COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

August 23, 2021

Katie Todt
Lewicki and Associates, PLLC
3375 West Powers Circle
Littleton, CO 80123

RE: Young Ranch Resource Quarry, File No. M-2021-009, 112 Construction Materials Reclamation Permit Application, Preliminary Adequacy Review

Ms. Todt:

The Division of Reclamation, Mining and Safety (Division) has completed its preliminary adequacy review of your 112 Construction Materials Reclamation Permit Application submitted for the Young Ranch Resource Quarry located in Gilpin and Clear Creek Counties. All comment and review periods for the application began on May 17, 2021, when the application was called complete for filing purposes. The decision date for the application is set for October 14, 2021.

The Division's review consisted of comparing the application content with the requirements of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials. The Division has identified adequacy items in the application requiring clarification or additional information. These items are identified below under their respective exhibit heading, and are numbered sequentially.

Exhibit B – Index Map (Rule 6.4.2):

1) Please provide a revised index map which shows all roads and other access to the affected land. This can be accomplished by labeling Central City Parkway on the map submitted.

Exhibit C – Pre-Mining and Mining Plan Map(s) of Affected Lands (Rule 6.4.3):

2) Please be sure Figure C-1 – Current Conditions shows the owner's name, type of structure, and location of all significant, valuable, and permanent man-made structures contained on the area of the affected land and within 200 feet of the affected land. The structures shown on this map should correlate with the structure list provided in Exhibit S. For example, the Division was unable to locate on this figure the fences and gates owned by Goltra West Ranch, LLC. Also, the Division was unable to locate some of the structures owned by Central City, such as the culverts associated with the Central City Parkway and the billboards. This figure should also show any structures located on or within 200 feet of the affected lands which are owned by the applicant (e.g., roads, gates, fences, buildings, wells, stormwater control structures, buried pipelines, power or communication lines). Please be sure this figure includes the owner's name for each structure.

3) On the applicable mine phase figures, please show the following:

   a. The proposed location(s) of any topsoil or overburden stockpiles.
   b. The proposed location(s) of any processing area(s), including any concrete or asphalt plants.

c. The proposed location(s) for material stockpiling.
d. The proposed location(s) of any fuel/oil storage.
e. The proposed location(s) of the scale, scale house, and any office/shop buildings.
f. The proposed location(s) of any water management structures including sediment ponds, sumps, ditches, culverts, and discharge locations required for the operation.
g. The proposed location(s) of any roads to be constructed for and/or used by the operation.
h. The proposed location(s) of any wildlife mitigation structures.

4) Please clarify whether the scenario depicted on Figure C-3 – End of Phase 1 shows the maximum disturbance proposed at this time for purposes of the reclamation bond.

5) On Figure C-4 – End of Phase 2, please show how the phase 2 quarry will be accessed.

6) Figure C-5 – End of Phase 3 depicts an "underpass" to be constructed under the realigned Central City Parkway, between the phase 2 and 3 quarries. Will this underpass be constructed for mine access between the two quarries? Or is this a proposed wildlife mitigation structure? Please describe how this underpass will be constructed and used by the operation.

7) Figure C-6 – End of Phase 4 & 5 Reservoir Excavation depicts the scenario in which the phase 2 and 3 quarries are mined more than 300 feet deeper than as shown on Figure C-5 – End of Phase 3, in preparation for utilizing the pits as reservoirs. However, (as requested in Exhibits D and E below) the applicant will need to commit to one mining plan (and reclamation plan) for now, and this plan can be revised later through the appropriate permit revision. Therefore, if the operator chooses to commit to the no-reservoir reclamation plan depicted in Figure F-1, please withdraw Figure C-6. If the applicant chooses the reservoir reclamation plan, the Division will have additional comments/questions regarding this figure.

Exhibit D – Mining Plan (Rule 6.4.4):

8) Please state the proposed maximum disturbance (in acres) for mine phase 1. This disturbance amount should correlate with the bond estimate provided in Exhibit L. Please ensure this estimate includes all disturbances associated with the operation, including quarry areas, processing areas, stockpiling areas, equipment storage areas, office/shop areas, scale/scale house areas, parking areas, waste rock storage areas, roads, stormwater structures, and wildlife mitigation structures.

9) The application states that gold may be mined as an incidental commodity during gravel mining. Please describe how the gold will be extracted, how it will be processed (if at all) on site, and how and where it will be temporarily stored on site. Will any chemicals be used to extract the gold?

10) Please provide demonstration that no toxic or acid-forming materials will be exposed or disturbed as a result of the proposed mining operation.

11) The application proposes realigning Central City Parkway during mine phase 2 (if the necessary county and city approvals are obtained). Please provide the design specifications and drawings for the proposed road realignment project.

12) Please provide more details on the existing culvert that runs under Central City Parkway and describe how it will be modified to accommodate drainage from the phase 1 processing area. Will this culvert location coincide with the proposed waste rock conveyor underpass?

13) On page D-1, the application states fencing and/or signage will be installed in some areas but not others. Please describe how the affected land boundary will be delineated in accordance with Rule 3.1.12(2), which requires the affected area be marked by monuments or other markers that are clearly visible and adequate to delineate such boundaries.

14) On page D-2, the application states "independent of realigning the Central City Parkway, the proposed road corridor may be used as an internal mining access road". Please clarify if the new road will be constructed regardless of whether the Central City Parkway is realigned. If so, please describe how this road would be blocked off from public access. Additionally, if the existing parkway location continues to be used by the public during mine phase 2, how will the waste rock landform be accessed by the operation during that time? Will haul trucks use the parkway to access this area? Or will a conveyor system be used?

15) On page D-4, the application states "In general, each new mining phase will be mined by first excavating vegetation and 0-24 inches of decomposed plant material and sandy loam with front-end loaders, excavators, and bulldozers from the first horizontal bench". Is this material expected to be used as a growth medium for reclamation? Where will this material be stored on site? Please ensure any proposed growth medium or overburden stockpiles are shown on the applicable mining plan maps in Exhibit C.

16) Please provide a copy of the SPCC plan or equivalent for any fuel/oil to be stored and/or used on site.

17) The Division has the following comments regarding Table D-1 – Mining Phase Dimensions:

    a. Please clarify if the acreage shown under the "Area" column includes only quarry disturbance or total proposed disturbance for each mine phase (e.g., pits, waste rock areas, stockpile areas, processing areas, equipment storage areas, parking areas, roads). If it only includes quarry disturbance, please add an additional column which shows the total disturbance proposed for each mine phase.

    b. The table includes a column with estimated disturbance created by the waste rock landform during each mine phase. Please include additional columns which provide an estimated disturbance created by other mine features such as roads, stockpile areas, processing areas, and parking/equipment storage areas, for each mine phase.

18) On page D-5, the application states "additional fill for establishment of the processing area may be imported from local construction jobs and other sources of fill material". Please provide the applicable information required by Rule 3.1.5(9) for the importation of backfill material to the site, including: a narrative that describes the approximate location of the proposed activity, the approximate volume of inert material to be backfilled, a signed affidavit certifying that the material is clean and inert as defined in Rule 1.1(22), the approximate dates the proposed activity will commence and end, an explanation of how the backfilled site will result in a post-mining configuration that is compatible with the approved post-mining land use, and a general engineering plan stating how the material will be placed and stabilized in a manner to avoid unacceptable settling and voids. If this information is not known at this time, please commit to submitting a Technical Revision with this information prior to importing any backfill material to the site.

19) Will the phase 1 processing area continue to be used as such during mine phase 2? If not, where will material processing occur after the phase 1 processing area can no longer be used?

