



GARY R. HERBERT  
Governor

SPENCER J. COX  
Lieutenant Governor

# State of Utah

## DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
Executive Director

### Division of Oil, Gas and Mining

JOHN R. BAZA  
Division Director

November 21, 2018

Bart Hyita, President  
Bronco Utah Operations, LLC  
P.O. Box 527  
Emery, Utah 84522

Subject: Full Extraction Revision, Bronco Utah Operations, LLC, Emery Deep Mine, C/015/0015, Task #5769

Dear Mr. Hyita:

The Division has reviewed your application. The Division has identified deficiencies that must be addressed before final approval can be granted. The deficiencies are listed as an attachment to this letter.

The deficiencies authors are identified so that your staff can communicate directly with that individual should questions arise. The plans as submitted are denied. Please resubmit the entire application.

If you have any questions, please call me at (801) 538-5325.

Sincerely,

Daron R. Haddock  
Coal Program Manager

DRH/sqs  
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**Technical Analysis and Findings**

**Utah Coal Regulatory Program**

**PID:** C0150015  
**TaskID:** 5769  
**Mine Name:** EMERY DEEP MINE  
**Title:** FULL EXTRACTION REVISION

**Summary**

This application provides a recent pre-subsidence survey of proposed full extraction of areas in T22S, R6E, Sections 30, 31, 32 and 33. The full extraction area is shown on Plate V-5. The 2017 survey in Appendix V-8 updates the 1980 survey (Appendix V-3).

pburton

On October 12th, 2018, the Division of Oil, Gas and Mining (DOG M) received an amendment from Bronco Utah Operations, LLC (the Permittee) to revise the Emery Deep Mine’s Mining and Reclamation Plan (MRP). The amendment seeks to gain approval for full extraction mining within an area adjacent to previously mined workings. Full extraction mining is proposed in portions of T22S, R6E, Sections 30, 31 and 32. DOGM's technical staff has reviewed the amendment and found that it does not meet areas of the State of Utah R645 Coal Mining Rules. Deficiencies have been identified that must be addressed prior to final approval.

schriste

**General Contents**

**Right of Entry**

*Analysis:*

The application does not meet the R645-301-114 requirements for Right of Entry, because the SITLA lease ML 51745 in Sections 29, 30 and 31 is presently listed as relinquished on plates (such as Plate IV-2 and Plate V-5) and is stated to be "relinquished" or "not renewed" in App. 1-2 (pgs. 9-10) of the Mining and Reclamation Plan. Current information for ROE into the SITLA Lease ML 51745 must be provided.

*Deficiencies Details:*

The application does not meet the R645-301-114, Right of Entry requirements. The following deficiency must be addressed prior to final approval:

R645-301-114.100, Please provide right of entry information for SITLA lease ML 51745 and revise text in Appendix 1-2 (p. 9-10) and maps accordingly.

R645-301-121.100, Surface ownership shown on Plate I-1 and Figure 1 of App. V-8 do not match. Please make the appropriate corrections so that pre-subsidence notifications are sent to the correct surface owners.

pburton

**Right of Entry**

*Analysis:*

The amendment does not meet the State of Utah R645 requirements for Right of Entry Information.

During the review and subsequent approval of the final phase of development for the Emery No. 2 Mine, it was determined that the Permittee would need to revise/update the Resource Recovery Protection Plan (R2P2) with the Bureau of Land Management (BLM). Plate IV-2, UG Operations Plan had depicted mining activity within Federal Coal Lease U-5287. After corresponding with BLM staff, it was determined that a revision to the R2P2 would be necessary. The Permittee provided a commitment in Chapter I, page 7A that "*Bronco will initiate the R2P2 modification in January of 2017 and endeavor to provide the Division with documentation of the modified R2P2 by December 31<sup>st</sup>, 2017*". At this time, the Division has not received the aforementioned documentation.

*Deficiencies Details:*

The amendment does not meet the State of Utah R645 requirements for Right of Entry Information. The following deficiencies must be addressed prior to final approval:

R645-301-114, -114.100: The Permittee must provide a description of the documents upon which they base their legal right to enter and begin coal operations within Federal Coal Lease U-5287. The description will identify the documents by type and date of execution and identify the specific lands to which the document pertains and explain the legal rights claimed by the Permittee. The text in Chapter 1 and Appendix I-2 must be revised accordingly.

schriste

## **Environmental Resource Information**

### **Historic and Archeological Resource Information**

*Analysis:*

The amendment does not meet the State of Utah requirements for Historic and Archeological Resource Information at R645-301-411.

