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DIVISION OF OIL, GAS AND MINING

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March 12, 1998

TO: File

THRU: Daron Haddock, Permit Supervisor DRH

FROM: Wayne H. Western, Senior Reclamation Specialist WHW

RE: Reclamation Section of the TA, Canyon Fuel Company, LLC, Dugout Canyon Mine, PRO/007/039-97A, File #2, Carbon County, Utah

RECLAMATION PLAN

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

Contemporaneous reclamation activities should be well documented in the plan and monitored to determine whether the reclamation treatments used in the area can be proven successful. These areas can provide invaluable information as well as demonstrating by field trials that reclamation treatments will be successful. However, contemporaneous reclamation at this small site is unlikely due to the space constraints.

Findings:

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

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Analysis:

The Applicant committed to comply with the approximate original contour provision of the R645 regulations. In Section 512.100 under the subheading of Variance From Approximate Original Contour the Applicant states:

> "No variance from the approximate original contour requirements of the regulations is being requested in this M&RP."
> In Section 553.100 under the subheading of Approximate Original Contour the Applicant states:
> "As indicated in Section 512.100 of this M&RP, the area of the proposed Dugout Canyon surface facilities was disturbed by previous mining activities. No pre-

mining topographic maps of the area are known to exist. The reclamation plan has been designed to allow that the site will be backfilled and graded to achieve the assumed approximate original contour (i.e., to blend into the surrounding topography) and eliminate existing highwalls."

Plate 5-3 shows the surface contours for the disturbed area after backfilling and grading has been completed. Cross sections for the reclaimed area are shown on Plate 5-4. The information in Plate 5-3 and Plate 5-4 shows that the site's topography will be similar to the surrounding area. Since the site will blend in with the surrounding topography, the AOC requirements have been met.

Findings:

The Applicant has met the minimum requirements of R645-301-512, 301-531, 301-533, 301-553, 301-536, 301-542, regarding the restoring the disturbed area to the approximate original contours.

BACKFILLING AND GRADING

General

Analysis:

The Applicant covers the engineering requirements for backfilling and grading in section R645-301-537, R645-301-552 and R645-301-553.

- R645-301-537 deals with regraded slopes that need special Division approval.

In Section 537 of the PAP the Applicant states:

"No mining or reclamation activities will be conducted in the permit area that require approval of the Division for alternative specifications of for steep cut slopes due to the inability of SCM to meet the regulatory requirement of R645-537.100."

R645-301-537.100 deals with steep slopes associated with road cuts. The Applicant has not proposed to construct any roads with steep cut slopes. The Division will not grant any variances from the general backfilling and grading requirements because of steep cut slopes associated with roads.

R645-301-537.200 applies to settled and revegetated fill. Under certain condition settled and revegetated fills do not have to be regraded during reclamation to achieve AOC. The Applicant states that they will grade all settled and revegetated fills that currently exist at the site. The Applicant has not applied for a waiver from the AOC requirements based on the settled and revegetated fills exemption. The Applicant has met the minimum requirements of R645-301-537.200.

- Section 552 deals with small depression and permanent impoundments.

R645-301-552 deals with permanent features such as small depression and permanent impoundments. The Applicant will leave small depression to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. No permanent impoundments will be left after reclamation.

The Division encourages the Applicant to leave small depression on the regrade slopes to aid in revegetation and slope stability. The Applicant has met the minimum requirements of R645-301-552.

- Section 553.100 deals with the disturbed area that the Applicant will backfill and grade during final reclamation. Those requirements require the Applicant to backfill and grade the site to achieve the (AOC) approximate original contour under most circumstances. Exceptions for the AOC requirements can be granted by the Division for (PMA) previously mined areas and (CMA) continuously mined areas. The site was disturbed before SMCRA and highwalls exist at the site. The Applicant's backfilling and grading plan calls for the elimination of all highwalls. Since no variance from AOC was requested none was given.

The site was disturbed before SMCRA and there are no known premining topographic maps of the disturbed area. Restoring the site to its premining contour is impossible. The site will be restored to the approximate original contours meaning that the reclaimed contours will blend in with the surrounding topography. The backfilling and regrading plan will restore the site to the approximate original contours.

The Applicant addressed the elimination of highwalls, spoils and depressions in Section 553.100 by stating:

"The backfilling and grading plan has been designed to eliminate highwalls at the site. No spoil piles exist. Except for the small depressions discussed in Section 552.100, no depressions will remain at the site following reclamation."