20) On page D-5, the application states that segregated plant debris (compacted mixed trees and sandy loam/forest litter) will be stockpiled along the northeastern edge of the proposed processing area, and this berm will be compacted, topped with at least 6 inches of topsoil, and seeded to protect the berm from erosion and create a more aesthetically pleasing screening berm. Please clarify if this material is expected to be used as a growth medium for reclamation. Is the applicant proposing to combine any salvaged topsoil with woody vegetation in these berms, or will topsoil be stored separately? Per Rule 3.1.9(2), an operator should make a reasonable effort to ensure that existing vegetation is put to a beneficial use such as firewood, mulching, lumber, etc. Has the applicant considered using the woody vegetation in this manner rather than storing it in the proposed berms? Given the limited amount of topsoil available on site, any topsoil salvaged during operations should be protected for use in reclamation. The Division does not recommend the applicant use the limited topsoil available to "top" vegetative piles. Please modify this exhibit accordingly. Also, please be sure any proposed growth medium stockpiles are shown on the applicable mining plan maps in Exhibit C.

21) Please provide the seed mixture that will be used to stabilize any temporary growth medium stockpiles.

22) On pages D-6 and D-7, the application states "the exact timing of gravel mining will be determined by market conditions and may occur out of sequence before Phase 2 or Phase 1 are completed". Please be advised, upon approval of this application, the operation would be authorized for a specified maximum disturbance which correlates to the reclamation bond. It appears the applicant is proposing to be bonded at this time for mine phase 1 disturbances only. Prior to creating disturbances not covered under the approved reclamation bond, the operator would need to submit a revision to increase the maximum allowed disturbance and to revise the bond estimate accordingly. Please ensure the proposed maximum disturbance [and corresponding mine phase(s)] in this exhibit correlates with the bond estimate provided in Exhibit L.

23) On page D-10, the application includes a list of "fixed" and portable installations that may exist on site at any given time. Please provide a separate list which includes only fixed/permanent structures which will require demolition and/or removal for reclamation, including their approximate dimensions. Please be sure the bond estimate provided in Exhibit L includes costs for removing and disposing of all fixed/permanent structures to occur during the mine phase(s) of the proposed maximum disturbance.

24) On page D-11, the application mentions a large box culvert (approximately 8-feet in diameter) or similar crossing will be constructed beneath Central City Parkway to convey waste material from the processing area (located west of the road) to the waste rock landform (located east of the road). Please provide details on how this underpass will be constructed. Additionally, please describe how material conveyed beneath the road will be temporarily managed at the waste rock landform prior to being placed on the lift. Please ensure the reclamation plan provided in Exhibit E addresses reclamation of this structure, and the bond estimate provided in Exhibit L includes any costs for reclaiming this structure (if it is not proposed to remain for reclamation).

25) On page D-11, the application states the waste rock landform will be constructed by edge dumping in lifts of approximately 50 feet in height, creating an initial 1H:1V slope, which will then be bulldozed to the final 2.2H:1V slope to reclaim each lift. Please describe the maximum length of slope at any time which will

require grading to the final reclamation configuration. Please ensure the bond estimate provided in Exhibit L includes costs for grading this proposed maximum length of slope for the waste rock landform.

26) Please state the maximum proposed mining depth (in feet) for each mine phase.

27) Please state the maximum proposed height (in feet) of the waste rock landform(s) for each mine phase.

28) This exhibit refers to potential mine phases 4 and 5 in which the phase 2 and 3 quarries are mined deeper to be utilized as reservoirs. Please commit to one mining plan at this time, either the plan proposed on Figure C-5 – End of Phase 3 or the one proposed on Figure C-6 – End of Phase 4 & 5 Reservoir Excavation. This plan can be revised later through the appropriate permit revision.

29) Please provide the approximate dimensions of all proposed roads and describe how they will be surfaced, if at all (e.g., paved, graveled). Please ensure the reclamation of any roads not proposed to remain for reclamation is addressed in Exhibit E and also in the Exhibit L bond estimate.

30) Please describe how the two waste rock landforms (including the toes) will be accessed after mine phase 1, when these two features merge. Will roads be constructed along the side(s) of the waste rock landforms? Even after each lift is reclaimed, the waste rock landform will require continued access for maintenance and reclamation. Please ensure all proposed roads are shown on the applicable mine phase maps in Exhibit C.

31) Figure 4 is a schematic typical cross section of the proposed quarry highwalls, showing the top gravel layer to be mined at the same near vertical slope gradient and backfilled at the same 2H:1V slope gradient as bedrock highwalls. Please describe the approximate portion of highwalls proposed for mine phase 3 which are expected to consist of gravel benches. Will only the southern highwall of the phase 3 quarry have gravel benches? Are the proposed gravel benches expected to have the same competency at the proposed mining configuration? Lastly, does the geotechnical stability analysis provided in this application factor in the portion of highwalls to be composed of gravel rather than bedrock?

32) On page D-14, the application states a stormwater/safety berm will be constructed along the upper crest of each 50 foot tall highwall bench to divert stormwater and to catch any rock falls. Please describe how these berms will be constructed. Additionally, please describe how these berms will be designed to minimize rockfall hazard, particularly where highwalls will rise above the realigned Central City Parkway in the southern access corridor (to be created during mine phase 2). According to Figures C-4 and C-5, these highwalls will rise approximately 300 feet above the road on its western side and 650 feet on its eastern side during mine phase 2, then 300 feet on its western side and 330 feet on its eastern side during mine phase 3 (and for final reclamation).

Exhibit E – Reclamation Plan (Rule 6.4.5):

33) The application proposes more than one reclamation plan for the site, including leaving two dry revegetated pits (shown in Figure F-1), leaving one dry revegetated pit and one reservoir (not shown on any figures), and leaving two reservoirs (shown on Figure F-2). On page E-1, the application states the "final post-mine land use will be determined following consultation with Central City". Please commit to one reclamation plan at this time (ensuring this plan is consistent with the post-mining land use proposed in this application). The reclamation plan and/or post-mining land use can be revised later through the appropriate permit revision. If the applicant chooses to commit to the reservoir plan, the Division will have additional questions

related to slope grading, filling of the reservoirs, water rights, stability analyses, wildlife and public safety, reservoir access, and how this proposed use compares with other land uses in the vicinity, etc.

34) Please confirm the applicant is proposing to be bonded only for mine phase 1 disturbance at this time. Additionally, please provide a description of the size and location of each area requiring reclamation under this scenario, including:

    a. The approximate maximum length of quarry walls requiring grading/backfilling at any given time.

    b. The approximate maximum acreage of quarry disturbance requiring retopsoiling and/or revegetation at any given time.

    c. The approximate maximum acreage of compacted areas (e.g., pit floor, roads, temporary stockpile and/or equipment storage areas) requiring ripping at any given time.

    d. The approximate maximum length of waste rock landform slopes requiring grading/backfilling at any given time.

    e. The approximate maximum acreage of waste rock landform disturbance requiring retopsoiling and/or revegetation at any given time.

    f. A description of any structures/features requiring removal and disposal for reclamation, including their approximate dimensions and the anticipated disposal location(s).

35) Please describe how quarry highwalls will continue to be accessed after initial reclamation for maintenance (e.g., erosion repair, weed control) and/or additional revegetation efforts. Will any ramps remain along quarry highwalls? Please be sure to show the approximate location of any remaining roads or ramps on the Exhibit F reclamation plan map(s).

36) Please describe how the waste rock landform will continue to be accessed after initial reclamation for maintenance (e.g., erosion repair, weed control) and/or additional revegetation efforts. Please be sure to show the approximate location of any remaining roads or ramps on the Exhibit F reclamation plan map(s).