Historic and Archeological information in chapter X of the Emery Deep Mining and Reclamation Plan (MRP) needs to be updated to include the proposed full extraction areas.

*Deficiencies Details:*

The amendment does not meet the State of Utah requirements for Historic and Archeological Resource Information at R645-301-411.

Historic and Archeological information in chapter X of the Emery Deep Mining and Reclamation Plan (MRP) needs to be updated to include the proposed full extraction areas.

jhelfric

## **Vegetation Resource Information**

*Analysis:*

The amendment does not meet the State of Utah requirements for Vegetation Resource Information at R645-301-320.

Vegetation information in chapter VIII of the Emery Deep Mining and Reclamation Plan (MRP) needs to be updated to include the proposed full extraction areas.

Revisions to all of the maps (non water resources) need to include the correct permit and adjacent area boundaries. Some of these maps do not include the current permit area boundaries (vegetation and fish and wildlife), some show full extraction extending beyond the adjacent area on the west boundary. Areas of mining activities and full extraction need

to be clearly identified on all of the maps in the MRP.

*Deficiencies Details:*

The amendment does not meet the State of Utah requirements for Vegetation Resource Information at R645-301-320

Vegetation information in chapter VIII of the Emery Deep Mining and Reclamation Plan (MRP) needs to be updated to include the proposed full extraction areas.

Revisions to all of the maps (non water resources) need to include the correct permit and adjacent area boundaries. Some of these maps do not include the current permit area boundaries (vegetation and fish and wildlife), some show full extraction extending beyond the adjacent area on the west boundary. Areas of mining activities and full extraction need to be clearly identified on all of the maps in the MRP.

jhelfric

## **Fish and Wildlife Resource Information**

*Analysis:*

The amendment does not meet the State of Utah requirements for Fish and Wildlife Resource Information at R645-301-322.

Fish and Wildlife information in chapter IX of the Emery Deep Mining and Reclamation Plan (MRP) needs to be updated to include the proposed full extraction areas.

Revisions to all of the maps (non water resources) need to include the correct permit and adjacent area boundaries. Some of these maps do not include the current permit area boundaries (vegetation and fish and wildlife), some show full extraction extending beyond the adjacent area on the west boundary. Areas of mining activities and full extraction need to be clearly identified on all of the maps in the MRP.

*Deficiencies Details:*

The amendment does not meet the State of Utah requirements for Fish and Wildlife Resource Information at R645-301-322.

Fish and Wildlife information in chapter IX of the Emery Deep Mining and Reclamation Plan (MRP) needs to be updated to include the proposed full extraction areas.

Revisions to all of the maps (non water resources) need to include the correct permit and adjacent area boundaries. Some of these maps do not include the current permit area boundaries (vegetation and fish and wildlife), some show full extraction extending beyond the adjacent area on the west boundary. Areas of mining activities and full extraction need to be clearly identified on all of the maps in the MRP.

jhelfric

## **Hydro Baseline Information**

*Analysis:*

The amendment does not meet the State of Utah R645 requirements for Hydrologic Baseline Information.

Full extraction mining is proposed in portions of T22S, R6E, Sections 30, 31 and 32. Upon reviewing the hydrologic baseline data for these areas, it's not clear that sufficient data has been provided to adequately characterize the ground and surface water systems in those areas.

### **SURFACE WATER**

The primary surface water resource within the areas proposed for full extraction mining (T22S, R6E, Sections 30, 31 and 32) is Quitcupah Creek. Active surface water monitoring sites for Quitcupah Creek within the proposed full extraction area include SWMS-1A, SWMS-3 and SWMS-4. SWMS-8 is located on an un-named tributary to Quitcupah Creek in Section 32.

Tributaries to Quitcupah Creek within the proposed full extraction area are located within Sections 30, 31 and 32.

During the permitting of the Emery No.2 Mine, the Permittee provided a characterization of an un-named tributary to Quitcupah Creek located in Section 32 (See Appendix VI-22, Baseline Investigation of Unnamed Ephemeral Wash Affected by Emery 2 Surface Facilities). It does not appear that the baseline information in the MRP adequately characterizes the tributary drainages to Quitcupah Creek in Sections 30 and 31. The Permittee must address this.