In Section 553.500 the Applicant restates that preexisting highwall will be eliminated. The Applicant committed to grading all slopes in the disturbed area to a minimum slope of 1.5H:1V and that the slopes will have a minimum safety factor of 1.3 (see Appendix 5-4 for details). The Applicant committed to backfill and regrade the disturbed area so the topography after reclamation will approximate the original contours. Since the Applicant does not know what the original contours were this commitment is taken by the Division to means that the topography of the site after reclamation will blend into the surrounding topography.

The Applicant claims that no spoil piles existed at the Dugout Canyon Mine site before the permit was issued and that no spoil piles will be created during mining and reclamation. The Division agrees that no spoil piles exist at the site before the permit being issued. The Applicant has addressed R645-301-553.210 and R645-301-553.220.

The Applicant addressed slope stability of the reclaimed slopes in Section 553.100 by stating:

"Backfilled and regraded slopes have been designed not to exceed the angle of repose (determined in Appendix 5-4 to be a slope of 1.5H:1V). At this slope, final reclamation slopes have been designed with a minimum static safety factor of 2.6 (see Appendix 5-4). The static safety factor increases as the slope angle increases. The slopes have thus been designed to prevent slides."

The Applicant states that the reclaimed slope angles will not excess the angle of repose, which they determined to be a 1.0 vertical rise to 1.5 horizontal run. The Division found several slopes that are steeper than 1V to 1.5 H. The Applicant needs to eliminate those steep slopes from the reclamation plan.

The Applicant addresses the erosion and water pollution at the site in Section 553.100 of the PAP by stating:

"Temporary sediment-control measures will be implemented during and following backfilling and regrading as outlined in Section 542.200 and Section 244 of this M&RP. As vegetation becomes established on the reclaimed surfaces, erosion potentials will be further minimized. By minimizing erosion, water pollution will also be precluded. Additional water-quality concerns do not exist at the site (see Chapter 7).

In an effort to eliminate preexisting highwalls at the site following reclamation, soil will be replaced during reclamation at slopes of up to 1.5H:1V. The steepness of these slopes will be reduced at their base, providing a concave slope. As noted above, these slopes will be geotechnically stable. Dozers will be used during placement of the topsoil or substitute topsoil on these steep slopes, taking care to achieve a reasonably uniform thickness of the final soil cover. Following placement and prior to seeding, all areas with a slope steepness of 3H:1V or steeper will be deep gouged using a trackhoe. The final surface will consist of mounds and depressions capable of holding runoff and difficult to walk on. Refer to Sections 355 and 341 regarding erosion-control matting and revegetation.

Although the gouging will extend below the depth of the final topsoil layer, information presented in Section 222.400 of the M&RP indicates that the subsoils will be of acceptable chemical and physical quality, with the possible exception of the percentage of rock fragments. Hence, the surface will still be capable of sustaining an adequate vegetative cover, further minimizing long-term erosion of the slopes."

The Applicant committed to backfill and regrade the slopes so that they will supports the approved postmining land use. The Applicant has met the minimum requirements of R645-301-553.100 to R645-301-553.150

- Section 553.200 deals with spoil and waste, refuse piles, and coal processing waste.

In Section 553.200 of the PAP the Applicant states that they will generate no spoil or coal processing waste at the mine. That information is confirmed in the Applicant's operational plan. The Applicant scheduled the refuse to be disposed in either the SUFCO or Skyline mines' waste rock disposal site. They schedule no refuse to be disposed on the site. The Applicant will address final disposal of refuse material from the Dugout Canyon mine in the SUFCO and Skyline mine's M&RP. The Division approved the waste rock facility at the SUFCO and Skyline mines to receive refuse from the Dugout Mine.

The Division was unable to check the cut and fill calculations, due to time constraints. The Division had to rely upon the Applicant's cut-and-fill computer program. The Division assumes that the cut-and-fill calculations are correct.

Exposed Coal Seams

Coal seams that were exposed during mining will be covered with a minimum of 4 feet of nontoxic and noncombustible materials during final backfilling and grading. This cover material may consist of material removed during grading of the site (see Section 542.200), subsoil, and/or topsoil.

Acid- and Toxic-Forming Materials

No storage of acid- and toxic-forming materials and underground development waste is planned for the Dugout Canyon Mine. Although not part of this permit submittal, future development of a waste-rock disposal site has been contemplated. Waste rock will not be used during reclamation, and soil substitutes will be used only if their chemical and physical properties are determined to be adequate through appropriate analyses.