37) On page E-1, the application states that “sporadic placement of 25-foot benches of intentional roughened faces, slopes, and cliff bands will be left to resemble a natural cliff face”. On page E-2, the application further states “resultant mined faces will be ~10% cliff face with 90% of each bench backfilled to a 2H:1V slope with waste material”. Please provide additional details on the proposed cliff faces to remain after reclamation. This might include providing a conceptual design of the proposed quarry highwall reclamation, depicting the proposed 90% backfilled slopes and the 10% cliff faces. Additionally, please explain how the proposed reclamation plan for quarry highwalls is consistent with the post-mining land uses of rangeland and wildlife habitat.

38) On page E-2, the application states “topsoil and overburden are absent from the site; however, as the mined phases will be mixed intentionally roughened bedrock surfaces and backfilled to 2H:1V slopes, replacement of topsoil and true overburden will not be necessary” and “backfilling will be completed with crushed rock, boulders and potentially waste fines”. On page E-3, the application further states “WRL lifts and mining benches will be capped with coarse blasted rock to encourage volunteer vegetation and provide micro-

climates for seed germinate prior to hydroseeding and protection for tree tubelings to establish". Firstly, please modify the first statement as the application states at least some salvageable topsoil is available on site. Secondly, please clarify whether quarry highwalls will be backfilled to 2H:1V with crushed rock, boulders, and potentially waste fines, and then capped with coarse blasted rock. Thirdly, please provide an estimated depth of placement for the coarse blasted rock cap on quarry walls and on waste rock landform lifts. Lastly, please explain how the proposed backfill material will create a suitable growth medium for establishing the grass, shrub, and tree species included in the proposed revegetation plan. Will the operation perform any test plots and/or soil testing? If so, please provide details of this plan.

Please be advised, if the applicant is unable to provide demonstration at this time that the proposed "growth medium" will be sufficient, the reclamation bond will need to include costs for importing topsoil to the site. In this case, additional information will be needed, including the estimated volume of topsoil required to reclaim the proposed maximum disturbance, the anticipated location from which the topsoil will be derived, and the approximate depth of placement.

39) On Page E-2, the application states in the no reservoir reclamation alternative, approximately 140 acres will be reclaimed as native forest shrubs and tree tubelings, while approximately 255 acres will be reclaimed with native dry rangeland species. This adds up to 395 acres, which exceeds the proposed affected area of 335.4 acres. Please explain this discrepancy. Is the difference in acreage due to additional slopes created during mining and reclamation?

40) On page E-2, the application states that on-contour single ripping to a minimum depth of 2 feet will be used at a 10-foot vertical spacing interval on waste rock landform lifts to divide each lift's final reclaimed slope drainage area by a factor of 5. Please clarify whether the proposed single shank ripping will be done after each lift is graded to 2.2H:1V or after the entire waste rock landform has reached capacity. Additionally, will each lift be "capped" and seeded soon after it has been graded to its reclamation configuration, or will this be done later during operations?

41) On page E-3, the application states "in the flat areas (if phase 4 and 5 mining does not occur) and the processing area at the end of the mine's life, plant growth medium (previously stored in onsite berms) will be placed on all surfaces to enhance the natural condition of the site (up to 2 to 6 inches plant growth medium)" and "plant growth medium may be recovered from onsite berms or by suitable amendment of late-phase mining fines". Firstly, please describe the areas where salvageable topsoil is expected to be present, and provide an estimated volume of topsoil available on site. Secondly, please specify the "flat areas" to receive 2-6 inches of topsoil placement. Does this include the tops of the waste rock landforms, the pit floors, and the initial processing area? Thirdly, please clarify which portions of the affected lands would receive topsoil replacement and which areas would receive only a coarse blasted rock cap, including estimated acreages for each. Is the applicant proposing to place topsoil only on flat surfaces and the rock cap only on backfilled quarry highwalls and waste rock landform slopes? Lastly, please explain how replacing only 2-6 inches of topsoil will be sufficient to achieve successful revegetation at the site. Based on the Division's experience, a topsoil replacement depth of less than 6 inches is typically not sufficient to achieve successful revegetation.

42) On page E-3, the application states a wood straw mulch may be applied to seeded surfaces. Please state whether this mulch will be used or not, and if so, specify the application method and application rate per acre.

43) The application provides three reclamation seed mixtures in Table 3.1 (Native Forest Shrub seed mix), Table 3.2 (Tree Tubelings), and Table 3.3 (Native Dry Rangeland seed mix). Firstly, please describe the areas to receive each of the proposed seed mixtures, including estimated acreages for each. Secondly, please clarify whether Lodgepole pine trees will only be planted on side slopes and Limber pine trees will only be planted on ridge tops, as Table 3.2 suggests. Thirdly, please provide a planting rate for the shrub species in Table 3.1. Lastly, please provide an estimated survival rate for the tree tubelings proposed in Table 3.2.

44) On page E-6, the application states "Map F-1 shows tentative post-reclamation roads to remain indefinitely; however, exact reclamation road orientations are not known and will be determined by the landowner". Please be advised, the proposed reclamation plan must specify which roads will remain for reclamation and include their approximate dimensions and type of surfacing if applicable (e.g., gravel, paved). Please provide this information in this exhibit and ensure the Exhibit F reclamation plan map shows the location of any roads proposed to remain for reclamation. If the landowner later requests changes to the final road configurations, these changes can be proposed through the appropriate permit revision.

45) On pages E-6 and E-7, the application includes a general weed control plan for the site. Please revise this plan to include specific measures for controlling any state-listed noxious weed species currently existing on site and any such species expected to exist at the site during mining and reclamation. During the pre-operation inspection conducted on August 4, 2021, the Division observed Canada thistle, Common mullein, and Downy brome (cheat grass) present within the proposed affected lands, which are all state-listed noxious weed species.

46) According to the F-1 Reclamation Plan Map, a total of 322.8 acres will be revegetated. However, the application is proposing a total affected area of 335.4 acres. Please explain this discrepancy in the acreage. Are the 12.6 acres of affected lands not proposed to be revegetated associated with the existing and proposed Central City Parkway alignments? If not, please describe the disturbed areas not proposed to be revegetated for reclamation, and provide an explanation for this proposal.

Exhibit F – Reclamation Plan Map (Rule 6.4.6):

47) This exhibit includes two maps depicting two different reclamation scenarios, one of which includes leaving two dry revegetated pits (Figure F-1), and the other of which includes leaving two reservoirs (Figure F-2). The applicant must commit to one reclamation plan in this application. Therefore, please commit to one of these reclamation plans (in Exhibit E) and remove the appropriate figure from this exhibit to reduce any confusion it may cause. Any future changes to the reclamation plan can be proposed through the appropriate permit revision.

48) Because the reclamation plan in Exhibit E provides more information on the no reservoir plan, the Division's adequacy items are focused more on this plan. However, if the applicant commits to the reservoir plan, the Division will have additional questions regarding that proposal. The Division has the following comments on Figure F-1:

    a. Please clarify which of the three seed mixtures presented in Exhibit E will be planted in areas designated as "Dry Rangeland Reclamation" and in areas designated as "Tree Tubeling Reclamation". For example, will the Table 3.3 grass mixture be planted in all areas or just in areas designated as "Dry Rangeland Reclamation"? Also, will the Table 3.1 shrub mixture be planted in all areas, or just in areas designated as "Tree Tubeling Reclamation"?

b. Please clarify whether Dry Rangeland Reclamation will occur on pit floors, the tops of the waste rock landforms, and the side slopes of the realigned segment of Central City Parkway, totaling 188.6 acres.

c. Please clarify whether Tree Tubeling Reclamation will occur on all quarry highwalls and on all side slopes of the waste rock landforms, totaling 134.2 acres.

d. Please explain why the east and west facing highwalls that rise above the southern portion of the realigned Central City Parkway (in the access corridor) are shown to receive "Dry Rangeland Reclamation" rather than "Tree Tubeling Reclamation" as proposed for other quarry highwalls.

e. Please show the location of any structures (e.g., roads, highwall ramps, stormwater structures, wildlife mitigation structures) proposed to remain for reclamation.

