expected from the mine. The formation dips to the 3 to 8 degrees to the north northeast.

Diversions.

Design Information

In a previous analyses the Division noted the permittee used smaller CN's than the Division felt was acceptable. Apparently, this resulted from differences in the Soil Hydrologic Group used in their analyses. In this submittal the applicant did not adjusted the Soil Hydrologic Group used to determine the CN but, did adjust the CN's. The applicant has included curve numbers that were agreed upon with the Division in a phone conversation. The following table presents the hydrologic group provided from the Soil Conservation Service and the Hydrologic Group used by the permittee.

Soil Hydrologic Group

Soil (unit#)	Components	% Inclusion	SCS Hydrologic Group	Hydrologic Group used
Midfork Comodor Complex (62)	Midfork Bouldery Loam	50%	B	B
	Commodore Bouldery Loam	30%	D	
	Other	30%		
Rock Outcrop (96)	Rubble Land	30%	NA (impervious)	D
	Rock Outcrop	30%	NA (impervious)	
	Travessilla	25%	D	
	Other	10%		
Croydon (21)	Croydon Loam	100%	B	B
Beje-Trag Complex Plateaus (7)	Beje Loam	55%	D	C
	Trag Clay Loam	20%	C	
Beje Complex - Mountain Ridge Tops (5)	Beje very gravelly fine sandy loam	45%	D	C
	Beje fine sandy loam	35%	D	
	Other	20%		

Source: Soil Survey of Carbon County Area, Utah, USDA SCS June, 1988

The CN range presented below is determined acceptable by the Division and was determined from TR55 methodology with vegetative information provided in the plan and information from the Soil Survey of Carbon County Area, Utah, USDA SCS June, 1988. The CN range determined by the Division are presented, as well as, the CN provided by the operator.

Soil Hydrologic Group

Soil (unit#)	Divisions CN Acceptable Range	Permittee's Adjusted CN (previous CN)	Comments
Midfork Comodor Complex (62)	64 to 62	64 (59)	
Rock Outcrop (96)	80 to 89	80 (78)	Although this is at the low end of the CN acceptable range the Division agrees with the number provided.
Croydon (21)	50 to 60	59 (59)	
Beje-Trag Complex Plateaus (7)	72 to 80	70 (70)	The proposed CN was accepted because this soil type is a small percentage of the area contributing to runoff.
Beje Complex - Mountain Ridge Tops (5)	80 to 89	70 (70)	The proposed CN was accepted because this soil type is a small percentage of the area contributing to runoff.

Source: Soil Survey of Carbon County Area, Utah, USDA SCS June, 1988

Bypass Culvert

The Right Fork Undisturbed Bypass Culvert receives runoff from a 687.8 acre drainage area. This is greater than a square mile; therefore, by definition it is intermittent and it is required to be designed for a 100 yr - 6 hr precipitation event.

Design criteria and design certifications are provided in Appendix 7-4. The applicant uses the Office of Surface Mining Watershed Model, Storm Version 6.20 by Gary E. McIntosh to determine design flows and flow volumes. The SCS upland Curve is used to develop the time of concentration, and a forested unit hydrograph type is assumed for the undisturbed watersheds. Although the Kirpich Method for time of concentration results in a more conservative design for the 100-yr 6-hr event (all other values held constant), the 50-yr 24-hr event used by the applicant for the bypass culvert design provides an additional capacity exceeding the values obtained using the Kirpich Method for time of concentration for the 100-yr 6-hr event.

The plan uses a CN of 0.020 for cmp culverts. According to Barfield, Warner and Haan, 1981 minimum values of 0.021 and maximum values of 0.025 can be used. If all other values provided by the applicant are held constant the 0.025 value used for the bypass culvert does not provide the capacity estimated for the 50-yr 24-hr event but, it would exceed the peak flow estimated from the 100-yr 6-hr event. In addition, the head created by up-gradient water will increase the volume that can move through the culvert when flowing full to adequately pass the

estimated peak flow. The design flow for the 50-yr 24-hr event provided in the plan meets or exceeds the minimum regulatory requirements.

The outlet to the Bypass Culvert will be equipped with a rip-rap apron. Designs are included in Appendix 7-4. Undisturbed drainage culverts will have trash racks and, inlets will be protected with riprap. The designs meet or exceed minimum regulatory requirements.