Combustible Materials

All combustible materials that are exposed, used, or produced during mining will be disposed of off site as outlined in Section 521.100.

In Section 542.200 of the PAP the Applicant states that:

"All coal outcrops within the proposed disturbed area will be covered with at least 4 feet of soil during reclamation."

The Applicant met the minimum requirements of R645-301-542.200.

Cut-and-Fill Terraces

In Section 553.400 the Applicant states:

"All surface structures associated with the mining operation will be removed as outlined in Section 542.200. A description ensuring that all structures and the sedimentation pond have been removed will be provided to the Division before seeking bond release or abandoning the permit area."

The Applicant does not propose to leave any cut-and-fill terraces. The Applicant has met the minimum requirements of R645-301-533.400.

Highwalls From Previously Mined Areas

In Section 553.500 of the PAP the Applicant states:

"Several highwalls currently exist within the proposed disturbed area that are the result of previous mining operations. The reclamation plan has been designed to eliminate these highwalls to the maximum extent technically practical."

The Applicant has met the minimum requirements of R645-301-553.500 by committing to eliminate all highwalls from the disturbed site.

Previously Mined Areas

In Section 553.600 of the PAP the Applicant states:

"As noted previously, the reclamation plan has been designed to eliminate preexisting highwalls

from the site following reclamation, to the maximum extent technically practical. Section 542.200 of this M&RP indicates that the plan has been designed with a reasonable balance between cut and fill quantities. Section 553.100 indicates that slopes of up to 1:5H:1V will be required to eliminate the highwalls. The steepness of these slopes will be reduced at the base to provide a concave profile. According to Appendix 5-4, these slopes will be geotechnically stable. Procedures to minimize erosion on these reclamation slopes are discussed in Section 553.100"

Backfilling and Grading - Thin Overburden

R645-301-553.700 is not applicable to this PAP because no surface coal mining and reclamation activities involving thin overburden will occur within the permit area.

Backfilling and Grading - Thick Overburden

R645-301-553.800 is not applicable to this PAP because no surface coal mining and reclamation activities involving thick overburden will occur within the permit area.

Regrading of Settled and Revegetated Fills

In Section 553.900 of the PAP the Applicant states:

"No regrading of settled and revegetated fills is anticipated in the permit area."

In Section 537.200 of the PAP the Applicant states:

"All settled and revegetated fills which currently exist within the disturbed area due to historic mining in the area will be regraded during site construction activities. No plan is presented in this M&RP to retain these settled and revegetated fills following reclamation."

Findings:

The Applicant has met the minimum requirements this section.

General:

The Division has not identified any deficiencies in the backfilling and grading plan. However, the Division has not had time to do check the cut-and-fill calculations.

MINE OPENINGS

Analysis:

In Section 542.700 of the PAP the Applicant states:

"All mine openings will be sealed at least 25 feet inside the mine opening. Prior to installation of the seal, all loose material will be removed from the roof, floor, and rib of the mine within 3 feet of the seal

area. The seal will then be constructed using solid concrete blocks (average minimum compressive strength of 1,800 psi) with nominal dimensions of 6 inches high, 8 inches wide, and 16 inches long. Mortar will consist of one part cement, three parts sand, and no more than 7 gallons of water per sack of cement.

The seal will be recessed at least 16 inches deep into each rib and 12 inches deep into the floor. No recess will be made into the roof. In the bottom course, each block will be laid with its long axis parallel to the rib. The long axis in succeedingly higher courses will be perpendicular to the long axis of the blocks in the preceding course. An interlaced pilaster will be constructed in the center.

The seals will have a thickness of approximately 16 inches. Following seal construction, the entries will be backfilled from the seal to the outside surface with soil that is sloped at the surface to match the final slope at the entry. The soil will then be raked and revegetated with the approved seed mixture (see Chapter 3).

Alternatively, a cast-in-place MSHA approved, seals will be installed with a minimum thickness of 3 feet and with a minimum compressive strength of 200 psi."

The mine opening seal plan is similar to others approved by MSHA and the Division. The Division has approved the mine opening closure plan.

Findings:

The Applicant met the minimum regulatory requirements of R645-301-542.700.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Analysis:

In Section 542.600 of the PAP the Applicant states:

"All roads not to be retained for an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads which will be retained through the disturbed area for access to private land within the permit area are noted on Plate 5-3. All remaining roads within the disturbed area will be reclaimed. All roads to be reclaimed will be graded and/or backfilled as indicated above.