#### GROUND WATER

The Permittee must revise Section VI.2.4.1 to address the baseline data utilized in characterizing the ground water systems located in the proposed full extraction areas mining (T22S, R6E, Sections 30, 31 and 32) per State of Utah R645-301-724.100.

Upon review of the data provided in the MRP as well as the data within the Utah Coal Mining Water Quality Database, it does not appear that adequate baseline data has been provided for potentially impacted ground water systems within the coal seam to be mined and each water bearing stratum above and potentially impacted stratum below the coal seam.

Section 30 contains four actively monitored ground water wells. R-1, R-2m and R-2b are monitored for quarterly water levels for the Lower Ferron Sandstone, Middle Ferron Sandstone and Bluegate Shale respectively. R-2u was removed from the water monitoring plan during the 2<sup>nd</sup> quarter of 2012. Active monitoring of the Lewis Well (completed within the Upper Ferron Sandstone) was curtailed in the 2<sup>nd</sup> quarter of 2012.

Section 31 currently has no active ground water monitoring wells. The last attempt to sample the Bryant Well (Upper Ferron Sandstone completion) was in March of 2012. Monitoring of the Bryant Well was curtailed per a permit revision in April of 2012 (Task #4055). At the time the Bryant Well was removed from the water monitoring plan, full extraction mining had not been contemplated within Section 31. As a result, baseline data for the ground water systems within Section 31 (i.e. Bluegate Shale, Upper, Middle and Lower Ferron Sandstones) does not meet the State of Utah requirements of R645-301-724.100.

Section 32 currently has seven active monitoring wells. Monitoring wells RDA2,4 and 6 are monitored annually for water quality and water level within the Quitcupah Creek Alluvium. Monitoring wells AA-B, AA-L, AA-M and AA-U are monitored quarterly for water level in the Blue Gate Shale, Lower Ferron Sandstone, Middle Ferron Sandstone and Upper Ferron Sandstone respectively.

The Permittee must provide and/or demonstrate that adequate baseline data has been collected to characterize the quality and quantity of both ground and surface water within the areas proposed for full extraction mining. Sections VI.2.4.1, Groundwater Information and VI.2.4.2, Surface Water Information of the approved Mining and Reclamation Plan (MRP) must be revised accordingly per R645-301-724.100 and -724.200.

#### *Deficiencies Details:*

The amendment does not meet the State of Utah R645 requirements for Hydrologic Baseline Information. The following deficiency must be addressed prior to final approval:

R645-301-724, -724.100, -724.200: The Permittee must provide and/or demonstrate that adequate baseline data has been collected to characterize the quality and quantity of both ground and surface water within the areas proposed for full extraction mining. Sections VI.2.4.1, Groundwater Information and VI.2.4.2, Surface Water Information of the approved Mining and Reclamation Plan (MRP) must be revised accordingly per R645-301-724.100 and -724.200.

*schriste*

### **Probable Hydrologic Consequences Determination**

#### *Analysis:*

The amendment does not meet the State of Utah R645 requirements for Probable Hydrologic Consequences.

During the review and subsequent approval of the final phase of development for the Emery No. 2 Mine, the Division made a finding that "If and when the Permittee determines that secondary mining (i.e. planned subsidence) is to be conducted, a re-evaluation of the PHC will be required." The Permittee must revise Section VI.2.8 to address potential impacts to ground and surface water resources in the proposed area of full extraction mining (T22s, R6E, Sections 30,

31 and 32).

The Permittee must revise Section VI.2.8, Probable Hydrologic consequences to address potential impacts to ground and surface water resources in the proposed area of full extraction mining (T22S, R6E, Sections 30, 31 and 32).

*Deficiencies Details:*

The amendment does not meet the State of Utah R645 requirements for Probable Hydrologic Consequences. The following deficiency must be addressed prior to final approval:

R645-301-728: The Permittee must revise Section VI.2.8, Probable Hydrologic consequences to address potential impacts to ground and surface water resources in the proposed area of full extraction mining (T22S, R6E, Sections 30, 31 and 32).

schriste

## Maps Subsurface Water Resources

*Analysis:*

The amendment does not meet the State of Utah R645 requirements for Maps of Subsurface Water Resources.