Road Drainage

The disturbed area drainage is primarily developed along the roads and meet or exceed minimum regulatory requirements for road drainage. The road drainage diverted around the lower pad area is designed to be conveyed to the existing downstream channel beyond the permitted area.

Disturbed Area Drainage

Diversions are sized for the 10-yr 24-hr event using the SCS - TR55 method for Type II storms. The constructed ditch design will include an additional 0.5 foot of freeboard to the design flow depth.

A Manning's n equal to 0.035 is used for all ditch designs. This roughness factor is generally the value used for earthen channels that are small drainage ditches, stony beds with weeds on banks, earth bottom and rubble sides, or large drainage ditches with 4.0-5.0 hydraulic radius. Inspecting the channels under field conditions will ultimately determine design adequacy and erosional stability. Additional drainage may be needed in the pad areas if runoff is not adequately conveyed toward the road drainages. The information presented is designed to meet minimum regulatory requirements.

Stream buffer zones.

A commitment to provide buffer zone signs at the mine pad boundaries upstream and downstream along the right fork drainage is found in section 521.260. The August 1998 letter from the Division of Water Rights indicates no stream alteration permit is required, appendix 7-9.

The Division hereby authorizes mining and reclamation operations through the West Ridge C canyon drainage and finds that:

1) Coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or Federal Water Quality Standards and will not adversely affect the water quantity and quality or other environmental resources of the stream;

2) There will be a temporary stream channel diversion that complies with R645-301-742.300; and
3) The area not to be disturbed will be designated as a buffer zone, and the operator will mark it as specified in R645-301-521.260.

Sediment control measures.

General Construction plan

Information related to hydrology and sediment control issues identified in the plan include the following commitments for the construction phase:

- The first sediment control measures will be silt fence placed across the stream using the UDOT post and mesh method. Silt fences placed in drainages will include a notched spillway and, will not extend above the streambank elevation. Sediment control measures and drainage control for the early phases of construction are described in the following locations; chapter 5 (section 526.300), Appendix 5-5 (8b), and Appendix 7-4 (section 3.5).

- A sedimentation pond as a temporary measure is proposed to be in place prior to other construction activities (Appendix 7-4, section 3.5).

- The channel will first be culverted through the office pad/lower cell area. After the temporary sedimentation pond is installed construction can begin upstream. The dam embankment will be constructed 12 feet high and the culvert will be fitted with an open riser (Attachment 3, Appendix 5-5). This structure is estimated to be in place for approximately two months. A commitment to construct the pond under direction of a P.E. and, P.E. certification are provided (Appendix 7-4, section 3.5). **Due to the temporary nature the pond size is approved by the division according to R645-301-742.231.**

- Previous submittals proposed siltation structures would be removed from the discharge area surrounding the bypass culvert when flow can pass through the culvert, but could not be found in the recent submittal. The inspector should ensure that the structures are removed from the discharge zone when flow can pass through the culvert to function properly.

- When installing the Bypass Culvert the plan proposes using two methods to place fill. One, in Channel, Rock, Fill (CRF) areas, fill will simply be placed in the existing channel. Second, in Channel, Topsoil, Fill (CTF) areas, geotextile will be placed over the topsoil prior to placing the fill. The culvert will closely follow the existing channel

alignment and grade.

In Channel, Rock, Fill (CRF) areas the plan commits to the following in Appendix 5-5, "The channel bottom will not be graded or bulldozed, however." and "...small irregularities of less than 12 inches will be modified to accommodate the culvert alignment." Also, "Imported bedding material (borrow) will be used to fill minor depressions within the channel prior to installing the culvert." Large bolders will be moved away from the culvert alignment.

Natural abrupt vertical gradient changes occur in the channel and were designated with the name "Rock Block" by the permittee. The plan commits to ramp the fill to the upstream gradient until the channel becomes level in order to retain these features for reclamation. This is an admirable effort to promote retaining the natural geomorphology of this canyon for channel reclamation.

In Channel, Topsoil, Fill (CTF) areas the same techniques will be used as for the (CRF) areas. However, the channel banks and sides containing topsoil will be draped with the geotextile material before other construction occurs and the culvert bedding will be placed over the geotextile material followed by culvert placement.

- Once the culvert is constructed 500 feet up canyon from the temporary pond the permanent ponds can be constructed. When the permanent ponds are functional the temporary pond riser can be removed, the bypass culvert can be connected and the temporary pond will be filled (Appendix 7-4).