In all cases (whether the road is to be retained for a post-mining land use or not), all asphalt or concrete surfaces will be removed from the roads during reclamation. The retained roads will then be regraded to the downslope side of the road. The road surface aterials will be buried on site beneath at least 4 feet of non-acid and non-toxic forming materials. All roads to be reclaimed will be graded and/or backfilled as indicated above."

Findings:

The Applicant met the minimum requirements of R645-301-542.600.

HYDROLOGIC DESIGN INFORMATION

Analysis:

Sedimentation Ponds

In Section 542.200 the Applicant states:

"The sedimentation pond will be retained for as long as practical during reclamation. Once backfilling and grading operations proceed to the location of the pond, it will be removed. Because the pond is designed primarily as an excavated structure, removal of the pond will consist primarily of backfilling. This removal will be accomplished using backhoes, loaders, dozers, and other appropriate earthmoving equipment.

As soon as regrading of an area no longer allows that area to drain to the sedimentation pond, silt fences will be installed along the base of the slopes adjacent to Dugout Canyon Creek to control erosion on an interim basis prior to revegetation success. These silt fences will be installed using a supportive backing and burying the toe of the filter fabric as noted in Figure 5-5.

On a temporary basis, straw-bale dikes may also be installed as necessary to control localized erosion prior to the establishment of revegetation efforts. If installed, locations of the straw-bale dikes will be selected to reduce sediment contributions to runoff based on field observations. Straw-bale dikes will be installed by keying the bales into the ground as noted in Figure 5-5."

The Applicant has met the requirements of R645-301-542.400. That regulation requires that prior to abandoning a permit area or seeking bond release the all temporary structures shall be removed. The only sediment pond on a site is scheduled to be removed after all reclamation work except for replacing topsoil and seeding has occurred. According to the timetable on Figure 5-4 removing the sediment pond will occur in the later half of the eighth month of reclamation.

Reclamation of the sediment pond will be done according to the specifications outlined in Section 542.200, Plan for Backfilling, Soil Stabilization, Compacting and Grading, of the PAP. According to the backfilling plan the sediment pond should be properly reclaimed.

Impoundments

There will be no permanent impoundments at the site.

Casing and Sealing of Wells

Procedures for casing and sealing, capping, backfilling or otherwise properly managing drilled holes, exploration holes and boreholes, and wells are discussed on pages 5-58, 6-18, **7-68,** and 7-90.

Findings:

Hydrologic operations information that was reviewed for this Technical Analysis, in particular information that pertains to ground water resources, is considered adequate to meet the requirements of this section.

CESSATION OF OPERATIONS

Analysis:

In Section 515.300 of the PAP the Applicant states:

"Prior to a temporary cessation of operations within the permit area that will last for a period of 30 days or more or as soon as it is known that a temporary cessation will extend beyond 30 days, CFC will submit to the Division a notice of intention to cease or abandon operations. This notice will include the following:

- A statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been affected by mining operations in the permit area prior to cessation of operations,
- A discussion of the extent and kind of reclamation activities which will have been accomplished prior to cessation of operations, and
- An identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures, and water treatment activities that will continue during the temporary cessation.

During the temporary cessation, CFC will support and maintain all surface access openings to underground operations. CFC will also secure surface facilities in areas in which there are no current operations but where future operations are to be resumed under an approved permit."

Upon the permanent cessation of coal mining and reclamation operations at the Dugout Canyon Mine, SCCC will close, backfill, or otherwise permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan.

Surface Coal Mining and Reclamation Activities

No surface coal mining and reclamation activities will be conducted in the permit area.

Underground Coal Mining and Reclamation Activities

All surface equipment, structures, or other facilities not required for continued underground mining activities and monitoring, unless approved by the Division as suitable for the postmining land use or environmental monitoring, will be removed and the affected lands reclaimed following permanent cessation of mining operations.

Environmental Protection Performance Standards

The plan presented herein is designed to meet the requirements of R645-301 and the environmental protection performance standards of the State Program.

The Applicant has met the requirements of R645-301-515.300 for temporary cessation and R645-301-541 for permanent cessation. The Applicant will notify the Division in the event of temporary cessation and take appropriate action. When the site is permanently closed, the Applicant has committed to commence reclamation.

Findings:

The Applicant has met the requirement of R645-301-513.300 and R645-301-541.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Analysis:

Affected Area Boundary Maps

Plate 5-1 shows the location of the permit and disturbed area boundaries. Plate 5-3 gives a detailed description of the disturbed area boundaries.