Exhibit G – Water Information (Rule 6.4.7):

49) Figure G-1 – Surface Hydrology – Reclaimed Conditions states "quarry floor drains offsite via road". Please provide additional details on this proposal. According to the gradients shown, the realigned Central City Parkway will be at a higher elevation (approximately 50-75 feet higher) than the adjacent quarry floors until it reaches the southern edge of the quarries. Please provide additional details on the point where the elevation of the road falls below the elevation of the quarry floors and depict this point on the figure. Given the proposed steep slopes adjacent to the southern portion of the realigned road, and the proposed plan to have the two quarries drain to this portion of the road, how will the road be protected from flooding and erosion damage? Additionally, how will water draining to the south (through the narrow access corridor) be managed? Will any culverts or other stormwater control structures be installed in this area? Please provide additional details in this exhibit and on Figure G-1 to describe how surface flows will be managed at this proposed "quarry discharge point".

50) On page G-2, the application states the entire process area during mine phase 1 will act as a sump and sediment from the low-lying east area will be removed as needed. The designed pad elevation will be approximately 3 feet lower than the elevation of the adjacent Central City Parkway. Please provide a generalized cross-section of this area during operations, showing the anticipated grade of the top of the processing pad, the sump area, the modified culvert under the parkway, and the area east of the road where the culvert will drain.

51) On page G-2, the application states surface water will be diverted around disturbed areas with perimeter ditches and berms. Please provide more details on the stormwater management plan, including the approximate locations and dimensions of any stormwater structures/features proposed. Additionally, please ensure any anticipated stormwater control structures/features (e.g., ditches, sumps, culverts, sediment ponds) are shown on the appropriate Exhibit C figures.

52) On page G-3, the application states "after allowing sufficient time for sediment settling, clean, sediment-free water will be allowed to flow into and through a gated arrangement to control flow" and "this arrangement will be an elevated culvert that moves water from the processing area sump and under the CCP and WRL to the toe of the dump". Please provide a design drawing(s) for this proposed stormwater structure. At what point during the mining operation will this structure be constructed? How will water discharging from this structure east of Central City Parkway be managed? How will the structure be maintained during operations? Will this structure be necessary throughout all mining phases to manage surface water west of the parkway?

Will this structure be reclaimed? If so, please be sure to address reclamation of this stormwater structure in Exhibit E and in the bond estimate provided in Exhibit L.

53) This exhibit mentions constructing sumps in the quarry areas to collect stormwater, and states the location of these sumps may change as new mining phases are opened up. Please describe how water from these sumps will be managed in the event the water does not fully infiltrate or evaporate within 72 hours, as required by the Division of Water Resources. Will this water be pumped out and discharged to North Clear Creek under a CDPHE discharge permit? If so, how will this be accomplished?

54) On Pages G-3 and G-4, the application states "sediment ponds will not be installed at the WRL toe". Please clarify whether any diversion ditches will be constructed around the edges of the waste rock landforms to convey stormwater around these features, and if so, to which location(s) will this water report? Please describe how water conveyed around the two waste rock landforms, water retained on each lift, and water draining from the base of these features will be managed. Lastly, does the applicant anticipate a CDPHE discharge permit will be required for any discharge to North Clear Creek from the waste rock landforms?

55) On Page G-4, the application states "discharge points will be monitored and located as shown on Map G-1". However, the Division was unable to locate any discharge points on this figure. Please be sure any proposed discharge points are clearly labeled on this figure.

56) On page G-4, the application states larger rock will be needed at the toe of the embankment in each of the two main drainages in which the waste rock will be placed. Please explain the purpose of this proposed (rock) feature and how the rock size was chosen. Additionally, please provide a schematic plan view and a generalized cross-section of the toe of each waste rock landform, showing any proposed structures/features to be constructed in these areas.

57) The toe of the proposed waste rock landform (in the east drainage) appears to be located within 300 feet of North Clear Creek. Please describe how the creek will be protected from any slides and/or sedimentation occurring from the waste rock landform during mining and reclamation. Will any additional BMPs be installed during reclamation of the waste rock lifts to protect these areas from erosion while the vegetation is establishing?

58) On page G-5, the application states "expected groundwater levels are known to be greater than 500 feet below the pre-mined ground surface based on well and spring data in the surrounding area". Please identify the location of any known springs/seeps that occur in the proposed affected lands on the Figure G maps. During the pre-operation inspection conducted on August 4, 2021, the Division observed multiple areas where saturated conditions existed within the larger drainage in which the proposed waste rock landform would be constructed. It was difficult to tell whether these saturated areas were from recent precipitation events or from seeps. The Division did identify a seep at the bottom of the larger drainage which had a discernible flow, estimated at approximately 1-2 gpm. Please include in this exhibit a discussion of any springs/seeps that occur in the drainages of the proposed waste rock landforms, any impacts these conditions might have on the stability of the waste rock landforms, and how any water draining from the base of the waste rock landforms will be managed during operations and reclamation.

59) Please provide a generalized cross-section of the proposed mine site, showing the proposed pit floor elevations (during mine phase 3) with respect to the elevations of Clear Creek (to the south), Russell Gulch (to the north)

North Clear Creek (to the north/northeast), the approximate groundwater table in the area, and the screening depth (if unknown, the total depth) of any wells located within 600 feet of the proposed permit area.

60) On page G-6, the application states up to 40,000-50,000 gallons of water a day will be trucked in from a legal source. Please specify the anticipated source for this water. Additionally, please clarify if the projected amount of water needed would include gravel washing.

61) On page G-6, the application states "following initial development and when economically appropriate, a well or other legal source of water, may be developed" and "alternatively, water may be pursued and supplied via pumps and pipes from either Clear Creek or the North Fork of Clear Creek". Please be advised, any changes to the project water requirements or source, and/or the construction of any new structures on site, including groundwater wells, must be reviewed and approved by the Division through the appropriate permit revision. This revision would need to address the reclamation of any new structures, as well as demonstrate the necessary water rights are in place for any water derived from on site.

Exhibit H – Wildlife Information (Rule 6.4.8):

62) On page 30 of the Wildlife Mitigation Plan provided in Appendix 2, it states "Smart technology is being considered at several locations for the project" and "at the time of installation and prior to each mining phase, the best technology will be evaluated (i.e., smart technology vs. underpass or combination)". Please clarify what is meant by "smart technology" and how this varies from the mitigation measures proposed in this application.

63) The Wildlife Mitigation Plan provides a summary of potential mitigation options for the project in Table 7 and a generalized list on pages 37 and 38 of recommendations for habitat management during operations and for final reclamation. Table 8 includes a mitigation installation schedule, listing mitigation measures to be implemented during each mining phase. Please confirm the wildlife mitigation measures presented in Table 8 are the ones the applicant is committing to installing for this operation. Additionally, please provide design details for all proposed wildlife mitigation structures/features.

64) Will any of the proposed wildlife mitigation structures/features be reclaimed? If so, please be sure to address reclamation of these structures/features in Exhibit E and include costs for their reclamation in the Exhibit L bond estimate.

65) The Wildlife Mitigation Plan lists (in Table 4) raptor species which potentially occur within the proposed project area, including American Peregrine Falcons, Bald Eagles, and Ferruginous Hawks. Additionally, Section 3.3 states some migratory birds may utilize the project area, and that proposed activities which will remove native vegetation, in particular large overstory trees should first ensure that active nests are not disturbed. Generally, the active nesting season for most migratory birds in this region of Colorado occurs between April 1 and August 31. Please commit to conducting raptor and migratory bird surveys prior to creating disturbances in each mine phase and working with the appropriate wildlife authority (e.g., CPW, USFWS) to address any active nests found. If the results of these surveys require any changes to the wildlife mitigation plan or mining plan, these changes must be proposed to the Division in the form of a Technical Revision.

