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August 20, 1998

Jean Semborski, Environmental Coordinator
West Ridge Resources, Inc.
6750 Airport Road
P. O. Box 902
Price, Utah 84501

Re: Technical Analysis, West Ridge Mine Application, West Ridge Resources, Inc., West Ridge Mine, PRO/007/041, Folder #3, Carbon County, Utah

Dear Ms. Semborski:

The Division has completed a Technical Analysis (TA) of the West Ridge Mine Application Package and you will find it enclosed for your information and files. The purpose of this TA is to determine the Technical Adequacy of your application. As you will note, there are a few areas of deficiency in your application that prevent us from approving it at this time. Please review the TA carefully to make sure you understand the concerns. The deficiencies will need to be adequately addressed before your application can be approved. In order for us to further process your application, please provide a response by no later than October 20, 1998.

Please call if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock". The signature is fluid and cursive.

Daron R. Haddock
Permit Supervisor

tam

Enclosure: Technical Analysis

cc: R. Davidson

P. Hess

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State of Utah
Division of Oil, Gas and Mining
Utah Coal Regulatory Program



Technical Analysis and Findings
West Ridge Mine Application
PRO/007/041
August 19, 1998

INTRODUCTION	1
LIST OF DEFICIENCIES	2
ADMINISTRATIVE INFORMATION	12
IDENTIFICATION OF INTERESTS	12
VIOLATION INFORMATION	13
RIGHT OF ENTRY INFORMATION	13
UNSUITABILITY CLAIMS	14
PERMIT TERM, INSURANCE, PROOF OF PUBLICATION, FACILITIES OR STRUCTURES USED IN COMMON, FILING FEE, NOTARIZED SIGNATURE	15
ENVIRONMENTAL RESOURCE INFORMATION	16
GENERAL	16
PERMIT AREA	16
HISTORIC AND ARCHAEOLOGICAL RESOURCE INFORMATION	17
CLIMATOLOGICAL RESOURCE INFORMATION	17
VEGETATION RESOURCE INFORMATION	18
FISH AND WILDLIFE RESOURCE INFORMATION	20
Wildlife Information	20
Threatened or Endangered Species	20
SOILS RESOURCE INFORMATION	22
Soil Survey Information	22
Soil Characterization	23
Substitute Topsoil Borrow Area	23
LAND USE RESOURCE INFORMATION	24
ALLUVIAL VALLEY FLOORS	26
PRIME FARMLAND	26
GEOLOGIC RESOURCE INFORMATION	27
HYDROLOGIC RESOURCE INFORMATION	29
Sampling and analysis	29
Baseline information	29
Ground-water information	29
Surface-water information	30
Baseline cumulative impact area information	31
Modeling.	32
Alternative water source information.	32
Probable hydrologic consequences determination.	32
Ground-water monitoring plan.	35
Surface-water monitoring plan.	36
MAPS, PLANS AND CROSS SECTIONS OF RESOURCE INFORMATION	39
Affected Area Boundary Maps	39
Archeological Site Maps	39
Coal Resource and Geologic Information Maps	39
Cultural Resource Maps	39

Existing Structures and Facilities Maps	39
Existing Surface Configuration Maps	39
Mine Workings Maps	39
Monitoring Sampling Location Maps	40
Permit Area Boundary Maps	40
Surface and Subsurface Manmade Features Maps	40
Surface and Subsurface Ownership Maps	40
Subsurface-water Resource Maps	40
Surface-water Resource Maps	41
Vegetation Reference Area Maps	41
Well Maps	41
Contour Maps	41
Certification	41
OPERATION PLAN	43
OPERATIONS AND FACILITIES	43
EXISTING STRUCTURES	43
PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES	44
RELOCATION OR USE OF PUBLIC ROADS	44
AIR QUALITY	45
COAL RECOVERY	45
SUBSIDENCE CONTROL PLAN	46
SLIDES AND OTHER DAMAGE	48
FISH AND WILDLIFE RESOURCE PROTECTION	48
TOPSOIL AND SUBSOIL	50
Topsoil and Subsoil Removal - Traditional Methods	50
RO/RL Travessilla Complex Soils	51
Topsoil Substitutes and Supplements	52
Topsoil Storage	52
INTERIM STABILIZATION	53
ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES	55
SPOIL AND WASTE MATERIALS	56
HYDROLOGIC INFORMATION	57
Ground-water monitoring.	57
Surface-water monitoring.	59
Acid and toxic-forming materials and underground development waste.	61
Transfer of wells.	62
Discharges into an underground mine.	62
Gravity discharges.	62
Water quality standards and effluent limitations.	62
Diversions.	63
Stream buffer zones.	65
Sediment control measures.	65
Alternate Sediment Control Measures	67
Siltation structures.	68
Sedimentation ponds.	68
Other treatment facilities.	68

Exemptions for siltation structures.	68
Discharge structures.	68
Impoundments.	68
Casing and sealing of wells.	69
SUPPORT FACILITIES AND UTILITY INSTALLATIONS	71
SIGNS AND MARKERS	71
USE OF EXPLOSIVES	72
MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS	72
Affected Area Subsidence Maps	72
Affected Area Maps	72
Mining Facilities Maps	72
Mine Workings Maps	72
Monitoring and Sampling Location Maps.	72
Certification Requirements	72
RECLAMATION PLAN	74
LAND USE RECLAMATION PLAN	74
APPROXIMATE ORIGINAL CONTOUR RESTORATION	74
BACKFILLING AND GRADING	74
MINE OPENINGS	76
TOPSOIL AND SUBSOIL	76
Soil Redistribution	77
Soil Nutrients and Amendments	77
Soil Stabilization	77
ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES	78
HYDROLOGIC INFORMATION	79
Ground-water monitoring.	79
Surface-water monitoring.	79
Acid and toxic-forming materials.	79
Transfer of wells.	79
Discharges into an underground mine	80
Transfer of wells.	80
Gravity discharges from underground mines.	80
Water quality standards and effluent limitations.	80
Diversions.	80
Stream buffer zones.	80
Sediment control measures.	80
Siltation structures.	80
Sedimentation ponds.	80
Other treatment facilities.	80
Exemptions for siltation structures.	80
Discharge structures.	80
Impoundments.	80
Casing and sealing of wells.	80
REVEGETATION	81
Revegetation Plan	81
Revegetation Success Standards	84

Field Trials	85
Wildlife Habitat	86
STABILIZATION OF SURFACE AREAS	88
CESSATION OF OPERATIONS	88
MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS ...	88
Affected Area Maps	89
Bonded Area Maps	89
Reclamation Backfilling and Grading Maps	89
Final Surface Configuration A.C. Maps	89
Reclamation Surface and Subsurface Manmade Features	89
Reclamation monitoring and sampling location maps	90
Certification Requirements	91
BONDING AND INSURANCE REQUIREMENTS	91
Determination of bond amount.	91
REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING	93
EXPERIMENTAL PRACTICES	93
Operations - Experimental Practices	93
Reclamation - Experimental Practices	94
CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT	95

INTRODUCTION

INTRODUCTION

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings which comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference which describes the minimum requirements. In this Technical Analysis we have summarized the deficiencies at the beginning of the document to aid in responding to them.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to a particular permitting action. TA's may have been completed previously and the revised information has not altered the original findings. Those sections that are not discussed in this document are generally considered to be in compliance.

LIST OF DEFICIENCIES

LIST OF DEFICIENCIES

- R645-301-112.410**, The application needs to include the names and other relevant information about affiliated coal mining and reclamation operations.
- R645-301-112.700**, MSHA numbers need to be included in the application as soon as they become available.
- R645-301-114**, The applicant needs to provide right of entry information for the entire proposed permit area.
- R645-301-121.100**, Before making a final determination about the adequacy of wildlife information, the Division will need to receive comments from the Division of Wildlife Resources.
- R645-301-411**, The statement that there are no agricultural activities in the proposed permit area needs to be modified. Grazing is considered an agricultural activity.
- R645-301-411**, The portion of the land use section that discusses previous mining activity needs to mention the entry driven from the southeast part of the proposed permit area.
- R645-301-411**, The application has a statement that the Bureau of Land Management controls all of the land in the proposed permit area. The School and Institutional Trust Lands Administration and a private entity also control part of the land.
- R645-301-623.300**, Presence or absence of the two faults, roughly in the area of Bear, C, and B Canyons and striking approximately northwest-southeast, shown on maps done by the Utah Geological Survey (UGS).
- R645-301-624.210**, Logs showing the location of ground water where occurring, or clarification in the text that no ground water was intercepted by any of the bore holes and a discussion of why none was encountered over such a large area.
- R645-301-624.220, - 624.230, -624.320, -624.330**, Additional information on acid- and toxic-forming materials in the coal and overlying and underlying strata, or sufficient information to determine that the one set of analyses from a single outcrop location is adequate to determine acid- and toxic-forming materials in the coal and overlying and underlying strata for the permit and adjacent areas.
- R645-301-624.340**, Thickness and engineering properties of clays or soft rock in the stratum immediately above and below each coal seam to be mined because standard room-and-pillar mining is planned for development of main entries, headgates, and tailgates.
- R645-301- 724**, Characteristics for flows observed at Bear Canyon need to be specifically identified and addressed in the plan in relation to timing of use for the water rights issued for the Bear Canyon

LIST OF DEFICIENCIES

drainage. Conflicting information regarding intermittent and ephemeral portions needs to be clarified and flow and water quality characteristic need to be described.

- R645-301-724**, Clarification of water rights information listed in Appendix 7-5 and shown on Map 7-3. It is unclear what the "Map #" in the appendix represents and how it relates to the map.
- R645-301-724**, Information on water-supply well DH 90-1, located in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. (Map 7-6), and the associated water rights.
- R645-301-724**, Baseline data from 1985 - 1986 for surface monitoring sites, if available, or discussion of why it is not available.
- R645-301-724.100**, Baseline data for springs WR-1 and WR-2.
- R645-301-724**, Baseline data for at least an additional year (1998) to sufficiently demonstrate seasonal variation and water usage. The PAP commits to a total of three years of baseline data (page 7-15).
- R645-301-728**, The PHC should be revised, if needed after the second year of baseline water-quality and -quantity data (or two more years according to page 7-15 of the PAP) are collected.
- R645-301-728.301**, The PHC determination is to include findings on what impact the proposed operation will have on sediment yield from the disturbed area. Sediment yield and sediment control are discussed at several places in the PAP, but the PHC does not clearly address this subject.
- R645-301-728.332**, Clarification by what standard the water to be discharged from the mine will be considered suitable for stockwatering. Reference is made to primary (PDW) and secondary (SDW) drinking water standards found in UAC R309-101; however, if the TDS content is 1,600 mg/L as predicted, it will exceed the Utah Water Quality Standard (UAC R317-2) of 1,200 mg/L for stockwatering.
- R645-301-731.200**, Clarification of when collection of baseline data will end and collection of operation data will begin. It is not clear from the text that baseline data will be collected for three years before operational monitoring under the protocols in Table 7-1 come into effect (page 7-15).
- R645-301-731.200**, Under UDOGM directive Tech-006, starting with the first midterm review of the five-year permit and every fifth year thereafter until reclamation is complete, one sample is to be taken at each spring at low flow and at each stream monitoring site at either low flow or high flow. Each should be taken for analysis for baseline water quality parameters.
- R645-301-731.212, -223**, A statement that quarterly reports will be submitted to UDOGM.
- R645-301-622.100** - The table of drill-hole collar elevations and intervals cored and plugged, stated to be in Appendix 6-2 (PAP p. 6-6) but not found at that location.

LIST OF DEFICIENCIES

R645-301-710 - Mark the water supply intake for the culinary water for East Carbon City and the town of Sunnyside, located at Grassy Trail Reservoir, marked on a map.

R645-301-722.300 - Label "1986" stream monitoring stations on Maps 7-5 and 7-6 (and correct "1896" transposition on Map 7-5).

R645-301-722.400 - Show the culinary water-supply well DH 90-1 in the sw¹/₄ sw¹/₄ of Section 17, T. 14 S., R. 14 E. on an appropriate map, such as Map 7-3 or 7-5.

R645-301-540, The applicant needs to show in the text and on a map where snow will be stored.

R645-301-522 - Clarification of the discussion on page 6-3 of the split that precludes mining in the Lower Sunnyside Seam in the southern portion of the lease. Map 6-3 does not indicate a split or an area precluded from mining by the split.

R645-301-322, In a few locations, the application says there are no agricultural activities in the proposed permit area. These statements need to be modified since grazing is considered an agricultural activity that produces food.

R645-301-332, The applicant needs to commit to compensate for any grazing animals lost as a result of mining induced subsidence.

R645-301-525.231, The applicant needs to commit to replacing water quantities impacted as a result of mining induced subsidence.

R645-301-535, At a minimum, the applicant should include a map or verbiage committing to install a monitoring plan in accessible areas in advance of mining as part of the PAP. If other means of monitoring subsidence under deep cover are known of or become available, the applicant should commit to utilizing same.

R645-301-525, A commitment to monitor subsidence locations annually (after secondary extraction is initiated) must be included as part of the application.

R645-301-333, The applicant has committed to consult with the Division and with Wildlife Resources about what actions to take if there is a raptor nest in an area that will be subsided. The Fish and Wildlife Service also needs to be consulted.

R645-301-333, The applicant needs to commit that construction will not be initiated in the upper part of the mine in the time period from February 1 through July 15 unless monitoring shows there are no active raptor nests.

R645-301-333, The potential topsoil borrow area is in critical deer winter range, and the applicant needs to commit to mitigate for the disturbance. It is recognized the disturbance may never occur, so it is not necessary to actually perform the mitigation at this time.

R645-301-333, The applicant needs to commit to conduct wildlife education sessions for its and its contractors' employees.

LIST OF DEFICIENCIES

R645-301-232, Several questions remain concerning topsoil removal and protection with respect to construction sequence of the pad as follows:

- How are soils protected during vegetation removal and grubbing? If soils are heavily impacted with haul roads and/or heavy equipment on hillsides, then they need be salvaged from these areas.
- Rather than bury all slash material, could the slash be chipped and used as mulch during interim reclamation?
- When are cutslopes constructed; after pad placement or before?
- If cutslopes are constructed before pad placement, how will soils below cutslopes and beneath the pad surface be protected during cutslope operations?
- Delineate on a map all areas within the disturbed area where cuts will actually occur during pad construction for the purpose of assessing soil salvage areas.

R645-301-232.200, R645-301-232.300 and R645-300-133.710, Concerning the RO/RL area, the following concerns need to be addressed as explained in the analysis section:

- The Division must conclude that based on information set forth in the application concerning the RO/RL area and lack of soil, the site is not reclaimable.
- Successful reclamation requires the same soil and rock parameters as currently exist to establish revegetation success standards. The indigenous RO/RL soils and rock material need to be salvaged and protected in like manner to the Midfork, Brycan and Strych soils (i.e., provide a marker layer and preserve undisturbed in-place).
- Either the RO/RL surface slopes are safe for constructing cutslopes and likewise soil salvage, or they're not safe for either activity.
- For the RO/RL area wherever cutslopes and cut areas are constructed, all indigenous soil and rock material must be salvaged and stockpiled for later reclamation use. These rocky, thin soils need be segregated and stockpiled separately from the Midfork, Brycan and Strych soils.

R645-301-233, Based on DOGM's soil and overburden guidelines, imported gravel fills in their current natural state are suitable as substitute topsoil based physical and chemical characterization. The PAP plan currently commits to leaving an average of 12 to 18 inches of pad fills as substitute soils. However, when these gravel subsoils and unconsolidated sub-materials are processed for standard 0 to 8" construction fills, their physical state will have been altered from native conditions and their suitability for substitute topsoil is no longer guaranteed.

R645-301-331, The amounts of alfalfa and sweet clover shown in the interim seed mixture are excessive and should be reduced to about one pound of pure live seed per acre. Several other species could also be used in the interim mix to increase diversity and provide better erosion protection.

LIST OF DEFICIENCIES

R645-301-331, It is not clear what seed mix will be used on the topsoil piles. The seed of canyon sweetvetch that was collected in 1997 will need to be planted somewhere so seed can be raised for use in final reclamation, and the application indicates the topsoil piles may be used. However, the application also mentions the topsoil piles could be used for test plots and that the interim revegetation seed mixture could be used there. In addition, the application should show what mitigation is being done for canyon sweetvetch.

R645-301-331, Other than the seed mixture and seeding methods, the application needs to show what methods would be used for interim revegetation, such as surface preparation, fertilization, and mulching.

R645-301-512.200 & R645-301-534, classification and designs for all roads to be used within the permit area. Designs for primary roads will need to be certified by a registered professional engineer.

R645-301-513.300, If it is the permittee's intent to store "gob material" in underground rooms, then approval from MSHA and the Division must be obtained. In addition, the development of the outcrop area is bound to generate some coal and roof material that will not be of saleable quality. What does the permittee propose to do with this?

R645-301-528.340, The PAP proposes to use portal face-up waste material as pad fill. The applicant must address the following regulations to gain approval:

- **R645-301-412.300**, Suitability and compatibility requirements for reclamation and revegetation. The permittee must commit to testing portal face-up waste material for acid and toxic forming potentials. The PAP must provide information showing total protection of the in-situ topsoil which requires complete segregation of the mine waste from the topsoil. The requirements of R645-301-536.300 et seq. must be met.
- **R645-301-514.100**, Inspections of fills during construction.
- **R645-301-745.100**, Disposal of excess spoil, General Requirements.
- **R645-301-512.200**, A map indicating where this mine development waste will be placed within the pad must be included as part of the plan, (R645-301-512.200).

R645-301-731.220, The water monitoring Table 7-1. Does not include all water monitoring locations referenced within the plan. The water monitoring plan is not clear and accurate. A method must be described how a discharge sample will be obtained from the pond outlet prior to discharge to the bypass culvert.

R645-301-731, The Spill Prevention and Control Countermeasure Plan should be included in the mining and reclamation permit to describe the steps to be taken to minimize disturbance to the hydrologic balance and to meet applicable federal and Utah water quality laws and regulations. The UPDES permit should be issued and incorporated into this plan prior to PAP approval. A plan for longwall mining fluid emergency spills needs to be addressed. A list of all chemical to be used and stored in the mining operations needs to be contemplated in the PHC.

LIST OF DEFICIENCIES

- R645-301-731.513**, The mine plan needs to contemplate the potential for intercepting water potentially accumulating in the old Sunnyside Mine workings.
- R645-301-740**, The applicant must adjust or justify the CN used in the calculations provided for runoff. Detail on soils, rock outcrops and rubbleland inclusions would be needed to justify the soil hydrologic group chosen for soil types.
- R645-301-742.400**, The applicant must provide a culvert design for the road drainage area that is within the southwest end of the disturbed area. The drainage from area UAZ-b needs to contemplate potential inflows from the side drainage. Geotextile manufacturing specifications and specifications for construction must be supplied for all fabrics to be used.
- R645-301-742.300**, Watershed maps, watershed calculations and associated drainage plans need to be corrected in regard to errors in the drainage plan for ASCA- X and Y.
- R645-301-731.600**, By regulatory definition the drainage in C canyon is considered intermittent and requires buffer zone signs. Provide a statement recognizing place buffer zone signs are required, within the text. The text needs to correctly identifies the 100 yr - 6 hr event as the minimum design required for the bypass culvert.
- R645-301-742**, 1) Interim sediment control measures and drainage need to be contemplated for construction phases. 2) The construction plan needs to contemplate a temporary topsoil storage location and sediment control measures. 3) Designs for the potential top soil substitute area should include: sediment control measures and drainage plans. 4) The plan contemplates additional sediment control measures in chapter 7: design criteria for these measures must be provided. 5) Conflicting information in the plan pertaining to topsoil sediment control measures needs to be clarified.
- R645-301-742.110**, The ASCA-Z needs to incorporate BTCA. The area should be designed to report to a sedimentation pond unless BTCA is demonstrated. A designed erosion control measure needs to be provided for the pad outslope.
- R645-301-741**, The plan must include the specific measures used to preserve the existing channel geomorphology where it is referred to in Appendix 5-5. Conflicting information provided in chapter 7 needs to be clarified.
- R645-301-742.311**, The emergency spillway on Pond C discharges into the bypass culvert. The details for discharge structure and culvert inlet needs to be designed to minimize adverse impacts within the permit and adjacent area.
- R645-301-724.100**, Baseline data for springs WR-1 and WR-2.
- R645-301-724**, Clarification of water rights information listed in Appendix 7-5 and shown on Map 7-3. It is unclear what the "Map #" in the appendix represents and how it relates to the map.
- R645-301-724**, Baseline data need to be collected for at least an additional year (1998) to sufficiently demonstrate seasonal variation and water usage.

LIST OF DEFICIENCIES

- R645-301-728.301**, The PHC determination is to include findings on what impact the proposed operation will have on sediment yield from the disturbed area. Sediment yield and sediment control are discussed at several places in the PAP, but the PHC does not clearly address this subject.
- R645-301-728.332**, Clarification by what standard the water to be discharged from the mine will be considered suitable for stockwatering. Reference is made to primary (PDW) and secondary (SDW) drinking water standards found in UAC R309-101; however, if the TDS content is 1,600 mg/L as predicted, it will exceed the Utah Water Quality Standard (UAC R317-2) of 1,200 mg/L for stockwatering.
- R645-301-731.200**, Clarification of when collection of baseline data will end and collection of operation data will begin. It is not clear that baseline data will be collected for three years before the protocols in Table 7-1 come into effect.
- R645-301-731.212, -223**, Clarification that quarterly reports will be submitted to UDOGM.
- R645-301-731.212, 223**, Clarification that when the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator will promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance.
- R645-301-731.730**, Elevations and locations of monitoring stations to be used to gather operational data on water quality and quantity.
- R645-301-412.200**, Comments from the Bureau of Land Management need to show their understanding of and support for leaving the road following reclamation.
- R645-301-540**, Address each of the following:
- Provide an approved MSHA plan for hauling excess fill back into the underground mine workings.
 - The Division and MSHA approved plans must include a map of the underground workings showing the storage volume required to backfill the 92,000 cubic yards.
 - Table 5-1, page 5-46 shows the removal of structures in the portals/highwall area prior to hauling pad material underground. The permittee should consider by what means the mine fan and the belt drives will be powered, and possibly revise the reclamation time line. In order to remove the fill from four of the conveyor support structures (i.e., fill removal of pad to return it to AOC), it will be necessary to relocate a belt drive to the #4 portal area pad.
 - Section 553.200, page 5-52, says excess fill material will be hauled off site or disposed of in the abandoned mine workings. As spills occur, contaminated fill material should be disposed of in a State certified landfill.
 - Can the material, that is in place at time of reclamation, be viewed as "clean"? Should the top 12 inches be disposed of as contaminated material? If the approval is given from the Division to

LIST OF DEFICIENCIES

haul fill off site, what approved area is the permittee considering? Is the approved area something that can be determined at the time of reclamation?

- The cost for underground storage of fill material shown in the reclamation cost survey is \$159,999, and this is not an accurate figure. This figure is only the material hauling cost. Mine operation costs must also be figured in. As noted above, approval to do this must be obtained from MSHA prior to DOGM approval, (R645-301-513.300). A more detailed cost analysis for this procedure must be made and included as part of the reclamation bond costs.

