



Technical Analysis and Findings

Utah Coal Regulatory Program

March 21, 2016

PID: C0150032
TaskID: 5067
Mine Name: CRANDALL CANYON MINE
Title: MIDTERM COMPLETION RESPONSE

General Contents

Identification of Interest

Analysis:

The application meets the State of Utah R645 requirements for Identification of Interest. In the previous technical analysis (Task ID #5011), a deficiency was identified relative to the first five pages of Chapter 1 of the Crandall Canyon Mining and Reclamation Plan (MRP). The pages contained out of date information (e.g. references to Intermountain Power Authority). It was determined that the first five pages are not in the Permittee's copy of the MRP. Interestingly, these first five pages of the Division's copy of the MRP are located immediately before the cover page for Chapter 1, Legal, Financial, Compliance and Related Information. It's unclear why those pages are found in the Division's copy of the MRP and not in the Permittee's MRP copy. As the information is out of date and the information required in the R645-301-100's rules is provided immediately following the aforementioned cover page, the Division will delete the "Introduction" section (i.e. first five pages) from it's copy of the MRP.

schriste

Violation Information

Analysis:

The application meets the State of Utah R645 requirements for Violation Information. The previous technical analysis (Task ID #5011) identified a deficiency and directed the Permittee to revise the violation information provided in Appendix 1-11. The Permittee has revised Appendix 1-11 to identify the violations received in connection with coal mining and reclamation activity at the Crandall Canyon Mine.

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Right of Entry

Analysis:

The application does not meet the State of Utah requirements for Right of Entry. The previous technical analysis (Task ID #5011) identified a deficiency relative to Right of Entry information. The Permittee was directed to revise/update the lease information. Several leases had been relinquished by the Permittee since the last mid-term review of the Crandall Canyon Mining and Reclamation Plan (MRP) was conducted.

The Permittee must revise section 114.100. The very beginning of this section contains discussion of leases that have been relinquished. Specifically, the 1st and 4th bullets immediately under section 114.100 discuss Federal Coal Leases UTU-54762 and UTU-68082. These bullets must be deleted. The relinquishment of these leases is discussed under the heading 'Federal Coal Lease Assignments' that immediately follows those bullets.

The Permittee was directed during the previous technical analysis to revise all maps, figures and plates that depicted the lease boundaries. It appears that this has been done. With the removal of the relinquished lease boundaries from the plates, the permit boundary for the Crandall Canyon Mine was revised as well. However; the newly depicted permit boundary does not contain the surface disturbance/bonded areas of the East Mountain drill pads/roads and a significant portion of the surface facilities at the main mine site. See Maps and Plans section for additional information.

*Deficiencies Details:*

The application does not meet the State of Utah requirements for Right of Entry.

The Permittee must revise section 114.100. Specifically, the 1st and 4th bullets immediately under the section 114.100 heading must be deleted as they discuss Federal Coal leases UTU-54762 and UTU-68082. These leases have been relinquished and are discussed immediately below these bullets under the heading "Federal Coal Lease Assignments".

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## Right of Entry

*Analysis:*

The amendment does not meet the State of Utah R645-301-114 requirements for Right of Entry Information.

Right of entry information is presented on pages 1-5 through 1-7. As indicated on page 1-5, Federal Coal Lease SL-62648 was relinquished and a Special Use Permit for the Sediment Pond is still in effect. However, evidence of Special Use Permit for remaining surface facilities (approximately 6.278 acres) is not provided. A description of the document upon which the permittee has a legal right to enter the Neilson Fee Lease as shown on Plate 1-1A is not provided.

*Deficiencies Details:*

The Permittee must provide a description of the document upon which the permittee has a legal right to enter and perform reclamation operations in the permit area. More specifically, Right of Entry information for surface facilities and disturbance area located in Lot 6, of Section 5, T.16S., R.7E (approximately 6.278 acres) as shown as the red polygon on plate 2-3 must be provided in both the Right of Entry section of the Plan and also the Legal Description of the Permit Area. Internal research suggests surface ownership is United States Forest Service. Additionally, the Permittee must provide a description of the document upon which the permittee has a legal right to enter the Neilson Fee Lease as shown on Plate 1-1A

Ireinhart

## Legal Description

*Analysis:*

The application does not meet the State of Utah R645 requirements for Legal Description.