Exhibit L – Reclamation Costs (Rule 6.4.12):

66) In this exhibit, the applicant proposes the reclamation bond cover a total of 24 acres of disturbance expected at the end of mine phase 1 (depicted on Figure C-3). This disturbance amount appears to include the active quarry highwall (0.5 acre?), a 10 acre processing area, and a 13.5 acre area at the top of the waste rock landform. The proposed maximum disturbance must include all lands to be disturbed by the operation. Therefore, please clarify whether the proposed 24 acre disturbance includes all disturbances expected at the end of mine phase 1, including the entire footprint of the two waste rock landforms, all roads constructed for the operation, the processing area, the quarry areas, and any areas disturbed by stormwater structures or other structures/features constructed for the operation.

    Please be advised, prior to disturbing more than the approved maximum disturbance, the applicant must submit a Technical Revision to increase the maximum disturbance amount and update the reclamation bond accordingly. Therefore, if there is a chance that multiple phases may be mined at the same time (as indicated in the application), the Division recommends the applicant include these areas in the proposed maximum disturbance and ensure reclamation of all proposed disturbances are included in the bond estimate.

67) Please ensure the mining plan map which correlates with the proposed reclamation bond (Figure C-3) includes all necessary information in order for the Division to calculate the bond, including proposed topsoil or overburden stockpiles, any proposed material stockpiles to be used for reclamation backfill, estimated acreages for each disturbance area which correlates with the information provided in this exhibit, etc. Alternatively, the applicant may wish to provide this information on a separate Exhibit L map which correlates with the reclamation bond estimate.

68) Please provide an estimated acreage of any compacted areas (e.g., quarry floor, roads, stockpiling areas, processing areas, equipment storage areas) that will require ripping prior to retopsoiling/revegetation, and ensure costs for completing this task are included in the bond estimate.

69) Will there be any roads constructed at the end of mine phase 1 which are not proposed to remain for reclamation? If so, please provide an estimated acreage for these roads. Will they require ripping, retopsoiling, and/or revegetation? Please ensure costs for reclaiming any roads not proposed to remain for reclamation are included in the bond estimate.

70) Please describe the location(s) from which the plant growth medium used for reclamation at the end of mine phase 1 will be derived. The Division requires this information in order to estimate haul distances for the reclamation bond. Will any growth medium need to be imported for reclamation at this stage? If so, please provide an estimated volume of growth medium to be imported, and ensure costs for this task are included in the bond estimate.

71) Please describe the location(s) from which the material used to backfill the quarry highwall at the end of mine phase 1 will be derived. The Division requires this information in order to estimate haul distances for the reclamation bond.

72) Please describe the location(s) from which the coarse blasted rock used to "cap" the backfilled quarry highwalls and graded waste rock landform slopes will be derived. The Division requires this information in order to estimate haul distances for the reclamation bond.

73) Please describe any structures that will be present on site at the end of mine phase 1 (e.g., buildings, scale, scale house, stormwater structures, wildlife mitigation structures) which would require demolition and/or removal for reclamation, including their approximate dimensions and the thickness of any foundations. Additionally, please ensure costs for demolition/removing and disposing of these structures is included in the bond estimate.

74) Will any demolished/removed structures be disposed of onsite? If so, please show the anticipated disposal location(s) on the Exhibit L map.

75) Will any demolished/removed structures require off-site disposal? If so, please specify the anticipated disposal location(s) or provide an approximate distance to the anticipated facility.

Exhibit M – Other Permits and Licenses (Rule 6.4.13):

76) This exhibit states a U.S. Bureau of Alcohol, Tobacco and Firearms permit will be required for blasting compliance. It is the Division's understanding that additional permitting and/or approvals may also be required from the Colorado Division of Oil and Public Safety. Is the applicant aware of any additional state requirements for blasting? If so, please include them in this exhibit.

77) Will any permitting and/or approvals be required from state and/or federal agencies for storing fuel on site? If so, please include them in this exhibit.

Exhibit P – Municipalities Within Two Miles (Rule 6.4.16):

78) This exhibit only includes Central City (due to their right-of-way for Central City Parkway being located within the proposed affected lands). However, it has been determined that Idaho Springs is another municipality located within 2 miles of the proposed operation. Therefore, please include Idaho Springs and the address of their general office in this exhibit.

Exhibit S – Permanent Man-made Structures (Rule 6.4.19):

79) This exhibit lists out several structures located within 200 feet of the proposed affected lands which are owned by Central City (roads, culverts, road gutters and other structures associated with Central City Parkway; overhead powerlines, power poles, lights, and other electric components; and billboards) and by Goltra West Ranch, LLC (fences and gates). However, the only structures identified on Figure C-1 – Current Conditions are "Central City Parkway" and "overhead power" located at the western edge of the parkway. Please ensure this exhibit and Figure C-1 include the location and owner's name(s) of all permanent, man-made structures located on or within 200 feet of the proposed affected lands. While agreements are not required for any structures owned by the applicant, please include in this list (and on Figure C-1) any structures owned by the applicant which are located on or within 200 feet of the proposed affected lands.

80) The application includes copies of structure agreements (dated February 3, 2021) which were sent to Central City Parkway and Goltra West Ranch, LLC for structures they own within 200 feet of the proposed affected lands. However, these agreements have not yet been signed and notarized by the structure owners. Additionally, proof the letters were delivered to the respective structure owner (return receipts of a Certified Mailing or proof of personal service) was not included in the application. Lastly, the structure agreement sent to Goltra West Ranch, LLC includes only "fences", whereas this exhibit lists "fences and gates". Please

resubmit the structure agreement to Goltra West Ranch, LLC with all structures included, and provide proof this was done. Please also provide proof the structure agreement was delivered to Central City.

81) Please be advised, in the absence of fully executed structure agreements for any structures located on or within 200 feet of the proposed affected lands, which are not proposed to be impacted by the operation, the applicant must provide an appropriate engineering evaluation that demonstrates that such structures shall not be damaged by activities occurring at the mining operation, in accordance with Rule 6.4.19(b). In this exhibit, the applicant refers to the Geotechnical Stability Exhibit provided in the application for demonstration that all structures located within 200 feet of the proposed affected lands will be protected. The Division is currently reviewing the Geotechnical Stability Exhibit and will inform the applicant of any adequacy issues identified. In the event the Division determines this evaluation does not fully demonstrate structures located within 200 feet of the proposed affected lands will not be damaged by the operation, the applicant may be required to adjust the proposed mining and/or reclamation plans in a manner to protect any such structures for which an agreement has not been obtained.

82) Please specify all existing structures located within the affected lands which will need to be relocated, removed, modified, or otherwise impacted by the operation. For example, during the August 4, 2021 preoperation inspection, the Division noted the presence of two stormwater drop structures located in the drainages proposed for the WRL, which the applicant indicated would need to be relocated. For any such structures not owned by the applicant, a structure agreement must be provided which states the owner's acceptance of any anticipated impacts (e.g., relocation, removal, modification) to the structure. This would include the applicant's proposal to realign the Central City Parkway, which requires an agreement with Central City clearly authorizing the realignment of this road (and the relocation, removal, etc. of any other structures associated with this road).

Geotechnical Stability Exhibit (Rule 6.5):

83) Under Section 1 – Area Faults, the application describes an unnamed fault which passes through the eastern mining area, striking at a roughly NW-SE orientation. Based on the USGS Black Hawk quadrangle, this fault appears to be vertical, in which case, the primary risk to slope stability would be if the fault orientation was parallel to the anticipated hard rock benches. Initial stripping in mine phase 1 will expose any observable portion of this fault, allowing a geotechnical analysis to be performed. Please commit to submitting a Technical Revision to update the geotechnical stability exhibit with this information once it is obtained.