R645-301-120, The following items need to be addressed and clarified in the PAP:

- The PAP contains conflicting reclamation commitments between normal reclamation AOC grading versus fill removal to expose original soil surfaces. Delineate in writing and on a reclamation map which reclamation technique applies to which area. This needs to be coordinated with the Operations deficiency for delineating on a map all areas within the disturbed area where cuts will actually occur during pad construction.
- It is unclear at what point the highwall will be reclaimed as fills are being removed from the pad and hauled into the old mine workings.

R645-301-242, Redistribute segregated stockpiled soils to their respective areas (e.g., RO/RL soils to RO/RL areas). Provide average replacement depths by area and by soil type based on stockpiled volumes.

R645-301-120, The following items need to be addressed and clarified in the PAP:

- A map showing cut areas to receive fill for achieving AOC.
- Buried RO/RL boulders need to go back on RO/RL slopes.
- Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.).

R645-301, Ground-water monitoring plans during reclamation.

R645-301, Parameters, protocols, and location of the surface-water monitoring station to be established below the reclaimed disturbed area to monitor water quality from the reclaimed site (page 7-36).

R645-301-341, The applicant needs to show how landscape diversity, and thus vegetation diversity and wildlife habitat, will be restored.

R645-301-341.210, The applicant needs to clarify seeding rates. Footnotes to the seed mixture tables indicate the rates shown are for drill seeding and that they would be doubled for broadcast seeding; however, the tables also say the rates are for broadcast seeding.

R645-301-341.210, The applicant needs to specify which subspecies of sagebrush would be seeded.

LIST OF DEFICIENCIES

- R645-301-341.230**, The application says in Section 341.230 that tackifier will be applied at the rate of 500 pounds per acre, and this is probably a mistake. Normally, wood fiber hydromulch would be applied at this rate together with a tackifier to anchor another mulch. This section should be clarified.
- R645-301-341.230**, The applicant intends possibly to use a polyacrylamide (PAM) or SoilLok as a tackifier. It appears these would work as tackifiers, but the applicant needs to supply further information about application rates.
- R645-301-341.250**, According to Map 3-2, the Douglas fir/maple reference area would be disturbed, so this area cannot be used as a reference area. The applicant needs to propose a different success standard.
- R645-301-341.250**, The applicant needs to provide further information about the diversity success standard, such as exactly what method would be used and what the standards are. The application also needs to show how other revegetation performance standards, such as seasonality, utility for the postmining land use, permanence, and capability for regeneration and succession, will be measured and what standards will be used.
- R645-301-341.250**, The Division has developed woody plant density success standards, and these have been approved by the Division of Wildlife Resources. These standards, as discussed in this technical analysis, need to be included in the application.
- R645-301-341.250**, Table 3-4 contains a schedule for monitoring vegetation after final reclamation. This table needs to include measurement of plant productivity in the tenth year following reclamation.
- R645-301-342**, Section 342.100 of the application indicates wildlife habitat will be restored following reclamation. This statement needs to be modified. Restoration implies the site will be made to be exactly as it was before disturbance.
- R645-301-342**, In reclamation, the applicant needs to use the best technology currently available to enhance wildlife habitat. The application needs to show how this performance standard is being achieved. The application references Appendix 3-6 for comments about the reclamation plan from Wildlife Resources. This appendix should also contain comments from the School and Institutional Trust Lands Administration about a habitat mitigation plan; however, the appendix is empty.
- R645-301-731.730**, Show the location of the water monitoring station to be established below the reclaimed disturbed area to monitor water quality from the reclaimed site (page 7-36).
- R645-301-120, R645-301-526.200, R645-301-541.300**, This permit application package is inadequate regarding the reclamation issues for the six inch East Carbon City water line and the 69 KV power line which is to be installed to provide service to the Mine. Also, an agreement which gives West Ridge Resources, Inc. the authority to reclaim that portion of the 69 KV line which lies within the DAB must be incorporated into the plan, or an agreement which indicates that the portion of the 69 KV line within the DAB belongs to West Ridge Resources, Inc. must be included in the plan.
- R645-301-121.200**, The Applicant must give the Division information on:

LIST OF DEFICIENCIES

- What costs the disposal fee covers and how that cost was determined.
- Give the Division documentation on the dump fee at the City Sanitation facility.

R645-302-200, Several Operational concerns and questions are listed for the Experimental Practice that need to be addressed and/or changed in the PAP:

- Andalex proposes to protect the soil resources in-place by covering the soil surface with a geotextiles fabric, then placing fill material over the fabric. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.
- The PAP contains conflicting construction and reclamation goals concerning preservation of the existing stream channel, stream bank geomorphology and original ground surface configuration. The conflict arises with construction procedures using a trackhoe to remove boulders and grade the stream channel prior to culvert installation versus channel preservation. In addition, Maps 2-4 shows culvert installation below original soil surface. If channel soils are not going to be preserved in-place and undisturbed, then they need to be salvaged and stockpiled.
- Information and specifications are needed on the geotextile fabric to assess it's suitability and durability for use as explained in the Experimental Practices.

R645-302-200, The following items need to be addressed and clarified in the Experimental Practices:

- PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.) needs to be applied to the soil surface.
- A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.
- In order to properly assess reclamation sequence for restoration of in-place soils, please explain coordination and timing of conveyor belt removal, highwall reclamation, fill transport into old mine workings and pad removal.

ADMINISTRATIVE

ADMINISTRATIVE INFORMATION

IDENTIFICATION OF INTERESTS

Regulatory Reference: R645-301-112

Analysis:

West Ridge Resources, Inc., has applied for a permit to mine in an area north of East Carbon in Carbon County. The applicant is a corporation existing under the laws of Delaware and qualified to do business in Utah. The application shows the applicant's address, telephone number, employer identification number, and resident agent. The applicant will pay the abandoned mine reclamation fee.

The applicant is owned jointly by the Intermountain Power Agency (IPA) and by Andalex Resources, Inc. Names, addresses, and employer identification numbers of persons that own or control the applicant are in Section 112.300 and Appendix 1-7. Appendix 1-5 lists affiliated coal mining and reclamation operations and these operations' permit and MSHA numbers (where MSHA numbers are available) together with dates of issuance. This information will need to be checked through the applicant violator system.

Until 1995, IPA was involved with the Wellington Preparation Plant, so information about this operation needs to be included in the application.

In Section 112.500, the application lists surface and subsurface owners in the proposed permit area. Map 5-2 shows surface land ownership in the area, and Map 5-3 shows subsurface ownership. Surface owners in the proposed permit area are the Bureau of Land Management (BLM), the State School and Institutional Trust Lands Administration (SITLA), and Penta Creek, LLC. The BLM and SITLA are subsurface owners. The BLM, SITLA, and Penta Creek own contiguous property, both surface and subsurface.

MSHA numbers have not yet been issued, and they need to be included in the application as soon as they are available.

West Ridge Resources has applied for a lease by application in an area north and west of the proposed permit area. They have also obtained an option to acquire mining rights for adjacent State coal reserves.

Findings:

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

R645-301-112.410, The application needs to include the names and other relevant information about affiliated coal mining and reclamation operations.

ADMINISTRATIVE

R645-301-112.700, MSHA numbers need to be included in the application as soon as they become available.

VIOLATION INFORMATION

Regulatory Reference: R645-301-113

Analysis:

Neither the applicant nor any subsidiary, affiliate, or any persons controlled by or under common control with the applicant has had a federal or state coal mining and reclamation permit suspended or revoked in the past five years, nor have they forfeited any performance bond or similar security.

Appendix 1-2 has a list of violations received by the applicant and associated entities within the three year period before the application date. MSHA numbers are not listed with the violations but can be found in Appendix 1-5.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

RIGHT OF ENTRY INFORMATION

Regulatory Reference: R645-301-114

Analysis:

The applicant holds federal coal lease SL-068754 and bases its right to enter most of the proposed permit area on language in the lease. The proposed topsoil borrow site is on land administered by SITLA, and the application says SITLA has issued a long-term special use permit for this area. The application also says this special use permit is pending. Also pending is a modification for the federal lease. Areas to be added to the lease include Township 14 South, Range 13 East, SE¼ SE¼ of Sect. 10 and the NE¼ NE¼ of Sect. 15. The applicant needs to provide complete right of entry information for the entire proposed permit area.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section. Prior to approval, the applicant must provide the following in accordance with:

R645-301-114, The applicant needs to provide right of entry information for the entire proposed permit area.

ADMINISTRATIVE

UNSUITABILITY CLAIMS

Regulatory Reference: R645-301-115

Analysis:

The application says the proposed permit area is not within an area designated as unsuitable for mining, and West Ridge Resources is not aware of any petitions to designate the area as unsuitable for coal mining and reclamation activities.

The operations will not be conducted within 100 feet of an occupied dwelling, and the application contains a copy of letter from Carbon County granting permission to conduct mining and reclamation operations within 100 feet of the proposed C Canyon road. The letter includes certain stipulations:

1. Andalex (West Ridge Resources) should avoid any negative impacts to the road and should place a sign on the road indicating that a controlled access area lies beyond.
2. Ingress and egress from the county road to the mine facilities should be designed and constructed to provide maximum safety to public users of the road.
3. All mining operations adjacent to the road should be conducted in a manner that assures safety to the public.
4. Andalex (West Ridge Resources) will be responsible for maintenance of the portion of the road within the disturbed area.
5. Carbon County requires that Andalex (West Ridge Resources) leave the road in place and intact upon final reclamation and terminate the road at a parking/turnaround area for public use.

The public notice advertising that an administratively complete plan was available indicated the mine would be within 100 feet of a public road. This is in compliance with the requirements of R645-300-121.150.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

ADMINISTRATIVE

PERMIT TERM, INSURANCE, PROOF OF PUBLICATION, FACILITIES OR STRUCTURES USED IN COMMON, FILING FEE, NOTARIZED SIGNATURE

Regulatory Reference: R645-301-116, -117, -118, and -120

Analysis:

The application contains a general schedule for mining operations. The schedule shows construction beginning in October 1998 with mining starting in January 2000.

The term of the permit would be for five years.

Appendix 1-1, Attachment 1-1 contains a certificate of liability insurance that meets the requirements of the State Program.

Proof of publication has not yet been put in the application, but West Ridge Resources will need to include it when it becomes available.

There are no facilities or structures that would be in common with any other coal mining and reclamation operation.

A copy of the \$5.00 check for the filing fee is in the application, and the application also contains a statement with the notarized signature of Samuel Quigley that the information in the application is true and correct to the best of his information and belief.

For this portion of the technical analysis, the application was not reviewed for compliance with other aspects of the cited rules.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. As soon as it becomes available, the proof of publication will need to be included in the application.

ENVIRONMENTAL RESOURCE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

GENERAL

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

Analysis:

The West Ridge Mine is located on the western escarpment of the Book Cliffs about 25 miles east of Price and 5 miles northwest of the town of East Carbon. The Book Cliffs consist of steep canyons and high mountains east of the mine site. Topographic elevations within the permit area range from 6,500 to over 8,800 feet. The highest point located above West Ridge is approximately 8,866 feet. Because of the rugged topography in the region, the present land uses are limited to wildlife habitat, rangeland and recreation. The average annual precipitation in the area of the mine site is 12-14 inches with the majority of the precipitation occurring from October to March. The mean annual air temperature is 45-47 degrees F and the average frost-free period is 80 to 120 days.

Within the permit area, all of the 2,571 acres are controlled by the BLM. There is a small area of privately owned land (surface only) in the permit area on the east side. Refer to Map 5-2.

Carbon County's zoning classification for the mine area is Mining and Grazing.

Findings:

Information provided in the plan meets the requirements of this section.

PERMIT AREA

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-521.

Analysis:

The Applicant must give the Division a legal description of the permit boundaries and acres in the permit boundaries. The Permittee must identify how many acres in the permit boundaries are owned by the federal government, state government, local governments and private parties. The Division needs that information for several reasons including to verify the permit boundary maps and number of acres in the permit boundaries. The Division often receives request for legal descriptions of permit areas from other government agencies and private individuals. Under the requirements of R645-301-521.190 the Division is authorized to require the Applicant to provide other relevant information.

Findings:

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

ENVIRONMENTAL RESOURCE INFORMATION

R645-301-521.190, The Applicant must give the Division a legal description of the permit boundaries, the total number of acres in the permit boundaries, and the amount of acres in the permit boundaries owned by the federal, state, and local governments, and private individuals.

HISTORIC AND ARCHAEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-411.140

Analysis:

There have been several archaeological studies done in the area including an intensive study done for this project in the area that would be disturbed by the mine. Other than the areas proposed to be disturbed, only a few relatively small areas have been surveyed within the proposed permit area.

No archaeological sites have been found within the proposed permit area. Eight sites are in nearby areas as shown on Map 4-2. One of these is a group of ruins north of Grassy Trail Reservoir, and the archaeological report says it should be considered eligible for listing in the National Register of Historic Places pending further research. None of the other sites are considered eligible. They consist of lithic scatters, old log cabins, and a trash dump.

Appendix 4-2 contains two letters from the Division of State History, one to the Bureau of Land Management and one to the State School and Institutional Trust Lands Administration. Both letters recommend a determination of no historic properties. Based on the information in the application, the Division should determine the mine will have no effect on archaeological resources.

The proposed permit area includes no cemeteries, trails in the National Trails System, rivers in the Wild and Scenic Rivers System, or public parks.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-724

Analysis:

Information on climatic resources can be found in chapters, 2, 4, and 7 and is summarized below. The plan meets the minimum regulatory requirements.

ENVIRONMENTAL RESOURCE INFORMATION

The mean annual air temperature 45-47 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).

The site is located within the Region 6 and Region 7, Palmer Hydrologic Drought Index boundaries.

Findings:

The applicant has met the minimum regulatory requirements for this section. It is recommended that an onsite climatic station be installed for the operational and reclamation period.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Vegetation information is in Chapter 3, Section R645-301-321, Appendices 3-1 and 3-5, and Maps 3-1, 3-2, and 3-3. Appendix 3-1 has a detailed vegetation study of the proposed mine site, and a study of the potential topsoil borrow area is in Appendix 3-5. Plant communities that could be affected by the proposed mine include pinyon/juniper, Douglas fir/maple, and Douglas fir/Rocky Mountain juniper. Sagebrush/grass and pinyon/juniper communities would be disturbed if the topsoil borrow area is used.

With the methods used for the vegetation studies, percentages of vegetative cover from both understory and overstory combined with litter, bare ground, and rock add to 100%. This method makes comparison of the reference and proposed disturbed areas much simpler than if the overstory and understory were kept separate.

The pinyon juniper community is mostly on the northwest side of the canyon and on both sides of the left fork. Most of the area sampled as "proposed disturbed" is not actually in the area proposed to be disturbed. Because of the ruggedness of the topography, it was very difficult to place the sampling points within the proposed disturbed area.

In the pinyon/juniper community, total cover was greater in the reference area than in the proposed disturbed area (52.83% compared to 47.93%), but the difference was not statistically significant. The report says woody plant density values were the same for the two areas although it does not give enough information for the Division to evaluate this statement. Production in both areas was

ENVIRONMENTAL RESOURCE INFORMATION

estimated by the Natural Resources Conservation Service as 750 pounds per acre, and the range conditions were both rated as good. Adequate samples of vegetative cover were taken for both areas.

Because of differences in topography and elevation, there are greater differences between the pinyon/juniper reference area and the proposed disturbed pinyon/juniper area at the topsoil borrow area. The reference area is in C Canyon, but the potential topsoil borrow area is on a relatively level bench outside the canyon. However, according to the Division's calculations, these two areas are only slightly different statistically, and since the reference area has more cover than the proposed disturbed area, there should be no concerns about having too low of a standard. There are some differences in species compositions, but these can be accounted for in setting diversity and other success standards.

Cover values were not statistically different between the proposed disturbed and reference areas for the Douglas fir/maple community. Production was slightly greater in the proposed disturbed area (1300 lbs. per acre) compared to the reference area (1200 lbs. per acre), but the range condition of the proposed disturbed area was only rated as fair while the range condition of the reference area was shown as good. The reference area had a greater number of species, and the proposed disturbed area had dogbane (*Apocynum cannabinum*), a species that indicates past disturbance. Canyon sweetvetch (*Hedysarum occidentale* var. *canone*) was encountered in both the proposed disturbed area and the reference area.

According to Map 3-2, the Douglas fir/maple reference area would be disturbed. If the reference area would actually be disturbed, the applicant needs to propose a different revegetation success standard. This is discussed under R645-301-341 below.

Species compositions in the proposed disturbed Douglas fir/Rocky Mountain juniper area and its corresponding reference area are very similar. The Division found a statistical difference in vegetative cover between the reference and proposed disturbed areas, but the applicant's consultant did not. This is because the consultant used a 95% confidence interval, but the Division used a 90% confidence interval. The proposed disturbed area had 75.75% vegetative cover where the reference area had 66.00% cover. The primary difference was that the proposed disturbed area had more cover from Douglas fir than the reference area. Production in both areas was the same, and both were in good range condition.

There were no statistical differences found between the proposed disturbed and the reference area for sagebrush/grass at the potential topsoil borrow area. The proposed disturbed area was in good range condition where the reference area was in fair condition. Both areas were estimated to have 800 pounds of annual production. Some the species in both areas are not desirable, but they do not constitute a major part of the cover.

In addition to the detailed studies of the proposed disturbed areas, the application includes a map showing vegetation communities in the entire permit area. Also, the applicant has committed to take aerial infrared photographs every five years to monitor the effects of underground mining on vegetation.

The vegetation measurements did not include cryptogams. Although cryptogams are not vascular plants, and some are not even plants, they can be an important component of the ecosystem. However, establishment of cryptogams is not required as a revegetation success standard, and the Division does not normally require cryptogam cover information. Because cryptogams probably contribute to the success of other species, it is conceivable that it would be necessary to establish

ENVIRONMENTAL RESOURCE INFORMATION

cryptogams to promote the growth of vascular species to the levels of the success standards. This is not anticipated.

If the applicant's vegetation consultant visits the site again, such as to measure the vegetation for a new Douglas fir/maple reference area, the Division recommends that cover values for cryptogams be measured. The Division will attempt to have an expert in cryptogams visit the site to evaluate it and give recommendations about reestablishing this component of the soil ecosystem.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. The Division recommends that the applicant measure cover from cryptogams.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

Wildlife Information

Appendix 3-3 has a list of wildlife species potentially occurring in the proposed permit area. Maps 3-4A, B, C, and D show information about raptor nests and deer, elk and antelope habitat.

There are several golden eagle, falcon, and buteo nests in and near the proposed permit area. Three eagle nests were found in C Canyon. The text should be updated to include the most recent information about the status of the nests from the 1998 raptor survey. The application should also mention the peregrine falcons found in the area although these locations should not be shown on any maps.

The proposed mine site includes high value deer and elk winter habitat. The potential topsoil borrow area contains critical deer winter range, and much of the proposed permit area, not including the area that would be disturbed by surface operations, contains critical deer summer range. No pronghorn habitat is shown as being in the proposed permit area.

About 360 species potentially exist in and near the proposed permit area, and the application includes relatively general information about several of these species. The only wildlife information gathered for the purpose of the application is the raptor nesting information.

It is unlikely the mine will affect bat concentration areas since few if any cliffs will be affected during construction. Besides the raptors, there are no other bird species that are likely to be significantly adversely affected by the mine. The application says there are no perennial streams, wetlands, or riparian areas within the proposed permit area. For this reason, the value for wildlife is restricted, and there are no amphibians or fish that are likely to be affected. While snakes inhabit the area, there is no known critical habitat.

ENVIRONMENTAL RESOURCE INFORMATION

Despite the lack of wildlife studies done for the proposed project, the information in the application is probably adequate. However, before making a final determination about the adequacy of wildlife information, the Division will need to receive formal comments from the Division of Wildlife Resources.

Threatened or Endangered Species

The application contains a letter from the Fish and Wildlife Service identifying eight listed and candidate threatened or endangered species that could occur in Carbon County. The application contains a statement in Sections 322.210 that the letter from the Fish and Wildlife Service states that no federally listed threatened or endangered species are known to occur in the project area. This statement is not correct and needs to be modified. The letter only provides a list of species reported from Carbon County and does not make a finding whether these species could occur in the project area. Section 333 under R645-301-330 contains a similar statement that also needs to be modified.

The only species likely to occur in the permit area are the bald eagle and peregrine falcon. There are only four known bald eagle nests in Utah, and the closest is near Castle Dale. Most bald eagles in Utah spend the winter but do not breed here.

Peregrine falcon nests have been found at mines in the Wasatch Plateau, but none were found in the raptor survey. Assuming the application is approved, the applicant will need to conduct further surveys to look for nesting activity of all raptors, including peregrines. If found, protection or mitigation plans would need to be developed.

Although there are no fish in the proposed permit area, the mine has a potential, through water depletion, of adversely affecting threatened or endangered fish of the Upper Colorado River. This issue is addressed as part of the fish and wildlife protection plan.

The letter from the Fish and Wildlife Service includes Graham beardtongue (*Penstemon grahamii*) as a candidate species that occurs in Carbon County. According to Ben Franklin of the Utah Natural Heritage Program, there is a historical collection of this species in the extreme northeastern corner of the county a few hundred feet from the county line. It is an endemic that occurs almost exclusively on the Green River formation in Uintah and Duchesne counties. There is virtually no likelihood the mine would affect this species.

Canyon sweetvetch is no longer a candidate threatened or endangered plant species, but it is on the Bureau of Land Management's list of sensitive species. It is relatively common in the area of the proposed mine as documented in the vegetation studies.

The application says the burrowing owl is not expected to be found within the permit area as they use prairie dog burrows as nest sites; however, the Fish and Wildlife Service commented that they also use badger and marmot burrows for their nest sites. It is not anticipated, though, that the proposed permit area contains suitable habitat.

Findings:

ENVIRONMENTAL RESOURCE INFORMATION

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

R645-301-322, The applicant needs to update the application text and show the status of raptor nests in the proposed permit and adjacent areas. It should also discuss the peregrine falcons found in the area (10-mile radius) although the locations of these birds and/or scrapes should not be shown.

R645-301-322, There are statements in section 322.210 and section 333 under R645-301-330 indicating the letter from the Fish and Wildlife Service letter in Appendix 3-4 says there are no threatened or endangered species known to occur in the project area. These statements need to be modified since the Fish and Wildlife Service letter only provides a list of species that could occur in Carbon County.

R645-301-121.100, Before making a final determination about the adequacy of wildlife information, the Division will need to receive comments from the Division of Wildlife Resources.

SOILS RESOURCE INFORMATION

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

Analysis:

Chapter 2, Soils, Sections R645-301-220 through -224, discuss the soil resources within the proposed West Ridge Mine area. Relevant soils information includes prime farmland investigation, current and published soil surveys, soil characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

- Soil Survey Information
- Soil Characterization
- Substitute Topsoil Borrow Area

Soil Survey Information

(1) General, Third Order Soil Survey:

- Reproduced from the Carbon County Soil Survey, published by the United States Department of Agriculture, Soil Conservation Service, National Cooperative Soil Survey, issued in June 1988.
- Appendix 2-1 - relevant portions of soil survey for the proposed permit area
- Soils Map 2-1 - regional soils map for the proposed permit area

(2) A site specific, First Order Soil Survey

- Performed during June and October 1997 and prepared by Mr. James Nyenhuis, Certified Professional Soil Scientist (ARCPACS #2753):

ENVIRONMENTAL RESOURCE INFORMATION

- Appendix 2-2 - proposed disturbed area mine site
- Appendix 2-4 - proposed topsoil borrow area
- Appendix 2-5 - proposed gravel borrow area
- Soils Map 2-2 - proposed disturbed area mine site
- Soils Map 2-3 - topsoil borrow area soils maps

Soil identification and soil descriptions are contained in each of the respective Appendices (2-1, 2-2 & 2-4) for each of the soil surveys. All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey. The First Order Soil Surveys for the proposed disturbed area mine site area, topsoil borrow area, and gravel borrow area were correlated with the published National Cooperative Soil Survey. Based on the site-specific soil descriptions, and laboratory data, each of the soils were classified according to current NRCS soil taxonomy, and correlated to specific soil series names. Correlation of site-specific soils with NRCS soil series criteria allows for subsequent reference to and use of established NRCS soil interpretation values for these soils.