The previous technical analysis (Task ID #5011) identified a deficiency for Legal Description. The legal description contained leases that had been relinquished by the Permittee. The Permittee was directed to revise the legal description accordingly. The deficiency discussed that the legal description must include all disturbed/bonded areas.

The Permittee removed the relinquished leases, but in doing so, the East Mountain rescue drill hole areas and a significant portion of the mine-site were removed from the depicted permit boundary on the plates as well as from the permit legal description found on page 1-7 of the MRP..

The Permittee must revise the Permit Legal Description to accurately reflect the permit area. The permit area, as discussed in the previous Technical Analysis (Task ID #5051) must include all disturbed (i.e. bonded) areas. With the removal of the relinquished leases from the Permit Legal Description/permit area discussion beginning on page 1-7 of the currently approved Mining and Reclamation Plan (MRP), the East Mountain drill holes and associated roads as well as a significant portion of the main mine facilities were removed from the permit area. All disturbed/bonded areas must be included in the permit area and as such, must be included in the Permit Legal Description found on page 1-7 of the MRP.

*Deficiencies Details:*

The application does not meet the State of Utah R645 requirements for Legal Description.

R645-301-112.800, -114: The Permittee must revise the Permit Legal Description to accurately reflect the permit area. The permit area, as discussed in the previous Technical Analysis (Task ID #5051) must include all disturbed (i.e. bonded) areas. With the removal of the relinquished leases from the Permit Legal Description/permit area discussion beginning on page 1-7 of the currently approved Mining and Reclamation Plan (MRP), the East Mountain drill holes and associated roads as well as a significant portion of the main mine facilities (i.e. L6 of Section 5, T16S, R7E) were removed from the permit area. All disturbed/bonded areas must be included in the permit area and as such, must be included in the Permit Legal Description found on page 1-7 of the MRP. In addition, the Neilson Fee parcel must be included in the legal description.

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## Maps and Plans

*Analysis:*

The amendment does not meet the State of Utah R645-301-521 requirements for providing maps identifying the lands subject to coal mining and reclamation operations because the "Permit Boundary" does not adequately represent the correct permit boundary and/or disturbance areas.

*Deficiencies Details:*

The amendment does not meet the State of Utah R645-301-521 requirements for providing maps identifying the lands subject to coal mining and reclamation operations because the "Permit Boundary" does not adequately represent the correct permit boundary and/or disturbance areas.

R645-301-521: The Permittee must revise all plates, maps, and figures that depict the Permit Area Boundary. The Permit Boundary must include all disturbed/bonded areas (i.e. East Mountain, Special Use Lease areas, and mine site facilities).

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## Environmental Resource Information

### Soils Resource Information

*Analysis:*

*Analysis:*

The application includes a revision of Plate 2-6 Regional Soils Map, which does not accurately show the permit boundary.

*Deficiencies Details:*

R645-301-222.100, The application includes a revision of Plate 2-6 Regional Soils Map, which does not accurately show the permit boundary.

pburton

## Operation Plan

### Mining Operations and Facilities

*Analysis:*

The midterm review of the MRP meets all the State of Utah R645 requirements for Mining Operations and Facilities.

The Division initiated a mid-term review of the Crandall mining and reclamation plan (Task ID #5011) on November 2015 in accordance with R645-303-211. This Technical Memorandum presents the findings of the Midterm Permit review for the Crandall Mine related to engineering and bonding.

The Permittee had several deficiencies identified in the initial review and was sent back on November 25, 2015. The Permittee resubmitted the Midterm review under task 5067 where all engineering and bonding deficiencies were addressed.

