0015

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

041/002 #2

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October 6, 1987

Mr. Ken Payne
Southern Utah Fuel Company
P. O. Box P
Salina, Utah 84654

Dear ~~Mr.~~ Ken Payne:

Re: Initial Completeness Review, Waste Rock Disposal Site, Convulsion Canyon Mine, ACT/041/002-1, Sevier County, Utah

The Division has finished its Initial Completeness Review (ICR) on the Waste Rock Disposal Site Mining and Reclamation Plan (MRP) received August 3, 1987. The plan has been found to be incomplete, as outlined in the attached review. The Division has also initiated a Technical Deficiency review. An initial identification of technical deficiencies is also attached.

Please format your responses to both ICR and technical deficiencies, such that direct insertions or replacements can be made into the MRP.

Please don't hesitate to contact me or Susan Linner should you have questions.

Sincerely,

Lawell

L. P. Braxton
Administrator
Mineral Resource Development
and Reclamation Program

SCL:jvb
Enclosure
cc: P. Rutledge
B Team
0028R-34

INITIAL COMPLETENESS REVIEW
Southern Utah Fuel Company
Convulsion Canyon Mine
Waste Rock Disposal Site
PRO/041/002-1
Sevier County, Utah

October 6, 1987

Legal Financial Information - General Comment - SCL

Since the proposed action is defined under UMC 788.12 as a new permitting action, legal and financial information must be included with the application. The majority of the required information can be addressed by reference to specific sections and pages of the approved Mining and Reclamation Plan (MRP). However certain sections, as noted below, must be addressed specifically for this submittal.

UMC 761.12 Procedures - SCL

(d) Since the applicant proposes to conduct mining activities within 100 feet of a public road, approvals must be obtained from the authority with jurisdiction over the road. The Division will provide opportunity for a public hearing and make a finding as required.

UMC 771.25 Permit Fees - SCL

The applicant must submit a $5.00 application fee.

UMC 771.25 Permit Fees - SCL

The application must be verified as required by this regulation.

UMC 782.13 Identification of Interests - SCL

(a)(2) According to the Bureau of Land Management, Richfield District, the coal within the proposed new permit area is owned by the federal government. They would like this noted in the plan even though no coal mining is proposed at this time.

(a)(3), (a)(4) The applicant should state whether or not there are any holders of lease hold interest or purchasers of record of areas to be affected by surface operations.

UMC 782.14 Compliance Information - SCL

(c) The application should contain a listing of all violations received within three years preceding the application date, as described herein.

UMC 782.16 Relationship to Areas Designated Unsuitable for Mining - SCL

The application must address this regulation and note whether there are any occupied dwellings within 300 feet of the permit area or any other prohibitions as outlined in UMC 761.11.

UMC 782.18 Personal Injury and Property Damage Insurance Information - JRH

This section is not considered to be complete.

The operator needs to indicate whether or not the liability insurance coverage currently held is inclusive of the proposed waste disposal site.

UMC 782.19 Identification of Other Licenses and Permits - SCL

An Air Quality Approval Order must be obtained for the new permit area and incorporated into the plan.

To comply with the requirements of the state Division of Water Rights, the applicant should complete the attached Application form and forward it to Water Rights.

UMC 782.20 Identification of Location of Public Office for Filing of Application - SCL

A copy of the application shall be filed at the appropriate public office.

UMC 782.21 Newspaper Advertisement and Proof of Publication - SCL

The applicant will be required to publish notice as described under UMC 786.11 when the Division has determined the application complete. A copy of the publication notice will need to be incorporated into the plan.

UMC 783.13 Description of Hydrology and Geology: General Requirements - KW

This section has been partially addressed, however there are several concerns that the Division has that have not been addressed.

The location and uses of the local ground water aquifer has not been identified. This is important because of the possibility for degradation of the groundwater by leaching of the fill material even if it has been shown to be non-toxic and non-acid forming. The waste rock site is located in an area with several summer residences, and the possibility exists that these residences use the same aquifer that the waste rock disposal site could impact.