Utilizing baseline and on-going water monitoring data collected per the approved MRP, the Permittee must update Plate VI-6, Anticipated Initial Depth of Groundwater Over Bottom of I Seam, Plate VI-7, Upper Ferron Sandstone Potentiometric Surface (2006) and Plate VI-8, Lower Ferron Sandstone Potentiometric Surface (2006).

The Permittee must revise/update Plate VI-6, Anticipated Initial Depth of Groundwater Over Bottom of I Seam, Plate VI-7, Upper Ferron Sandstone Potentiometric Surface (2006) and Plate VI-8, Lower Ferron Sandstone Potentiometric Surface (2006).

*Deficiencies Details:*

The amendment does not meet the State of Utah R645 requirements for Maps of Subsurface Water Resources. The following deficiency must be addressed prior to final approval:

R645-301-722, -722.100: The Permittee must revise/update Plate VI-6, Anticipated Initial Depth of Groundwater Over Bottom of I Seam, Plate VI-7, Upper Ferron Sandstone Potentiometric Surface (2006) and Plate VI-8, Lower Ferron Sandstone Potentiometric Surface (2006).

schriste

## Operation Plan

### Subsidence Control Plan Renewable Resource

*Analysis:*

The application does not meet the requirements of R645-301-525 pre-subsidence survey, because the panels and monitoring locations in Sections 31 and 32 are not shown on Figure 1.

Appendix V-8 provides a 2017 pre-subsidence survey of 360 acres of irrigated lands in Sections 31 and 32 and part of Section 30. It is an update to the 1980 pre-subsidence survey in Appendix V-3. The pre-subsidence survey describes the installation of above ground pivots in Sections 31 and 32 to replace Features 32, 33 and 10 shown on Figure 1 of Appendix V-8. The pivots are supplied by underground waterlines (Features 44 and 127). The pre-subsidence survey describes dry irrigation ditches (Features 2, 1, 24). The survey was conducted in December 2017, when one would expect the ditches to be dry, but the fact that ponds (Features 6, 15, 41, 44) were also dry, supports the abandonment of the ditches.

The 2017 pre-subsidence survey confirmed the existence of two grassy areas (Features 23 and 25) that are topographic lows which receive surface water from the surroundings. Both locations are within Section 32 (full-extraction area). Both locations are grazed.

The pre-subsidence survey identified two new sinkhole features in Section 30 and 31, as Features 130 and 126, respectively. The pre-subsidence survey states that these features could not be caused by the old works, because of

their distance (2,550 ft) from the mine panels, but does not speculate as to their occurrence. The Division notes that the sinkhole features are in line with irrigation ditches passing over Chipeta Badland soil type and Chipeta/Persayo soil type (Carbon Emery Soil Survey map, USDA Soil Conservation Service, 1970). These soils contain approximately 10% gypsum in the subsurface and lie over gypsum bearing shale. Therefore, the sink hole features may be the result of subsurface drainage flushing calcium and magnesium salts from the gypsum soil and bedrock below, over time resulting in unstable cavities in the shale.

*Deficiencies Details:*

The application does not meet the R645-301-525, pre-subsidence survey. The following deficiency must be addressed prior to final approval:

R645-301-525.420, Figure 1 (App. V-8) should show panels in Section 31 and 32.

pburton

## **Subsidence Control Plan Subsidence**

*Analysis:*

The application does not meet the State of Utah R645 requirements for Subsidence Control Plans.

The attached Plate V-5 illustrates a large area in sections 31 and 32 that has been designated for full extraction mining. A portion of that area lies beneath State Highway 10 southwest of the town of Emery. Previous agreements in Appendix V-6 of the Mining and Reclamation Plan indicate that the Permittee and Emery County have entered into an agreement allowing for mining beneath State Highway 10. This agreement was entered into back in July of 2007 and has a built-in expiration date of ten years after the agreement was signed, and has since expired. Permittee must secure an up to date agreement with the County if they intend to pursue plans to undermine State Highway 10. Additionally, since State Highway 10 is a well used State route, permission to subside SR-10 should be sought by UDOT as well as the County.

*Deficiencies Details:*

The application does not meet the State of Utah R645 requirements for Subsidence Control Plans. The following deficiency must be addressed prior to final approval:

R645-301-525.300, -525.700: Permittee must secure a more recent and up to date County Road Repair Agreement with Emery County since the previous agreement expired on July 3, 2017. Additionally, a subsidence notification should be sent and written approval secured from the Utah Department of Transportation prior to undermining SR-10.

jeatchel

## **Subsidence Control Plan Performance STD**

*Analysis:*

The application does not meet the State of Utah R645 requirements for Subsidence Control Plan Performance Standards.