The midterm review of the MRP meets the minimum requirements of R645-301-523, -526, and 528 by addressing the current operational amounts of the Burma pond in Appendix 7-65 attachment 11. The text within Appendix 7-66 was updated to clarify the accumulation rate of solid material within the Burma Pond. Narrative within Chapter 5 section 5.40

was updated to reflect the relevant direction to additional reclamation plans associated with the Burma Pond and water treatment facility. Plates 5-2 BC, 5-2H, and 5-3A were updated within the amendment to address previous deficiencies. Plate 5-2BC and 5-2H were updated to reflect the relinquishment of federal leases. Plate 5-3A was updated to show the as-built facilities located at the Burma Pond.

Chapter 5 of Appendix 7-66 was updated to reflect the current Burma Pond operations and costs. Pending clear weather and road conditions, the Crandall water treatment facility is cleaned out twice a week by approximately 2-3 truckloads per day of 4,000 gallons per truck. If weather or road conditions do not allow the water treatment facility to be cleaned, the site has gone up a month with no sludge clearing and still no failure of treatment. Text was added to the MRP detailing such, that due to low iron levels, the cleaning could be suspended at any time, up to four months a year. The annual cubic feet per year hauled to the Burma pond is approximately 130,000 CF/yr. The expected average volume of solids accumulated is 4,300 cubic feet per year. Said volume spread out to dry over the 20,000 square foot bottom of the evaporation basin, the rate of solids accumulation in the basin is expected to average about 2.6 inches per year.

cparker

## **Subsidence Control Plan Subsidence**

### *Analysis:*

The midterm review of the MRP meets the State of Utah R645-301-525.400 requirements for Subsidence Control Plan.

The minimum requirements of R645-301-525.400 are met in the midterm review of the MRP as the Permittee presented a clear subsidence plan for protected areas. The Permittee corrected the subsidence section to detail that monitoring requirements have been met as of December 2015, as no subsidence over one foot has been recorded within the last five years. Mining was idles after the 2007 accident and mining is anticipated to resume after the market improves. In the event mining resumes subsidence monitoring will also be resumed and all relevant maps and narratives will be updated at said time.

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## **Topsoil and Subsoil**

### *Analysis:*

#### **Analysis:**

The information provided includes a revision of Plate 2-3 Topsoil Stockpile Locations showing the current permit boundary.

Operation and reclamation of the Burma pond is described in Chapter 7 Appendices D, Appendix 7-66 (electronic page 242). Although the Burma evaporation pond disturbed area is recorded as 7.32 acres, the Permittee anticipated soil salvage and redistribution from only 1.41 acres. Redistribution depth of the 1,137 cu yd topsoil will be six inches over the 1.41 acres as described in (Chap. 2). Chapter 2 of App. 7-66 states that after soil salvage at the Burma pond is completed, a final assessment of the volume will be updated in the MRP and a final report will be prepared and submitted to the Division. The work was completed in 2012. Plate 5-3A, dated January 13, 2016, states that 860 CY were salvaged and stockpiled. This is about half of what was anticipated. During a site visit on 3/17/2016, a second stockpile was noted that should also be included in the volume available for reclamation. This pile must be signed and protected with sediment control.

Reporting of depth of placement and sampling of dried sludge and routine compaction of the waste is described in (App. 7-66 Chap 5, item 7) and in the event of temporary cessation, covering of sludge with six inches of subsoil and an interim seeding of crested wheatgrass (App 7-66, Chap 5, Item 6). The information provided on January 19, 2016 states that construction of the Burma Pond was completed on January 9, 2013 and the sediment will be sampled in 2018, unless sediment accumulation reaches 7.5 inches before then. In 2014, pond sediments were reported to be 3.5 inches deep. Current levels are unknown and will be monitored in 2016. No information on compaction was reported. It is therefore assumed that there has been no compaction of the dried sludge in the ponds.

### *Deficiencies Details:*

R645-301-121.300, The cover letter provides an estimate of the current depth of sludge in the Burma Pond. Please include a commitment in the MRP to include in the Annual Report the depth of the sludge and describe whether compaction or other measures were used to control fines (as required by App.7-66 Chap 5, item 7).