During the onsite visit by Division personnel on 9-19-87 an inspection of the wells suggested that the local groundwater aquifer was quite close to the surface in the area of the proposed sediment pond. This could present a problem during the spring recharge period when groundwater levels could be significantly higher, interfering with the storage capacity of the incised sediment pond.

The level of ground water investigation at the site is dependant on the results of the analysis of the waste rock. The applicant has four monitoring wells on site, these may or may not be sufficient for determining the ground water hydrology in the area. At a minimum, two years of baseline monitoring of the water quality and groundwater levels are needed.

UMC 783.18. Climatological Information - LK

This section is complete and adequate.

UMC 783.19 Vegetation Information - LK

The submittal proposes the use of a reference area for establishing revegetation standards. However, as discussed on September 14, 1987 on site, the baseline data method would be acceptable provided an adequate productivity sample had been made. This would remove concerns raised with the proposed reference area regarding similarity between it and the area to be disturbed, and ownership and control of the reference area location. On September 18, 1987 it was confirmed over the phone that the productivity sample met adequacy requirements (Mean = 1008 lbs/acre dry wt., Sample Size = 10 and Standard Deviation = 29.8. N_{mine} = 1 (@90% confidence)).

The Following items are needed to have a complete and adequate vegetation survey for the site:

1. Table 4 in Appendix IV needs to be revised to include Sample Size and Standard Deviation,

2. The current range condition of the disposal site needs to be determined (preferably by the U.S. Soil Conservation Service),

3. Reference to using a reference area for the success standard need to be changed to reference baseline data, and

4. For clarity, Tables 3, 5, & 7 and discussions regarding the reference area should be removed from the submittal.

UMC 783.20 Fish and Wildlife Information - LK

This section is complete and adequate.

UMC 783.21 Soil Resources Information - JSL

The plan does not contain an adequate soil survey and map of the proposed waste rock disposal site. A soil survey and map must be submitted. The survey and map must identify all soil sample sites, phases of soil series and inclusions that are distinctly more limiting for use than the identified soil such as rock outcrops. The map scale should be comparable to the facilities map.

Appendix IV, Vegetation and Soils of the Proposed Waste Rock Disposal Site, associates the soils at the proposed waste rock site to the fine mixed frigid Typic Argixeroll soils (map unit D) within the approved permit area. Due to a lack of specific data and a disagreement between the submitted data, the equivalence between these two soils is questionable. Map unit D of the approved MRP list 62.2 ppm Ca, 6.85 pH, greater than one percent organic matter for the upper eleven inches and a median clay loam texture. The waste rock disposal site however list Ca at 7185 ppm, pH of 7.96, organic matter greater than one percent in the upper 38 inches and a median texture of a sandy clay loam. The following must be included in the survey to adequately define the soil type: hydrologic group, slope aspect and percentage, capability subclass, erosion hazard, drainage characteristics, parent material, and water holding capacity.

Table 8 of Appendix A of Appendix IV must be corrected. The soil texture in horizons B21, B22, B3ca and C must be changed from clay loam to sandy clay loam.

UMC 783.22 Land Use Information - LK

This section is complete and adequate.

UMC 783.24-25 Maps: General Requirements, Cross Sections, Maps, and Plans - JRH

This section is not considered complete.

The site plans for the waste disposal site do not bear the mark of a registered professional engineer.

UMC 783.25 Maps and Cross-Sections - DD

The applicant shall submit cross-sections that show the depth of alluvium at the Waste Rock Disposal Site and the contact of consolidated formation(s).

The applicant shall submit a geologic map that includes the Waste Rock Disposal Site and adjacent areas (including the surrounding stream areas). Attitudes of consolidated formations should be indicated on the map.

UMC 783.25 Cross-Sections, Maps, and Plans - KW

In order to evaluate culvert capacities and undisturbed diversion designs a map of the entire undisturbed drainage is needed. This map should be of sufficient detail to delineate drainage boundaries, watershed slopes, and channel slopes in the undisturbed watersheds.