For the disturbed area mine site, four mapping units were delineated (Map 2-2) and include Rock Outcrop-Rubbleland-Travessilla complex, Midfork very stony fine sandy loam, Brycan loam and Strych stony fine sandy loam. In the proposed topsoil borrow area, three soil units were mapped (Map 2-3) as Strych stony fine sandy loam, Atrac fine sandy loam and Gerst-Badland-Rubbleland complex. For the gravel borrow area, one soil series, Strych gravelly loam, was present across the entire sampled area.

Soil productivity of existing soils was determined by Mr. George Cook from the Natural Resources Conservation Services and results are shown in Appendix 3-1.

Soil Characterization

Soil pedons were characterized by the soil horizons at each sampling location. All profile descriptions were recorded on standard NRCS "232" forms and are provided in each of the appendices.

The soil horizons at each sampling location were sampled and characterized according to the State of Utah Division of Oil, Gas and Mining (DOGGM) guidelines for topsoil and overburden¹. Sampled parameters included: soil texture; pH; organic matter percent; saturation percent; electrical conductivity; CaCO₃; soluble potassium, magnesium, calcium and sodium; sodium absorption ratio, and extractable selenium and boron. Available water capacity, alkalinity, total nitrogen and available phosphorus were not analyzed at this time; these parameters can be tested at reclamation time. Organic matter percent was substituted for organic carbon. Soil texture by hand-texture method, rock fragment content (% by volume), Munsell color, and qualitative calcium carbonate content were determined in the field by Mr Nyenhuis.

No unacceptable criteria were found for salvageable soils and substitute soils except for percent rock content. Although DOGM suitability criteria considers >30% (by volume) rock fragments (for both gravels <3" in size and cobbles 3 to 10" in size) to be unacceptable, and >10% stones and boulders >10" in size to also be unacceptable, the recent trend by DOGM is to salvage "native soils" with "intrinsic

¹Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

ENVIRONMENTAL RESOURCE INFORMATION

rock content". Jim Nyenhuis somehow thought that the Division's general idea was to salvage otherwise suitable soil with higher amounts of rock content in the soil than typical. However, the general idea is that native soils could be salvaged containing a higher rock content than the DOGM guidelines deems acceptable. Ultimate site reclaimability using these rocky soils could enhance reclamation success by providing an environment similar to native conditions. Higher rock content soils provide for a more stable reclaimed surface, aid in water harvesting and ultimate water holding capacity of interstitial soils, and create wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed.

Substitute Topsoil Borrow Area

A supplemental soil resource areas has been identified in the event that reclamation efforts are not successful utilizing the topsoil resources at the mine site. The borrow topsoil site has been investigated to document the physical and chemical characteristics of this material and to determine the soil's suitability (see Appendix 2-4).

Appendix 2-5 gives the soil resource assessment of the gravel borrow material that will be used for fill during culvert installation and pad construction. Based on DOGM's soil and overburden guidelines, these gravel fills in their current natural state are suitable as substitute topsoil based on physical and chemical characterization.

Findings:

The information provided meets the regulatory requirements of this section.

LAND USE RESOURCE INFORMATION

Regulatory Reference: R645-301-411

Analysis:

According to the application, land uses in the proposed permit area have included grazing, wildlife habitat, coal mining, and recreational activities. The application says there are no agricultural activities, but grazing is considered an agricultural activity. This statement should be corrected.

Use of the land is limited largely by topography. There is an elevation change of about 2000 feet from the lowest to the highest parts of the proposed permit area. Steep-walled canyons, cliffs, and numerous large rocks on the slopes make other uses very difficult to impossible.

All but a small portion of the proposed permit area is in the Grassy Trail and Bear Canyon grazing allotments. The locations of these and other nearby allotments are shown on Map 4-1. The Bear Canyon and Grassy Trail allotments produce a total of 150 animal unit months of forage. In 1985, the Soil Conservation Service estimated production in the proposed disturbed area as 300 pounds per acre, but more recent estimates are in Chapter 3.

ENVIRONMENTAL RESOURCE INFORMATION

The area is zoned by Carbon County for mining and grazing use, and West Ridge Resources has obtained a conditional use permit from the county.

According to the application, previous mining consists of exploration activities in the proposed disturbed area where a total of less than one ton of coal was removed from the Lower Sunnyside Seam. This portion of the application should mention underground mining where an entry was driven from the southeast part of the proposed permit area.

In Section 411.130, the application says all of the 2751 acres in the permit area are controlled by the Bureau of Land Management, but it also says there is a small area of private land (surface only) on the east side of the proposed permit area. The School and Institutional Trust Lands Administration also owns property in the proposed permit area. Therefore, the statement that the BLM controls all land in the proposed permit area needs to be modified.

Findings:

Information in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must submit the following in accordance with:

R645-301-411, The statement that there are no agricultural activities in the proposed permit area needs to be modified. Grazing is considered an agricultural activity.

R645-301-411, The portion of the land use section that discusses previous mining activity needs to mention the entry driven from the southeast part of the proposed permit area.

R645-301-411, The application has a statement that the Bureau of Land Management controls all of the land in the proposed permit area. The School and Institutional Trust Lands Administration and a private entity also control part of the land.

ENVIRONMENTAL RESOURCE INFORMATION

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 785.19; R645-302-320

Analysis:

The PAP presented several factors that preclude the mine site, both permit and adjacent areas, including the substitute topsoil borrow area, from being classified as alluvial valley floors. Based on information presented, the following findings can be made:

- The proposed mine is located in C Canyon which is drained by an ephemeral drainage system. During the Order 1 soil survey conducted during the summer of 1997, no water was encountered or observed in any of the excavated test pits that were placed in the canyon bottom alluvial/colluvial soils.
- Steeper slopes and limited flat areas within the vicinity of the mine site and permit area preclude cultivation and irrigation.
- No seeps or springs are present within the proposed disturbed area. Due to the rock outcrop and bed dip, this area does not produce groundwater discharge from the exposed stratigraphy.
- There are no agriculturally beneficial plant species in the mine site area.
- Irrigation water is not available.
- No farming exists or has ever existed within the permit area.

Findings:

The information provided meets the regulatory requirements of this section.

PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-270

Analysis:

Prime Farmland site investigations were performed by the Natural Resources Conservation Service (NRCS). No prime farmland or farmland of statewide importance were found within the proposed permit area, mine site and topsoil borrow site because of slope and soil erodibility. The determination letter from the NRCS dated August 7, 1998, was sent to Andalex Resources, Inc., and is included in Appendix 2-3.

Findings:

The information provided meets the regulatory requirements of this section.

ENVIRONMENTAL RESOURCE INFORMATION

GEOLOGIC RESOURCE INFORMATION

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

Analysis:

Geologic information in Chapter 6 and Appendix 7-1 includes a description of the stratigraphy of the proposed permit and adjacent areas down to the Mancos Shale and the basal sandstone and coal-bearing units of the Blackhawk Formation that intertongue with the Mancos. The main sandstone bearing units of the Blackhawk are, starting with the lowest, the Aberdeen, Kenilworth, and Sunnyside Members. The coal seam to be mined at the West Ridge Mine, the Lower Sunnyside Seam, lies directly above the Sunnyside Member.

The Upper Sunnyside Seam lies as little as 5 to 10 feet above the Lower Sunnyside Seam in places. The Upper Sunnyside Seam consists of six lenticular beds that cannot be correlated between widely spaced data points, according to West Ridge Resources (page 6-4). The seam ranges in overall thickness from 2.0 to 15.0 feet in the Sunnyside Mine to an average of 7 feet in the Sunnyside No. 1 Mine and 5.7 in the workings of the Sunnyside No. 3 Mine. On the West Ridge Mine lease area, the average seam height is less than 4 feet. Because of its thinness and close proximity to the Lower Sunnyside Seam, none of the Upper Sunnyside is considered to be mineable using underground mining methods.

Strata above the coal seam to be mined will not be removed, so samples have been collected and analyzed from outcrop, test borings, or drill cores. Chemical analyses for acid- or toxic-forming materials in the coal seam to be mined and in the strata immediately above and below the coal, including pyritic sulfur for the coal, are in Appendix 6-1. There were only three samples, one each from the roof, coal, and floor, taken from a single outcrop exposure in the Left Fork of B Canyon. Because of the lateral uniformity of lithologies in the Book Cliffs Coal Field these three samples may be sufficient to characterize a large area, but the adequacy of this sampling methodology should be evaluated and discussed in the PAP.

Drill-hole logs, which show the lithologic characteristics, including physical properties and thickness of immediately adjacent stratum that may be impacted, are in Appendix 6-2. The logs show the strata from immediately below the Lower Sunnyside Seam up to the Upper Sunnyside Seam, and up to 30 feet of strata above the Upper Seam. There are logs for 25 holes. These are not direct copies of the original logs but drawings apparently based on the driller's logs. They are not certified.

Ground-water occurrence is not noted and it is not clear if water was absent or simply not marked on these logs. Ground water may have been encountered in stratigraphic intervals included in the original logs that have not been included in these drawings. Ground water is being monitored in drill hole DH 86-2 (Appendix 7-3), so it is likely that ground water was encountered in other bore holes also. The drill-hole log for DH 86-2 in Appendix 6-2 does not show where water was encountered.

The application includes geologic information in sufficient detail to assist in preparing the subsidence control plan.

ENVIRONMENTAL RESOURCE INFORMATION

The two methods being proposed for mining the coal are standard room-and-pillar mining to develop the main entries, headgate and tailgate entries; and longwall mining to mine the outlined panels. Although most mining is to be done by longwall rather than standard room-and-pillar operations, for standard room-and-pillar mining operations samples are to be collected and analyzed from test borings or drill cores to provide the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined. West Ridge Resources contends this regulation is not applicable; however, it still applies for the areas to be mined using the room-and-pillar method.

Strike of the beds at the West Ridge Mine site is northwest-southeast and generally parallel to the face of the cliffs. Dip is 3 to 8 degrees to the northeast (it is shown as 13%, or 7 degrees, on Map 6-2). No major faults have been mapped by West Ridge Resources within the mine permit area but 2 small faults have been mapped just to the northeast (Map 6-1). The Sunnyside fault is a major north-northwest striking fault throughout much of the Sunnyside Mining District to the south. The vertical displacement on this fault decreases northward and is not detectable from surface mapping within the lease area. Maps done by the Utah Geological Survey (UGS) indicate at least two other faults, in the area of Bear, C, and B Canyons and striking approximately northwest-southeast.

Geologic information in the plan is based on maps and plans required as resource information for the plan, detailed site specific information, and geologic literature and practices.

UDOGM has not determined at this time that collection, analysis, and description of additional geologic information is necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards.

The applicant has made no request to the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section.

Except for the deficiencies noted below, geologic information is sufficiently detailed to assist in determining the proposed West Ridge Mine has been designed to prevent material damage to the hydrologic balance outside the permit area; to assist in determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined; to assist in determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; and to assist in determining reclamation can be accomplished. Areal and structural geology of the permit and adjacent areas are discussed adequately to show how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. There are no known geologic conditions that could influence the required reclamation in a way so as to require collection of additional information or monitoring of other parameters.

Findings:

Geologic information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

ENVIRONMENTAL RESOURCE INFORMATION

R645-301-623.300, Presence or absence of the two faults, roughly in the area of Bear, C, and B Canyons and striking approximately northwest-southeast, shown on maps done by the Utah Geological Survey (UGS).

R645-301-624.210, Logs showing the location of ground water where occurring, or clarification in the text that no ground water was intercepted by any of the bore holes and a discussion of why none was encountered over such a large area.

R645-301-624.220, - 624.230, -624.320, -624.330, Additional information on acid- and toxic-forming materials in the coal and overlying and underlying strata, or sufficient information to determine that the one set of analyses from a single outcrop location is adequate to determine acid- and toxic-forming materials in the coal and overlying and underlying strata for the permit and adjacent areas.

R645-301-624.340, Thickness and engineering properties of clays or soft rock in the stratum immediately above and below each coal seam to be mined because standard room-and-pillar mining is planned for development of main entries, headgates, and tailgates.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: R645-100-200, -301-724.

Analysis:

Sampling and analysis.

Water quality sampling and analyses have been and will be conducted according to the "Standard Methods for the Examination of Water and Wastewater" or EPA methods listed in 40 CFR Parts 136 and 434. Laboratory reporting sheets in Appendices 7-2 and 7-3 indicate the specific method that have used for each parameter.

Baseline information.

Baseline ground water, surface water, geologic, and climatologic data are described in Mayo and Associates' report in Appendix 7-1.

Ground-water information.

The location of wells and springs are shown on Maps 7-5 and 7-6 in the PAP and on Figures 8 and 10 in Appendix 7-1. Ground-water rights in and around the permit and adjacent areas are shown on Map 7-3. A summary of water rights in Appendix 7-5 includes usage. There are no filings for water rights within the initial permit area, but there are 3 within the LBA. However, the "Map #" listed in Appendix 7-5 do not correspond with numbers on Map 7-3 and it is unclear what these numbers represent.

ENVIRONMENTAL RESOURCE INFORMATION

Part of the culinary water for East Carbon City and the town of Sunnyside comes, or at least in the past has come, from water-supply well DH 90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. DH 90-1 is shown on Map 7-6 but is not identified as a water supply well. This well is just off the east edge of most of the other PAP maps. It is not known what strata the water is withdrawn from. There is no discussion of this well or associated water rights in the PAP.

Data on seasonal quality and quantity of ground water and usage are in the 1985-86 spring and seep survey (Appendix 7-6) and West Ridge Resources, Inc.'s 1997 baseline monitoring (Appendix 7-2). These data have been analyzed by Mayo and Associates (Appendix 7-1.)

Ground-water quality and quantity information for the 1985 and 1986 seep and spring surveys in Appendix 7-6 includes flow or water level, temperature, pH, and specific conductivity, but does not include total iron and total manganese so the minimum regulatory requirements for baseline hydrologic data are not met.

Flow or water level, temperature, pH, both specific conductivity and TDS, and total iron and manganese were determined for the samples collected in the 1997 ground-water survey (Appendix 7-3). These meet the minimum regulatory requirements. In these 1997 surveys analyses were also done for the parameters listed in UDOGM Technical Directive 006. Field parameters were measured and samples were collected between May to October, but the specific times at each site have varied and seasonal variation has not been adequately determined. Baseline data need to be collected for at least an additional year (1998) to sufficiently demonstrate seasonal variation and water usage. West Ridge Resources commits to three years of baseline data on page 7-15.

It is not clear that the protocols and locations in Table 7-1 do not come into effect until after three years of baseline data have been collected. Or in other words, it is not clear when baseline data collection will end and operational data collection will begin; although there is no date given for beginning of construction in the PAP, it has been expressed verbally that construction is hoped to be started by early 1999. That will allow only two years of baseline data, rather than three, to be collected before operations begin.

Surface-water information.

Surface water information is provided in Appendix 7-1. Discharge from Bear Canyon was characterized as ephemeral yet, it is also stated that the headwaters are intermittent. Characteristics for flows observed at Bear Canyon need to be specifically identified and addressed in the text in relation to timing of use for the water rights issued for this drainage.

The location of streams and reservoirs are shown on Map 4-1. No stock watering ponds are indicated. Surface-water rights in and around the permit and adjacent area are shown on Map 7-3 and summarized in Appendix 7-5. However, the "Map #" listed in Appendix 7-5 does not correspond with numbers on Map 7-3 and it is unclear what these numbers represent.

West Ridge Resources, Inc. anticipates that as mining progresses it may become necessary to discharge water from the proposed mine. Mine water will be discharged to the ephemeral drainage in C Canyon. The location of proposed mine discharge point UPDES #1 is shown on Map 7-2.

ENVIRONMENTAL RESOURCE INFORMATION

1986 stream monitoring sites are shown on Map 7-6, but there are no surface-water monitoring data in the PAP for these sites.

Total suspended solids, flow, temperature, pH, both specific conductivity and TDS, and total iron and manganese were determined for samples collected in the 1997 surface-water survey (Appendix 7-2). Analyses were also done for the additional parameters listed in UDOGM directive Tech-006, including acidity and alkalinity. Surface-water baseline monitoring data are discussed in Appendix 7-1. Field parameters were measured and samples were collected between May to October, but the specific times at each site have varied and seasonal variation has not been adequately determined. Baseline data need to be collected for at least an additional year to sufficiently demonstrate seasonal variation and water usage. West Ridge Resources commits to three years of baseline data on page 7-15.

It is not clear that the protocols and locations in Table 7-1 do not come into effect until after three years of baseline data have been collected. Or in other words, it is not clear when baseline data collection will end and operational data collection will begin; although there is no date given for beginning of construction in the PAP, it has been expressed verbally that construction is hoped to be started by early 1999. That will allow only two years of baseline data, rather than three, to be collected before operations begin.

No acid drainage is expected from the proposed mining operation. Acid-forming materials in western coals generally consist of sulfate minerals such as pyrite and marcasite that oxidize when exposed to air and water and produce acid. Oxidation of pyrite can be expected in the West Ridge Mine. However the amount of acid produced will be small because of the small amount of pyrite present; analysis results from a single sample (Appendix 6-1) indicate 0.08% pyrite in the coal. Furthermore any acid produced will be quickly consumed by reaction with abundant, naturally occurring carbonate minerals; the acid-base potential of the roof and floor samples are 162 and 1.35 t/1000tons, respectively (Appendix 6-1). Iron is readily precipitated as iron-hydroxide and it is not expected that excess iron will be observed in mine discharge water. No other acid-forming materials or any toxic-forming materials have been identified or are suspected to exist in materials to be disturbed by mining.

Climatological information, including seasonal precipitation, wind direction and velocity, and seasonal temperature ranges, is on pages 7-4 and 7-5.

The determination of the PHC has not indicated that adverse impacts may occur to the hydrologic balance on or off the proposed permit area, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies. As a result there is no requirement for supplemental information.

Baseline cumulative impact area information.

No discussion on the flow characteristic at Whitmore Canyon and Grassy Trail Reservoir are provided in the section discussing surface water however, information is provided in Appendix 7-1.

Map 5-4B shows anticipated mining. To contemplate all anticipated potential coal mining impacts, future baseline information should include a water balance analyses for Grassy Trail Reservoir. Storage relationships, inflow, precipitation, evaporation rates and ground water losses should be

ENVIRONMENTAL RESOURCE INFORMATION

determined. Wells should be installed to characterize the alluvium hydrology at Whitmore Canyon and Grassy Trail Creek below the reservoir.

Mayo and Associates (Appendix 7-1) have analyzed geologic and hydrologic information and prepared a report describing the surface-water and ground-water systems of the permit and adjacent areas. UDOGM will be using this information along with information from Federal and State agencies to assess the probable cumulative hydrologic impacts of coal mining and reclamation operations at the West Ridge Mine and prepare the Cumulative Hydrologic Impact Assessment (CHIA).

Modeling.

No modeling techniques, interpolation, or statistical techniques have been used in preparation of the PAP.

Alternative water source information.

No alternative water source information was prepared by the applicant. Their PHC indicates no contamination, diminution or interruption of groundwater and surface water will occur in the proposed or adjacent area.

The determination of the Probable Hydrologic Consequences (PHC) has indicated that the proposed coal mining activities will not result in the contamination, diminution, or interruption of ground-water or surface-water sources within the proposed or adjacent areas. Therefore West Ridge Resources, Inc. has not prepared information regarding alternative water sources.

Probable hydrologic consequences determination.

The Probable Hydrologic Consequences (PHC) determination is on pages 7-8 through 7-12. This PHC determination is based on one-year of baseline hydrologic data, plus geologic and other information collected for the permit application. Most of this information is in Chapter 7 and the report by Mayo and Associates in Appendix 7-1 of the PAP. The PHC determination is not based on data statistically representative of the site. Two more years of baseline water-quality and -quantity data are to be collected, at which time the PHC should be revised, if needed.

The PHC determination includes 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; 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 local impact; flooding or streamflow alteration; ground-water and surface-water availability. No other characteristics were identified as necessary for the PHC determination.

Adverse impacts to the hydrologic balance

Identified potential adverse impacts to the hydrologic balance are land subsidence and bedrock fracturing, which have the potential to impact the hydrologic balance if fracturing increases the vertical hydraulic conductivity of overburden rock. Such vertical fracturing has the possibility of decreasing

ENVIRONMENTAL RESOURCE INFORMATION

discharge rates of near-surface ground water while increasing the recharge rates of deeper ground-water systems.

Based on their analysis of the probable hydrologic consequences (PHC), West Ridge Resources, Inc. has concluded that it is highly unlikely that mining in the West Ridge area will result in the decrease of near-surface ground-water discharge rates:

- 1) Thick interburden between the mined horizon and the near-surface ground-water systems and the presence of swelling clays in the North Horn Formation will prevent fracturing and subsidence from increasing vertical hydraulic conductivities and decreasing spring discharge rates.
- 2) Ground water that is encountered by mining operations will likely be old, meaning that recharge occurred thousands of years in the past. Water in the Sunnyside Sandstone in well DH 86-2 has a radiocarbon age in excess of 11,000 years.
- 3) Ground water systems encountered in the Blackhawk Formation occur in isolated sandstone paleochannels, fractures, and faults. These ground-water systems are not in active hydraulic communication with the subsurface and have limited areal and vertical extent. Mining could dewater some of these systems if they are intercepted during mining operations, but because of the limited spatial extent of these systems, discharge from these isolated ground-water systems will cease soon after interception by mine workings.

The thickness and low permeability of the interburden between the mined horizon and the near-surface ground-water systems, the presence of swelling clays, and the lack of interconnectivity between elements of the hydrologic system and between those elements and the surface all diminish the probability that fracturing and subsidence will adversely affect the ground-water resources. The long residence time ("age") of the water supports the concepts of slow movement and lack of interconnectivity.

Acid-forming or toxic-forming materials

Acid-forming materials in western coal mines generally consist of sulfide minerals, namely pyrite and marcasite, which, when exposed to air and water, are oxidized and produce acid. Oxidation of pyrite will occur in the West Ridge Mine; however, the acid will quickly be neutralized by abundant, naturally occurring carbonate minerals. Iron is readily precipitated, as iron-hydroxide, and excess iron will be not observed in mine discharge water.

Coal will be stockpiled in a relatively contained area of the mineyard and all runoff from the site will flow to the sediment pond for containment. At the time of reclamation, the coal will be removed from the site prior to the commencement of any regrading activities. Also, any waste rock generated through underground activities, such as construction of overcasts, will be permanently stored underground and therefore should not be a factor in surface reclamation activities.

No other acid-forming materials or any toxic-forming materials have been identified or are suspected to exist in materials to be disturbed by mining.