R645-301-234 and R645-301-521.270, Plate 5-3A should show the location of a second, smaller topsoil stockpile noted during a site visit on 3/17/2016. The volume contained in this pile must be stated on Plate 5-3A and in the narrative of App. 7-66 Chap 2 and Chap 5. This pile must be signed, seeded and protected with sediment control.

## Hydrologic Ground Water Monitoring

### Analysis:

The amendment meets the State of Utah R645 requirements for Hydrologic Ground Water Monitoring.

A note has been added to the bottom of the water monitoring tables stating that the monitoring of the underground wells are no longer taking place due to the sealing off of the portals. This satisfies the previous deficiency under Task ID 5011.

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## Hydrologic Impoundments

### Analysis:

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

The operations and current hauling process of taking iron sludge from the treatment ponds to the Burma evaporation pond, have been updated in the corresponding appendices. This addresses the prior deficiency under Task ID 5011.

Text was added to page 7-54 of the MRP describing the iron sludge hauling operations. The text discusses the off-site hauling of material to the Burma evaporation basin, but was added to section "7.55 Casing and Sealing of Wells". This information must be moved to the appropriate section.

### Deficiencies Details:

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

Text was added to page 7-54 of the MRP describing the iron sludge hauling operations. The text discusses the off-site hauling of material to the Burma evaporation basin, but was added to section "7.55 Casing and Sealing of Wells". This information must be moved to the appropriate section.

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## Reclamation Plan

### General Requirements

### Analysis:

The midterm review of the MRP meets the State of Utah R645 requirements for Reclamation Activities.

The minimum requirements of R645-301-540 are met within the midterm review of the MRP as the Permittee including updating Chapter 5 to reflect the current lease relinquishment, correct references in Chapter 5 Section 5.40, and relevant updates to Appendix 7-66 detailing current Burma Pond operations.

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## Backfill and Grading General

### Analysis:

The midterm review of the MRP meets the State of Utah R645 requirements for Backfill and Grading.

The midterm review of the MRP meets the general requirements of R645-301-553 by detailing a general backfill and grading plan that details how disturbed areas will be backfilled and graded to achieve the approximate original contour, eliminate all highwalls, spoil piles, and depressions, and achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides, minimize erosion and water pollution both on and off the site, and support the approved postmining land use. Narrative was added to address clarification of the reclamation of the Burma pond in Appendix 7-66. Plate 5-17 still does not match the assumed reclamation of the site with a discharge from the portals, but this item will be addressed in coming board actions.

## Topsoil and Subsoil

### Analysis:

#### Analysis:

The Mining and Reclamation meets the requirements of R645-301-240 for soils redistribution during final reclamation. The MRP itemizes the total disturbed area as 34.47 acres (MRP Chap 1, p. 1-10 or electronic page 19). Of those acres, 11.89 acres were disturbed during the emergency rescue attempt and were reclaimed between 2007 through 2011, See Appendix 5-22A for details.

Fifteen of the 34.47 acres were disturbed for the surface facilities located in Crandall Canyon (MRP Chap 2, Section 2.42, pg 2-10 or electronic page 18), including 1.4 acres of topsoil storage in Crandall Canyon. Redistribution volumes from twelve to sixteen inches at the mine facilities area are reported in Section 2.42, page 2-10. A total stored topsoil volume of 12,912 cu yds is reported in on page 2-11. Refer to Appendix 5-22 for Crandall Canyon surface facility reclamation details.

The remainder of the disturbed acres (7.32 acres) are associated with the Burma Evaporation Basin which is the waste disposal for the [temporary] water treatment facility. Operation and reclamation of the Burma pond is described in Chapter 7 Appendices D, Appendix 7-66 (electronic page 242). Although the Burma evaporation pond disturbed area is recorded as 7.32 acres, the Permittee anticipated soil salvage and redistribution from only 1.41 acres. Redistribution depth of the estimated 1,137 cu yd topsoil would be six inches over the 1.41 acres as described in (Chap. 2). The as-built topsoil storage volume of stored topsoil is 860 CY as reported on Plate 5-3A, dated 1/13/2016.

