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CUNNINGHAM HILL MINE RECLAMATION PROJECT
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May 27, 2022

Carmen Rose, Permit Lead Carmen.Rose@State.nm.us
Reclamation Specialist Mining and Minerals Division
Mining Act Reclamation Program
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Responses to agency comments for 2021 CCP update for MMD Permit No. SF002RE, LAC Minerals (USA) LLC Cunningham Hill Mine

Dear Ms. Rose:

This letter and attachments are responses to agency comments regarding revised Closeout/Closure Plan (CCP) for the LAC Minerals (USA) LLC, Cunningham Hill Mine Reclamation Project, Permit No. SF002RE. On September 11, 2021, the New Mexico Mining and Minerals Division (MMD) received a revised and updated Closure/Closeout Plan (CCP) from John Shomaker & Associates, Inc. (JSAI) on behalf of LAC Minerals (USA) LLC (LAC). Attached are response to agency comments and supplemental information to the revised CCP and pit waiver request.

A hard copy of this letter and attachments will be sent by mail. Do not hesitate to contact me at (775) 397-7215 if you have any questions or concerns regarding this report.

Sincerely,

Jennifer L Ortega

LAC Minerals (USA) LLC
Jennifer L Ortega
Health, Safety, and Environmental Superintendent
Cunningham Hill Mine Reclamation Project

ec: B Bingham, Barrick
Steve Finch, Principal Hydrogeologist-Geochemist, JSAI
Holland Shepherd, Program Manager, MARP, MMD
Joe Fox, Acting Program Manager, MECS, NMED
Kevin Myers, Senior Reclamation Specialist, MARP, MMD
Anne Maurer, Permit Lead, MECS, NMED
Gabe Wade, Assistant General Counsel, MMD
Charles de Saillan, Attorney, NM Environmental Law Center

SUPPLEMENTAL INFORMATION

Revised CCP Section 6.1 – Open Pit Reclamation Plan (page 39)

- Correction to 1st paragraph: A pit waiver request is for un-reclaimed open pit area of 19.37 acres which include 16.55 acres of open pit walls and benches, and 2.82 acres of open pit waterbody

Revised CCP Section 6.2 – Waste Rock Pile Reclamation Plan page 39

- **Attachment 1** DP-55 Waste Rock Pile Workplan submitted December 27, 2021
- **Attachment 2** WRPWP timeline (approved)

Revised CCP Section 6.5 – Growth Medium for Final Reclamation page 39

- **Attachment 3** Revised Table 6

Revised CCP Section 6.7 – Trees and Shrubs page 44

- References to One-seed juniper is to be removed from this section

Revised CCP Section 6.8.1 - grassland-revegetated vs. woodland-revegetated units of the remaining units in Permit No. SF002RE.

- **Attachment 4** Cedar creek Associates (2021) report

Revised CCP Appendix H – pit waiver justification and request responses

- **Attachment 5** Amended Appendix H

Revised CCP – applicable DP-55 permit conditions

- **Attachment 6** DP-55 renewed 11/20/2020 Section C106 Closure

Draft Financial Assurance Cost Estimates

- **Attachment 7**

LAC Minerals (USA) LLC responses to CHMRP Closure/Closeout Plan Application for Revision 20-1, Permit No. SF002RE

Responses to comments from Energy, Minerals and Natural Resources Department dated March 12, 2022

1. Figures 4 and 7 should be modified to include the access road along the southwestern edge of the open pit as "disturbed area, unreclaimed". Please describe the closeout activities (i.e., will there be any ripping, regrading, or reseeding of the access road or portions of it?) proposed for this access road, including whether it is within the proposed pit waiver area.

Response: Figure 4 is a map showing only current access roads. The road along the southwestern edge was related to open pit operations but is currently not an access road. Figure 7 shows the road on the southwestern edge of the pit as reclaimed. As described in Section 5.1, portions of the open pit have been reclaimed and will be reclaimed for maintaining source controls as required by AP-27 issued by the New Mexico Environment Department (NMED). The proposed pit waiver is for all unreclaimed disturbed areas within the Open Pit watershed as identified on Figure 7. Unreclaimed area totals 19.37 acres which include 16.55 acres of open pit walls and benches, and 2.82 acres of open pit waterbody.