84) Under Section 2 – Slopes Stability, the application states "sufficient buffers will be maintained to neighboring property lines" so that "buildings or other structures within 200 feet of the affected area will not be affected by mining excavation" and "Maps C-2 through F-2 show these buffers". However, the Division could not find any mining setbacks on the figures mentioned. Please clarify if the applicant is referring to the "200' offset of DRMS Permit Boundary" which is depicted on these figures with a pink dotted line. Will any setbacks/buffers be maintained from the proposed permit boundary? If so, please ensure these setbacks/buffers are shown on the mining plan maps in Exhibit C.

85) Under Section 2 – Mining Highwall, the application states "the colluvium covers the gneiss at an average depth of 160 feet" and "therefore, geotechnical information such as joint orientation will not be obtained until over 10 years into the life of the mine". Please clarify the mine phase during which this information will be collected. Additionally, please commit to submitting a Technical Revision to update the geotechnical stability exhibit with this information once it is obtained.

86) Under Section 2 – Waste Rock Landform, the application provides the proposed final overall slope gradient for this feature, which is 2.2H:1V, but does not provide the proposed operational slope gradient. Please provide the proposed slope gradient of each waste rock lift during operations (prior to reclamation).

87) Under Section 2 – Slopes Stability, the application states the tallest mining highwall and the tallest waste rock landform scenarios were chosen for modeling. However, the highwall was modeled at 475 feet tall, whereas the tallest highwall depicted on Exhibit C maps is approximately 650 feet tall (in the phase 3 quarry area) and 500 feet tall (in the phase 2 quarry area). Additionally, the tallest waste rock landform slope was modeled at 600 feet tall, whereas the tallest waste rock landform slope depicted on Exhibit C maps is approximately 800 feet tall (during mine phase 3). Please update the analyses accordingly or explain why the scenarios modeled are sufficient.

88) According to Figure C-5 – End of Phase 3 and Figure F-1 – Reclamation, the toes of the proposed waste rock landforms will be located within approximately 50 feet of the northern permit boundary. Additionally, the proposed eastern and southern extents of the larger waste rock landform appear to be located within 30 feet of the eastern and southern permit boundaries. Per Rule 6.5(3), please demonstrate through appropriate geotechnical and stability analyses that off-site areas will be protected, with appropriate factors of safety incorporated into the analysis, from slope failure of the waste rock landforms during mining and reclamation.

    Additionally, please describe how the operation will work to prevent off-site impacts in these areas during construction, maintenance, and reclamation of the waste rock landforms. How will the permit boundaries be delineated in these areas to provide clear visual guidance for site workers?

89) Please provide a slope stability monitoring plan to include, at a minimum, the type and frequency of monitoring to be conducted to assess any potential slope stability issues during mining operations.

Appendix 3 - Preliminary Blast Plan:

90) On page 1 of this plan, the application states “a more detailed and accurate blast plan will be prepared by the third-party blasting contractor and will be submitted to the DRMS following the start of operations and prior to beginning of active mining” and “a third-party, potentially the same contractor as the blasting third-party, monitoring plan will be prepared and also submitted to the DRMS on the same schedule as the blast plan”. Please commit to submitting any changes to the blasting plan and/or monitoring plan from what is proposed in this application in the form of a Technical Revision.

91) On page 2 of this plan, the application states “a copy of the Pre-Blast Survey notification is included at the end of Appendix 3”. However, the Division was unable to find this document in the application. Please provide a copy of the document referenced.

92) On page 17 of this plan, the application states “blast guards will be posted at all entrances to the permit boundary to make sure the access corridors through the active mining area are secure during the blast process”. Please clarify whether the Central City Parkway will require temporary closure during blasting. If so, what is the average amount of time the parkway will be closed for blasting? How does the operation intend to stop/control traffic on the parkway during blasting? Will signs and/or barricades be used? How far back from the blasting area will traffic need to be restricted on the parkway during blasting? Lastly, please

specify the Central City person or department that will be notified regarding any parkway closures required for the operation.

93) Please describe how the operation will work to prevent flyrock from leaving the site, particularly during the initial mining of each phase when blasting will occur at the highest elevation.

94) On page 24 of this plan, the application lists several structures located within 200 feet of the permit area which are said to be "identified in Exhibit S" and "shown on Map C-1". However, the Division was unable to locate all of these structures in Exhibit S and on Figure C-1. For example, the structure list provided in Exhibit S does not mention the Young Ranch LLC cabins or the overhead communication lines along the Central City Parkway. Additionally, the only structures from this list the Division was able to locate on Figure C-1 was the Central City Parkway and overhead power lines along the western edge of the parkway. Please ensure all structures located on or within 200 feet of the proposed affected lands, including ones owned by the applicant, are shown on Figure C-1 and included in the structure list provided in Exhibit S.

Appendix 6 – Cultural Resource Inventory:

95) Please state whether a copy of the cultural resource inventory report prepared by Metcalf Archaeological Consultants, Inc. will be provided to the Colorado State Historic Preservation Office.

Additional Items:

96) Please review and respond to the adequacy review letter provided by Rob Zuber, DRMS (see enclosed letter, dated July 26, 2021).

97) Please review and respond to the adequacy review letter provided by Zach Trujillo, DRMS (see enclosed letter, dated July 23, 2021).

98) On July 22, 2021, August 2, 2021, and August 23, 2021, the Division sent the applicant copies of all timely comments (2) and objections (40) received for the application. Please inform the Division of how the applicant intends to address the jurisdictional issues raised by objectors and any concerns expressed by agencies.

99) Pursuant to Rule 1.6.2(e), please submit proof of the notice sent to all owners of record of surface and mineral rights of the affected land and the owners of record of all land surface within 200 feet of the boundary of the affected lands (including all easement owners located on the affected land and within 200 feet of the boundary of the affected lands). Proof of notice may be by submitting return receipts of a Certified Mailing or by proof of personal service.

100) Pursuant to Rule 1.6.2(1)(c) and (2), any changes or additions to the application on file in our office must also be reflected in the public review copy which was placed with the local County Clerk and Recorder. Pursuant to Rule 6.4.18, you must provide our office with an affidavit or receipt (with the revised application/adequacy response) indicating the date this was done.

This concludes the Division's preliminary adequacy review of your application. Please ensure the Division sufficient time to complete its review process by responding to these adequacy items no later than two weeks prior to the decision date, by **September 30, 2021**. If additional time is needed to respond, you must submit an extension request to our office prior to the decision date.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129 or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger
Environmental Protection Specialist

Encls: Adequacy Review of Surface Water Management, from Rob Zuber, DRMS, dated July 26, 2021.
Adequacy Review of Slope Stability, from Zach Trujillo, DRMS, dated July 23, 2021.

Cc: Ben Miller, Lewicki and Associates, PLLC
Robert L. Young Jr., Young Ranch Resource, LLC
Rob Zuber, DRMS
Zach Trujillo, DRMS
Michael Cunningham, DRMS

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

MEMORANDUM

Date: July 26, 2021
To: Amy Eschberger and Michael Cunningham, DRMS
From: Rob Zuber, DRMS
RE: Young Ranch Resource Quarry (M-2021-009),
Review of Original Application (received 8 February 2021), Emphasis on Surface Water

---

I reviewed the application in the context of Rules 3.1.5, 3.1.6, and 6.4.7. I considered potential impacts to the hydrologic balance during all phases of the operation: during mining, after mining and during reclamation, and post-reclamation.