ENVIRONMENTAL RESOURCE INFORMATION

Sediment yield from the disturbed area

The PHC determination is to include findings on what impact the proposed operation will have on sediment yield from the disturbed area. Sediment yield and sediment control are discussed at several places in the PAP, but the PHC does not clearly address this subject.

Important water quality parameters

Because it is anticipated that only a small volume of mine discharge water will flow into Grassy Trail Creek; because of the anticipated chemical similarities of the mine discharge water to the water in the Grassy Trail Creek; and because of the poor quality of the water naturally flowing in Grassy Trail Creek, overall water quality in Grassy Trail Creek will likely not be significantly impacted and specific water quality parameters such as sodium, sulfate, and bicarbonate will not be significantly increased as a result of discharging water from the mine.

It is unlikely that the water discharged from the mine into the C Canyon drainage will flow all the way to Grassy Trail Creek. Except during large storms or heavy snowmelt, water in similar ephemeral drainages nearby is entirely lost to infiltration or evapotranspiration before reaching Grassy Trail Creek.

The TDS concentration of discharge water from West Ridge Resources, Inc.'s proposed new mine will probably be similar to the discharge from the Sunnyside Mines, which had TDS concentrations of about 1,600 mg/l, with the dominant ions being sodium, sulfate, and bicarbonate. This chemical composition is similar to that of waters that have been in contact with the Mancos Shale. West Ridge Resources states that water discharged from the mine would be suitable for use by wildlife and cattle, and reference is made to primary (PDW) and secondary (SDW) drinking water standards. However, if the TDS content is 1,600 mg/L as predicted, it will exceed the Utah Water Quality Standard (UAC R317-2) of 1,200 mg/L for stockwatering. It isn't clear by what standard the water is considered suitable for stockwatering.

Water discharged from the proposed West Ridge mine (most of such water, according to the PAP) will infiltrate into the alluvial sediments near the Book Cliffs escarpment, which will raise the local water table or create a perched water table above the Mancos Shale. Raising of the local water table may result in increased vegetation, which in turn will could have a positive impact on wildlife and the local ecosystem. Water quality of ground waters in the Mancos Shale is naturally poor, with TDS significantly greater than 1,600 mg/l, so addition of mine discharge water will not have detrimental effects on water quality.

West Ridge Resources asserts that the chemical quality of ground water discharging from springs above the proposed coal mine will not be adversely affected by underground mining operations. According to the PAP, Mayo and Associates (Appendix 7-1) have demonstrated that deep ground waters adjacent to the coal seams throughout the Book Cliffs and Wasatch Plateau coal fields are hydraulically isolated from shallow overlying ground-water systems that support springs and provide baseflow to streams at the surface. There is no mechanism by which important water quality parameters in shallow ground-water systems above West Ridge Resources, Inc.'s proposed coal mine may be adversely impacted by mining operations. Furthermore, there are no known springs of significance in the lease and adjacent area that discharge from locations that are stratigraphically or topographically below the coal

ENVIRONMENTAL RESOURCE INFORMATION

seam to be mined. The thick Mancos Shale will prevent the migration of any mine discharge water downward to formations underlying the Mancos Shale.

Flooding or streamflow alteration

West Ridge Resources, Inc. anticipates that at some time it may be necessary to discharge water from its proposed mine into the C Canyon drainage. The discharge point will be about 1 mile above the confluence with B Canyon. Both C and B Canyons are ephemeral drainages that rarely have flow. The stream channel in this drainage is large enough to contain torrential thunderstorm events that commonly exceed several CFS in this region.

The anticipated discharge rate from the mine is unknown at this time; however, discharges from the nearby Soldier Canyon and Sunnyside mines have averaged about 300 to 400 gpm. It is possible that over the life of the proposed West Ridge mine the discharge rate could be in this same range. Discharge rates from other mines in the Book Cliffs have been quite variable over time due to the nature of the ground-water systems encountered in the mines. Ground water flows encountered in coal mines in the Book Cliffs and Wasatch Plateau coal fields are contained mostly in sandstone channels and in fractures and faults. It is not unusual for large portions of mines to be mostly dry; at the Soldier Canyon Mine, mining proceeded for several years before any significant water sources were encountered and thus, no discharge occurred. Similar experiences are reported at Andalex's Tower, or Centennial, Mine. As new mine workings are developed in "wet" areas, the discharge rate may temporarily exceed 300 to 400 gpm. The mine discharge rate is considered more a function of the amount of new mine area recently opened than the total size of the mine.

A discharge of 300 to 400 gpm will not cause flooding or significant alteration of the streambed in the C Canyon drainage. The channel geometry in C Canyon is primarily the result of erosion that occurs during torrential thunderstorm events where the flow in the drainage is several times that anticipated from the proposed West Ridge Mine. The mine discharge will easily be contained within the inner stream channel, which should be stable. Additionally, if a constant discharge is achieved in C Canyon as a result of mine discharge, increased vegetation densities along the stream bank will increase bank stability and decrease erosion. Wildlife habitat will also be improved with the available water and the vegetation growing on the stream bank.

Ground water and surface-water availability

Mining in the permit area will not significantly affect the availability of ground water. Ground waters in the Blackhawk Formation exist in highly compartmentalized partitions, both vertically and horizontally, and the formation does not act as a hydraulically continuous aquifer. Ground-water systems in the Blackhawk Formation are hydraulically isolated from overlying, modern ground waters. The effects of locally dewatering the Blackhawk Formation adjacent to mine openings will not have any significant impact on ground-water availability in the region surrounding the mine.

West Ridge Resources indicates there are no ground-water supply wells in the mine lease area or adjacent to it and that the removal of water from horizons immediately above and below the mined horizon will not impact any water supplies. Rather, West Ridge Resources contends that underground mining makes available water from the Blackhawk Formation that was previously inaccessible.

ENVIRONMENTAL RESOURCE INFORMATION

Part of the culinary water for East Carbon City and the town of Sunnyside comes from water-supply well DH 90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. DH 90-1 is shown on Map 7-6 but is not identified as a water supply well. This well is just off the east edge of most of the other PAP maps. It is not known what strata the water is withdrawn from. There is no discussion of this well or associated water rights in the PAP.

Ground-water monitoring plan.

The PAP does not contain an explicit baseline ground-water monitoring plan. Locations for baseline ground-water monitoring are on Map 7-6. Parameters to be monitored are not listed in the PAP, but data analysis reports in Appendices 7-2 and 7-3 indicate that UDOGM directive Tech-006 is being followed; this directive provides 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. In 1997 sampling was done when the sites were accessible in May, July, August, and October, so monitoring has not been monthly but has been frequent enough that it should detect seasonal changes. Baseline ground-water monitoring is to continue for three years, so it should be completed in the fall of 1999.

It is not clear that the protocols and locations in Table 7-1 do not come into effect until after three years of baseline data have been collected. In other words, it is not clear when baseline data collection will end and operational data collection begin; although there is no date given for beginning of construction in the PAP, it has been expressed verbally that construction is hoped to be started in 1999. That will allow only two years of baseline data to be collected before operations begin.

Springs

Seven springs in the permit and adjacent areas are being monitored (Map 7-6). Four of these springs (SP-12, SP-13, SP-15, and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs, WR-1 and WR-2, discharge from the upper slope of West Ridge in Whitmore Canyon. One spring (SP-8) discharges in the upper drainage of C Canyon. No baseline data for springs WR-1 and WR-2 were found in the PAP.

Most of the monitoring stations in this monitoring program are located on the east slope of West Ridge. This is because, with the exception of SP-8, there are no springs that are suitable for monitoring on the west side of West Ridge.

Wells

Only one ground-water monitoring well, DH 86-2, exists in the permit area. This well monitors the Sunnyside Sandstone Member of the Blackhawk Formation, which is below the coal seam that will be mined. West Ridge Resources proposes that after three years of baseline and two years of operational monitoring, water level only will be measured in this well, which is open to the entire thickness of the Sunnyside Sandstone member of the Blackhawk Formation

Part of the culinary water for East Carbon City and the town of Sunnyside comes from water-supply well DH 90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. DH 90-1 is shown on Map 7-6 but is not identified as a water supply well. This well is just off the east edge of most of the other PAP

ENVIRONMENTAL RESOURCE INFORMATION

maps. It is not known what strata the water is withdrawn from. There is no discussion of this well or associated water rights in the PAP.

Surface-water monitoring plan.

The PAP does not contain an explicit baseline surface-water monitoring plan. Locations for baseline surface-water monitoring are on Map 7-6. Parameters to be monitored are not listed in the PAP, but data analysis reports in Appendices 7-2 and 7-3 indicate that UDOGM directive Tech-006 is being followed; this directive provides 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. In 1997 sampling was done when the sites were accessible in May, July, August, and October, so monitoring has not been monthly but has been frequent enough that it should detect seasonal changes. Baseline surface-water monitoring is to continue for three years, so it should be completed in the fall of 1999.

Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-1. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in 7-2. The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-006.

Operational field and laboratory parameters will be measured for the first two years of mine operation; following this time, only field parameters will be measured. The physical parameters and chemical composition of springs and streams in and around the permit area will be adequately characterized following the collection of three years of baseline laboratory data (in progress) and two years of operational laboratory data. Thereafter, continued monitoring for laboratory parameters will not enhance the scientific understanding of hydrologic systems in the mine permit area. However, in order to identify mining-related impacts to the discharge and chemical characteristics of streams and springs in the permit and adjacent area, monitoring of field parameters will continue during mine operation. If field parameters (pH, specific conductance, and temperature) at any sampling site deviate significantly from historical values, monitoring of operational laboratory water quality will resume at that site.

West Ridge Resources, Inc. believes that discontinuance of laboratory parameters after two years of operation is acceptable for two reasons. First, there are no mechanisms whereby the chemical composition of springs and streams that are above the mine workings can be adversely impacted by mining activities. Second, this type of ground-water monitoring program has been approved for the Alkali Creek and Dugout Canyon tracts at the Soldier Creek Mine, 10 miles north of the West Ridge area.

Although Table 7-1 indicates data will be collected quarterly, the PAP contains no commitment to submit quarterly reports to UDOGM. This commitment needs to be stated in the PAP.

Streams

Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. However, the permit area does not include any portion of the upper Grassy Trail Creek watershed. Nevertheless, two sites on Grassy Trail Creek will be monitored. Stream site ST-3 is located below the confluence with

ENVIRONMENTAL RESOURCE INFORMATION

Hanging Rock Canyon and is upstream of the permit area. Stream site ST-8 is located just above the confluence with Water Canyon, downstream of the permit area.

If it becomes necessary to discharge water from the proposed mine, this water will discharge into the ephemeral C Canyon drainage. Because flow in C Canyon is ephemeral, West Ridge Resources, Inc. does not propose any surface-water monitoring locations in this drainage. Discharge water will be subject to monthly monitoring stipulated by a UPDES permit. Because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, no monitoring in the C Canyon drainage below the mine discharge is proposed.

Findings:

Information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

R645-301-724, Characteristics for flows observed at Bear Canyon need to be specifically identified and addressed in the plan in relation to timing of use for the water rights issued for the Bear Canyon drainage. Conflicting information regarding intermittent and ephemeral portions needs to be clarified and flow and water quality characteristic need to be described.

R645-301-724, Clarification of water rights information listed in Appendix 7-5 and shown on Map 7-3. It is unclear what the "Map #" in the appendix represents and how it relates to the map.

R645-301-724, Information on water-supply well DH 90-1, located in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. (Map 7-6), and the associated water rights.

R645-301-724, Baseline data from 1985 - 1986 for surface monitoring sites, if available, or discussion of why it is not available.

R645-301-724.100, Baseline data for springs WR-1 and WR-2.

R645-301-724, Baseline data for at least an additional year (1998) to sufficiently demonstrate seasonal variation and water usage. The PAP commits to a total of three years of baseline data (page 7-15).

R645-301-728, The PHC should be revised, if needed after the second year of baseline water-quality and -quantity data (or two more years according to page 7-15 of the PAP) are collected.

R645-301-728.301, The PHC determination is to include findings on what impact the proposed operation will have on sediment yield from the disturbed area. Sediment yield and sediment control are discussed at several places in the PAP, but the PHC does not clearly address this subject.

R645-301-728.332, Clarification by what standard the water to be discharged from the mine will be considered suitable for stockwatering. Reference is made to primary (PDW) and

ENVIRONMENTAL RESOURCE INFORMATION

secondary (SDW) drinking water standards found in UAC R309-101; however, if the TDS content is 1,600 mg/L as predicted, it will exceed the Utah Water Quality Standard (UAC R317-2) of 1,200 mg/L for stockwatering.

R645-301-731.200, Clarification of when collection of baseline data will end and collection of operation data will begin. It is not clear from the text that baseline data will be collected for three years before operational monitoring under the protocols in Table 7-1 come into effect (page 7-15).

R645-301-731.200, Under UDOGM directive Tech-006, starting with the first midterm review of the five-year permit and every fifth year thereafter until reclamation is complete, one sample is to be taken at each spring at low flow and at each stream monitoring site at either low flow or high flow. Each should be taken for analysis for baseline water quality parameters.

R645-301-731.212, -223, A statement that quarterly reports will be submitted to UDOGM.

MAPS, PLANS AND CROSS SECTIONS OF RESOURCE INFORMATION

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

Analyses:

Affected Area Boundary Maps

Archeological Site Maps

Coal Resource and Geologic Information Maps

Overburden depths (cover lines) for the Lower Sunnyside Seam are shown on Map 5-7. The maximum cover exceeds 2,500 feet. The average overburden under West Ridge is approximately 1,500'. Nature of the overburden and the stratum immediately below the lowest coal seam to be mined is indicated on the bore-hole logs in Appendix 6-2 and on the Geologic Cross-section, Map 6-1A.

Thickness of the Lower Sunnyside Seam is shown on Map 6-3. The nature of this coal is indicated by the bore-hole logs in Appendix 6-2 and the coal analysis in Appendix 6-1.

Thickness and nature of the Upper Sunnyside Seam is indicated on the logs in Appendix 6-2; however, there is no analysis of this coal and no isopach map. From the bore-hole logs in Appendix 6-2, the Upper Seam appears thick enough to be mined; however, West Ridge Resources contends the average seam height is less than 4 feet, that it consists of six lenticular beds, and that it cannot be correlated between widely spaced data points (page 6-4). The Upper Sunnyside Seam lies as little as 5 to 10 feet above the lower seam in places and because of the thin interburden both seams cannot be recovered using current underground mining methods. Isopach maps of the Upper Seam and Upper to

ENVIRONMENTAL RESOURCE INFORMATION

Lower Seam interburden would help in determining if any minable sections of the Upper Seam are located where mining operations in the Lower seam would not interfere with or prevent mining in the Upper Seam, and visa-versa. However, because the currently proposed permit area involves federal coal and potential future additions to the permit will involve federal and state coal, this is more appropriately the concern of the BLM and SITLA.

Coal outcrop lines and strike-and-dip of the Lower Sunnyside Seam are shown on Map 6-2 and several other maps in the PAP.

Cultural Resource Maps

Existing Structures and Facilities Maps

Existing Surface Configuration Maps

Mine Workings Maps

The West Ridge Mine area is located northwest of U.S. Steel Corporation's old Sunnyside No. 1 underground mine workings. The old workings adjacent to the proposed West Ridge Mine are shown on Map 5-7. Kaiser Coal Company extended a set of test entries from the Sunnyside No. 1 mine through the area of the proposed West Ridge Mine to a portal in B Canyon. Map 5-7 also shows these underground test entries and the location of the portal, which still exists but has been sealed.

Monitoring Sampling Location Maps

Locations of test holes bored from the surface and in-mine from Kaiser's exploratory entries core samplings are shown on Map. Drill hole locations are shown on Map 6-2. Drill-hole collar elevations and intervals cored and plugged are stated to be in Appendix 6-2 in a table format (PAP p. 6-6) but there is no such table in that appendix.

Elevations and locations of monitoring stations used to gather data on water quality and quantity are shown on Map 7-6. However; "1986" stream monitoring stations on Maps 7-5 and 7-6 are not labeled.

Permit Area Boundary Maps

Surface and Subsurface Manmade Features Maps

Surface and Subsurface Ownership Maps

Subsurface-water Resource Maps

As described by Mayo and Associates (Appendix 7-1), ground-water systems in the permit and adjacent area have limited areal and vertical extent due to the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata. It is asserted that no aquifers exist in the permit and adjacent areas and therefore no map has been prepared to show the location and extent of subsurface water.

ENVIRONMENTAL RESOURCE INFORMATION

Part of the culinary water for East Carbon City and the town of Sunnyside towns comes from water-supply well DH-90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. This well is shown on Map 7-6 but is just off the east edge of most of the other PAP maps. It is not known what strata the water is withdrawn from. There is no discussion of this well or associated water rights in the PAP.

Ground water has been encountered in at least one bore hole, DH 86-2, in the permit area. It is likely that ground water was encountered in other bore holes, but the information is not included on drawings representing bore-hole logs in Appendix 6-2 nor elsewhere in the PAP. The number of springs and seeps, and the water rights on those springs and seeps and on the streams fed by ground-water baseflow, indicates that there are valuable ground-water resources in the permit and adjacent areas, especially in the North Horn and Colton Formations on West Ridge and in Whitmore Canyon.

Thick overburden between the coal seam and the North Horn and Colton will possibly preclude or minimize impacts from mining on the ground water, but this is not discussed in the PAP. Maps and cross sections are not used to show the location and extent of ground water and to clarify the relationship between the ground-water resources and the proposed mining operation. Instead the ground-water resources are dismissed as inconsequential because there is no mappable aquifer, and potential impacts from mining treated as non-existent. This is not acceptable.

Surface-water Resource Maps

The location of surface-water bodies can be found on Map 7-3, which shows Grassy Trail Reservoir and it's location with respect to the permit area. Grassy Trail Reservoir stores culinary water for East Carbon City and the town of Sunnyside, and for other uses such as irrigation. The water supply intake for the culinary water is located at the reservoir but this is not marked on a map. In addition the towns have a water-supply well in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E., which is just off the east edge of the PAP maps.

West Ridge Resources, Inc. anticipates that as mining progresses it may become necessary to discharge water from the proposed mine. Mine water will be discharged to the ephemeral drainage in C Canyon. The location of mine discharge point UPDES #1 is shown on Map 7-2. Surface drainage from the disturbed area will pass through a sediment pond into the B Canyon drainage. The sediment pond is shown on Map 5-5 and in detail on Map 7-4. There are irrigation ditches that divert flow from Grassy Trail Creek but none of them are within the proposed permit and adjacent areas.

Vegetation Reference Area Maps

Well Maps

No oil and gas wells exist within the proposed permit area.

Water rights information in Appendix 7-5 indicates there are no water supply wells in the area. However, part of the culinary water for East Carbon City and the town of Sunnyside comes from water-supply well DH 90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. DH 90-1 is shown on Map 7-6 but is not identified as a water supply well. This well is just off the east edge of most of the other PAP maps.

ENVIRONMENTAL RESOURCE INFORMATION

The location of water monitoring well DH 86-2, which was monitored during 1986, 1987 and 1997, is on Map 7-6.

Contour Maps

The PAP contains sufficient slope measurements or contour maps to adequately represent the existing land surface configuration of proposed disturbed areas for underground coal mining and reclamation activities, to take into account natural variations in slope, and to provide accurate representation of the range of natural slopes and reflect geomorphic differences of the area to be disturbed.

Certification

All maps in Chapters 6 and 7 of the PAP have been certified by a qualified, registered, professional engineer.

Findings:

Maps, plans, and cross sections of resource information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

R645-301-622.100 - The table of drill-hole collar elevations and intervals cored and plugged, stated to be in Appendix 6-2 (PAP p. 6-6) but not found at that location.

R645-301-710 - Mark the water supply intake for the culinary water for East Carbon City and the town of Sunnyside, located at Grassy Trail Reservoir, marked on a map.

R645-301-722.300 - Label "1986" stream monitoring stations on Maps 7-5 and 7-6 (and correct "1896" transposition on Map 7-5).

R645-301-722.400 - Show the culinary water-supply well DH 90-1 in the sw¹/₄ sw¹/₄ of Section 17, T. 14 S., R. 14 E. on an appropriate map, such as Map 7-3 or 7-5.

OPERATION PLAN

OPERATION PLAN

OPERATIONS AND FACILITIES

Regulatory Reference: R645-301-540

Analysis:

There is nothing in Chapter five of the application addressing snow removal and showing an on-site storage plan. At a minimum, snow storage areas should be shown on a disturbed area map of the site. As the mine site is very small in disturbed area acreage, snow storage could easily become a critical issue,

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval, the applicant must provide the following in accordance with:

R645-301-540, The applicant needs to show in the text and on a map where snow will be stored.

EXISTING STRUCTURES

Regulatory Reference: 30 CFR Sec. 784.12; R645-301-526

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

OPERATION PLAN

Gravity discharges.

No gravity discharges are expected from the mine. The formation dips to the 3 to 8 degrees to the north northeast. *However, sumping and pumping operations could promote seeps along coal outcrop locations.*

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area (page 7-20).

Water quality standards and effluent limitations.

Currently no UPDES permits are granted. The applicant commits to obtain a permit. West Ridge Resources, Inc. will obtain a UPDES discharge permit to cover any possible discharge from the sediment pond (page 7-34). A copy of the issued permit should be incorporated in the plan.

Sediment control measures have been designed to prevent, to the extent possible, additional contributions of sediment to stream flow or runoff outside the permit area, to meet effluent limitations and to minimize erosion (page 7-29).

Diversions.

Design Information

Diversions are sized for the 10 yr-24 hr event using the SCS - TR55 method for Type II storms. However, in general the CN used are smaller than those expected for a site with a lot of exposed rock. The following table indicates the hydrologic group for the soil unit according to the SCS Soil Survey information. The Hydrologic groups used by the applicant in the CN determination did not reflect inclusions in complexes or rock outcrop locations.

OPERATION PLAN

Acid and toxic-forming materials and underground development waste.

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water shall be avoided by: identifying and burying and/or treating, when necessary, materials that may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated; and, storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water.

Storage of acid- and toxic-forming materials and underground development waste shall be limited to the period until burial and/or treatment first become feasible, and so long as storage will not result in any risk of water pollution or other environmental damage. Storage, burial or treatment practices shall be consistent with other material handling and disposal provisions of the regulations.

Hydrocarbons

The plan calls for retaining the gravel borrow fill in the rock outcrop/rubbleland. Protection from contamination by hydrocarbons or other toxic and hazardous wastes to this fill needs to be addressed. The Spill Prevention and Control Countermeasure Plan should be included in the mining and reclamation permit to describe the steps to be taken to minimize disturbance to the hydrologic balance and to meet applicable federal and Utah water quality laws and regulations.

Other Chemicals

Gravel areas will be sprayed with a chemical surface stabilizer such as potassium chloride, or water control (Chapter 4, pg 4-8). *Using these chemicals was not specifically addressed. Using these chemicals could affect water quality discharged from the mine area.*

A plan for longwall mining fluid emergency spills needs to be addressed. A list of all chemical to be used and stored in the mining operations needs to be contemplated in the PHC.

Transfer of wells.

Upon completion of activities, the wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized. Permanent closure of the water supply well for the mine and monitoring well DH 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights. The well abandonment plan is on page 7-37. Any future water or monitoring wells will be abandoned in a similar manner (page 7-34).