As part of the AP-27 revised remediation plan (JSAI, 2011), the open pit access roads and some bench areas have been partly reclaimed by regrading, installation of stormwater controls, and covered with caliche and compacted. In addition, 21.92 acres of the open pit perimeter has been reclaimed (see Fig. 7).

2. Section 5.1 Reclamation Performance Objectives, Open Pit, page 37, bullet 3 describes further reclamation to be completed in the open pit, "Reclaim portions of the Open Pit area that will assist with source controls, and sustain water-quality standards (see Fig. 7). Allow for natural revegetation of inaccessible pit walls and benches, such as what has already occurred over the last 25 years". Please discuss why LAC has changed this most recent submittal to not include installing wire mesh on the highwall along the eastern pit perimeter access road. This inquiry is echoed in NMED's comment letter, specific comment number 1.

Response: Installation of wire mesh was part of the original 1996 CCP. The eastern pit highwall is part of the disturbed unreclaimed area request for Pit waiver. The purpose of the wire mesh was for safety and not reclamation; however, LAC is concerned that the wire mesh cannot be safely installed. As part of AP-27 reclamation, the access road was reshaped for installation of stormwater controls and a berm was put in place to contain rock fall.

3. Section 5.1 Reclamation Performance Objectives, Open Pit, page 37: In LAC's response letter to MMD's original comments, dated May 21, 2021, LAC responded to comment 11, "An alternative water source will be provided within our allowable use of water rights",

but no alternative water source is proposed in the Application Amendment. NMDG&F continues to recommend providing an alternative water source to discourage wildlife from accessing the pit, as discussed in their comment letter.

Response: The open pit water body currently meets NMED standards for wildlife, and it is required by AP-27 to meet water quality standards for wildlife. LAC believes this is an AP-27 issue addressed by the Contingency Plan in Appendix B Section 3.1. Nevertheless, LAC will work with NMG&F to develop an alternative water source for wildlife.

4. Section 6.2, Reclamation Plan, Waste Rock Pile, page 39 does not include any information on the currently planned reclamation activities on the waste rock pile. These activities are outlined in the conditionally approved Waste Rock Pile Work Plan ("WRPWP"), submitted to MMD and NMED on December 27, 2021. Please submit, for incorporation into the CCP, the conditionally approved WRPWP and note that MMD will incorporate any future WRPWP submittals into the CCP. This is also addressed in NMED's Updated CCP comment number 2.

Response: The approved WRPWP was submitted prior to this version of the CCP. The WRPWP is provided as supplemental information to Section 6.2 (**Attachments 1 and 2**).

5. Table 6, page 41 does not include any growth medium for the open pit unit, although some reclamation around source controls, the RO ponds, and access roads is proposed in Section 6.7. Please update the table to incorporate these reclamation activities. This table should also be updated to include the anticipated volume of growth medium for repairs on the waste rock pile, as described in the WRPWP.

Response: The requested Pit Waiver is for the disturbed unreclaimed vertical pit walls and benches. Growth medium maybe in conflict with sources control measures required by AP-27, therefore it is not proposed for the pit walls and benches included in the Pit Waiver request. The WRPWP growth medium requirements are included in the revised Table 6 (**Attachment 3**).

6. Section 6.5, *Reclamation Plan, Growth Medium for Final Reclamation,* page 41 should be updated to include results of the soils analysis of the stockpiled cover material required under the WRPWP.

Response: The work related to the WRPWP is currently underway, and the results will be included in the CCP as it becomes available. Soil analysis will be included in engineering plan for WRP and submitted to MMD.

7. Section 6.7 *Reclamation Plan, Trees and Shrubs*, page 44: one-seed juniper is referenced in the text but not included in Table 9. MMD suggests removing one-seed juniper from the text altogether.

Response: References to One-Seed Juniper is removed from the CCP as corrected in the attached supplemental information

8. Section 6.8.1 Reclamation Plan, Revegetation Success Monitoring, Proposed Revegetation Standards, page 47, bullet number 3 includes a shrub/tree density standard for non- grassland revegetated units. Please provide a map showing grassland-revegetated vs. woodland-revegetated units of the remaining units in Permit No. SF002RE.

Response: Vegetation results can be referenced from Cedar Creek Associates reports submitted every three years to MMD and referenced in the CCP. The Cedar Creek Associates (2021) report is presented as **Attachment 4**.