EXHIBIT D – MINE PLAN

1. There appears to be a discrepancy on Figure 5 (page D-12). Per this figure, the WRL will have a rock surface, but it also will be planted with a native seedmix. The applicant needs to provide more detail on where the rock cap will be located and where the topsoil and plants will be placed in relation to the rock.
2. Regarding page D-13, the applicant should confirm that the height of the berm is 9 feet or less. There could be an error and this dimension should be 9 feet or more.
3. On page D-14 more detail is needed regarding the culvert mentioned in the first paragraph. Calculations for the size of the culvert should be provided, or the application should include an explanation as to why this calculation is not needed. Additional information in text and on Map G-2 should answer the following questions. What happens to the water that will flow through this culvert? Will it be diverted offsite? How will the WRL be protected from these flows?

EXHIBIT E – RECLAMTION PLAN

4. On pages E-2 to E-4, the applicant has committed to practices for reducing erosion (roughening, ripping, hydroseeding, mulch, and wood straw), but given the fact that reclaimed slopes will not be compacted (on page G-4 the application states that lack of compaction will create lower runoff conditions), there is a higher likelihood of erosion.

Therefore, the application should include a commitment to repair any rills that develop and to use additional Best Management Practices, including straw bales and wattles (aka erosion logs), as appropriate. The application should also state if access roads will be built on reclaimed slopes to assist in rill repair.

EXHIBIT G – WATER INFORMATION (AND ASSOCIATED MAPS)

5. The applicant should state if there are known seeps or springs in the vicinity of the WRL, and (if so) provide some detail on location, size, and other pertinent information related to these features.
6. As required by Rule 3.1.5(3), the mining plan needs to include a detailed discussion of the practices that will be employed along the ridgetop, at the southern and western sides of the quarry, to prevent the transport of sediment onto downgradient undisturbed areas. Specify if diversion ditches, vegetated berms, straw bales, or other BMPs will be used. This is especially necessary during the mining phase of the operation, but should also be addressed for the post-mining and post-reclamation phases.
7. On page G-1 there appears to be a discrepancy. There is text regarding "deep organic litter and sandy loam substrate" onsite that has "moderate to high" permeability. However, the text also indicates that the site has mostly group D soils (which means low permeability). Furthermore, page D-10 (bottom of page) discusses the lack of topsoil onsite. Please explain these apparent discrepancies.
8. Page G-4 (middle of page) discusses "the channel bottom created by the embankment slope where it intercepts the natural grade on either side." The applicant should explain why this "channel" is not a designed ditch. This explanation should include estimated flows using the SCS Method or other method used in standard practice of stormwater engineering. Alternatively, designs for WRL side ditches (including hydrology and hydraulics calculations) should be included in the application, and these structures should be shown on Map G-2 and other applicable maps.
9. Map G-1 contains a statement that the "quarry floor drains offsite via road." Given this, more details for the road drainage at the south end are required. If appropriate, include flow calculations, a design for a roadside ditch and any other related structures, and a discussion on how this flow will be managed to prevent erosion on the undisturbed area adjacent to the road.
10. A text box on Map G-2 states that the riprap for the buttresses at the bottom of the WRL was sized for 100-year flows. However, Exhibit G does not provide calculations for riprap size or for other design parameters for these buttresses. The applicant needs to provide this information.

11. On Map G-2 there appears to be an error with symbology. The buttress on the east side of the WRL is indicated, but there is no symbol for a buttress on the west side.
12. North Clear Creek is within 300 feet of the toe of the WRL. As required by Rule 3.1.6(1), describe how the applicant will ensure that mining operations will not impact water quality in North Clear Creek. In addition, please specify if surface water monitoring is required under any of the other permits, licenses or approvals which will be sought for the proposed mining operation.

APPENDIX 4 - HYDROLOGY

13. The applicant should explain why the SCS method was not used to estimate peak flows from the mining operation. (Only volumes are provided.)

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

Date: **July 23, 2021**

To: **Amy Eschberger**

CC: **Jason Musick, Michael Cunningham**

From: **Zach Trujillo**

RE: **Young Ranch Resource Quarry, DRMS File No. M-2021-009**
Technical Adequacy Review

Amy,

As requested I have reviewed the proposed 112c Permit Application for the Young Ranch Resource Quarry (YRRQ) submitted by Young Ranch Resource, LLC (YR) in relation to the requested and applicable Rules, Regulations and Policies. The primary focus of this review as requested is to ensure Rules 3.1.5(3), 6.5(2) and 6.5(3) of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials have been satisfied. Additionally, proposed geotechnical stability support material as part of the application was reviewed in relation to Section 30 of the Policies of the Mined Land Reclamation Board.

The YRRQ application is proposing 335.4 acres of disturbance with a permit area of 469.7 acres. The location of the site is approximately 2.5 miles northeast of Idaho Springs, CO. The site will be mined in three phases with contemporaneous reclamation occurring when possible. YR also states that up to five phases is possible but it is unclear during this review whether this is being proposed with the application as more process would be required as stated in the application. Waste material generated from mining activities will be transferred and placed east of the primary mine site in what is being named the Waste Rock Landform (WRL).

Rule 3.1.5(3)

Per Rule 3.1.5(3), [a]ll grading shall be done in a manner to control erosion and siltation of the affected lands, to protect areas outside the affected land from slides and other damage. If not eliminate, all highwalls shall be stabilized.

As part of Exhibit E of the proposed application, backfill and grading is discussed for both the YRRQ pit and the WRL. For the pit area, once benches have been completed, backfilling will commence with crushed rock, boulders and potentially with waste fines to a 2H:1V slope. Approximately 90% of the highwall of each bench will be backfilled leaving about 2' – 3' of exposed highwall remaining. While this doesn't eliminate the entirety of the highwall, stabilization is enhanced with the placement of backfill and grading to 2H:1V slope. With that said, YR has not provided any discussion regarding erosion control along the slopes of the reclaimed pit. Given the length of some of the proposed reclaimed slopes, best

1313 Sherman Street, Room 215, Denver, CO 80203 P 303.866.3567 F 303.832.8106 http://mining.state.co.us
Jared S. Polis, Governor | Dan Gibbs, Executive Director | Virginia Brannon, Director

management practices will need to be implemented to manage or prevent potential erosional features from developing.

- **Please have YR provide additional discussion on why highwalls will not be eliminated entirely and approximately 10% of highwalls will remain after backfill and grading concludes.**

- **Please have YR provide additional discussion on how they plan on grading the reclaimed pit slopes so that it is done in a manner to control erosion and siltation of the affected lands to satisfy Rule 3.1.5(3).**

During Phase I of the proposed YRRQ application, the WRL construction will begin in two separate areas. The first area being the "western area" followed by the "eastern area". Each of these areas are located in separate drainages and over the course of mining progression into Phase 2, the two areas will combine to one area. The WRL will be constructed in 50' lifts by haul truck or conveyor pending Division and Central City approval. Edge dumping will create a 1H:1V initial slope which will then be graded to a final 2.2H:1V slope by dozers. During the construction of the WRL, cross ripping will occur in 10-foot vertical spacing to prevent surface erosion and assist in infiltration. Once the WRL has been fully reclaimed, "catch ditches" will be formed by contour ripping to control surface runoff and assist in infiltration on the final slopes. While the proposed grading plan accounts for prevention of erosion along the reclaimed slopes, it appears that YR does not address the potential impacts that infiltration may have on slope stability. Additional discussion regarding this topic will be found under Rule 6.5 of this memo.

Additionally, no discussion regarding compaction during the construction of either the reclaimed slopes of the pit or WRL was discussed. Also, no discussion was found in regards to preparation of the foundation of the WRL. Ensuring the foundation of the WRL is addressed with proper material compaction prevents settlement and provides additional stability to the slope.