Discharges into an underground mine.

The potential for intercepting waters accumulating in the old Sunnyside Mine workings has not been contemplated.

OPERATION PLAN

West Ridge Resources believes that discontinuance of laboratory parameters after two years of operation is acceptable for two reasons. First, absence of mechanisms whereby the chemical composition of springs and streams that are above the mine workings can be adversely impacted by mining activities. Second, this type of ground-water monitoring program has been approved for the Alkali Creek and Dugout Canyon tracts at the Soldier Creek Mine, 10 miles north of the West Ridge area.

In response to the second reason above, the programs at Soldier and Dugout Canyon Mines are subject to ongoing evaluation. Soldier Canyon Mine has sufficient water quality and quantity data that UDOGM agreed that modification of the monitoring plan was justified at the time the Alkali lease addition was approved. Failure to establish the distinction between baseline and operational monitoring has already produced some problems at the Dugout Mine.

The Division may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained, that the operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; that water quantity and quality are suitable to support approved postmining land uses; or that monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan. West Ridge Resources has not yet met these criteria.

Although Table 7-1 indicates data will be collected quarterly, the PAP contains no commitment to submit quarterly reports to UDOGM. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator is to promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. These commitments need to be stated in the PAP.

West Ridge Resources, Inc. will obtain a UPDES discharge permit to cover any possible discharge from the sediment pond (page 7-34).

Streams

Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. However, the permit area does not include any portion of the upper Grassy Trail Creek watershed. Nevertheless, two sites on Grassy Trail Creek will be monitored. Stream site ST-3 is located below the confluence with Hanging Rock Canyon and is upstream of the permit area. Stream site ST-8 is located just above the confluence with Water Canyon, downstream of the permit area.

If it becomes necessary to discharge water from the proposed mine, this water will discharge into the C Canyon drainage. Discharge water will be subject to monthly monitoring stipulated by a UPDES permit. Because flow in C Canyon is ephemeral and because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, West Ridge Resources does not propose any surface-water monitoring locations in this drainage other than the UPDES discharge point.

OPERATION PLAN

Part of the culinary water for East Carbon City and the town of Sunnyside comes from, or at least has come from, water-supply well DH 90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. DH 90-1 is shown on Map 7-6 but is not identified as a water supply well. This well is just off the east edge of most of the other PAP maps. It is not known what strata the water is withdrawn from. There is no discussion of this well or associated water rights in the PAP.

Surface-water monitoring.

All monitoring locations identified are not included in Table 7-1, such as Monitoring Bear Creek.

The PAP includes 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 surface-water monitoring plan provides 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. The surface-water monitoring plan identifies the surface-water quantity and quality parameters to be monitored, sampling frequency, and site locations.

Locations of surface-water monitoring sites are indicated on Map 7-6, but this is not clear from the map "Legend", which indicates baseline sites only. The operational sites need to be clearly identified. Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-1. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in 7-2. The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-006.

It is not clear that baseline data will be collected for three years before the protocols in Table 7-1 come into effect (page 7-15). Or in other words, it is not clear when baseline data collection will end and operational data collection begin; although there is no date given in the PAP for beginning of construction, it has been expressed verbally that construction is hoped to be started in 1999. That will allow only two years of baseline data to be collected before operations begin.

Under UDOGM directive Tech-006, every five years and corresponding either with permit renewal or mid-term review, one sample is to be taken at each ground-water monitoring site at low flow for analysis for baseline water quality parameters.

Operational field and laboratory parameters will be measured for the first two years of mine operation; following which time only field parameters will be measured. West Ridge Resources is of the opinion that the physical parameters and chemical composition of springs and streams in and around the permit area will be adequately characterized following the collection of three years of baseline laboratory data (in progress) and two years of operational laboratory data; following which time only field parameters will be measured. Continued monitoring for laboratory parameters will not enhance the scientific understanding of hydrologic systems in the mine permit area. However, monitoring of field parameters - pH, specific conductance, and temperature - will continue during mine operation in order to identify mining-related impacts to the discharge and chemical characteristics of streams and springs in the permit and adjacent area. If the field parameters at any sampling site deviate significantly from historical values, monitoring of operational laboratory water quality will resume at that site.

OPERATION PLAN

mining activities. Second, this type of ground-water monitoring program has been approved for the Alkali Creek and Dugout Canyon tracts at the Soldier Creek Mine, 10 miles north of the West Ridge area.

In response to the second reason above, the programs at Soldier and Dugout Canyon Mines are subject to ongoing evaluation. Soldier Canyon Mine has sufficient water quality and quantity data that UDOGM agreed that modification of the monitoring plan was justified at the time the Alkali lease addition was approved. Failure to establish the distinction between baseline and operational monitoring has already produced some problems at the Dugout Mine.

The Division may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained, that the operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; that water quantity and quality are suitable to support approved postmining land uses; or that monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan. West Ridge Resources has not yet met these criteria.

Although Table 7-1 indicates data will be collected quarterly, the PAP contains no commitment to submit quarterly reports to UDOGM. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator is to promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. These commitments need to be stated in the PAP.

Springs

Seven springs in the permit and adjacent areas will be monitored (Map 7-6). Four of these springs (SP-12, SP-13, SP-15, and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs, WR-1 and WR-2, discharge from the upper slope of West Ridge in Whitmore Canyon. One spring (SP-8) discharges in the upper drainage of C Canyon. No baseline data for springs WR-1 and WR-2 were found in the PAP.

Most of the monitoring stations in this monitoring program are located on the east slope of West Ridge. This is because, with the exception of SP-8, there are no springs that are suitable for monitoring on the west side of West Ridge.

Wells

Only one ground-water monitoring well, DH 86-2, exists in the permit area. This well monitors the Sunnyside Sandstone Member of the Blackhawk Formation, which is below the coal seam that will be mined. West Ridge Resources proposes that after three years of baseline and two years of operational monitoring, water level only will be measured in this well.

Sealing of the ground-water monitoring well and any future wells will comply with R645-301-748 (page 7-27).

OPERATION PLAN

Regulatory Reference: 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:

Ground-water monitoring.

The PAP includes 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 ground-water monitoring plan provides 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 identifies the quantity and quality parameters to be monitored, sampling frequency, and site locations.

Locations of operational ground-water monitoring sites are indicated on Map 7-6, but this is not clear from the map "Legend", which indicates baseline sites only. The operational sites need to be clearly identified. Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-1. Operational field and laboratory hydrologic monitoring parameters for ground water are listed in Table 7-3. The hydrologic monitoring parameters have been selected in consultation with UDOGM directive Tech-006.

It is not clear that baseline data will be collected for three years before the protocols in Table 7-1 come into effect (page 7-15). Or in other words, it is not clear when baseline data collection will end and operational data collection begin; although there is no date given in the PAP for beginning of construction, it has been expressed verbally that construction is hoped to be started in 1999. That will allow only two years of baseline data to be collected before operations begin.

Under UDOGM directive Tech-006, every five years and corresponding either with permit renewal or mid-term review, one sample is to be taken at each ground-water monitoring site at low flow for analysis for baseline water quality parameters.

West Ridge Resources is of the opinion that the physical parameters and chemical composition of springs and streams in and around the permit area will be adequately characterized following the collection of three years of baseline laboratory data (in progress) and two years of operational laboratory data; following which time only field parameters will be measured. Continued monitoring for laboratory parameters will not enhance the scientific understanding of hydrologic systems in the mine permit area. However, monitoring of field parameters - pH, specific conductance, and temperature - will continue during mine operation in order to identify mining-related impacts to the discharge and chemical characteristics of streams and springs in the permit and adjacent area. If the field parameters at any sampling site deviate significantly from historical values, monitoring of operational laboratory water quality will resume at that site.

West Ridge Resources believes that discontinuance of laboratory parameters after two years of operation is acceptable for two reasons. First, absence of mechanisms whereby the chemical composition of springs and streams that are above the mine workings can be adversely impacted by

OPERATION PLAN

- 1) R645-301-412.300, Suitability and compatibility requirements for reclamation and revegetation. The permittee must commit to testing this material to indicate its acid and toxic forming potentials. The permittee is proposing to leave the site's existing topsoil (or plant growth medium) in situ and protect it by laying down a geotextile material. They also indicate that they want to use coal mine waste generated during the face up of the portal area as fill. It would seem that some protection should be warranted (i.e., a layer of clean fill borrow area material) to segregate the mine waste from the topsoil is warranted. Hence the requirements of R645-301-536.300 et seq. must be met.
- 2) R645-301-514.100, Inspections of fills during construction.
- 3) R645-301-745.100, Disposal of excess spoil, General Requirements.

A map indicating where this mine development waste will be placed within the pad must be included as part of the plan, (R645-301-512.200).

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval the applicant must provide the following in accordance with:

- R645-301-513.300**, If it is the permittee's intent to store "gob material" in underground rooms, then approval from MSHA and the Division must be obtained. In addition, the development of the outcrop area is bound to generate some coal and roof material that will not be of saleable quality. What does the permittee propose to do with this?
- R645-301-528.340**, The PAP proposes to use portal face-up waste material as pad fill. The applicant must address the following regulations to gain approval:
- **R645-301-412.300**, Suitability and compatibility requirements for reclamation and revegetation. The permittee must commit to testing portal face-up waste material for acid and toxic forming potentials. The PAP must provide information showing total protection of the in-situ topsoil which requires complete segregation of the mine waste from the topsoil. The requirements of R645-301-536.300 et seq. must be met.
 - **R645-301-514.100**, Inspections of fills during construction.
 - **R645-301-745.100**, Disposal of excess spoil, General Requirements.
 - **R645-301-512.200**, A map indicating where this mine development waste will be placed within the pad must be included as part of the plan, (R645-301-512.200).

HYDROLOGIC INFORMATION

OPERATION PLAN

An Analysis and Finding for the C Canyon Road were previously done on March 25, 1998 (See letter to file from Mary Ann Wright, Associate Director, Mining). The analysis determined that the C Canyon road leading from County Road 123 up to the proposed West Ridge Mine disturbed area boundary is exempt from regulation under the Utah Coal Regulatory Program and that section of road inside the disturbed area boundary will be permitted.

The application also states that, "There are no plans for the construction of primary or ancillary roads in the permit area." This seems to be a contradictory statement since the surface facilities map shows other segments of roads extending beyond the public road within the disturbed area boundary (truck loop and road to portal area). These roads must be classified, and if they are primary roads the designs will require certification by a registered professional engineer.

Findings:

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

R645-301-512.200 & R645-301-534, classification and designs for all roads to be used within the permit area. Designs for primary roads will need to be certified by a registered professional engineer.

SPOIL AND WASTE MATERIALS

Regulatory Reference: R645-301-528.300, R645-301-536

The permittee has stressed since the inception of the West Ridge Mine idea that no refuse will be generated, stored or disposed of within the permit area. The construction of overcasts, and belt transfer points will require the taking down of primary roof (average mineable thickness of the Lower Sunnyside is approximately eight feet, see page 5-19, paragraph 2). If it is the permittee's intent to store this material in "gob" rooms underground, then approval from MSHA and the Division must be obtained, (see R645-301-513.300). Page 5-1, 513.300 does not address the storing of mine development waste underground, nor does it discuss the seeking of an approval from MSHA to do so. Secondly, the development of the outcrop area is bound to generate some coal and roof material that will not be of saleable quality. What does the permittee propose to do with this? It is this inspector's recommendation that the permittee, at least, permit a temporary storage site within the facilities area; from that point, it can at least have some time to determine a final deposition point for this material without delaying the mine construction activities. An alternative for final deposition may be to establish an agreement with Sunnyside Cogeneration Associates for disposal; however this must be agreed to by the DOGM through proper permitting action.

Page 5-23, paragraph 2, indicates that "material generated by face up work in the portal area will be used to construct a mine pad area." R645-301-528.340 requires, that at a minimum, the following regulations be addressed if Division approval is to be received in order to do this:

OPERATION PLAN

- 1) R645-301-412.300, Suitability and compatibility requirements for reclamation and revegetation. The permittee must commit to testing this material to indicate its acid and toxic forming potentials. The permittee is proposing to leave the site's existing topsoil (or plant growth medium) in situ and protect it by laying down a geotextile material. They also indicate that they want to use coal mine waste generated during the face up of the portal area as fill. It would seem that some protection should be warranted (i.e., a layer of clean fill borrow area material) to segregate the mine waste from the topsoil is warranted. Hence the requirements of R645-301-536.300 et seq. must be met.
- 2) R645-301-514.100, Inspections of fills during construction.
- 3) R645-301-745.100, Disposal of excess spoil, General Requirements.

A map indicating where this mine development waste will be placed within the pad must be included as part of the plan, (R645-301-512.200).

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval the applicant must provide the following in accordance with:

R645-301-513.300, If it is the permittee's intent to store "gob material" in underground rooms, then approval from MSHA and the Division must be obtained. In addition, the development of the outcrop area is bound to generate some coal and roof material that will not be of saleable quality. What does the permittee propose to do with this?

R645-301-528.340, The PAP proposes to use portal face-up waste material as pad fill. The applicant must address the following regulations to gain approval:

- **R645-301-412.300**, Suitability and compatibility requirements for reclamation and revegetation. The permittee must commit to testing portal face-up waste material for acid and toxic forming potentials. The PAP must provide information showing total protection of the in-situ topsoil which requires complete segregation of the mine waste from the topsoil. The requirements of R645-301-536.300 et seq. must be met.
- **R645-301-514.100**, Inspections of fills during construction.
- **R645-301-745.100**, Disposal of excess spoil, General Requirements.
- **R645-301-512.200**, A map indicating where this mine development waste will be placed within the pad must be included as part of the plan, (R645-301-512.200).

HYDROLOGIC INFORMATION

OPERATION PLAN

An Analysis and Finding for the C Canyon Road were previously done on March 25, 1998 (See letter to file from Mary Ann Wright, Associate Director, Mining). The analysis determined that the C Canyon road leading from County Road 123 up to the proposed West Ridge Mine disturbed area boundary is exempt from regulation under the Utah Coal Regulatory Program and that section of road inside the disturbed area boundary will be permitted.

The application also states that, "There are no plans for the construction of primary or ancillary roads in the permit area." This seems to be a contradictory statement since the surface facilities map shows other segments of roads extending beyond the public road within the disturbed area boundary (truck loop and road to portal area). These roads must be classified, and if they are primary roads the designs will require certification by a registered professional engineer.

Findings:

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

R645-301-512.200 & R645-301-534, classification and designs for all roads to be used within the permit area. Designs for primary roads will need to be certified by a registered professional engineer.

SPOIL AND WASTE MATERIALS

Regulatory Reference: R645-301-528.300, R645-301-536

The permittee has stressed since the inception of the West Ridge Mine idea that no refuse will be generated, stored or disposed of within the permit area. The construction of overcasts, and belt transfer points will require the taking down of primary roof (average mineable thickness of the Lower Sunnyside is approximately eight feet, see page 5-19, paragraph 2). If it is the permittee's intent to store this material in "gob" rooms underground, then approval from MSHA and the Division must be obtained, (see R645-301-513.300). Page 5-1, 513.300 does not address the storing of mine development waste underground, nor does it discuss the seeking of an approval from MSHA to do so. Secondly, the development of the outcrop area is bound to generate some coal and roof material that will not be of saleable quality. What does the permittee propose to do with this? It is this inspector's recommendation that the permittee, at least, permit a temporary storage site within the facilities area; from that point, it can at least have some time to determine a final deposition point for this material without delaying the mine construction activities. An alternative for final deposition may be to establish an agreement with Sunnyside Cogeneration Associates for disposal; however this must be agreed to by the DOGM through proper permitting action.

Page 5-23, paragraph 2, indicates that "material generated by face up work in the portal area will be used to construct a mine pad area." R645-301-528.340 requires, that at a minimum, the following regulations be addressed if Division approval is to be received in order to do this:

OPERATION PLAN

This rule requires the applicant to minimize disturbance. As far as possible the applicant needs to avoid using the topsoil borrow area.

Findings:

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

R645-301-331, The amounts of alfalfa and sweet clover shown in the interim seed mixture are excessive and should be reduced to about one pound of pure live seed per acre. Several other species could also be used in the interim mix to increase diversity and provide better erosion protection.

R645-301-331, It is not clear what seed mix will be used on the topsoil piles. The seed of canyon sweetvetch that was collected in 1997 will need to be planted somewhere so seed can be raised for use in final reclamation, and the application indicates the topsoil piles may be used. However, the application also mentions the topsoil piles could be used for test plots and that the interim revegetation seed mixture could be used there. In addition, the application should show what mitigation is being done for canyon sweetvetch.

R645-301-331, Other than the seed mixture and seeding methods, the application needs to show what methods would be used for interim revegetation, such as surface preparation, fertilization, and mulching.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-301-521, -301-527, -301-534, -301-732

Analysis:

The primary access and haulage route to and from the mine will be the C Canyon County road, which is a public road under the jurisdiction of Carbon County. Carbon County has provided authorization to Andalex Resources to construct their mining facilities within 100 feet of the C Canyon road and also maintain approximately 1000 feet of the road as part of the mining operation. The application states, "Approximately 1,000 feet of the northern end of the Carbon County road will extend into the minesite disturbed area. The road will terminate at the junction of the truck loop. A turn around will be constructed at this terminus to give public vehicles an opportunity to turn around without having to drive through the mine yard. This 1,000 foot long segment of the public road, from the terminus of the road at the truck loop junction to just below the office at the southern end of the disturbed area, will be included within the permit area of the West Ridge mine. Carbon County will allow special mine-related utilization of this segment of the road, such as the ability to operate mine vehicles thereon. In return, WEST RIDGE Resources, Inc. will be responsible for maintenance along this road segment, including maintenance of drainage ditches and culverts. Runoff from this road surface will be treated according to the mine's sedimentation and drainage control plan, as presented in Appendix 7-4. Refer to Figure 5-3 West Ridge Road - Typical Cross-Section for the typical engineering cross-section of the Carbon County road."

OPERATION PLAN

INTERIM STABILIZATION

Regulatory Reference: R645-301-331

Analysis:

The plan for interim revegetation is to seed the mixture shown in Table 3-3 in late fall or early spring on topsoil stockpiles and regraded slopes. Among the areas that would be seeded are the outslope of the sediment pond, fill slopes, and side slopes.

The amounts of alfalfa and sweet clover in the interim seed mix are excessive and should be reduced to about one pound of pure live seed per acre.

A few other species, such as Kentucky bluegrass, bluebunch wheatgrass, Indian ricegrass, blue flax, yarrow, and Louisiana sage, could be added to the mix. Not all of these species are needed, but a few should be included. They are all natives, and, once established, should provide good erosion protection.

Canyon sweetvetch is included in the seed mix for final reclamation, but it is not shown in the seed mix for interim revegetation. While it is expected the seed of this species will retain its viability for relatively long periods, most of the seed collected in 1997 will probably not still be viable when the mine is reclaimed.

The application mentions the possibility of seeding topsoil piles with canyon sweetvetch seed, but it also says the interim seed mix could be used on the topsoil piles and that they could be used as revegetation test plots. The section on experimental practices discusses using part of the topsoil pile in the right fork as a test plot to compare certain reclamation techniques.

The application needs to clarify what revegetation methods, particularly what seed mixtures, would be used on the topsoil piles. If built, the topsoil stockpile in the left fork could be used as a nursery for canyon sweetvetch, but a few other non-competitive species, such as bluebunch wheatgrass or Indian ricegrass, should be planted with it. In case the initial seeding failed, not all of the seed gathered in 1997 should be used at once. The remainder of the seed should be stored in controlled conditions. Generally, room temperature or slightly cooler temperatures with moderate relative humidity work well. High temperatures with high humidity will kill the seed. Any area planted with canyon sweetvetch will need to be monitored closely. If the applicant does not build the stockpile in the left fork, another location will need to be found to plant some of the seed.

The topsoil stockpile in the right fork would not be needed as a test plot for about ten years, so it could be planted with the interim mix to begin with. All other areas to be redisturbed should also be planted with the interim mix.

In Section R645-301-341, the application says the interim seed mixture will be hand broadcast and the areas raked to cover the seed. Interim revegetation areas should also be mulched, but the application does not indicate they will be mulched. The application should also mention what surface preparation and fertilization methods will be used. It could refer to the final reclamation plan.

OPERATION PLAN

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-232, Several questions remain concerning topsoil removal and protection with respect to construction sequence of the pad as follows:

- How are soils protected during vegetation removal and grubbing? If soils are heavily impacted with haul roads and/or heavy equipment on hillsides, then they need be salvaged from these areas.
- Rather than bury all slash material, could the slash be chipped and used as mulch during interim reclamation?
- When are cutslopes constructed; after pad placement or before?
- If cutslopes are constructed before pad placement, how will soils below cutslopes and beneath the pad surface be protected during cutslope operations?
- Delineate on a map all areas within the disturbed area where cuts will actually occur during pad construction for the purpose of assessing soil salvage areas.

R645-301-232.200, R645-301-232.300 and R645-300-133.710, Concerning the RO/RL area, the following concerns need to be addressed as explained in the analysis section:

- The Division must conclude that based on information set forth in the application concerning the RO/RL area and lack of soil, the site is not reclaimable.
- Successful reclamation requires the same soil and rock parameters as currently exist to establish revegetation success standards. The indigenous RO/RL soils and rock material need to be salvaged and protected in like manner to the Midfork, Brycan and Strych soils (i.e., provide a marker layer and preserve undisturbed in-place).
- Either the RO/RL surface slopes are safe for constructing cutslopes and likewise soil salvage, or they're not safe for either activity.
- For the RO/RL area wherever cutslopes and cut areas are constructed, all indigenous soil and rock material must be salvaged and stockpiled for later reclamation use. These rocky, thin soils need be segregated and stockpiled separately from the Midfork, Brycan and Strych soils.

R645-301-233, Based on DOGM's soil and overburden guidelines, imported gravel fills in their current natural state are suitable as substitute topsoil based physical and chemical characterization. The PAP plan currently commits to leaving an average of 12 to 18 inches of pad fills as substitute soils. However, when these gravel subsoils and unconsolidated sub-materials are processed for standard 0 to 8" construction fills, their physical state will have been altered from native conditions and their suitability for substitute topsoil is no longer guaranteed.

OPERATION PLAN

material need to be salvaged and protected in like manner to the Midfork, Brycan and Strych soils.