9. Please include a timeline of the work described in the WRPWP for repairs on the waste rock pile in Section 8.0, Reclamation Schedule.

Response: The approved timeline is provided as **Attachment 2**.

10. Appendix H, Section 1.3 states, "*LAC is not requesting a change to the Post Mining Land Use (PMLU). The CHMRP Open Pit PMLU of wildlife habitat and livestock watering will be maintained by meeting applicable Open Pit water-quality standards established by the New Mexico Water Quality Control Commission (NMWQCC) and requirements defined in 19.10.5.507.B(2) NMAC.*" This is also stated in Section 5.1 *Reclamation Performance Objectives, Open Pit,* "*The PMLU will remain the same*". To clarify, a waiver for the open pit would waive LAC's requirement of achieving a post-mining land use or self-sustaining ecosystem, in accordance with 19.10.5.507 NMAC. If the pit waiver is approved, MMD would not consider the open pit unit wildlife habitat or a self-sustaining ecosystem. However, MMD may condition a waiver to ensure LAC is reclaiming the open pit in a manner that reduces environmental impacts and addresses public health and safety.

Response: The open pit water body is included as the part of the area for Pit Waiver request. See response to MMD comment 1 and revised Appendix H Pit Waiver request (**Attachment 5**).

11. Appendix H, Figure 2 does not clearly show what area is proposed for the waiver. LAC must provide a modified Figure 2 that illustrates the acreage proposed to be waived from surface reclamation in the pit, including any water bodies, highwalls, benches, staging areas, pumping facilities, and access roads within the pit unit.

Response: See revised Appendix H and Figure 2 (**Attachment 5**).

12. Appendix H, Section 2.3.1 mentions the possibility of filling the pit using groundwater wells. LAC must provide more detail on the feasibility of locating and transferring water rights to partially fill (to 6945 ft amsl) the open pit by pumping groundwater. Specifically, the detail should provide more explanation about the nearest high yield wells (on and off-site sources), uncertainty of water rights transfer or leasing, and infrastructure needed if piped from a source capable of a 10-year at 100 gpm or some other more rapid fill scenario.

Response: On site wells and their capacity are discussed in Section 2.3.1, and as mentioned in Table 2 of the report, all onsite wells are permitted with existing water right permits held by LAC. To fully address MMD comment 12, LAC included a discussion regarding water rights availability and high-capacity wells within a five-mile radius of the open pit or reference previous studies in support of MMD Permit No. SF002RE that evaluated availability of water sources for filing the pit in the revised Appendix H (**Attachment 5**).

13. Appendix H, Section 3.1 mentions lack of annual rain without providing a graph or table. Please provide a graph of annual historical precipitation at the site.

Response: Annual historical precipitation at the site has been extensively evaluated by JSAI (2011) and JSAI (2020) as referenced in Section 3.1. Also please see CCP Appendix E, Table 1 Summary of annual precipitation and measured Upper Cunningham Gulch stormwater diversions. Annual precipitation data has also been included in the revised Appendix H (**Attachment 5**).

14. Appendix H, Section 3.2 considers one on-site (waste rock) and one offsite (Moriarty quarry) source of backfill. Provide discussion of other potential clean on-site sources and their proposed use in reclamation of the pit. Additionally, provide more detailed design basis information, even if only conceptual, such as full backfill plus swell factor when estimating volume need to fill the entire pit with positive drainage of stormwater.

Response: LAC is not aware of any other potential clean on-site sources as mentioned in first sentence of the second paragraph of Section 3.2. More detailed design basis information has been provided as "conceptual" in the revised Appendix H (**Attachment 5**).

15. Appendix H, Section 3.2 Provide at least one scenario(s) of a partial backfill in addition to the full backfill scenario of the pit and evaluate each scenario in accordance with 19.10.5.506.C. Include details about stormwater management in partial/full backfill scenarios. Provide more text and data that supports the pit waiver from achieving a post-mining land use or self-sustaining ecosystem achievement based on the technical feasibility, economic feasibility, and/or environmental soundness of each partial and full backfilling scenario.

Response: LAC expanded on the discussion in revised Appendix H, Section 3.2 to address MMD comment 15 (See **Attachment 5**).