To help facilitate the hydrology review and eliminate unnecessary and outdated information, Map 2 from the MRP and the site plan from the SHB report should be combined and updated. This map should show the location of each completed well, all diversion ditches, correct location of the culverts, correct location of the sediment pond, and each proposed monitoring station for ground water and surface water.

These and all maps submitted should be properly prepared and certified as required by the respective sections in the regulations.

UMC 783.27 Prime Farmland Investigation - JSL

The negative determination of prime farmland is not acceptable. Elevation is not a criteria for prime farmland. According to the limited information presented in the soil survey, the soils at the rock waste disposal site may be classified as a prime farmland. The operator shall contact the U.S. Soil Conservation Service (SCS) to determine if the proposed site soils have been designated as prime farmland. A copy of the SCS determination must be included in the permit application.

UMC 784.11 Operation Plan: General Requirements - JSL

The permit application must include topsoil removal, storage, and redistribution plans for the sediment pond site. The MRP must also include a plan for the disposal of the sediment pond waste at phase II final reclamation.

The applicant must discuss proposed methods and equipment that will be utilized to ensure the proper depth of soil removal. Two possible methods include leaving small islands and a grid staking system at a spacing of 100 to 200 feet. In either case a removal isopach map and topsoil mass balance table based on annual removal, should be included with the MRP. The topsoil balance sheet must be utilized throughout the life of the project to keep a running total of available soils versus disturbed acreage for the purpose of ensuring that adequate soil is available for reclamation.

UMC 784.12 Operation Plan: Existing Structures - JRH

There are no existing structures within the intended area for the waste disposal site. This section is considered to be not applicable.

UMC 784.13 Reclamation Plan: General Requirements - JRH

This section is not considered to be complete.

The operator has indicated that the final reclamation plan is to terrace the waste pile for final configuration. Although the regulations allow for terracing in certain instances, it is not felt that the location or the slopes of the final waste pile warrant terracing. Moderate slopes of less than 3:1 should be suitably controlled and protected by other means than terracing.

The 6 inches of topsoil indicated by the operator is not considered to be sufficient "cover" for the waste in order to prevent exposure of the material to erosion. It appears that there are sufficient materials located on the site to develop sufficient cover material in addition to those requirements for topsoil. The operator must take into consideration, sufficient cover materials for design of the waste disposal facilities.

UMC 784.13 Reclamation Plan: General Requirements - JSL

The mine plan must include a map showing the location of all topsoil stockpiles. The applicant must also clarify the measures that will be employed to achieve topsoil stockpile protection. Section 3.2.3 states that the stockpile will not be revegetated while section 4.4 states that it will be revegetated. The Division recommends that the applicant reseed and establish berms around the perimeter of the stockpiles.

Methods such as scarification of the waste should be discussed to ensure good overburden contact. The depth of scarification must be at a minimum six inches deep.

Soil redistribution must be carried out when the soil is dry. Working on wet soil results in excessively compacted soil. The redistribution plan states that six inches of topsoil will be top-dressed on the waste site. However the application contains no verification that vegetation success can be met with this minimum cover depth. The suitable depth(s) of topsoil redistribution shall be determined by the quality and depth of overburden, effective length of vegetative root growth and previous topsoil depth.

The physio-chemical nature of the overburden is uncertain. According to Volume 3, Appendix 783.14(a)(2)(iii) and Table 783.14(a)(2)(iii), the overall average percent pyritic sulfur ranges from 0.05 to 2.33 percent. The calculated acid production potential [(% pyritic S)(-31.24)] is -21.56 to -72.79. Acid water production will occur in material with an Acid Base Potential (ABP) of -5 or less. To calculate the ABP the neutralization potential (NP) must also be known. The NP [($CaCO_3$%)(10)] is added to the acid production potential to calculate the ABP. The NP data for the waste material has not been submitted.