Narrative on page 27 within chapter V states that the Permittee will employ two types of mining going forward: Partial pillar extraction, and full extraction. Partial pillar extraction as explained in Chapter V, page 28a of the Mining and Reclamation Plan consists of determining a safety factor for the smallest pillar in the area of the mine where extraction is taking place. The safety factor is calculated by dividing the pillar strength by the stresses on that same pillar. If the quotient in that scenario equals 1.75 or more then no surface subsidence should occur. The pillar strength is calculated using the industry accepted tributary area stress method, which takes into account the density of rock, overburden depth, and extraction ratio. The flip side of the safety factor equation is pillar stress which is calculated using another industry accepted method: The Mark-Bieniawski pillar strength equation, which takes into account pillar dimensions and the in-situ coal strength factor.

If the smallest pillar in the section being pillared retains a safety factor of 1.75 or more then not only will that pillar be stable, but all larger pillars within that section will also remain stable resulting in no surface subsidence. These calculations were provided by Mr. Gregory J. Hasenfus, a Geomechanical Engineer for Consol Energy, Inc. These same calculations were reviewed and approved in 2005 by Mr. Dan W. Guy, a Registered Professional Engineer in the State

of Utah and employed by Blackhawk Engineering Inc at the time of review.

Further narrative on page 27 of this application asserts that partial pillaring will result in no subsidence. Full extraction is the practice of taking all of the pillars in a specific section and will result in subsidence. Plate V-5 indicates that full extraction is proposed for all areas of section 31 and 32, and a small portion on the south of sections 29 and 30. Only partial pillaring will be employed everywhere outside of areas approved for full extraction, including areas actively protected from subsidence such as Quitchupah Creek, State Highway 10, and the structural and AVF buffer zones on the west end of the permit area.

However, in light of a roof collapse that occurred over Panel-02 that straddles sections 32 and 33 recently, the practice of partial pillaring deserves to be reconsidered. If partial pillaring was capable of producing such pronounced subsidence over Panel-02, can the same results be anticipated everywhere else that partial pillaring is employed? Even though industry accepted methods dictate that subsidence is not expected, experience has demonstrated otherwise. Permittee must present sufficient evidence to demonstrate that structures and zones that are protected from subsidence will remain unaffected.

The last part of the narrative on page 27 asserts that pages V-28 through V-35 of chapter V have been removed because they are not pertinent to the mine plan that will be adopted going forward. But this assertion causes confusion since pages V-28 through V-35 are a series of calculations and diagrams pertaining to pillar stability in partial pillar extraction scenarios. By claiming to do away with that narrative is the Permittee proposing to abandon partial pillaring?

*Deficiencies Details:*

The application does not meet the State of Utah R645 requirements for Subsidence Control Plan Performance Standards. The following deficiency must be addressed prior to final approval:

R645-301-525.311: Permittee must present sufficient evidence to demonstrate that structures and zones that are protected from subsidence will remain unaffected. Perhaps altering the pillar dimensions or adopting a higher factor of safety could contribute to ensuring subsidence does not occur in sensitive areas. Regardless of what Permittee intends to adopt, the Division is not comfortable with the present subsidence control plan in light of recent events.

jeatchel

## **Subsidence Control Plan Notification**

*Analysis:*

The application does not meet the requirements of R645-301-525.700, Public Notice of Proposed Mining, because notification of surface landowners must be made within six months of mining (including the Emery Water Conservancy District, Muddy Creek Irrigation Company, and Utah Department of Transportation). The notice must provide the information stated in R645-301-525.700, including a location where the subsidence control plan may be examined.

Notification will include the pre-subsidence survey as stated in the MRP Section V-B.2 item 1.1.2.

*Deficiencies Details:*

The application does not meet the R645-301-525.700, Public Notice of Proposed Mining. The following deficiency must be addressed prior to final approval:

R645-301-525.700, Please confirm notification of the Emery County Water Conservancy District, the Muddy Creek Irrigation Company, Utah Department of Transportation and all surface owners. The notice must provide the information stated in R645-301-525.700, including a location where the subsidence control plan may be examined. Notification to the landowner(s) will include the pre-subsidence survey as required by R645-301-525.130 and stated in the MRP Section V-B.2 item 1.1.2.

pburton

## Hydrologic Ground Water Monitoring

### Analysis:

The amendment does not meet the State of Utah R645 requirements for Ground Water Monitoring.