16. Appendix H, Section 3.2 Please include a more detailed cost estimate in Table 1 and include cost estimates for any additional pit filling scenarios as requested in the general comments and specific comment 7 in this letter.

Response: LAC provided the detailed cost estimate analysis supporting Appendix H Table 1 in revised Appendix H (**Attachment 5**).

17. Appendix H, Section 4.1 The surface water standards for the open pit are mentioned in Appendix E and in the main body of the CCP, but are not outlined in Appendix H. Please confirm these standards or cite other sections of the document in Appendix H.

Response: The surface water standards have been added to revised Appendix H (**Attachment 5**) and referenced with the main body of the CCP, Appendix A, Table 1, and Appendix E Table 3.

18. Appendix H, Section 4.2 A summary of remaining closeout/closure measures should be included. Provide details of what reclamation work remains and reference the CCP for reclamation work that needs to be done for facilities related to nanofiltration, reverse osmosis ponds, ARD ponds, waste rock pile repairs, etc.

Response: These are discussed in Section 4.2, and further discussed in Appendix B Section 2.0, and in greater detail in Appendix B of CCP Appendix B. This discussion has been added to the revised Appendix H (**Attachment 5**).

19. Appendix H, Section 5.2 Provide an estimated time of when a fence would be installed to protect humans and wildlife from the open pit. Please review NMDG&F's attached comment letter and respond to their recommendation on installing more protective fencing than what is currently proposed in the CCP.

Response: LAC is current working on obtaining the budget to implement this task next year, and will notify the MMD and NMDG&F when the budget has been secured and the project will be implemented.

20. Appendix H, Section 6.0 states that LAC is requesting a waiver for 16.55 acres of exposed vertical pit walls in the open pit, but not the pit lake itself which consists of 2.82 acres according to Figure 2. However, as previously stated in a comment letter from MMD on April 21, 2021, NMDG&F does not consider the pit lake wildlife habitat. If LAC does not consider the pit lake part of the waiver request, please discuss why LAC is only requesting a pit waiver for the exposed pit walls but not the pit lake.

Response: See response to MMD comment 1

21. Appendix H, Section 6.0 Overall, the argument justifying a pit waiver needs a conclusion rather than referencing Section 3.

Response: A conclusion has been provided in the revised Appendix H (**Attachment 5**)

Responses to comments from State of New Mexico Department of Cultural Affairs Historic Preservation Division; Richard Reycraft

According to our files, there are no cultural resources listed on either the National Register of Historic Places (NRHP) or the State Register of Cultural Properties in the modified permit area. There are also no known cemeteries or other burial grounds. Based on this information, this permit modification will have no adverse impacts to cultural resources listed on the National or State Registers.

In a prior consultation for this permit revision project (HPD log#114059) The State Historic Preservation Officer (SHPO) recommended that a cultural resources survey be conducted on any undisturbed portions of the permit area where new ground disturbance would occur for the permit revision. Responding to our comments in a letter to the Mining and Minerals Division, dated May 21, 2021, John Shomaker & Associates Inc. stated that "If any new disturbances occur a survey will be conducted". The SHPO appreciates the commitment to a survey for any new ground disturbance associated with this permit revision.

This survey should be performed by a qualified professional to determine if any historic or archaeological properties are present and if so, to provide documentation of those resources to our office. This information can then be used to evaluate the National Register of Historic Places eligibility of any resources identified during the survey and determine project effects on those resources. A list of state permitted archaeologists and archaeological firms are available from this office upon request or can be downloaded from our web site at:

http://www.nmhistoricpreservation.org/documents/consultants.html

Response: noted

New Mexico Office of the State Engineer, Hydrology Bureau, Christoper Angel

Re: Comments on Updated Closure/Close Out Plan and Financial Assurance, Permit Revision 20-1, Permit No. SF0002RE, Cunningham Hill Mine

1) The NMOSE D6 will need to be contacted to determine if the appropriate permits and/or water rights are obtained and are in place to account for the injection of the groundwater.

2) The NMOSE D6 will need to be contacted to determine and/or obtain the appropriate permits and/or water rights to account for evaporative losses.

3) NMOSE D6 needs to be contacted to determine if water rights are present for the pumping of water out of the open pit, through the membrane filtration and then back into the open pit or into the evaporation pond.