Top Soil Substitute Area.

This area is proposed to be utilized only if needed during final reclamation. Section 724.200 discusses utilizing silt fencing, roughening and final surface configuration. The applicant discusses insloping the site but, it is not clear what is intended by that statement. Creating a ponded area on the top of the pile may lead to gully erosion if the water can breaches the ponded area.

Alternate Sediment Control Measures

Topsoil stockpiles ASCA X and Y will use the following sediment control measures; pocking (also referred to as irregular pitted surfaces), silt fencing around the perimeter, seeding (following topsoil placement and after September 15), and constructing ditches at the base of the pile to convey runoff away from the topsoil stockpile (section 732.100).

Snow removal stockpiles are shown on drainage map 7-4. Snow from areas other than the area draining to ASCA-Z can not be stockpiled in the ASCA-Z stockpile location because, the design does not consider treatment for runoff from snow beyond the alternate sediment control area. Snow from adjacent areas are therefore not approved to be stockpiled in ASCA-Z. Additionally, care should be conducted when grading the road crest at ASCA-Z to ensure the road drainage, not included in the design, does not enter the ASCA.

Siltation structures.

The siltation structures are sedimentation ponds. See the following discussion.

Sedimentation ponds.

Spillways

Two sedimentation ponds in series will be constructed at this site. The upper pond has an open channel spillway and will be constructed with a minimum 1.5 foot depth. The lower pond has two drop inlet spillways that will discharge to the bypass culvert, the primary spillway has a riser with an oil skimmer. The lower pond is designed with an emergency spillway and a primary spillway that will pass the 25-year, 6-hour storm event. Two feet of freeboard are designed between the emergency spillway (6938 ft) and embankment crest (1640). One foot of head is designed between the primary spillway 6937 ft and the emergency spillway 6938 ft. The primary spillway will carry the peak flow with 0.85 ft of head over the pipe. The plan meets minimum regulatory requirements.

The pond will be constructed with a walkway attached to the primary spillway (section 733.130) to allow for sampling discharged pond water.

Decant

Decanting the pond will be conducted by removal with a portable pump containing an inverted inlet and having a 100 gpm pumping capacity (Appendix 7-4 and section R645-301-742). The plan meets minimum regulatory requirements.

Pond Capacity

This pond is designed so the maximum extent the water can be impounded above the upstream toe is 16.5 ft (to the top of the primary spillway) in cell B. The pond contains less than 20 acre feet. Therefore the pond does not require MSHA approval.

The sedimentation pond design capacity is 7.67 acre feet at the pond spillway. The estimated run off volume 7.05 acre feet for a 10 year 24 hour event was determined but has some

minor errors. First, a small addition error was noted in Table 4 regarding the runoff volume to the sedimentation pond. Second, runoff from the downstream portions from ASCA X and Y and adjacent watershed areas are not calculated in the pond and drainage designs. ASCA X and ASCA Y are shown in the plan with two construction options the second option reduces the mineyard area and if, implemented eliminates the error at ASCA X and ASCA Y. The excess pond volume and, the disturbed area which is delineated as extending beyond the proposed cut slopes, should provide a buffer and result in adequate pond capacity.

Pond areas used to determine the Pond Volume Curve were not verified. It is assumed the pond areas presented by the applicant in the pond volume curve are accurate. Sedimentation markers will be provided in both cells. The calculation for sediment yield appears to be estimated using a metric ton rather than a U.S. ton. The maximum sediment volume therefore, is slightly less than a 3 year estimate. The applicant has committed to clean out the pond at the 60% cleanout level and meets minimum requirements for sediment storage. The annual report survey will also track accumulations in the ponds.

Other treatment facilities.

No other treatment facilities are proposed for this site.

Exemptions for siltation structures.

No exemptions for siltation structures were requested or granted with this application.

Discharge structures.

Designs for the spillways in the upper cell is shown to be adequate to pass the 25-year, 6-hour peak flow. The peak flow from 10-year, 24-hour event should be passed to the lower ponds because the total pond volume is to contain the 10-year, 24-hour event. According to the calculations provided the spillway can pass the 10-year, 24-hour event at the 1 foot stage elevation.

Impoundments.

All impoundments are sedimentation ponds. See the discussion above.

Findings:

The plan meets the minimum regulatory requirements for this section.

Recommendation:

It is recommended this PAP be approved.

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