- **Please have YR provide additional discussion on compaction of the reclaimed slopes for both the pit and the WRL.**

- **Please have YR provide additional discussion on how the foundation of the WRL will be addressed prior to the placement of waste material.**

Rule 6.5(2) and 6.5(3)

Per Rule 6.5(2), [o]n a site-specific basis, an Applicant shall be required to provide engineering stability analyses for proposed final reclaimed slopes, highwalls, waste piles and embankments. An Applicant may also be required to provide engineering stability analyses for certain slopes configuration as they will occur during operations, including, but not limited to embankments. Information for slope stability analyses may include, but would not be limited to, slope angles and configurations, compaction and density, physical characteristics of earthen materials, pore pressure information, slope height, post-placement use of site, and information on structures or facilities that could be adversely affected by slope failure.

Per Rule 6.5(3), [w]here there is the potential for off-site impacts due to failure of any geologic structure or constructed earthen facility, which may be caused by mining or reclamation activities, the Applicant shall demonstrate through appropriate geotechnical and stability analyses that off-site areas will be protected with appropriate factors of safety incorporated into the analysis. The minimum acceptable safety factors will be subject to approval by the Office, on a case-by-case basis, depending upon the degree of certainty of soil or rock strength determinations utilized in the stability analysis, depending upon the consequences associated with a potential failure, and depending upon the potential for seismic activity at each site.

As part of YRRQ application, a geotechnical stability analysis was provided under Exhibit 6.5: Geotechnical Stability Exhibit (Geotech Exhibit). The proposed set of analyses within the Geotech Exhibit takes into consideration six general conditions of the YRRQ operation. 1) Stability of the active mined slope/benches, 2) Stability of the reclaimed mined slope/benches, 3) Stability of the WRL during construction, 4) Stability of the reclaimed WRL, and finally 5) and 6) Stability of the reclaimed mined slope/benches and reclaimed WRL under pseudo-static conditions.

While multiple scenarios are provided under the Geotech Exhibit, it is unclear to the Division on the location of the slope profiles used in each of the analyses. To ensure the critical slope(s) have been evaluated for both the pit area and the WRL, the location of the slope(s) profile are necessary.

- **Please have YR provide the location of each slope profile used in the slope stability analyses in the form of a transect line within an appropriate map or figure.**

No site specific soil or bedrock samples were gathered or tested as part of the YRRQ application and identification is based on a NRCS soil survey found in Appendix 5 – NRCS Soil Report. Material properties of the soils and bedrock used in the stability analyses are briefly discussed in the Geotech Exhibit in terms of the sources referenced. While the material properties used in the slope stability analyses are decipherable within the resultant printouts found in Appendix GS, the entirety of this information is not easily attained or mentioned within the Geotech Exhibit.

- **Please have YR include the material properties used in the stability analyses as part of the text within the Geotech Exhibit.**

As part of the design for the reclaimed slopes of the pit area as well as the WRL, infiltration is expected and encouraged as part of the surface runoff control as discussed in Exhibit E and G of the YRRQ application. However, infiltration has the potential to reduce shear strength of soils as well create excessive pore water pressure due to saturation. It does not appear this has been discussed or addressed in the slope stability analyses provided in the Geotech Exhibit.

- **Please have YR address potential impacts of water infiltration as part of the slope stability discussion and analysis for both the pit area and the WRL.**

As required by Section 30 of the Policies of the Mined Land Reclamation Board, factors of safety have been provided with the Geotech Exhibit for both static and seismic conditions. For more information regarding Section 30 requirements, please refer to Section 30 of this memo. The following table are the resulting factors of safety provided in the Geotech Exhibit:

Analysis	FoS Result
#	-
Mine Benched Slope	
1	41.61
2	54.22
3	1.93
**4	0.32
5	1.94
*6	1.72
WRL	
1	1.53
**2	0.77
3	1.54

*4	1.42

*Factor of Safety – Seismic conditions
**Surficial slope failures

It is observed that there are two slope stability analyses that indicate failure. Analysis #4 for the Mine Benched Slope and Analysis #2 for the WRL. While these factors of safety indicate a slope failure, the restraints used within these models are made to observe small surficial failures along individual bench crests or on the WRL waste material surface. These types of failures are small in nature and would be considered general maintenance items during mining and reclamation operations. They are not representative to the global stability of a slope. Discussion in regards to this topic along with maintenance has been included in the Geotech Exhibit. Global stability under static conditions for active operations are shown in Analyses #1 for both the Mined Bench Slope and WRL. All factors of safety that have been provided that represent global stability of the associated slope exceed the minimum requirements of Section 30.

While the provided analyses in the Geotech Exhibit meet the minimum requirements of Section 30, there are certain scenarios that are necessary to satisfy the Division's review that were not evaluated or provided.

- **Please have YR provide the following analyses for the following scenarios:**

    1. **Slope stability analysis for the entire <u>reclaimed</u> mined bench slope (restraints including crest and toe of slope).**

    2. **Slope stability analysis for the entire <u>reclaimed</u> mined bench slope (restraints including crest and toe of slope) under seismic conditions.**

    3. **Slope stability analysis for the entire slope (restraints including crest and toe of slope) of the <u>active</u> WRL under seismic conditions.**

    4. **Slope stability analysis for the entire slope (restraints including crest and toe of slope) of the <u>reclaimed</u> WRL.**

    5. **Slope stability analysis for the entire slope (restraints including crest and toe of slope) of the <u>reclaimed</u> WRL under seismic conditions.**

Finally, while seismic conditions were evaluated in the slope stability analyses, there was no discussion regarding the topic in the Geotech Report regarding rational to the seismic coefficients used in the associated models. It should be noted that two separate coefficients were used for the mined bench slope and the WRL. Additionally, it is unclear if the seismic coefficients used take blasting proposed during the mining operation into consideration.

- **Please provide the Division with discussion and rationale behind the seismic coefficients used in the slope stability analyses including why two separate coefficients are used between the mined bench slope and the WRL.**

- **Please provide the Division information regarding whether the seismic coefficients used in the slope stability analyses take into consideration blasting that may occur during mining operations.**

<u>Section 30</u>

The purpose of Section 30 of the Policies of the Mined Land Reclamation is to promote the orderly development of the state's natural resources while considering the industry's "standard of care" relative to Factors of Safety with the intent to:

i. Protect and promote the safety and general welfare of the people of Colorado,
ii. Ensure reclamation of lands affected by mining to beneficial use, and
iii. Aid in the protection of aquatic resources and wildlife.

Based on the information provided in the YRRQ and Table 1 of Section 30.4, factors of safety will be compared to generalized, assumed, or single test strength measurements for a critical structure. For static conditions, minimum required factor of safety is 1.5 and for seismic conditions, minimum required factor of safety is 1.3. For more information regarding factors of safety provided with the YRRQ application, please refer to Rule 6.5 of this memo.

Other Comments

As discussed in the YRRQ application, there is a fault that runs through the proposed mining area and is shown on Figure GS-1 and GS-2 of the Geotech Exhibit. Per the Geotech Exhibit, the exact fault location and orientation is not determinable until mining commences. It is expected that initial stripping in Phase I will expose any observable portion of the fault. YR states that, "[a]t that point, a geotechnical analysis of the fault and its orientation with regards to Phase I mining can be produced and its insights incorporated into the permit."

At the discretion of the lead EPS of the YRRQ and direct management, it may be appropriate to include this as a commitment in some form as part of the YRRQ application review process.

This concludes my review and comments for the proposed 112c Permit Application for the Young Ranch Resource Quarry submitted by Young Ranch Resource, LLC in relation to the requested and applicable Rules, Regulations and Policies. If you have any questions feel free to contact me.

Sincerely,

Zach Trujillo
Environmental Protection Specialist
(303) 866-3567 ext. 8164
Zach.Trujillo@state.co.us