4) NMOSE D6 needs to be contacted prior to performing construction activities that require water, including but not limited to dust control, and soil compaction.

5) NMOSE D6 needs be contacted prior if water is needed for irrigating any of the seedings, trees and shrubs prior to irrigating

6) NMOSE D6 needs to be contacted prior to diverting any stormwater from the closing of the evaporation ponds or to determine if any additional water rights or points of diversion are necessary.

7) NMOSE D6 needs to be contacted prior to plugging or installing any new monitor or recovery wells that encounters water.

Response: Thanks for the comments. District 6 has been notified of all CHMRP site activities and appropriate water right permits have been obtained to cover all water diversion and consumptive uses related to the CHMRP. Please see CCP Table 2 which list all CHMRP water right permits issued by the NMOSE. LAC will provide copies of existing NMOSE issued water right permits to the Hydrology Bureau or Water Right Division District 6, if the NMOSE files are missing or incomplete. LAC will continue to abide by the NMOSE rules and regulations and notify District 6 of any permits required for the seven items listed above.

Responses to Comments from State of New Mexico Department of Game & Fish
Matt Wunder

RE: ***Closure/Closeout Plan Update, Permit Revision 20-1, LAC Minerals LLC, Cunningham Hill Mine, Permit No. SF002RE; NMDGF No. NMERT-1501***

In the previous closure/closeout plan, LAC requested that the Post Mine Land Use (PMLU) for the open pit be designated as Wildlife Habitat and stated that the pit lake will meet MMD's definition of a "Self-sustaining Ecosystem" (SSE). In the current, updated closure/closeout plan, LAC is now requesting a pit waiver for SSE. This change was based on a report prepared by JSAI at the request of MMD to evaluate the open pit and its ongoing water quality issues (Appendix E). The report concluded that "Open pit pool pH mitigation has been ongoing since 1996, and it is unknown if Acid Wall Seeps (AWS) source controls will eliminate the need for re- occurring pH mitigation" and that the "remaining exposed pit walls and benches are considered to not achieve the Post Mine Land Use of Wildlife Habitat". The Department concurs that a pit waiver is the most appropriate option if reclamation by backfilling the pit with clean material is deemed technically infeasible. The Department maintains that the hydro-geological complexities at the site and associated inherent uncertainties will continue to make predicting long-term future pit lake water quality extremely difficult. In addition to AWS, the long-term potential effects of climate change and periods of prolonged drought could also lead to hazardous water quality conditions for wildlife as a result of evapoconcentration of trace elements in the pit lake water.

In Section 6.1, the current closure/closeout plan states that, in order to prevent humans and wildlife from entering the pit lake area, "an 8-ft-high chain-link fence buried 2 ft below ground, where practicable, will be installed around the open pit perimeter". As stated above, the plan appears to indicate a total fence height of eight feet with only six feet being above ground. In order to exclude deer and elk, the above ground fence height should be a minimum of eight feet, in addition to the two feet of fence extending below ground to deter animals from burrowing under, for a total of ten feet. The Department also recommends that the bottom two feet of the above ground fence include a permanent solid or scored plastic or metal barrier, potentially with a horizontal lip at the top[1-3], to exclude smaller animals from accessing the pit lake. The Department reiterates that LAC should provide some type of alternative, clean water sources that would help attract wildlife away from the pit lake.

The current pit lake water quality meets the standards for wildlife, provided that pH control measures are maintained. If pH control measures cannot be maintained or become inadequate such that the pit lake's water quality declines to the point of being hazardous to wildlife, additional measures to exclude or deter birds and bats from accessing the pit lake may become necessary.