The ABP, among other constituents, must be quantified for all underground developement waste material. To determine the acid- or toxic- forming potential of the waste the Division proposes that the applicant sample each and every lift prior to backfilling the waste into the proposed waste disposal area. Each sample shall be a composite sample. The Division must receive the data of the specific lift prior to the backfilling of any other underground waste materials into the waste disposal area. All samples must be analyzed for the following parameters to adequately determine the acid- or toxic- forming potential: % pyritic S; $CaCO_3$%; selenium; pH; SAR; texture; electrical conductivity; and, Boron. The results of the evaluations should be integrated into the plan to demonstrate that all coal and acid- or toxic-forming material (ATFM) is disposed of in a manner that will prevent environmental degradation. The reclamation plan must include proper disposal methodology if the material is an ATFM. The plan would include sealing the material from oxidation, and/or neutralization of the problem material.

The reclamation plan must also include compaction mitigation and stabilization plans. The Division recommends tilling one ton of alfalfa hay into the redistributed soil at a six inch depth. Contour furrowing or pitting should also be implemented after soil redistribution.

The fertilization plan must clarified. Section 4.5 states that 150 lb nitrogen per acre will be applied while section 4.6.4 states that fertilization will be based on soil analysis. A blanket application rate may cause water quality and revegetation problems. Sampling should be accomplished prior to topsoil removal and after soil redistribution. A total of three sample sites locations with sample depth intervals of 0-6, and 6-18 inch should be adequate to represent the soil resources. After redistribution the sampling rate should be one sample per 2 acres at a depth interval of 0-6 inches.

The Division recommends that fertilization rates be established by analyzing each sample for the following soil parameters: texture; electrical conductivity; pH; calcium; magnesium; sodium adsorption ratio; available phosphorus; organic matter, and potassium. A discussion of implements to be used to apply the soil nutrients should be included in the context of the reclamation plan. The Division recommends drilling the fertilizer in the soil approximately one inch below the seeds.

<u>UMC 784.13 Revegetation Plan - LK</u>

(b)(5) The applicant needs to provide plans to reclaim each section of the waste rock disposal area as contemporaneously as possible after completion of each section. Also, the applicant needs to provide a timetable as to when each major step in reclamation will be completed (i.e. grading, topsoiling, seeding, mulching, fertilizing, etc.).

Seeding rates must be in terms of Pure Live Seed (PLS). The proposed seed list has several introduced species with no demonstration that they meet the criteria of UMC 817.112. Also, more shrub species should be added to the mix. Attached is a recommended seed mix for your consideration, which would be acceptable for this site.

The proposed mulching rate is not adequate. A minimum of 2,000 pounds per acre should be used. Please clarify how mulch will be applied and anchored (if mulch is not anchored, its effectiveness is greatly reduced).

Please clarify whether irrigation will be used or not. Will pest/disease control (including weed control) be used? (See comments under UMC 817.97 also).

The applicant needs to identify baseline data as the criteria for determining revegetation success (see comments under UMC 783.19). Methods used to measure revegetation success should be the same as those used to collect the baseline data. Also, the level of confidence (90%) for sampling needs to be identified.

The applicant needs to provide a monitoring plan for reclaimed areas, identifying parameters to be sampled and the year of sampling. Attached are the Division's monitoring guidelines to assist you in developing an acceptable plan.

The applicant needs to provide a plan and commit to repairing rills and gullies as per UMC 817.106.

UMC 784.14 Reclamation Plan: Protection of Hydrologic Balance - KW

A detailed cross-section is needed showing the waste rock area after it is completed. This should show the terraces, slopes, and location of the terrace diversions. This cross-section should be of sufficient detail to evaluate the average slope, how the surface runoff from the area will be collected, and the height and steepness of the terraces.

UMC 784.15 Reclamation Plan: Postmining Land Use - LK

This section is complete and adequate.

UMC 784.16 Reclamation Plan: Ponds, Impoundments, Banks, Dams and Embankments - JRH

This section is not considered to be complete.

The operator has not addressed all of the requirements of this section. Primarily, the detailed design plans for the sediment pond are not sufficient, plans for the removal of the sediment pond are not included in the reclamation plan, and certifications have not been included.