Section 30 contains four actively monitored ground water wells. R-1, R-2m and R-2b are monitored for quarterly water levels for the Lower Ferron Sandstone, Middle Ferron Sandstone and Bluegate Shale respectively. R-2u was removed from the water monitoring plan during the 2<sup>nd</sup> quarter of 2012. Active monitoring of the Lewis Well (completed within the Upper Ferron Sandstone) was curtailed in the 2<sup>nd</sup> quarter of 2012.

Section 31 currently has no active ground water monitoring wells. The last attempt to sample the Bryant Well (Upper Ferron Sandstone completion) was in March of 2012. Monitoring of the Bryant Well was curtailed per a permit revision in April of 2012 (Task #4055). At the time the Bryant Well was removed from the water monitoring plan, full extraction mining had not been contemplated within Section 31. As a result, baseline data for the ground water systems within Section 31 (i.e. Bluegate Shale, Upper, Middle and Lower Ferron Sandstones) does not meet the State of Utah requirements of R645-301-724.100.

Section 32 currently has seven active monitoring wells. Monitoring wells RDA2,4 and 6 are monitored annually for water quality and water level within the Quitchupah Creek Alluvium. Monitoring wells AA-B, AA-L, AA-M and AA-U are monitored quarterly for water level in the Blue Gate Shale, Lower Ferron Sandstone, Middle Ferron Sandstone and Upper Ferron Sandstone respectively.

The Permittee must provide a ground water monitoring plan capable of determining whether proposed full extraction mining has or has not produced impacts to the hydrologic balance.

### Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Ground Water Monitoring. The following deficiency must be addressed prior to final approval:

R645-301-731, -731.210: The Permittee must provide a ground water monitoring plan capable of determining whether proposed full extraction mining has or has not produced impacts to the hydrologic balance.

schriste

## Hydro Surface Water Monitoring

### Analysis:

The amendment does not meet the State of Utah R645 requirements for Surface Water Monitoring.

Surface water monitoring site SWMS-1A is located within Section 30 on Quitchupah Creek at Utah State Road 10. The site has been monitored quarterly for water quality and quantity since 1989 and is the sole surface water monitoring point in Section 30.

Currently, no surface water monitoring points are located within Section 31. The Permittee must address the absence of a water monitoring location on the un-named Quitchupah tributary located within Section 31 of the proposed full extraction area.

The primary surface water resource within the areas proposed for full extraction mining is Quitchupah Creek. Surface water monitoring sites (SWMS) SWMS-3, 4,5 and 8 are actively monitored within Section 32. SWMS-3 is located below the confluence of Christiansen Wash and Quitchupah and has been monitored quarterly since 1989. SWMS-4 is located on Quitchupah Creek above the confluence with Christiansen wash and has been monitored quarterly since 1989. SWMS-5 is located on Christiansen Wash above the confluence with Quitchupah Creek and has also been monitored since 1989. SWMS-8 is located on an un-named tributary to Quitchupah Creek and has been monitored quarterly since 1981. SWMS-1 (located on Quitchupah Creek above the confluence with an un-named tributary) has not been monitored since October of 2010. The Permittee should potentially re-establishing surface water monitoring at SWMS-1.

The Permittee must provide a surface water monitoring plan capable of determining whether proposed full extraction mining has or has not produced impacts to the hydrologic balance.

*Deficiencies Details:*

The amendment does not meet the State of Utah R645 requirements for Surface Water Monitoring. The following deficiency must be addressed prior to final approval:

R645-301-731, -731.220: The Permittee must provide a surface water monitoring plan capable of determining whether proposed full extraction mining has or has not produced impacts to the hydrologic balance.

schriste

## Maps Mine Workings

*Analysis:*

The application does not meet the State of Utah R645 requirements for Mine Workings Maps.

The application includes an updated Plate V-5 that includes an overview of the historic mine workings as well as the proposed mine plans going forward. A large swath of area to the southwest (sections 31 and 32) has been designated as full extraction mining as indicated with red, diagonal lines. The wording in the Legend implies that the areas considered for full extraction mining in sections 31 and 32 have already been approved for mining. This obviously cannot be the case since this application is requesting approval for full extraction mining. The wording needs to be changed to indicate that sections 31 and 32 have not previously been approved for full extraction mining yet.