Appendix 1-16 SITLA Lease (for the Burma Pond( Article 12.2) requires reclamation upon termination of the lease and stipulates 4 feet of cover over the iron precipitate in the pond. The pond dimensions shown on Plate 5-3A are 191 ft x 89 ft. I walked the site on 3/17/2016 and found the area of the pond along the edge of the berm to be 1.11 acres. A fenceline is shown on Drawing 5-3A. I walked the outside perimeter of the fence and found the area to be 1.77 acres. The fence does not enclose the topsoil area. As built Plate 5-3A must confirm the area disturbed in total and also the area within the fence.

In accordance with R645-301-542.742, the plan provides for routine compaction of the waste and covering to prevent windborne waste (Chap. 5, p. 8, Item 7) App. 7-66, Chapter 5 describes 2,363 cu yds of subsoil stockpiled in the berm around the pond. This material will cover the 0.5 acre pond area (200ft x 100 ft) to a depth of three feet. As-built Plate 5-3A must confirm the volume of subsoil stored in the berms around the pond, because if there is a deficit of cover, borrow soils must be identified.

Chap. 3 describes replacement of this subsoil in 18 inch lifts over an accumulated layer of dried sludge (estimated to be 24 inches deep after 16 years, Chap. 5). Using the permittee's estimates, of 1.5 inch accumulation per year, the life of this facility is twenty four years, at which time the dried waste will be at the design maximum of 36 inches, leaving 24 inches of freeboard (Chap. 5). (The plan does indicate that there is room for expansion to the east and west within the permitted area.) In accordance with R645-301-542.742, the plan provides for routine compaction of the waste and covering to prevent windborne waste (Chap. 5, p. 8, Item 7). Upon final reclamation, the first 18 inch lift of cover soil will be incorporated into the mine waste with ripping or other tillage (Chap 3, Item b). In this manner, the waste will be incorporated into the soil and will not create a chemical or physical barrier to roots, promoting revegetation success, in accordance R645-301-542.730.

### Deficiencies Details:

#### Deficiency:

R645-301-121.100,

1) On Plate 5-3A, please state the acreage disturbed within the fenced area and the total acreage disturbed including the topsoil storage area. State the volume of subsoil stockpiled in the pond berm. Based on the as-built figure for acreage disturbed within the fence and as built volumes for subsoil and topsoil stockpiled, make the appropriate corrections to App. 7-66, Chapter 2 and Chap 5 for subsoil and topsoil redistribution depth. Please state the location of this information being on asbuilt Plate 5-3A in App. 7-66 Chapter 2.

2) Based upon the as built volume of topsoil and subsoil stockpiled, determine whether there is adequate soil to cover the waste with four feet of cover. And, if there is less than adequate volume of subsoil to ensure four feet of cover, please state a location of substitute cover for the site, such that the pond waste will receive four feet total as required by App. 1-16 SITLA Lease Article 12.2.

## Stabilization of Surface Areas

### Analysis:

#### Analysis:

The MRP is in compliance with its description of soil stabilization, however reporting on stabilization measures and an evaluation of the necessity of mine water treatment is requested in the annual report in accordance with R645-301-121.100 and R645-301-121.300.

The permitted area is 7.32 acres; however the proposed disturbed area is 1.41 acres. App 7-66 describes interim reclamation on the outslope of the pond containment berm during operations. The plan also references interim reclamation of land which does not have topsoil removed, but which may be affected by equipment moving boulders and topsoil from the pond location to storage locations (Chapter 5, Item 6, page 10, elec. page 252). Chapter 5, Item 9, page 10 (electronic page 252) describes cover of the berm outslope boulders with 6 - 12 inches of subsoil that will receive interim reclamation.

In addition, Article 10.2 of the SITLA Lease 1708 (MRP Chapter 1, Appendix 1-16, electronic page 276) requires intermediate reclamation of disturbed areas not required for continuing operations, along with control of noxious weeds. MRP Chapter 5, page 33 (e-page 53) has been updated to state that noxious weeds do not occur in abundance and that treatment of weeds has been physical removal. Spray will be used when appropriate for large areas.