UMC 784.19 Underground Development Waste - JRH

This section is not considered to be complete.

The operator has not provided sufficient cross sections to indicate the design and detail of the structure. Refer also to comments made under UMC 783.13 and UMC 783.25.

UMC 784.21 Fish and Wildlife Plan - LK

See comments under UMC 817.97.

UMC 784.23 Operation Plan: Maps and Plans - JRH

This section is not considered to be complete.

The operator has not provided a map of the facility showing the sequence for topsoil removal and subsequent placement of spoils. The operator has generally indicated the sequence of the operation in the text of the report but has not provided sufficient detail on the drawing to indicate the intended sequence for construction during operation.

UMC 784.24 Transportation Facilities - JRH

This section is not considered to be complete.

The operator needs to show on the drawing and within the text of the proposal, how trucks will be staged and unloaded at the waste facilities. Primarily of concern is the use of the county road and other such road areas which the trucks will have to utilize in order to turn around during waste disposal operations.

UMC 784.25 Return of Coal Processing Waste To Underground Workings - JRH

This section is not applicable.

TECHNICAL DEFICIENCIES

UMC 817.13 -.15 Casing and Sealing of Exposed Underground Openings - JRH

The operator has not provided a commitment or methodology for the closure of monitoring and test boreholes within the permit area. This information must be incorporated into the plan in order for this section to be considered technically adequate.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations - KW

In order to show compliance with this section and with the hydraulic structure designs specifications the applicant needs to commit to the installation and maintenance of a standard large capacity 8 inch rain gage or a standard Fergusson type weighting rain gage. Since precipitation in this area comes in the form of snow with little immediate runoff the rain gage does not need a snow shield and does not need to be maintained during the winter season.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow ground Water Flow, And Ephemeral Streams - KW

The designs for all of the diversions in the disturbed area need to be corrected and channel protection provided in the areas where channel velocities are greater than 3.5 ft/sec. Problems with the diversions include the following:

1. The incorrect area was used for calculating peak flows from the disturbed area.

2. For the terrace diversions T_c was incorrectly calculated.

3. The designs for all diversions and channels found the use of a Mannings 'n' value of 0.045, although the channels may eventually become vegetated, they will initially be barren straight and clean; therefore, the designs should reflect this condition. A Mannings 'n' of 0.035 is more appropriate for non-riprapped channels.

The use of a Curve Number (CN) of 80 is acceptable; however it should be noted that this is a weighted CN. The disturbed areas should have a CN of 90 and the areas that are undergoing concurrent reclamation have various lower values.

The applicant proposes using the existing channel for Ditch No. 2. Since the upper section is deeply incised the applicant needs to show how they will convey the water from the terrace diversions into the incised channel. The Division recommends designing and emplacing a separate channel to convey the water off of the steep area; this channel could join the existing channel at a point below where the channel is incised. If the applicant chooses to follow this course of action then the maps requested in section 783.25 of this document should show the diversion channel separate from the existing channel.

The applicant's designs for the undisturbed drainages could not be checked at this time due to the insufficient maps, however a cursory check showed the use of 6 ft/sec as the permissible velocity in the grassed waterway (Diversion for area 1). Due to the erosive soils the Division feels that this value is too high and a more correct value would be 4 ft/sec.

The applicant back calculated channel designs by using a limiting velocity approach and estimating channel slopes. This approach works well on relatively flat land; however, at the waste rock disposal site some reaches of the proposed channel have twenty percent slopes. For these steeper sections the back calculations can produce unacceptably wide shallow channels. It appeared from the calculations that the applicant used a more average channel slope rather than the maximum channel slope. The maximum and minimum slopes should be calculated using the steepest and shallowest channel reaches that are easily estimated from the contour map (between 10 ft contours).

The Division calculations show that the applicant significantly underestimated peak flows in the disturbed area diversions. Upon recalculation the applicant may find that some reaches of the diversions may need to be riprapped. Using a standard channel design the applicant should calculate the slope at which the velocities become erosive and commit to riprap any reaches of channel that are steeper than the critical slope.