- The Soil Resource Assessment report further concedes that attempting to salvage the RO/RL soils might destabilize immediate upslope areas endangering equipment operators with possible boulder slides. However, the PAP operation plan clearly shows (as shown on Map 5-5, Surface Facility Map) that nearly every slope located along the entire length of "C" canyon, including the left and right hand forks, will be cut to widen the pad surfaces. The majority of these cut slopes are contained exclusively within the RO/RL mapping unit. *Therefore, either the RO/RL surface slopes are safe for constructing cutslopes and likewise soil salvage, or they're not safe for either activity.*
- Finally, if the RO/RL soils and surface materials render themselves suitable for constructing purposes using conventional construction equipment, (e.g., sediment pond basins, and pad fill), then these same indigenous soil and rock material from the unconsolidated RO/RL surfaces can likewise be salvaged and stockpiled for later reclamation use. *Therefore, in the RO/RL area wherever cutslopes and cut areas are constructed, all indigenous soil and rock material must be salvaged and stockpiled for later reclamation use. These rocky, thin soils need be segregated and stockpiled separately from the Midfork, Brycan and Strych soils.*

Topsoil Substitutes and Supplements

Appendix 2-5 gives the soil resource assessment of the gravel borrow material that will be used for fill during culvert installation and pad construction. Based on DOGM's soil and overburden guidelines, these gravel fills in their current natural state are suitable as substitute topsoil based physical and chemical characterization. *However, when these gravel subsoils and unconsolidated sub-materials are processed for standard 0 to 8" construction fills, their physical state will have been altered from native conditions and their suitability for substitute topsoil is no longer guaranteed.*

Topsoil Storage

The PAP states that soil salvaged from the cutslopes above the pads and from the M1, M2, B1, and S1 areas will be stockpiled and preserved for final reclamation. Two separate sites located in either the left fork or the right fork have been identified for topsoil storage. The sites are located up and away from the active mine yard area. The stockpiled soils will be seeded and mulched to minimize erosion. Both stockpile areas combined can hold about 11,000 CY of soil with outslopes of 2:1 and depths ranging up to 15 feet. The outslope surfaces will be surface roughened and pitted to help retain moisture and minimize runoff. Map 2-4 shows details for each stockpile.

The primary topsoil storage area will be located in the right fork. This area is large enough to accommodate the total projected volume of salvaged topsoil. If extra capacity is needed, then the left fork area will be utilized for soil storage.

Construction of the topsoil stockpiles will begin by vegetation removal and installing the bypass culvert in the drainage channel. The stockpile will be built up over the bypass culvert with diversion ditches installed along the both flanks of the stockpiles.

OPERATION PLAN

on the First Order soil survey as Brycan, Midfork and Strych soil units. A total of 6500 CY of topsoil is projected for salvage.

(2) RO/RL Travessilla Complex - The plan commits to salvaging isolated pockets of Travessilla soil during construction.

Several questions remain concerning topsoil removal and protection with respect to construction sequence of the pad as follows:

- *How are soils protected during vegetation removal and grubbing? If soils are heavily impacted with haul roads and/or heavy equipment on hillsides, then they need be salvaged from these areas.*
- *Rather than bury all slash material, could the slash be chipped and used as mulch during interim reclamation?*
- *When are cutslopes constructed; after pad placement or before?*
- *If cutslopes are constructed before pad placement, how are soils below cutslopes and beneath the pad surface protected during cutslope operations?*
- *Delineate on a map all areas within the disturbed area where cuts will actually occur during pad construction.*

RO/RL Travessilla Complex Soils

The Permit Application Package (PAP) concludes that soil salvage of the RO/RL, Rock Outcrop-Rubbleland-Travessilla complex soils is generally not recommended because these areas have little or no topsoil material. The plan does commit to salvaging isolated pockets of Travessilla soil during construction and protecting buried Travessilla soils under geotextile. However, the general nature of RO/RL soils need to be addressed or resolved as follows:

- The Soil Resource Assessment report concludes that the RO/RL mapping unit is dominantly unsuitable for soil salvage. Since the RO/RL complex occupies the majority of the surface disturbance area, then the "unsuitable" nature of this mapping unit for soil salvage renders the site generally "unsuitable" for reclamation success. *Therefore, the Division must conclude that based on information set forth in the application concerning the RO/RL area and lack of soil, the site is not reclaimable.*
- The fact is that the RO/RL mapping unit does contain significant soils (35% soils by volume - 25% Travessilla plus 10% other) that support a significant vegetation community - 750 lbs/acre of Pinyon/Juniper versus 1500 lbs/acre of Douglas Fir/Rocky Mountain Juniper in the Midfork soils. These "rocky" soils have intrinsic value for restoring RO/RL slopes and surfaces during reclamation to match current soil and vegetation conditions. The current vegetation community evolved to fit environmental conditions as they currently exist. *Therefore, successful reclamation requires the same soil and rock parameters as currently exist to establish revegetation success standards. The indigenous RO/RL soils and rock*

OPERATION PLAN

R645-301-333, The applicant has committed to consult with the Division and with Wildlife Resources about what actions to take if there is a raptor nest in an area that will be subsided. The Fish and Wildlife Service also needs to be consulted.

R645-301-333, The applicant needs to commit that construction will not be initiated in the upper part of the mine in the time period from February 1 through July 15 unless monitoring shows there are no active raptor nests.

R645-301-333, The potential topsoil borrow area is in critical deer winter range, and the applicant needs to commit to mitigate for the disturbance. It is recognized the disturbance may never occur, so it is not necessary to actually perform the mitigation at this time.

R645-301-333, The applicant needs to commit to conduct wildlife education sessions for its and its contractors' employees.

It may be necessary to make additional requirements after the Division receives comments from the Division of Wildlife Resources.

TOPSOIL AND SUBSOIL

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

Analysis:

Chapter 2, Soils, Sections R645-301-230 through -234, and R645-302-200 through -218, discusses the soil's operation plan for the proposed West Ridge Mine. Topsoil protection incorporates traditional methods of salvaging/stockpiling and an experimental practice method for protecting in-place soils with a layer of geotextile fabric. The **Experimental Practice** is unique by taking a **Reclamation Approach** for topsoil protection (see EXPERIMENTAL PRACTICES MINING section located under REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING). Relevant analysis information includes soil salvage, stockpiling, topsoil substitutes and supplements, and experimental practice. This Analysis section discusses operation information as follows:

- Topsoil and Subsoil Removal - Traditional Methods
- RO/RL Travessilla Complex Soils
- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal - Traditional Methods

For the purpose of maximizing topsoil recovery during construction, topsoil salvage will occur under the on-site supervision of a competent soil scientist. Traditional methods for protecting topsoil resources will occur in the following areas:

- (1) Excavated areas - Topsoil will be salvaged from those areas of the mine yard where material will be excavated in order to achieve final yard configuration. Topsoil salvage areas are identified

OPERATION PLAN

Wildlife Service, it may not be necessary to acquire this permit, and they have not yet established a firm policy about this type of situation. For now, the application can be considered adequate.

The construction schedule for the mine indicates the applicant would begin in October of 1998. Assuming this schedule is followed, there should be no effect on nesting birds, such as causing them to abandon their nests. However, the nest in the left fork of C Canyon is close enough to the mine site that it would probably not be used during the life of the mine.

As mining begins, the applicant would need to continue to monitor the nests in the area and may need to obtain additional take permits. It may also be necessary to preclude birds from nesting in particular places because of the potential of losing the nests through cliff spalling or other results of subsidence. At other mines, chain link fencing material has been put over nests to keep birds away.

Through water use, the mine has the potential of adversely affecting threatened and endangered fish of the Upper Colorado River. In Appendix 7-7, the application includes estimates of how much water will be used, and it is less than one hundred acre feet per year. Above one hundred acre feet per year, the Fish and Wildlife Service would require a mitigation fee. A final determination of effect will need to be made by the Office of Surface Mining, Reclamation and Enforcement in consultation with the Fish and Wildlife Service.

The site for potential topsoil borrow is in critical deer winter range, and the applicant needs to commit to mitigate for this potential disturbance. Because the site may not be disturbed, it is not necessary to perform the mitigation or pay for it now, but the applicant should commit to doing the mitigation if the site is ever disturbed.

The Division requires enhancement or avoidance for areas of critical habitat, but it is understood the Bureau of Land Management requires mitigation for areas of high priority habitat as well. The mine site is in high priority habitat.

Some of the greatest effects on wildlife would be from the proposed road. While it does not appear the Division will have jurisdiction over most of the road, drivers need to be instructed on the importance of maintaining a proper speed through the area and of removing any big game animals killed as far as possible from the road. Killed animals should also be reported to DWR. By removing these carcasses or keeping them as far away from the road as possible, the risk of collisions with eagles, other raptors, and vultures can be reduced.

The applicant needs to commit to conducting wildlife education session for its and its contractors' employees. Many conflicts with wildlife can be avoided through knowing what actions may be detrimental or beneficial.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section. Prior to approval, the applicant must provide the following in accordance with:

OPERATION PLAN

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

FISH AND WILDLIFE RESOURCE PROTECTION

Regulatory Reference: R645-301-333

Analysis:

Power lines will be designed and installed using raptor-proof designs. Hunting platforms could be installed on select poles.

Areas in the proposed permit area containing potential raptor nesting habitat will be surveyed in the field within one year of any mining activity that could result in subsidence. Should any nests be found, the applicant would consult with the Division and with DWR. The applicant would also need to consult with the Fish and Wildlife Service.

Surface water quality will be protected using sedimentation controls. The sediment ponds will be monitored for any adverse effects on wildlife, and these effects would be reported to DWR. Should mining disrupt a seep or spring that was utilized by cattle or wildlife, the applicant would replace the quantity of water depleted from that source at a similar location unless the seep is restored naturally in a nearby area.

As mentioned above, there are three golden eagle nests in C Canyon near the proposed mine. One of these in the right fork had been tended in 1997. The tended nest is within one-half mile of the proposed mine site, but the application says, and DWR confirmed, the nest is not within line of site of the proposed mine. However, the application says DWR recommended that construction not occur in the upper part of the mine in the time period from February 1 through July 15. The applicant needs to commit to not begin construction in this time period unless monitoring shows the nests are not active.

In the left fork of the canyon is a nest that was inactive in 1997, and much of the proposed minesite is within one-half mile of this nest. The application says DWR recommended obtaining a "take" permit for this nest and that the applicant is pursuing this option. The Division has received a copy of the application for this permit. However, according to verbal information from the Fish and

OPERATION PLAN

supply water to the area being grazed should it be established that mining under the area has impacted the flows to the springs, (see R645-301-525.160 and 230 et seq.).

There is no anticipated method of monitoring the subsidence induced from the extraction of coal in the area. The mine will be developed in the Lower Sunnyside seam which pitches at approximately 13 percent grade. The development under the West Ridge area will take place under a maximum of 2,500 feet of cover. In checking Plate #5A, Mining Projections, it appears that the mining of Federal lease SL-068754 will not intercept any canyons where subsidence monitoring locations can be installed. Additional leases (if obtained) as indicated from Plate #5B, Extended Reserve Mining Projections will undermine the left hand fork of Whitmore Canyon above the Grassy Trail Reservoir. At a minimum, the applicant should include a map or verbiage committing to install a monitoring plan in accessible areas in advance of mining as part of the PAP. If other means of monitoring subsidence under deep cover are known of or become available, the applicant should commit to utilizing same.

A commitment to monitor subsidence locations annually (after secondary extraction is initiated) must be included as part of the plan.

Findings:

Information provided in the application is not considered adequate to meet the aforementioned sections of the R645 regulations. Prior to approval, the applicant must provide the following in accordance with:

R645-301-322, In a few locations, the application says there are no agricultural activities in the proposed permit area. These statements need to be modified since grazing is considered an agricultural activity that produces food.

R645-301-332, The applicant needs to commit to compensate for any grazing animals lost as a result of mining induced subsidence.

R645-301-525.231, The applicant needs to commit to replacing water quantities impacted as a result of mining induced subsidence.

R645-301-535, At a minimum, the applicant should include a map or verbiage committing to install a monitoring plan in accessible areas in advance of mining as part of the PAP. If other means of monitoring subsidence under deep cover are known of or become available, the applicant should commit to utilizing same.

R645-301-525, A commitment to monitor subsidence locations annually (after secondary extraction is initiated) must be included as part of the application.

OPERATION PLAN

Seam appears thick enough to be mined; however, West Ridge Resources states that the average seam height is less than 4 feet, that it consists of six lenticular beds, and that it cannot be correlated between widely spaced data points (page 6-4). The Upper Sunnyside Seam lies as little as 5 to 10 feet above the lower seam in places and because of this thin interburden both seams cannot be recovered using current underground mining methods.

In leases SL-068754 and UTU-76577 the BLM has apparently determined the Upper Sunnyside Seam to be non-economic. Sterilization of this seam by mining of the Lower Seam will eliminate any need to re-affect these leases in the future through coal mining and reclamation operations.

Findings:

Maps, plans, and cross sections of resource information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

R645-301-522 - Clarification of the discussion on page 6-3 of the split that precludes mining in the Lower Sunnyside Seam in the southern portion of the lease. Map 6-3 does not indicate a split or an area precluded from mining by the split.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: R645-301-525, R645-301-332

Analysis:

Chapter 3 has general comments about the mining methods and anticipated effects of subsidence, but Chapter 5 has more detail and mitigation commitments. Longwall mining methods will be employed for secondary extraction; subsidence will generally be a broad lowering effect of the surface over the mined panels. Coal pillars will be left in place to protect drainages. Barrier pillars will protect escarpments.

The West Ridge area has generally been used for cattle grazing and wildlife habitat. The PAP states in Section 525.100 that there is no agriculture or silviculture in or adjacent to the area and that there is no food or fiber production within the permit area.

It appears the applicant is referring to crop production rather than agricultural production, but "grazing is an agricultural activity that produces food. Statements in this and other sections of the PAP indicating that there is no agricultural activity or food production within the proposed permit area need to be modified.

Mitigation measures may include the regrading of the surface on grazable lands where accessible, fencing to restrict access, and restoration of adversely affected roads and trails. The two springs which supply the water on West Ridge for grazing are minimum in volume (less than .5 GPM as I recall). Drought years reduce these flows to almost zero. The PAP should include a commitment to

OPERATION PLAN

AIR QUALITY

Regulatory Reference: R645-301-420

Analysis:

The application is required to show the coordination that has been undertaken with the Division of Air Quality to comply with the requirements of the Clean Air Act. The application says the applicant is in the process of applying for an air quality permit. This satisfies the requirements of this regulations for the present, but the application will need to be updated as a notice of intention is filed and the approval order is given.

The application says the truck loop loading area will be broom swept and/or water flushed as needed. The applicant may want to consider other methods since broom sweeping is not a very cost-effective way to control fugitive dust. Water flushing requires repetition but can cover a much larger area and does a better job.

The applicant may also want to consider a sediment trap to catch coal fines before they enter a sediment pond and give FEL operators a place to pick up water for re-dispersal in the coal yard. This will allow fines to settle out in advance of pond A and allow for the re-use of water which may be a precious commodity at this site.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. However, the application will need to be updated as steps are taken to receive an Air Quality Approval Order. The Air Quality Approval Order is a useful document for the Division and should be incorporated into the mining and reclamation plan.

In addition, the Division recommends the applicant consider alternative methods of controlling fugitive dust and coal fines.

COAL RECOVERY

Regulatory Reference: 30 CFR Sec. 817.59; R645-301-522.

Analysis:

The Lower Sunnyside Seam is the most important coal seam in the area. According to information on page 6-3, it exceeds 6 feet throughout most of lease SL-068754, the West Ridge Mine area. But the PAP states that in the southern portion of the lease the seam is split thus precluding mining. Map 6-3 does not indicate a split or an area precluded from mining by the split.

Thickness and nature of the Upper Sunnyside Seam is indicated on the logs in Appendix 6-2, but there is no analysis of this coal and no isopach map. From the bore-hole logs in Appendix 6-2, the Upper

OPERATION PLAN

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: R645-301-411

Analysis:

No public parks, archaeological sites, or similar cultural resources are known to exist in the proposed permit area or adjacent areas that could be affected by mining. Therefore, no protection measures are needed.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR Sec. 784.18; R645-301-521, -301-526

Analysis:

The C Canyon road is scheduled to be upgraded and realigned by Carbon County in order to provide permanent and unrestricted access to State school trust lands and Federal public lands for multiple-use activities. On March 25, 1998 the Division completed a separate analysis (letter to Mine Permit File from Mary Ann Wright, Associate Director) in regard to "Permitting of Roads". The analysis indicates that during operation of the West Ridge Mine, the C Canyon Road will remain a public road, allowing access by multiple purpose users up to a public turnaround area within the proposed mine surface facilities area. The C Canyon Road is found under this analysis to be exempt from regulation according to the State of Utah Coal Mining Rules, R645, et seq. and the UDOGM July 3, 1995 policy on roads. The road within the disturbed area boundary of the mine and mine roads beyond the public turnaround area and will be permitted and maintained by the coal mining company, Andalex, (the Permittee).

Findings:

Information provided in the plan meets the requirements of this section. For detailed analysis and findings see March 25, 1998 "Letter To File" from Mary Ann Wright, Associate Director.

RECLAMATION PLAN

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

The C Canyon County road will be retained as part of the postmining land use. The road will terminate at a public turnaround and will serve as permanent access to public lands in the area.. All other roads built by the mine will be removed and the area reclaimed according to the approved reclamation plan.

Findings:

Information provided in the plan meets the requirements of this section.

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:

Ground-water monitoring.

No provisions for ground-water monitoring during reclamation are mentioned in Chapter 7 or in the Construction and Reclamation Plan - Appendix 5-5 except that final abandonment of water monitoring well DH 86-2 (at the mine site) will be conducted prior to completion of final reclamation (page 7-20).

Surface-water monitoring.

A water monitoring station will be established below the reclaimed disturbed area to monitor water quality from the reclaimed site (page 7-36). The location of this station is not identified on a map. The parameters and protocols are not given in the PAP.

Acid and toxic-forming materials.

Transfer of wells.

Sealing of the ground-water monitoring well and any future wells will comply with R645-301-748 (page 7-27). Upon completion of activities, the wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized. Permanent closure of the water supply well for the mine and monitoring well DH 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights. The well abandonment

RECLAMATION PLAN

purpose of the pocks, or gouges, is to capture and retain water, reduce erosion and provide a cradle for seedling germination and development. Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.).

Vegetation will be the primary source for erosion control and surface stabilization. Revegetation efforts will include regrading, topsoiling, fertilizing, mulching and seeding.

The following items need to be addressed and clarified in the PAP:

- *A map showing cut areas to receive fill for achieving AOC.*
- *Buried RO/RL boulders need to go back on RO/RL slopes.*
- *Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.).*

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-120, The following items need to be addressed and clarified in the PAP:

- The PAP contains conflicting reclamation commitments between normal reclamation AOC grading versus fill removal to expose original soil surfaces. Delineate in writing and on a reclamation map which reclamation technique applies to which area. This needs to be coordinated with the Operations deficiency for delineating on a map all areas within the disturbed area where cuts will actually occur during pad construction.
- It is unclear at what point the highwall will be reclaimed as fills are being removed from the pad and hauled into the old mine workings.

R645-301-242, Redistribute segregated stockpiled soils to their respective areas (e.g., RO/RL soils to RO/RL areas). Provide average replacement depths by area and by soil type based on stockpiled volumes.

R645-301-120, The following items need to be addressed and clarified in the PAP:

- A map showing cut areas to receive fill for achieving AOC.
- Buried RO/RL boulders need to go back on RO/RL slopes.
- Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.).

RECLAMATION PLAN

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

Soil Redistribution

Reclamation of the disturbed area will begin once all surface facilities and structures have been demolished and removed. Cut areas will be restored to AOC as the yard fill is removed. Cutslopes will be backfilled and regraded using fill material taken from the adjacent pad area. After the cutslopes are backfilled, topsoil will be redistributed and the slopes revegetated. Much of the regrading, re-topsoiling, and revegetation of the cutslopes can be accomplished using the adjacent pad fill areas as a work platform for equipment and materials. It is unclear at what point the highwall will be backfilled and reclaimed as fills are being removed from the pad and hauled into the old mine workings. The plan needs to provide information concerning topsoil replacement depths, with soil depths correlated with each corresponding soil and replacement area (e.g., Midfork soils or RO/RL soils).

Pad fill will be removed in 5-10 foot lifts starting from the upper end of the yard and proceeding down the canyon. As the yard area is being removed to establish AOC, the yard pad fill will be excavated and hauled underground for permanent storage. By removing the fill in 5-10 foot lifts and simultaneously reclaiming the slopes in corresponding lifts, the pad area can then serve as a convenient operating platform for machinery and supplies used during the reclamation effort.

The following items need to be addressed and clarified in the PAP:

- *The PAP contains conflicting reclamation commitments between normal reclamation AOC grading versus fill removal to expose original soil surfaces. Delineate in writing, and on a reclamation map, which reclamation technique applies to which area. This needs to be coordinated with the Operations deficiency for delineating on a map all areas within the disturbed area where cuts will actually occur during pad construction.*
- *It is unclear at what point the highwall will be backfilled and reclaimed as fills are being removed from the pad and hauled into the old mine workings.*
- *Redistribute segregated stockpiled soils to their respective areas (e.g., RO/RL soils to RO/RL areas). Provide average replacement depths by area and by soil type based on stockpiled volumes.*

Soil Nutrients and Amendments

Topsoil and substitute topsoils will be sampled as they are redistributed. Fertilizer needs will be assessed based on analyses for soil nutrients. Nutrients and other amendments can be added by hydroseeding, by broadcasting or by other conventional methods.

Soil Stabilization

After AOC is met for each cut area, the surface will be prepared according to the roughen, vegetate and mulch method (R-V-M). Pocking will be the primary method used to roughen the surface and consists of imprinting the surface with a pattern of depressions measuring approximately 18" x 24" x 8" deep. The

RECLAMATION PLAN

- Table 5-1, page 5-46 shows the removal of structures in the portals/highwall area prior to hauling pad material underground. The permittee should consider by what means the mine fan and the belt drives will be powered, and possibly revise the reclamation time line. In order to remove the fill from four of the conveyor support structures (i.e., fill removal of pad to return it to AOC), it will be necessary to relocate a belt drive to the #4 portal area pad.
- Section 553.200, page 5-52, says excess fill material will be hauled off site or disposed of in the abandoned mine workings. As spills occur, contaminated fill material should be disposed of in a State certified landfill.
- Can the material, that is in place at time of reclamation, be viewed as “clean”? Should the top 12 inches be disposed of as contaminated material? If the approval is given from the Division to haul fill off site, what approved area is the permittee considering? Is the approved area something that can be determined at the time of reclamation?
- The cost for underground storage of fill material shown in the reclamation cost survey is \$159,999, and this is not an accurate figure. This figure is only the material hauling cost. Mine operation costs must also be figured in. As noted above, approval to do this must be obtained from MSHA prior to DOGM approval, (R645-301-513.300). A more detailed cost analysis for this procedure must be made and included as part of the reclamation bond costs.

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.

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

TOPSOIL AND SUBSOIL

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

Analysis:

Chapter 2, Soils, Sections R645-301-240 through -244, discusses the soil's reclamation plan for the proposed Dugout Canyon Mine. The Analysis section discusses reclamation information as follows:

RECLAMATION PLAN

Analysis:

Section R645-301-541.400 discusses hauling excess fill material into the abandoned mine entries. In order to accomplish the backfilling of the anticipated 92,000 cubic yards of fill, using the mine conveyor system in reverse to transport the material to the disposal area, MSHA will require the permittee to operate the mine as if it were still in the coal production mode. Operation of the ventilation system will be mandatory, as will required examinations of the mine. The Division and MSHA approved plan must show a map of the underground workings showing the storage volume required to backfill the 92,000 cubic yards.

Table 5-1, page 5-46 shows the removal of structures in the portals/highwall area prior to hauling pad material underground. The permittee should consider by what means the mine fan and the belt drives will be powered, and possibly revise the reclamation time line. In order to remove the fill from four of the conveyor support structures (i.e., fill removal of pad to return it to AOC), it will be necessary to relocate a belt drive to the #4 portal area pad.

Section 553.200, page 5-52, says excess fill material will be hauled off site or disposed of in the abandoned mine workings. This is an entirely new twist. How does the Division view this fill material? Obviously, if you consider the fact that it will be in place for 20 years, some contamination (oils, hydraulic fluids, fuel spills, etc) will have taken place. This fill should be disposed of as the spills occur in a State certified landfill.