Chapter 5 item 5 page 8 describes weekly evaluation of the need for treatment at the mine and the subsequent need for the disposal site and possible interim reclamation of the disposal site, in the case of temporary cessation (item 6, page 8, electronic page 250).

### Deficiencies Details:

#### Deficiency:

R645-301-244.100, R645-301-121.100, and R645-301-121.300,

1) Please provide state in the narrative and show on a map the interim seeding completed on disturbed areas (pond outsoles topsoil piles, etc.) as required by Article 10.2 of SITLA Lease 1708 (App. 1-16) and App 7-66, Chapter 5, Item 6, page 9 and item 9 page 10.

2) Please provide a commitment to provide a status update on the need for continued treatment of water at the mine and continued use of the Berma Pond in the Annual Report (item 5, Chap 5, App. 7-66).

pburton

## Bonding and Insurance General

### Analysis:

The midterm review of the MRP meets the State of Utah R645 requirements for Bonding and Insurance Requirements.

The midterm review of the MRP meets the minimum requirements of R645-301-800 as the applicant included updated bond information within appendix 5-20.

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## Bonding Form of Bond

### Analysis:

The midterm review of the MRP meets the State of Utah R645 requirements for Form of Bond.

The midterm review of the MRP meets the minimum requirements of R645-301-860.100 as the applicant currently maintains a total surety bond amount of \$2,802,910 which is held by American Home Assurance and Rockwood Casualty. A total bond of \$720,000 is held specifically for the Crandall water treatment facilities. A total of \$2,082,910 is held in a combination of three surety bonds (\$266,000, \$162,910, and \$1,654,000) is held for the main Crandall Canyon Mine surface disturbances.

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## Bonding Determination of Amount

*Analysis:*

The midterm review of the MRP does not meet the State of Utah R645 requirements for Determination of Bond Amount.

The Division requires an evaluation of the reclamation cost estimate during each midterm permit review. This cost estimate is updated to current year dollars then escalated for five years or until the next midterm review. In accordance with the requirements of R645-303-211, R645-301-830, and -301-830.140, it is the Permittees responsibility to provide detailed estimated cost sheets to support the reclamation cost estimate.

The midterm review of the amendment to update the MRP does not meet the minimum requirements of R645-301-830.140 due to incorrect and missing information the Permittee submitted with the bond information. Specifically due to missing references for third party costs utilized in the estimate, incorrect application of salvage credit, utilization of 2016 dollars when 2015 dollars should have be utilized, and the total reclamation cost is missing the escalation to the next midterm 2020. Each of these deficiencies in the cost estimate are discussed in detail below.

The Permittee must update the unit cost data used in the 2010 Midterm Permit Review reclamation cost estimate to 2015 unit costs using the 2015 R.S. Means Heavy Construction Cost Data manual. All computation sheets for demolition, earthwork and re-vegetation must be updated and submitted to the Division. The Division can then determine the required bond amount needed through 2020.

In accordance with R645-301-830.410, Division Technical Directive 007, and Office of Surface Mining Handbook for Calculation of Reclamation Bond Amounts the Permittee may utilize third party contractors for cost references when a general cost references does not adequately describe the required reclamation task. In the event the Permittee utilizes local third party contractors cost estimates additional reference information must be submitted with the application. Additional reference information includes a minimum of three individual quotes for the work. Reference information may include items such as a letter or email transcript that includes all relevant contact information from the contractor. The contact information must be readily available so that the Division may contact said contractor to verify unit cost is valid in the event the Division was the hiring personal. References must be submitted at the time the reclamation bond amount is submitted to the Division. The current amendment includes approximately six different sources for various unit costs but failed to include any reference material for the Division to be able to verify said costs. The Permittee will submit detailed cost references for the following references: ConcreteDemo1, City Sanitation, Nelson Construction, AML1-2, Reveg 001-005, Crandall 15321-15325.