The present MRP does not show any design details for energy dissipators at the outlets of the culverts and diversions into and out of the sediment pond. The energy dissipator and spreader designs are critical especially at the outlet of the culvert in the grass swale. Since the proper performance of a grassed waterway is dependant on the water not being concentrated this spreader design is critical to ensure that the flow is not concentrated at a single point.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds - JRH

The operator has not provided in the plans and on the drawings for the removal and the reclamation of the sediment ponds. Post reclamation contours should show the location and the drainage to the sediment pond for Phase I reclamation. Additionally, upon meeting successful vegetative and effluent requirements, plans showing the contours of the reclaimed sediment pond and the permanent drainage for final reclamation in Phase II should be provided.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds -. KW

The review of the sediment pond could not be completed because of insufficient details of the pond. The Division needs a contour map (2 ft C.I.) or further cross-sections to be able to evaluate the capacity of the pond. Furthermore, the elevations in technical analysis (SBH report) of the sediment pond should be corrected to show the current pond location.

The calculations of sediment yield for the pond are incorrect. The applicant choose to use 0.1 ac-ft per acre of disturbed area for the sediment yield. When using this method the entire disturbed area must be considered not the area disturbed in 1 year.

The emergency spillway design was not evaluated at this time however the Division recommends that this spillway be located at the front of the sediment pond to eliminate the bend in the channel and the necessity of designing riprap diameters and flow depth to account for this bend.

UMC 817.52 Hydrologic Balance: Surface and Groundwater Monitoring - KW

The MRP does not address a proposed monitoring plan. This plan should include all baseline, operational and reclamation period water monitoring stations, parameters that will be monitored as per DOGM guidelines, dates of sampling, and a commitment to a date at which to have the water monitoring data submitted to the Division. The application must also commit to E.P.A. certified laboratory analysis for all samples.

The applicant also needs to show that it is attempting to obtain a NPDES permit for the sediment pond.

UMC 817.59 Coal Recovery - JRH

This section is not considered to be applicable to the waste facility permit.

UMC 817.61-68 Use of Explosives - JRH

This section is considered to be not applicable to the permit since no plans for the use of explosives are expected within the waste disposal area.

UMC 817.71 Disposal of Excess Spoil and Underground Development Waste: General Requirements - JRH

This section is not considered to be technically adequate. Groundwater and bedrock conditions provided in the plan do not sufficiently delineate the site for determination of stability and protection of surface and groundwater.

The proposed 6" of topsoil over the waste material is not considered to be sufficient cover material in order to prevent exposure of the spoils through erosion.

The proposed terraces by the operator are not sufficiently detailed by the operator in order to show the final configuration of the waste pile. Additionally, is has not been sufficiently justified by the operator, that there is a need for terraces of the pile upon final reclamation. The steepest portion of the pile as currently shown appears to be about 2.75:1. Additional capacity of the pile could be achieved by providing slopes which are not terraced and could be maintained at less than 3:1. It is strongly recommended by the Division that the operator reconsider the use of terraced in the final reclamation design. Terraces slopes do not blend in with the surrounding surface contours and may be denied upon further study as not meeting the requirements of approximate original contour.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values - LK

The applicant must commit to promptly report any threatened or endangered species (plant or animal) or golden eagles not previously reported to the Division of which he becomes aware in the permit area.

The applicant must commit to not use persistent pesticides unless approved by the Division in advance.

The applicant must commit to prevent, control and suppress range, forest and coal fires not approved by the Division.

UMC 817.100 Contemporaneous Reclamation - LK

See comments under UMC 784.13(b)(5).

UMC 817.111-.117 Revegetation Plan - LK

Until a complete plan is submitted (See comments under UMC 784.13(b)(5)), compliance under these regulations cannot be determined.

UMC 817.133 Postmining Land Use - LK

This section is complete and adequate.

1305R