Bonded Area Map

Plate 5-3 shows the areas that are covered by the reclamation bond.

Reclamation Backfilling and Grading Maps

Plate 5-3 and Plate 5-4 show the surface and cross section of the reclaimed site.

Reclamation Facilities Maps

Plate 5-3 shows the facilities in the disturbed area that will be left after final reclamation. Those facilities are the main access road and culverts. The Applicant has not addressed the roads outside the disturbed area. If any road in the permit area is used for mining or reclamation activities it must either be reclaimed or approved as a postmining feature. The Applicant has not adequately addressed how roads outside the permit area will be reclaimed.

Final Surface Configuration Maps

Plate 5-3 shows the final surface contours to the disturbed area.

Reclamation Surface and Subsurface Manmade Features Maps

The Applicant needs to show all permanent manmade surface and subsurface features on the reclamation maps. Those surface and subsurface features include transmission lines and underground pipelines.

Monitoring and sample location maps.

Elevations and locations of monitoring stations used to gather operational water quality and quantity data are on Plate 7-1.

Findings:

The Applicant has met the requirement of R645-301-541.

BONDING AND INSURANCE REQUIREMENTS

Analysis:

- R645-301-830.110 states that the bond amount will be determined by the Division.
- R645-301-830.130 states that the bond amount will reflect the probable difficulty of reclamation, giving consideration to such factors as topography, geology, hydrology and revegetation potential.
- R645-301-830.140 states that the bond amount will be based on, but not limited to, the detailed estimated cost. With supporting calculations for the estimates submitted by the permit applicant.

The reclamation cost estimate for the Dugout Canyon Mine is found in Appendix 5-6 of the PAP. The reclamation costs are divided into demolition, earthwork and revegetation. The Applicant supplied enough information for the Division to determine the demolition and revegetation costs.

The Division calculated the demolition cost estimates based on the methods outlined in the OSM Reclamation Costs Handbook and the unit costs given in Means. The Division did not have the time to estimate the earthwork costs prior to the permit being issued. The Division relied upon the Applicant's estimate. The Division increased the amount by 100% because of the uncertainty.

The Applicant's reclamation costs were based on generic haul and push distances and grades. Backfilling and grading steep slopes and earthwork in narrow canyons is different from working in flat open areas. The generic figures used by the Applicant may not be appropriate for this site.

In Section 542.200 of the PAP the Applicant states:

All vegetation, organic matter, and debris will be cleared from areas to receive fill. The cut materials from site regrading will be placed as fill and graded to facilitate drainage from the mine site and contributing side areas. All fill placed during

recontouring of the site will be compacted to at least 85 percent of maximum Proctor density (ASTM D698). Compaction will be accomplished using repeated passes of rubber-tired equipment, rollers, and other appropriate equipment. Side hill embankments, where the width is too narrow to allow access by compaction equipment, will be initially constructed by end dumping, but only to a width necessary to allow compaction equipment access."

In Section 553.100 of the PAP the Applicant states:

"Dozers will be used during placement of the topsoil or substitute topsoil on these steep slopes, taking care to achieve a reasonably uniform thickness of final soil cover"

The Division does not want to dictate the earthwork methods that the Applicant must use to reclaim the site. For estimating reclamation costs the Division must use methods that they fell comfortable about. The Division does not consider end dumping to be an effective way of placing fill material on steep slopes, or the use of dozers to distribute topsoil on steep slopes. The Division needs to calculate the reclamation costs based upon methods that are commonly used in steep slope area. The Division must do a detailed earthwork reclamation cost estimate.

The Division considers the present bond adequate to the time being. The Division needs to estimate the reclamation cost properly. That estimate will be needed for updating the bond whenever there is a change in the permit or when periodically adjusting the bond for inflation.

Findings:

The reclamation bond determined by the Division is adequate to ensure reclamation of the site. However, the reclamation bond was not calculated according to standard methods because the Applicant did not provide a detailed reclamation plan. The Applicant needs to develop more detail to the reclamation plan that can be used to estimate the reclamation cost. One item that would be helpful to the Division is reclamation cross section where the horizontal and vertical scales are equal and in an ACAD drawing file.

The permit should be granted with the following stipulation in accordance with:

R645-301-830.140, The Applicant will provide additional specifics as to how backfilling, grading and revegetation are to be accomplished in order that the Division may prepare a more specific bond cost estimate.