Can the material, that is in place at time of reclamation, be viewed as "clean"? Should the top 12 inches be disposed of as contaminated material? If the approval is given from the Division to haul fill off site, what approved area is the permittee considering? Is the approved area something that can be determined at the time of reclamation?

The cost for underground storage of fill material shown in the reclamation cost survey is \$159,999, and this is not an accurate figure. This figure is only the material hauling cost. Mine operation costs must also be figured in. As noted above, approval to do this must be obtained from MSHA prior to DOGM approval, (R645-301-513.300). A more detailed cost analysis for this procedure must be made and included as part of the reclamation bond costs.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section. Prior to approval, the applicant must provide the following in accordance with:

R645-301-540, Address each of the following:

- Provide an approved MSHA plan for hauling excess fill back into the underground mine workings.
- The Division and MSHA approved plans must include a map of the underground workings showing the storage volume required to backfill the 92,000 cubic yards.

RECLAMATION PLAN

RECLAMATION PLAN

LAND USE RECLAMATION PLAN

Regulatory Reference: R645-301-412

Analysis:

The applicant proposes no changes to the existing land uses. The application includes copies of comments from the Bureau of Land Management and the School and Institutional Trust Lands Administration supporting the proposed and current land uses.

Carbon County requires that the access road be left following mining, including that portion in the proposed permit area. In its letter commenting on the postmining land use, the BLM did not mention the road. Use of the road can be considered as part of the current land uses, but the Division needs to know the land owner understands and accepts that the road will remain following reclamation.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section. Prior to approval, the applicant must provide the following in accordance with:

R645-301-412.200, Comments from the Bureau of Land Management need to show their understanding of and support for leaving the road following reclamation.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, 301-553, 302-230, -302-232, 302-233.

OPERATION PLAN

R645-301-731.730, Elevations and locations of monitoring stations to be used to gather operational data on water quality and quantity.

OPERATION PLAN

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68,
R645-301-524

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

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.

Analyses:

Affected Area Subsidence Maps

Affected Area Maps

Mining Facilities Maps

Mine Workings Maps

Monitoring and Sampling Location Maps.

Elevations and locations of monitoring stations used to gather baseline data on water quality and quantity are shown on Map 7-6. It is not clear from the map whether or not these will also be operational monitoring stations.

Certification Requirements

Cross sections, maps, and plans have been certified by a registered professional engineer.

Findings:

Maps, plans, and cross sections of operations information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

OPERATION PLAN

R645-301-731.212, 223, Clarification that when the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator will promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

OPERATION PLAN

required, within the text. The text needs to correctly identifies the 100 yr - 6 hr event as the minimum design required for the bypass culvert.

- R645-301-742**, 1) Interim sediment control measures and drainage need to be contemplated for construction phases. 2) The construction plan needs to contemplate a temporary topsoil storage location and sediment control measures. 3) Designs for the potential top soil substitute area should include: sediment control measures and drainage plans. 4) The plan contemplates additional sediment control measures in chapter 7: design criteria for these measures must be provided. 5) Conflicting information in the plan pertaining to topsoil sediment control measures needs to be clarified.
- R645-301-742.110**, The ASCA-Z needs to incorporate BTCA. The area should be designed to report to a sedimentation pond unless BTCA is demonstrated. A designed erosion control measure needs to be provided for the pad outslope.
- R645-301-741**, The plan must include the specific measures used to preserve the existing channel geomorphology where it is referred to in Appendix 5-5. Conflicting information provided in chapter 7 needs to be clarified.
- R645-301-742.311**, The emergency spillway on Pond C discharges into the bypass culvert. The details for discharge structure and culvert inlet needs to be designed to minimize adverse impacts within the permit and adjacent area.
- R645-301-724.100**, Baseline data for springs WR-1 and WR-2.
- R645-301-724**, Clarification of water rights information listed in Appendix 7-5 and shown on Map 7-3. It is unclear what the "Map #" in the appendix represents and how it relates to the map.
- R645-301-724**, Baseline data need to be collected for at least an additional year (1998) to sufficiently demonstrate seasonal variation and water usage.
- R645-301-728.301**, The PHC determination is to include findings on what impact the proposed operation will have on sediment yield from the disturbed area. Sediment yield and sediment control are discussed at several places in the PAP, but the PHC does not clearly address this subject.
- R645-301-728.332**, Clarification by what standard the water to be discharged from the mine will be considered suitable for stockwatering. Reference is made to primary (PDW) and secondary (SDW) drinking water standards found in UAC R309-101; however, if the TDS content is 1,600 mg/L as predicted, it will exceed the Utah Water Quality Standard (UAC R317-2) of 1,200 mg/L for stockwatering.
- R645-301-731.200**, Clarification of when collection of baseline data will end and collection of operation data will begin. It is not clear that baseline data will be collected for three years before the protocols in Table 7-1 come into effect.
- R645-301-731.212, -223**, Clarification that quarterly reports will be submitted to UDOGM.

OPERATION PLAN

All impoundments are sedimentation ponds. See the discussion above.

Casing and sealing of wells.

Sealing of the ground-water monitoring well and any future wells will comply with R645-301-748 (page 7-27). Upon completion of activities, the wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized. Permanent closure of the water supply well for the mine and monitoring well DH 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights. The well abandonment plan is on page 7-37. Any future water or monitoring wells will be abandoned in a similar manner (page 7-34).

Findings:

Information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

- R645-301-731.220**, The water monitoring Table 7-1. Does not include all water monitoring locations referenced within the plan. The water monitoring plan is not clear and accurate. A method must be described how a discharge sample will be obtained from the pond outlet prior to discharge to the bypass culvert.
- R645-301-731**, The Spill Prevention and Control Countermeasure Plan should be included in the mining and reclamation permit to describe the steps to be taken to minimize disturbance to the hydrologic balance and to meet applicable federal and Utah water quality laws and regulations. The UPDES permit should be issued and incorporated into this plan prior to PAP approval. A plan for longwall mining fluid emergency spills needs to be addressed. A list of all chemical to be used and stored in the mining operations needs to be contemplated in the PHC.
- R645-301-731.513**, The mine plan needs to contemplate the potential for intercepting water potentially accumulating in the old Sunnyside Mine workings.
- R645-301-740**, The applicant must adjust or justify the CN used in the calculations provided for runoff. Detail on soils, rock outcrops and rubbleland inclusions would be needed to justify the soil hydrologic group chosen for soil types.
- R645-301-742.400**, The applicant must provide a culvert design for the road drainage area that is within the southwest end of the disturbed area. The drainage from area UAZ-b needs to contemplate potential inflows from the side drainage. Geotextile manufacturing specifications and specifications for construction must be supplied for all fabrics to be used.
- R645-301-742.300**, Watershed maps, watershed calculations and associated drainage plans need to be corrected in regard to errors in the drainage plan for ASCA- X and Y.
- R645-301-731.600**, By regulatory definition the drainage in C canyon is considered intermittent and requires buffer zone signs. Provide a statement recognizing place buffer zone signs are

OPERATION PLAN

ASCA - X and Y, watershed areas contributing to the pond, and those areas that will drain to the bypass culvert need to be corrected.

Siltation structures.

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

Sedimentation ponds.

Three sedimentation ponds in series will be constructed at this site. The two upper ponds have open channel spillways. The lower pond has a riser with an oil skimmer that will lead to the bypass culvert. A method must be available to obtain a discharge sample from the pond outlet prior to discharge to the bypass culvert.

Appendix 5-5 states that all open channel spillways will be constructed to pass the 10 yr-24 hr storm event. The lower pond will have an emergency spillway that handles the 25 yr-6 hr storm event. The regulations require the open channel spillways for the proposed ponds to pass the 25 yr - 6 hr event. The 10 yr-24 hr storm event exceeds required design criteria.

The downstream pond, Pond C, has two emergency spillways. One open channel spillway dumps into the culvert. This method has the potential to impound water on the parking lot if the culvert plugged. Water and oil accumulating in the pad has the potential to be discharged off site. Though the discharge structures meet R645-301-742.223 the design does not meet 742.311: all diversions will be designed to minimize adverse impacts within the permit and adjacent area.

Decanting the pond will consist of a portable pump with an inverted inlet. And a 100 gpm pumping capacity.

The lower pond has 1 foot of freeboard between the primary spillway 6902 ft and the emergency spillway 6903 ft. However the text (pg. 7-25) indicates the primary spillway will carry the peak flow with 1.05 ft of head over the pipe. This means the secondary spillway will also be required to safely pass the peak event. Although the flow to be carried is minor, it is not a standard engineering procedure.

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.

Spillways will have a bottom width of 5 ft. Freeboard of 2 ft and 2:1 side slopes (Appendix 5-5, pg.12) and are designed to reduce erosion.

Impoundments.

OPERATION PLAN

"The lower pond will also be equipped with an open channel emergency spillway." Pond "C" is the lower pond. The open channel spillway (as shown on Map 5-5, Surface Facilities Map) terminates in the NE corner of the office parking area, where it then discharges into an offshoot of the undisturbed bypass culvert. At this point, the open channel spillway is no longer effective, by definition.

Map 7-2, Mine site drainage map, shows the runoff from undisturbed watershed UD-Za flowing NW where it discharges into the same undisturbed bypass culvert. If the riprapped open channel is continuous along the NE edge of the parking area to the point where it can discharge into the natural drainage, then the open channel spillway requirement has been fulfilled. Also, the runoff from UD-Za can flow into the channel, thence to the natural drainage.

The permitting of the parking area as an ASCA, (ASCA-Z) does not utilize the best technology currently available. Pond "C" is adjacent to the parking area. The parking lot drainage should be designed to use the sediment pond as it's method of treatment. Using an ASCA to treat hydrocarbon contaminated (automotive fluids) runoff and road salts, etc., is not sound environmental engineering. The permittee may want to consider moving the parking area above the ponds.

The flow in UD-Zb (as depicted on Map 7-2, Mine Site Drainage Map) is shown to terminate near the west corner of the parking lot ASCA-Z. Is there a culvert under the road here or does the flow run across the road uncontrolled? This flow is within the DAB.

A plan for the treatment of potentially contaminated mine water (this will be a longwall operation utilizing water soluble emulsion) needs to be addressed. Mine water will be discharged from UPDES point #2 to the "C" Canyon drainage. The interception of mine flows may change the classification of this drainage.

The PAP lacks the necessary designs for pre-pond and post-pond sediment control; also, several items of the operational hydrology portion need to be addressed. The submittal is inadequate.

Alternate Sediment Control Measures

Topsoil stockpiles ASCA X and Y will use the following sediment control measures; contour furrows, pocking (also referred to as irregular pitted surfaces), silt fencing around the perimeter, seeding (following placement and after September 15), berm and ditch configuration at the base of the pile (section 222.100, pg 2-8 and section 231.400 2-10). See Map 2-4. Information conflict in the mine plan text between section 200 and appendix 7-4 in regard to the sediment control measures to be applied at the topsoil piles.

Maintenance practices include; monitoring for excessive erosion, reseeding, maintenance of ditches and/or silt fence (chapter 2).

ASCA-Z is the proposed parking lot. Because it is at the downstream end of the site it is not designed to report to the sedimentation ponds. This parking area should be moved above the sedimentation ponds or demonstrate that is BTCA. The outslope should utilize erosion control matting or other erosion control practices to minimize erosion at the site.

OPERATION PLAN

- When installing the bypass culvert without geotextile, construction boulders will be moved out of the channel and placed on the bank. The channel bottom will be regraded and bedding materials will be laid down. The area where the pond is to be located will be keyed into the embankment. These areas will change the geomorphologic characteristics and determine the postmining configuration and channel gradient. Boulders that are placed back into the channel need to be embedded into the embankment or channel bottom. **During bypass culvert construction the applicant should consider methods to increase roughness and bed slope changes within the channel. A survey to identify areas of competent bedrock (grade control) for the reclamation channel should be mapped and details in the reclamation plan can be adjusted as appropriate.**
- Geotextile manufacturing specifications and specifications for construction must be supplied for all fabrics to be used.
- Topsoil salvage will be hauled to designated topsoil areas which are to be located over the bypass culvert (pg. 2-10). Topsoil will be removed and stockpiled prior to construction activities (section 232.600). The plan contemplates starting at the south end of the site, building the culvert and sedimentation ponds simultaneously. Should any topsoil be salvaged prior to the upstream culvert construction a temporary storage location would be necessary.

Top Soil Substitute Area.

This area is proposed to be utilized only if needed during final reclamation. No further discussion on proposed configuration and sediment controls is provided. Calculations and quantities for bond estimations assuming the worst case scenario are available in the plan.

Additional Measures

The text says additional sediment control measures may be taken. The applicant should provide design information regarding these measures. Where, when and how they will be used etc.

“Prior to beginning installation of the bypass-culvert system, interim (temporary) sediment control measures (sediment traps, berms, silt fences, and straw bales) will be constructed in the drainage near the downstream end of the proposed mine yard area. These features, which will treat disturbed area runoff, will be installed as temporary measures to control sediment during installation of the bypass culvert system.” No designs exist for these temporary sediment control measures. Is the area within the DAB (as shown on Map 5-5) sufficient to implement these designs? Similarly, no designs could be found for the sediment basins which are to be implemented in the main Canyon drainage post pond. A maintenance plan needs to be incorporated along with these designs to ensure that they will continue to function at least until Phase 2 bond release is granted.

It is this inspector's thinking that a sediment control plan be devised which will leave the undisturbed bypass culvert in place under the sediment ponds (in other words, the ponds will be left in place for sediment control until phase 2 bond release is granted for the left fork, right fork, and main canyon areas above the ponds). The ponds could then be removed as well as the remaining undisturbed bypass culvert. Although this means additional cost for the permittee (i.e., mobilization/demobilization plus construction, regrading and revegetation costs), the concept is worth evaluating.

OPERATION PLAN

The outlet to the Bypass Culvert will be equipped with a rip-rap apron. *Because this channel has a large rock component it is recommended the applicant determine whether the proposed location for the outlet is of competent material which would not require riprap. Riprap on competent bedrock generally is washed downstream.*

Undisturbed drainage culverts will have trash racks and, inlets will be protected with riprap.

Road Drainage

A culvert should be designed for the road drainage that is at the southwest most portion of the disturbed area. *The drainage from area UAZ-b needs to contemplate potential inflows from the side drainage. The basin below at the culvert outlet should consider potential drainage from this site if necessary.* Maps show the basin is above potential inflows from the side drainage.

Drainage associated with ASCA's

Watershed map, watershed areas, calculations and associated drainage plans need to be corrected at ASCA's X and Y.

Stream buffer zones.

By regulatory definition the drainage in C canyon is considered intermittent and requires buffer zone signs. No discussion was found in the text.

Sediment control measures.

General Construction plan

Information that affects hydrology and related sediment control issues identified for the construction plan are:

- No sediment control measures or drainage control is identified for the early phases of construction. Sedimentation pond construction commences once the culvert installation progresses approximately 500 ft up canyon. Drainage for the site will not be installed until pad levels are constructed and roads are installed. **Interim sediment control measures were not presented for construction phases. A means for runoff from all disturbed areas to report to the sedimentation ponds needs to be identified or other sediment control measures provided.**
- When installing the bypass culvert with geotextile, boulders will be moved out of the channel and placed on the bank. The channel bottom will be prepared and the geotextile material will be installed followed by fill and culvert placement. The preparation to be conducted on the channel prior to placing the geotextile was described as having a 10 - 12 foot bottom section with 2:1 side slopes. Channel bottom will be regraded and bedding materials will be laid down prior to laying the fabric to preserve the existing geomorphology. **It is not clear how regrading the channel preserves the existing channel geomorphology. Specific information should be provided to show how the existing channel geomorphology will be preserved. This information conflicts with statements in chapter 7.**

OPERATION PLAN

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	
	Other	25%		
Beje Complex - Mountain Ridge Tops (5)	Beje very gravelly fine sandy loam		D	C
	Beje fine sandy loam		D	
	Other	20%		

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

If the applicant wishes to justify the Hydrologic Group used to determine the CN increased detail on soils and rock outcrops and rubble land inclusions would be necessary, otherwise the applicant should adjust the CN as appropriate.

Bypass Culvert

The plan states that all undisturbed area culverts are sized to pass the 50 yr - 24 hr precipitation event. The bypass culvert receives drainage from an area 687.8 acres and is greater than a square mile. By definition, the drainage is intermittent and it is required to be designed for a 100 yr - 6 hr precipitation event, not the 10 yr- 6 hr event as indicated in the plan. However, the 50 yr -24 hour precipitation event exceeds the required 100 yr - 6 hr event. Unfortunately the CN's used do not appear accurate. In order to determine whether the applicant meets minimum requirements additional information supporting the values provided for CN determination is necessary.

RECLAMATION PLAN

plan is on page 7-37. Any future water or monitoring wells will be abandoned in a similar manner (page 7-34).

Discharges into an underground mine.

No discharge into the underground mine is anticipated (page 7-20).

Transfer of wells.

Upon completion of activities, the wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized. Permanent closure of the water supply well for the mine and monitoring well DH 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights. The well abandonment plan is on page 7-37. Any future water or monitoring wells will be abandoned in a similar manner (page 7-34).

Gravity discharges from underground mines.

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area (page 7-20).

Water quality standards and effluent limitations.

Diversions.

Stream buffer zones.

Sediment control measures.

Siltation structures.

Sedimentation ponds.

Other treatment facilities.

Exemptions for siltation structures.

Discharge structures.

Impoundments.

Casing and sealing of wells.

RECLAMATION PLAN

Sealing of the ground-water monitoring well and any future wells will comply with R645-301-748 (page 7-27). Upon completion of activities, the wells will be permanently sealed to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized. Permanent closure of the water supply well for the mine and monitoring well DH 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights. The well abandonment plan is on page 7-37. Any future water or monitoring wells will be abandoned in a similar manner (page 7-34).

Findings:

Hydrologic reclamation information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

R645-301, Ground-water monitoring plans during reclamation.

R645-301, Parameters, protocols, and location of the surface-water monitoring station to be established below the reclaimed disturbed area to monitor water quality from the reclaimed site (page 7-36).

REVEGETATION

Regulatory Reference: R645-301-341

Analysis:

Revegetation Plan

The revegetation plan is primarily in Section R645-301-341. Three revegetation scenarios are shown, one for areas where topsoil would be salvaged and redistributed, one for areas with topsoil that is covered with a geotextile, and one for rock/rubbleland areas. In the rock/rubbleland areas, there are a few areas where topsoil would be salvaged and later replaced.

In areas where the topsoil is salvaged and redistributed, fill will be removed until approximate original contour is achieved, topsoil will be replaced, a weed-free straw mulch would be applied at the rate of 2000 pounds per acre, fertilizer would be added if deemed necessary, the surface will be gouged, the seed mix will be broadcast seeded or hydroseeded, the area will be mulched with 4000 pounds per acre of straw, and a tackifier will be applied. As an alternative to the tackifier, SoilLok or a polyacrylamide (PAM) may be used. The same methods will be used in rock/rubbleland areas except that soil will not need to be replaced.

The Division is concerned about using fill in rock outcrop/rubbleland areas without first salvaging soil and without a plan to restore the landscape diversity. The methods proposed in the plan are likely to lead to slopes that have few areas of exposed large rocks with few protected areas between the rocks. Under the proposed plan, areas between the rocks would be filled and would not be available for wildlife

RECLAMATION PLAN

habitat. Large rocks, in addition to providing wildlife habitat, create local areas of concentrated runoff and cooler temperatures where species can become established that would not survive if the site was uniform. The applicant needs to show how these conditions will be restored to obtain the vegetation diversity and wildlife habitat required.

It appears the first mulch being applied, 2000 pounds per acre of straw, is more of a soil conditioner than a mulch. Alfalfa hay would work much better for this purpose than straw since it contains more nitrogen and would not be as much of a nitrogen sink.

Using 4000 pounds per acre of straw for mulch is a little more than needed, but it should still work. A more desirable rate is 2000 pounds per acre. With the tackifier, the applicant should plan to apply wood fiber hydromulch at the rate of about 500 pounds per acre.

The Division is not familiar with using PAM or SoilLok as tackifiers, but it appears SoilLok has been used for this purpose. Rates of application of traditional tackifiers is well established, but application rates for Pam and SoilLok are not as well known. Before using these products, the applicant needs to show what application rates would be used and how these products would be applied.

In the experimental practice areas where topsoil is left in place and is covered with a geotextile, PAM would be applied to the soil surface after it is exposed. The surface would then be perforated with the teeth of a backhoe bucket to a depth of about eight inches to relieve compaction and allow water infiltration. The area would then be seeded, the seed raked in, PAM would be applied a second time, and weed-free straw would be applied at the rate of 4000 pounds per acre and held to the surface with a tackifier. Finally, transplants would be planted in some areas.

PAM does not reduce soil compaction, and it only increases infiltration by keeping already-formed soil aggregates together. In a massive compacted soil, PAM would have little effect. Therefore, while the Division initially recommended this treatment, it now appears it would not be beneficial and would possibly even be detrimental. The applicant intends to use PAM in the test plots, so it will be possible to determine what effects it will have on revegetation and soil conditions prior to reclamation. If the effects are negative, it will be necessary to delete this treatment from the plan.

Instead of simply perforating the soil surface with the teeth of a backhoe, it is recommended the applicant gouge the experimental practice areas in the same manner as other parts of the proposed disturbed area. The Division has seen slopes as steep as 1.5h:1v successfully gouged without destabilizing the slopes.

The same soil amendment used in other areas, hay applied at the rate of 2000 pounds per acre, could be used in the experimental practice area.

Toward the end of Section R645-301-341 is a paragraph discussing other possible methods of roughening the surface. Although these other methods could be used and would be acceptable if applied properly, they are rarely done correctly. For this reason, they usually lead to erosion problems and less revegetation success than would otherwise be expected.

RECLAMATION PLAN

Section 341.230 contains a statement that straw mulch will be held in place with a chemical tackifier applied at the rate of 500 pounds per acre. This is an excessive rate for applying tackifier; it is probably meant to be the rate of wood fiber mulch application with the tackifier over the straw.

The seed mixes to be used in final reclamation are in Tables 3-2A, B, C, and D. For the most part, these seed mixes are acceptable, but the Division recommends some modifications as discussed below. Yellow sweet clover is the only species in the mixes not native to Utah, and it serves to help reestablish microorganisms. It also competes with weeds during early stages of revegetation.

(Throughout the following discussion, seeding rates are considered pure live seed.)

At the proposed mine site, the plan text says seed will be broadcast seeded. The tables containing the seed mixes indicate the rates of seed application are broadcast rates, but footnotes with the tables say they are drill rates and that the rates will be doubled if the seed is broadcast. This needs to be clarified. The "Interagency Forage and Conservation Planting Guide for Utah" recommends broadcast seeding at a rate of about 50-100 seeds per square foot with rates cut by one-fourth to one-half for drill seeding. The lowest seeding rate obtained by planting the seed mixes as shown would be about 65 seeds per square foot (the numbers of seeds per pound were estimated for some species), and the highest would be about 89 seeds per square foot. Doubling these rates for broadcast seeding would be excessive; the rates shown are adequate for broadcast seeding. Adding a few species to each mix as recommended below would still be acceptable.