In accordance with R645-301-830.410, Division Technical Directive 007, and Office of Surface Mining Handbook for Calculation of Reclamation Bond Amounts the Permittee must utilize bare unit costs when using standardized cost reference manuals such as R.S. Means Heavy Construction. The Division applies an indirect cost of 26.8% that covers overhead and profit calculations in the indirect line items of the total sheet. The Permittee within the amendment utilized Total costs from the 2016 R.S. Means Heavy Construction cost reference, which include overhead and profit. When the 26.8% indirect cost is then applied the Permittee costs are double accounting indirect costs. The Permittee will utilize the bare unit cost when utilizing R.S. Means Heavy Construction cost reference.

In accordance with R645-301-830.410, Division Technical Directive 007, and Office of Surface Mining Handbook for Calculation of Reclamation Bond Amounts the Permittee may not utilize salvage costs in the demolition of structures. There is no reasonable means of predicting whether equipment and/or supplied or other materials with potential resale value will be left on site at the time of bond forfeiture, therefore the Division does not allow credit for the salvage value of building materials or abandoned equipment and supplies. The Permittee will remove all salvage credit details within the reclamation bond estimate and replace the costs with pertinent removal of structures or equipment and supplies.

The Crandall Midterm in accordance with R645-303-211 was commenced on October 1, 2015 by the Division. In accordance with R645-301-830.410, Division Technical Directive 007, and Office of Surface Mining Handbook for Calculation of Reclamation Bond Amounts the Permittee must utilize the dollar year for which the midterm was commenced. The Permittee submitted unit cost that utilized 2016 cost references. The Crandall midterm reclamation bond amount must utilized 2015 cost references. The Permittee may request the use of 2016 dollars costs but must include a request to the Division for approval prior to submission. The escalation equation must also be amended change the escalation from the typical five years to the appropriate timeframe to the next midterm.

The total reclamation cost for the Crandall Canyon Mine (sum of the direct and indirect costs) must be escalated from 2015 to 2020 (5 years) using an escalation factor of 1.2 %.

This escalated cost is rounded to the nearest \$ 1,000 to determine the amount of required bond which must be posted with the Division by the Permittee.

The Permittee must resubmit updated reclamation costs using the 2015 R.S. Means Heavy Construction Cost Data catalog. The three categories re-calculated in this new estimate, and their sub-totals are as follows:

Facility Demolition and Removal.....	\$
Disturbance Backfilling and Grading.....	\$
Re-vegetation of Disturbed Areas.....	\$
Indirect Costs .....	\$
Total Reclamation Cost in 2015 dollars .....	\$
Total minimum Bond Required in 2020 dollars .....	\$

The Total Direct Cost to reclaim all disturbed areas associated with the Crandall Canyon Mine cannot be accurately determined at this point due to a lack of information provided by the Permittee.

*Deficiencies Details:*

- R645-303-211, R645-301-830.100 through -830.140, R645-301-830.410: The Permittee must submit the detail reclamation bond estimate in 2015 Dollars or seek permission to utilize 2016 Dollars prior to submission.
- R645-303-211, R645-301-830.100 through -830.140, R645-301-830.410: The Permittee must submit detail cost quotes from a minimum of three parties to utilize a cost reference outside of published construction related cost reference manuals, e.g. R.S. Mean Heavy Construction.
- R645-303-211, R645-301-830.100 through -830.140, R645-301-830.410: The Permittee will utilize the bare unit cost when utilizing R.S. Means Heavy Construction cost reference.
- R645-303-211, R645-301-830.100 through -830.140, R645-301-830.410: The Permittee will remove all salvage credit.
- R645-303-211, R645-301-830.100 through -830.140, R645-301-830.410: The permittee will add indirect and escalation to the next midterm on the Total sheet.
- R645-303-211, R645-301-830.100 through -830.140, R645-301-830.410: Permittee shall include East Mountain bond updates which were not included in the amendment.

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**Bonding Terms and Conditions Liability Insurance**

*Analysis:*

- The midterm review of the MRP meets the State of Utah R645 requirements for Terms and Conditions for Liability Insurance.
- The midterm review of the MRP meets the minimum requirements of R645-301-850 as the applicant currently holds liability insurance through Federal Insurance Company, effective until 6/1/16. The insurance includes the required Marsh from, explosives and claims made per occurrence.

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