Additionally, the mine plans proposed on Plate V-5 contradict previously approved underground operations plans contained on Plate IV-2 of the Mining and Reclamation Plan. Permittee must make the required changes to ensure both of these plates are consistent with one another.

*Deficiencies Details:*

The application does not meet the State of Utah R645 requirements for Mine Workings Maps. The following deficiency must be addressed prior to final approval:

R645-301-521.142, -525.420: Currently Plates V-5 and IV-2 are proposing two different mining scenarios. Permittee must change these plates to restore consistency and ensure that no contradictions exist. Additionally, please delete the word "Previously" from the "Areas to be Fully Extracted" legend item on V-5 to dispel the notion that Sections 31 and 32 have previously been approved for full extraction mining.

jeatchel

## Special Categories

### Operations Alluvial Essential Hydrologic Functions

*Analysis:*

The application meets the Alluvial Valley Floor (AVF) performance standard requirements of R645-302-324, because the AVF buffer zones and stream buffer zones identified on Plate V-5 encompass flood irrigated lands in Range 6, Township 22 S, Section 19 & 30, as outlined on Plate 1, Chap XI.

Mining beneath the Quitcupah stream buffer zone and the AVF buffer zone will be room and pillar mining with no full extraction and no partial extraction, as described in Section IV.A.1. Plate XI-1 shows historic mine panels in the grandfathered AVF area. To the North and West of the SITLA lease is an active flood irrigation area as shown on Plate XI-1. The full extraction stops short of the irrigated area to the NW in Sec 19.

Monitoring of irrigation ditches is described in Chap V page 37 and 38.

pburton

### Operations Alluvial Protection of Agricultural

*Analysis:*

The application does not meet the requirements of R645-301-525.440 protection of agricultural lands, because there are no monitoring locations above irrigated prime farmlands in Sections 31 and 32.

R645-301-525.110 requires a map showing the location of renewable resource lands and the narrative describing the potential for material damage or diminished value of the renewable resource lands. The term renewable resource lands is defined by R645-100, includes agricultural lands, croplands, and grazing lands. R645-301-525.420 requires a map of the underground workings showing the extent of the planned subsidence.

The area to be fully extracted (planned subsidence) is in Sections 30, 31, 32 and 33 (Plate V-5), but neither Plate V-5, Plate IV-2 or Figure 1 (App. V-8) show panels in Sections 31 and 32. Depth of coal in Sections 31 is approximately 600 – 900 feet below the surface (Plate V-10). Subsidence is expected to be approximately 50% of the depth of the removed coal or approximately 5 feet in a 10 ft. seam. The angle of draw would be 15 degrees at this depth (Chap. V, p. 29).

Aerial imagery from Google Earth shows Sections 30 and 31 contain irrigated lands. Irrigated pastureland in Section 31 is also shown on Plate VIII-1 Vegetation and Land Use. Panels shown West of the highway in Section 30 will be removed from Figure 1 and Plate V-5 (personal communication with John Gefferth, 11/15/2018).

The area of full extraction shown on Plate V-5 is beneath prime farmlands in Sections 30, 31 and 32. [Prime Farmland is designated by the State Soil Survey Staff and is mapped in Utah Agricultural Experiment Station Research Report No. 76, "Important Farmlands of Parts of Carbon, Emery Grand and Sevier Counties." Prime Farmlands and Farmlands of Statewide Importance were mapped South of Emery Town in Section 19, 30, 31, and 32.]

Subsidence monitoring is described in Chap V, p. 37- 38 for the Emery2 mine. This plan describes monitoring irrigation ditches and pond embankments for 6 months. This monitoring would apply to flood irrigated lands in Sections 19, 29 & 30. However, since irrigation ditches are being replaced by center pivots in Sections 31 and 32, this monitoring plan should be updated.

Mitigation for subsidence is described on Chap V, p. 39.

*Deficiencies Details:*

The application does not meet the R645-301-525, subsidence control plan. The following deficiency must be addressed prior to final approval:

R645-301-525.440, Monitoring points on Plate V-5 should be shown above mining panels beneath irrigated lands in Sections 30, 31 and 32.