The mixture shown in Table 3-2A is for use in pinyon/juniper areas. Sandberg bluegrass (*Poa secunda*) is the dominant grass in these areas and should be included in the seed mix at a rate of about 0.5 pounds per acre. Bitterbrush (*Purshia tridentata*) could also be included at the rate of one pound per acre.

Muttongrass (*Poa fendleriana*) and Indian ricegrass (*Stipa hymenoides*) could be added to the mix for the Douglass fir/maple community shown in Table 3-2B. Recommended rates would be about 0.3 and two pounds per acre, respectively.

Serviceberry (*Amelanchier alnifolia*) and mountain mahogany (*Cercocarpus ledifolius*) line many areas of the undisturbed streambank in a manner similar to willows along perennial streams. The applicant has proposed seeding mountain mahogany in these areas, but the Division recommends using transplants, probably gallon containerized plants planted in the fall at about five-foot spacing, along the reclaimed channel.

Muttongrass could also be added to the mix for the Douglas fir/Rocky Mountain juniper community shown in Table 3-2C. The recommended rate would again be 0.3 pounds per acre. Also in this mixture, the applicant needs to specify which subspecies of sagebrush would be used. Mountain big sage (*Artemisia tridentata*, var. *vaseyana*) is probably the species in the area although it could be Wyoming big sage (*A. t.* var. *wyomingensis*).

Douglas fir would be planted in Douglas fir/Rocky Mountain juniper areas both from seed and transplants. Since Douglas fir is a common tree grown for timber, it is likely that plants inoculated with ectomycorrhizae are available commercially. Using inoculated plants is suggested but not required.

RECLAMATION PLAN

In the seed mix for the topsoil borrow area, needle and thread grass (*Stipa comata*) and black sage (*Artemisia nova*) should be added at the rates of about two and 0.5 pounds per acre, respectively.

The applicant does not intend to irrigate but, instead, will use water harvesting methods. Irrigation should not be necessary at this site.

Pesticides will only be used if a problem is identified and spraying is deemed necessary to control damage to reclamation. The area does not have heavy infestations of noxious weeds at this time, so it is not anticipated herbicides will be needed. The use of other pesticides would depend on what problems are encountered, but none are foreseen.

Revegetation Success Standards

As discussed in the vegetation information section, there are few differences between the reference areas and the proposed disturbed areas. The only significant difference where the proposed reference area has less cover than the proposed disturbed area is in the Rocky Mountain juniper/Douglas fir community. The vegetative cover values were statistically different at 90% but not at 95% confidence. Constructing a 90% confidence interval allows 66.53% cover, and the actual value is 66.00%. If one performs a natural logarithm transformation of the data, there is no statistical difference.

Other than cover, every aspect of the proposed reference and disturbed areas in the Rocky Mountain juniper/Douglas fir community is the same or very similar, including species composition, aspect, slope, soils, productivity, and range condition. Considering there is no difference in cover if one does a natural log transformation of the data, it is felt the similarities outweigh the one possible difference in this case, and the difference is felt to be minor if it exists.

According to Map 3-2, the Douglas fir/maple reference area would be disturbed, so this area, obviously, cannot be used as a reference area. The applicant could combine the data from the two areas and use this as a baseline vegetation success standard or a new reference area could be established in this community. Before proposing to use the data in the application as a success standard, the applicant would need to ensure that adequate samples were taken.

The application says Appendix B will be used for calculating diversity. It is assumed this reference is to Appendix B of the Vegetation Information Guidelines. Although at least one of the methods (the Ruzicka index) in this appendix would provide an acceptable means for measuring diversity, the applicant also needs to propose a standard and show what measurement, such as cover or production, would be used to calculate the Ruzicka index.

The two similarity indexes in Appendix B are used for showing similarity in species composition, and reclaimed sites commonly have different species complements than undisturbed areas. Therefore, a direct comparison is not usually appropriate. Also, the similarity indexes do not show whether one or a few species dominate.

Erosion control would be judged using the "Erosion Condition Classification System" originally developed by the Bureau of Land Management and modified by the Office of Surface Mining. Reclamation would be considered successful if soil surface factor values were the same as or lower in the reclaimed areas as in adjacent undisturbed areas.

RECLAMATION PLAN

The application needs to show success standards for seasonality and a method for measuring this parameter. It should also contain a discussion of how the species will meet the requirements to be permanent, capable of regeneration and plant succession, and compatible with the postmining land use.

For areas with a postmining land use of wildlife habitat, the Division is required to consult with State wildlife agencies and gain approval for tree and shrub establishment success standards. The Division has consulted with the Division of Wildlife Resources and developed standards. These are based primarily on existing conditions and take into account the species that contribute to the woody plant densities in the various areas. In the sagebrush/grass area, the numbers of woody plants in both the proposed disturbed and reference areas are considered excessive. The established standards in numbers of woody plants per acre are:

Pinyon/Juniper	800
Douglas Fir/Maple	2000
Douglas Fir/Rocky Mountain Juniper	2500
Sagebrush/Grass	2500

These standards need to be included in the application.

Table 3-4 of the application is a revegetation monitoring schedule. Qualitative observations would be done every year after seeding, but quantitative observations would be done only in the years specified. Productivity measurements in final reclamation areas would be done in the eighth and ninth years, but the applicant needs to include productivity measurements in the tenth year.

All other final reclamation monitoring is adequate, but it is probably more than actually needed. Second year quantitative monitoring could probably be deleted. The applicant might want to do interim quantitative monitoring as needed to determine whether remediation is necessary rather than committing to a specific schedule.

The test plots would also be monitored according to the schedule in Table 3-4. This intensive monitoring is appropriate for test plots.

In Sections 341.300 and 342.100, the application indicates native species have become reestablished in disturbed areas without seed or mulch application or surface preparation. While the Division does not know precisely what reclamation efforts have been undertaken in this area, there are stands of introduced grasses that have the appearance of having been seeded.

Field Trials

Information about test plots is in Section 231.300. In an area near the topsoil pile in the right fork, an area will be covered with geotextile and fill, in this case topsoil, in a manner similar to the rest of the experimental practice area. It will be left in place for about five years after which the soil will be exposed. The fill--topsoil--will be moved to a part of the topsoil stockpile where it can be subjected to the same treatments as the soil left in place and covered with the geotextile and fill.

Each of the two test plots, the topsoil and the geotextiled soil, will be divided in half with one half receiving an application of PAM. Next, each half would be further divided in half with one of each of

RECLAMATION PLAN

these halves being treated with an organic soil activator and the other half left untreated. The areas will then be seeded, the seed raked in, and the areas will be mulched with 3000 pounds per acre of straw followed by application of a tackifier.

The eight test plots will be monitored for five years and compared with each other and the Douglas fir/maple reference area. The revegetation plan will be revised as necessary to incorporate the best practices used in the test plots.

Wildlife Habitat

According to the application, reclamation of the disturbed area following mining activities will result in the restoration of the environment for wildlife habitat, such as small mammals and reptiles, and for grazing. This statement needs to be modified. While reclamation is intended to restore the postmining land uses at a level approximately equal to what they were before disturbance, restoration implies bringing the site back to the exact premining condition.

Plant species in the seed and planting mixtures were selected on the bases of forage nutrition and cover values and adaptability to the environment. As discussed above, the Division recommends certain species be added to the mixtures. While the species in the proposed seed mixtures and in the recommendations are not all identical to those currently existing on the site, they are similar and may enhance the value of vegetation for wildlife.

The application says Appendix 3-6 contains comments from the Division of Wildlife Resources about additional wildlife enhancement measures and that the applicant has incorporated several of their suggestions in the permit application package. Appendix 3-6 does not contain comments from Wildlife Resources, and the Division will need to receive comments about what habitat enhancement opportunities are available for this site.

The applicant intends to do off-site mitigation in the form of either shrub plantings or pinyon and juniper removal. According to the application, Wildlife Resources, the BLM, and SITLA are supportive of these options, and the habitat enhancement would be done on State land. The application refers to Appendix 3-6 for evidence of SITLA's support of the proposal, but this appendix is empty.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval the applicant must provide the following in accordance with:

R645-301-341, The applicant needs to show how landscape diversity, and thus vegetation diversity and wildlife habitat, will be restored.

R645-301-341.210, The applicant needs to clarify seeding rates. Footnotes to the seed mixture tables indicate the rates shown are for drill seeding and that they would be doubled for broadcast seeding; however, the tables also say the rates are for broadcast seeding.

R645-301-341.210, The applicant needs to specify which subspecies of sagebrush would be seeded.

RECLAMATION PLAN

R645-301-341.230, The application says in Section 341.230 that tackifier will be applied at the rate of 500 pounds per acre, and this is probably a mistake. Normally, wood fiber hydromulch would be applied at this rate together with a tackifier to anchor another mulch. This section should be clarified.

R645-301-341.230, The applicant intends possibly to use a polyacrylamide (PAM) or SoilLok as a tackifier. It appears these would work as tackifiers, but the applicant needs to supply further information about application rates.

R645-301-341.250, According to Map 3-2, the Douglas fir/maple reference area would be disturbed, so this area cannot be used as a reference area. The applicant needs to propose a different success standard.

R645-301-341.250, The applicant needs to provide further information about the diversity success standard, such as exactly what method would be used and what the standards are. The application also needs to show how other revegetation performance standards, such as seasonality, utility for the postmining land use, permanence, and capability for regeneration and succession, will be measured and what standards will be used.

R645-301-341.250, The Division has developed woody plant density success standards, and these have been approved by the Division of Wildlife Resources. These standards, as discussed in this technical analysis, need to be included in the application.

R645-301-341.250, Table 3-4 contains a schedule for monitoring vegetation after final reclamation. This table needs to include measurement of plant productivity in the tenth year following reclamation.

R645-301-342, Section 342.100 of the application indicates wildlife habitat will be restored following reclamation. This statement needs to be modified. Restoration implies the site will be made to be exactly as it was before disturbance.

R645-301-342, In reclamation, the applicant needs to use the best technology currently available to enhance wildlife habitat. The application needs to show how this performance standard is being achieved. The application references Appendix 3-6 for comments about the reclamation plan from Wildlife Resources. This appendix should also contain comments from the School and Institutional Trust Lands Administration about a habitat mitigation plan; however, the appendix is empty.

There are a few other problems in the application that are not considered deficiencies but for which the Division offers recommendations.

1. The application says straw mulch would be mixed into the soil as it was being gouged in all but the experimental practices area. Hay should be used instead of straw.
2. Some wood fiber mulch, about 500 pounds per acre, should be mixed with the tackifier to hold the straw mulch on the surface (not the mulch being mixed in).

RECLAMATION PLAN

3. The mulch rate could be reduced from 4000 to 2000 pounds per acre.
4. Rather than just being perforated with the teeth of a backhoe, the geotextiled areas should be gouged as long as they remain stable.
5. Methods other than gouging can be used successfully to roughen the surface, but they are not generally applied properly. For this reason, they are not recommended.
6. The Division recommends several changes to the seed mixes for final reclamation.
7. It is recommended that mountain mahogany and serviceberries be planted along the reclaimed channel.
8. Douglas fir transplants inoculated with ectomycorrhizae are probably available commercially, and the Division recommends using these to increase establishment and subsequent growth.

STABILIZATION OF SURFACE AREAS

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

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-545.

Analyses:

Analyses of this section will be completed following response to the requirements identified in this Technical Analyses.

Findings:

RECLAMATION PLAN

A findings will be conducted on this information following response to the requirements identified in this Technical Analyses.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: R645-301-526.200, R645-301-541.300

Analysis:

Affected Area Maps

Bonded Area Maps

Reclamation Backfilling and Grading Maps

Final Surface Configuration AOC Maps

Reclamation Surface and Subsurface Manmade Features

Map 5-5, Surface Facility Map shows the 69 KV power line entering the West Ridge disturbed area boundary 50 feet west of the west side of the truck loadout loop. It then enters the disturbed area boundary (DAB) for 220 feet, exits same for 40 feet, and then re-enters the DAB and travels ENE to the substation.

The powerline cannot just jut in and out of the disturbed area boundary. The sediment control for the support structures (whether they are SAE's or not) must report to the sediment ponds, as must all disturbed area runoff. In Table 2, Demolition Cost Estimate in the submitted PAP, the applicant is committed to reclaiming the substation and 700 feet of 69 KV line within the DAB. Although the line is on the Mine's property, it will be installed and maintained by the local utility company, (see page 5-27, paragraph j, Electrical power). Based on this, it is assumed that UP & L will maintain ownership of the line as well. If the applicant is to reclaim this line, an agreement must be in place between UP & L and West Ridge Resources, Inc. to allow them to do so. Verbiage discussing exactly what portion of the power line is to be reclaimed should be included in the text. The agreement should be included in the MRP.

The construction of the power line will impact the following acreages as managed by their respective agencies:

- 1) 70 acres of surface disturbance are managed by the USBLM
- 2) 5.48 acres of surface disturbance are managed under Utah SITLA
- 3) 10.04 acres are privately owned.

Easements in perpetuity need to be negotiated and included in the MRP in order to relinquish the reclamation responsibilities overseen by the Division. The power line and water line are being installed for the sole purpose of servicing the proposed mine, therefore the reclamation requirements of SMCRA

RECLAMATION PLAN

must either be met or suitably overshadowed by acceptable agreements issued by the managing surface management agencies.

The reclamation plan of this PAP discusses the removal of all structures, plus the removal of the Canyon fill material as part of returning the area to AOC. As part of the reclamation plan, Table 2, Demolition Cost Estimate shows that the substation will be reclaimed prior to removing the fill material in this area. The applicant is proposing to backfill 92,000 cubic yards of fill in the underground entries prior to sealing. In order to do this, MSHA will require ventilation of the mine as long as the backfilling is proceeding. How does the applicant intend to provide continued adequate ventilation of the Mine during the backfilling process (i.e., with the fan and power line facilities removed)? Map 5-9, Mine Site Reclamation shows the 69 KV line removed in it's entirety, (i.e., including the structures owned by UP & L.).

Page 5-28, paragraph K, Water Facilities

"Water will be delivered to the site by a 6" pipeline originating in East Carbon City." Is it to be reclaimed? Is it to be included as part of the approved post mining land use? Regarding the retention of this line, the following acreages are impacted and, as such, must have approvable or agreed to post-mining land use agreements in place from the respective surface management agencies. The acreages to be impacted by the water line include:

- 1) 7.34 acres managed by the USBLM.
- 2) 1.98 acres managed by the Utah SITLA.
- 3) 0.96 acres which are the responsibility of the Utah DOT.
- 4) 4.73 acres which are privately owned.

Again, the tenure of the easement agreements from the different surface management agencies needs to be determined. The retention of the waterline as part of the approved post-mining land is not approvable if perpetual lease agreement(s) is/are not approved by the SITLA and the USBLM.

Also, I think we need to be realistic here in that, if a dry year prevails, will the mine be shut down for lack of water? East Carbon City cannot sell something it does not have. Citizens of the East Carbon/Sunnyside area have battled for years over sufficient water to keep cattle alive. Sunnyside Cogeneration Associates has fought over sufficient water to make power since it's inception. The applicant should consider other means of obtaining an adequate volume of water with which it can operate the mine.

It is understood that the Carbon County public road will remain as a part of the post mining land use, at least if the Bureau of Land Management is in agreement to providing this public access to their ownership.

The issue regarding the 69 KV Utah Power and Light powerline and the six inch water line from East Carbon City to the mine needs to be addressed as to whether they are to remain as part of the approved post-mining land use. Both are being installed solely for the purpose (at least at this time) to provide service to the new West Ridge Mine. The documentation to retain these structures as a part of the post-mining land use must be in place prior to the issuance of the mine permit.

RECLAMATION PLAN

The submittal, as it currently exists, does not adequately address the requirements of the needed reclamation plan regarding the utilities to be installed to service the Mine.

Reclamation monitoring and sampling location maps.

A water monitoring station will be established below the reclaimed disturbed area to monitor water quality from the reclaimed site (page 7-36). The location of this station is not shown on a map.

No provisions for ground-water monitoring during reclamation are mentioned in Chapter 7 or in the Construction and Reclamation Plan - Appendix 5-5. Final abandonment of water monitoring well DH 86-2 (at the mine site) will be conducted prior to completion of final reclamation (page 7-20).

Certification Requirements

Cross sections, maps, and plans have been certified by a registered professional engineer.

Findings:

Maps, plans, and cross sections of reclamation information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval West Ridge Resources must provide the following information:

R645-301-731.730, Show the location of the water monitoring station to be established below the reclaimed disturbed area to monitor water quality from the reclaimed site (page 7-36).

R645-301-120, R645-301-526.200, R645-301-541.300, This permit application package is inadequate regarding the reclamation issues for the six inch East Carbon City water line and the 69 KV power line which is to be installed to provide service to the Mine. Also, an agreement which gives West Ridge Resources, Inc. the authority to reclaim that portion of the 69 KV line which lies within the DAB must be incorporated into the plan, or an agreement which indicates that the portion of the 69 KV line within the DAB belongs to West Ridge Resources, Inc. must be included in the plan.

BONDING AND INSURANCE REQUIREMENTS

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

Analyses:

Determination of bond amount.

The Division will wait until the reclamation plan has been approved for completing the bond amount. The Division has reviewed the demolition section of the reclamation cost estimate. Comments on the demolition cost estimates are:

RECLAMATION PLAN

- The Applicant used a regional adjustment factor for costs in the Price area. The Division does not use a regional adjustment factor. The regional factor is based on labor and equipment costs. Since demolition work requires little material costs, the regional factor does not accurately represent the type of work being done. The labor factor assumes that the bid would go to a Price-based company. Since many reclamation contracts are awarded to Wasatch front companies, the wage rates should be based on Wasatch Front wage rates that are similar to national wage rates. The regional factor varies over time. The Division does not have an accurate way of estimating the regional factor during reclamation.
- The Applicant uses a disposal fee but not state what the disposal fee covers or how it was determined. The Applicant must provide that information as required by R645-301-121.200.
- The Applicant must provide documentation for the dump fee at the City Sanitation facility as required under R645-301-121.200.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval the applicant must provide the following in accordance with:

R645-301-121.200, The Applicant must give the Division information on:

- What costs the disposal fee covers and how that cost was determined.
- Give the Division documentation on the dump fee at the City Sanitation facility.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

EXPERIMENTAL PRACTICES

Regulatory Reference: 30 CFR Sec. 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

Analysis:

Chapter 2, Soils, and Appendix 2-6, West Ridge Mine Experimental Practice In-Place Topsoil Protection, discuss topsoil protection incorporating traditional methods of salvaging/stockpiling and an experimental practice method for protecting in-place soils with a layer of geotextile fabric. The **Experimental Practice** is unique by taking a **Reclamation Approach** for topsoil protection.

Operations - Experimental Practices

Most of the West Ridge Mine site will have topsoil salvage and protection using traditional methodology. However, Andalex is proposing a topsoil protection plan which incorporates Experimental Practices (R645-302-200) for protecting the in-place soil with a layer of geotextile fabric. The geotextile fabric provides a protective barrier between the existing soil and the imported fill materials used to construct the mine pads. By utilizing this procedure, soils are not only preserved in-place, but the existing stream channel morphology and original ground surface configuration are preserved likewise. Approximately 4.75 acres of the proposed 29 acres disturbed area will be affected using the experimental practice.

In order to test this practice, Andalex has proposed a test plot study in the right fork topsoil stockpile. After the fill material has been in place for five years, the test plot study will monitor reclamation success of the Experimental Practice by removing the geotextile and then treating the surface with several treatments utilizing the same methodology being proposed for final reclamation. For comparison to assess reclamation success, an adjacent plot will also be constructed utilizing traditional reclamation methodology. If additional testing needs to be conducted, then fifteen years will remain to conduct additional testing. As a last, Andalex will utilize the soil borrow area for obtaining soils to reclaim the site if the experimental practice is determined to be unworkable.

The following Operational concerns and questions are listed for the Experimental Practice that need to be addressed and/or changed in the PAP:

- *Andalex proposes to protect the soil resources in-place by covering the soil surface with a geotextile fabric, then placing fill material over the fabric. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.*
- *The PAP contains conflicting construction and reclamation goals concerning preservation of the existing stream channel, stream bank geomorphology and original ground surface configuration. The conflict arises with construction procedures using a trackhoe to remove boulders and grade*

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

the stream channel prior to culvert installation versus channel preservation. In addition, Maps 2-4 shows culvert installation below original soil surface. If channel soils are not going to be preserved in-place and undisturbed, then they need to be salvaged and stockpiled.

- *Information and specifications are needed on the geotextile fabric to assess it's suitability and durability for use as explained in the Experimental Practices.*

Reclamation - Experimental Practices

Fill removal from the slopes will be done carefully without disturbing the in-place soils located under the geotextile. Fill removal will be done by small earth moving equipment and/or by hand labor if necessary to minimize disturbance of the topsoil. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.

Once the geotextile fabric has been exposed, the fabric will be carefully peeled away from the soil and the condition of the underlying soil materials observed at this time. The soil will be reclaimed in 5-10 foot horizontal zones that can be easily accessed and worked by hand from the adjacent pad fill level. All reclamation work performed directly on the slopes will be done with hand labor and tools. Slope restoration will be supported by heavy equipment staged on the adjacent pad level. Work will be done in continued successive lifts, involving fill removal, peeling away the geotextile, revitalizing the in-place topsoil, and revegetating the newly exposed increments. After the fill removal process reaches the bottom of the canyon, the bypass culvert will be exposed. After culvert removal, the underlying geotextile fabric will be peeled away from the soil surface.

The plan states that Polyacrylamide (PAM) relieves soil compaction. PAM is used to preserve soil structure and reduce soil erosion; PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.) needs to be applied to the soil surface. The plan also states that different techniques, including soil inoculum and soil stimulator, will be applied to the soil to stimulate soil microbiological activity.

The following reclamation items need to be addressed and clarified in the PAP for experimental practices:

- *PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC[®], Tackifier, etc.) needs to be applied to the soil surface.*
- *A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.*

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

- *In order to properly assess reclamation sequence for restoration of in-place soils, please explain coordination and timing of conveyor belt removal, highwall reclamation, fill transport into old mine workings and pad removal.*

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to approval the applicant must provide the following in accordance with:

R645-302-200, Several Operational concerns and questions are listed for the Experimental Practice that need to be addressed and/or changed in the PAP:

- Andalex proposes to protect the soil resources in-place by covering the soil surface with a geotextiles fabric, then placing fill material over the fabric. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.
- The PAP contains conflicting construction and reclamation goals concerning preservation of the existing stream channel, stream bank geomorphology and original ground surface configuration. The conflict arises with construction procedures using a trackhoe to remove boulders and grade the stream channel prior to culvert installation versus channel preservation. In addition, Maps 2-4 shows culvert installation below original soil surface. If channel soils are not going to be preserved in-place and undisturbed, then they need to be salvaged and stockpiled.
- Information and specifications are needed on the geotextile fabric to assess it's suitability and durability for use as explained in the Experimental Practices.

R645-302-200, The following items need to be addressed and clarified in the Experimental Practices:

- PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®, Tackifier, etc.) needs to be applied to the soil surface.
- A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.
- In order to properly assess reclamation sequence for restoration of in-place soils, please explain coordination and timing of conveyor belt removal, highwall reclamation, fill transport into old mine workings and pad removal.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

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

Analysis:

The Division will provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. The CHIA will be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division intends to use data and analyses submitted by West Ridge Resources, Inc. in the PAP.