During the most recent site inspection in December, 2021, at collection ponds A and B, it was observed that sections of the protective netting, installed to prevent birds and bats from contacting the toxic Acid Rock Drainage (ARD) water, have not been repaired and continue to sag below water level. The Department has previously requested that LAC adequately repair and redesign the protective netting to prevent wildlife from accessing the toxic ARD water (e.g., previous letter from the Department dated 12 March 2021, NMDGF No. NMERT-864). Extruded plastic, knit or woven netting material is preferred. Monofilament nylon netting should not be used due to its tendency to ensnare wildlife and cause injury or death. All materials should be resistant to corrosion and ultraviolet radiation. The Department recommends a mesh size of 3/ th inch to exclude smaller animals. If the potential for snow loading needs to be addressed, a maximum mesh size of 1½ inches is acceptable. Netting must be held taut and securely fastened to a rigid and adequately supportive frame, or cross-hatched wire cables, to prevent sagging. Regular inspection and maintenance are critical to repair holes and to restore tension to prevent sagging. A site inspection should be conducted as soon as possible following heavy snow or high wind events to assess netting for damage or to clear excessive snow loading if necessary. The Department is available for consultation regarding netting options for site- specific pond sizes and containment needs. The bottom two feet of the above ground chain link perimeter fence should incorporate a permanent solid or scored plastic or metal barrier, potentially with a horizontal lip at the top, to exclude smaller animals from accessing the toxic ARD containment ponds.

Response: Open pit pool pH controls have been self-maintained since source controls were implemented in 2016 with the addition of lime to accessible benches and roads. LAC will consider an alternative source of water for wildlife, in the event the NMWQCC standards for wildlife cannot be maintained for the open pit pool. Please see CCP Appendix B Section 2.0 regarding measures to protect wildlife. Also see responses to MMD comments.

Issues with Collection Ponds A and B are noted, and LAC has been proactively mitigating these issues.

Responses to Comments from New Mexico Environment Department Ground Water Quality Bureau;
Amber Maurer, Mining Environmental Compliance Section
Alan Klatt, Surface Water Quality Bureau
Sufi Mustafa, Air Quality Bureau

Subject: NMED Review and Comments, Revision 20-1, Updated Closure/Closeout Plan and Financial Assurance, Cunningham Hill Mine, LAC Minerals (USA), LLC, Santa Fe County, New Mexico Mining Act Permit No. SF002RE

Mining Environmental Compliance Section (MECS)

General Comments

1. The NMED-issued discharge permit (DP-55) for this mine was renewed and modified on November 20, 2020. There are numerous places in the Updated CCP that indicates that the permit renewal is pending, but this permit has been renewed and is in effect for five years. The Updated CCP should be updated accordingly. DP-55 regulates groundwater abatement associated with the Waste Rock Pile and the Dolores Gulch Acid Rock Drainage collection and treatment system. DP-55 also regulates groundwater abatement associated with the Cyanide Residue Pile plume, but this is not addressed as part of the Updated CCP because this part of the facility has been released from the Mining Act. The Cyanide Residue Pile plume will continue to be regulated under DP-55.

Response: Noted. The CCP references the current DP-55 permit issued November 20, 2020 in Table 2, pg. 9.

2. The NMED-issued abatement plan (AP-27) for this mine regulates abatement of the pit lake water body and groundwater around the Open Pit. AP-27 needs to be updated to reflect updates to the applicable surface water abatement standards for the pit lake water body in 20.6.4.99 NMAC. In addition, the costs for abatement activities also will need to be addressed as part of an update to AP-27.

Response: Noted.

Specific Comments:

MECS provided comments on the Updated CCP on March 19, 2021. Many of the comments in the March 19, 2021 letter are still relevant, as they were not adequately addressed in the permittee's May 21, 2021 response to comments (RTC) or the Updated CCP. These are as follows:

1. Open Pit – Comment 1 RTC – The pit waiver does not address source controls in the Open Pit that can be completed at this time. This includes reclamation of bench areas around the

Open Pit, placement of wire mesh on certain portions of the pit walls, and surface reclamation of an area on the north side of the Open Pit. Please verify if these areas are included in the Updated CCP, and if so, in what sections of the Updated CCP are they located.

Response: With a MMD pit waiver request, it was implied by the Agencies that any further reclamation was to be for maintaining open pit pool water quality standards for wildlife and livestock, and groundwater discharges, which would be addressed by an updated AP-27.

2. Open Pit– Comment 2 RTC – The pit waiver does not address reclamation of the Open Pit water body access corridor or the West side access road. Please indicate when the reclamation of these features will be completed.

Response: Please see response to MMD comments

3. Waste Rock Pile RTC – NMED received an updated Waste Rock Pile Work Plan (Work Plan) and Response to Comments from the applicant on December 27, 2021. NMED and MMD are in the process of reviewing the Work Plan and will provide comments directly to the applicant on the Work Plan. The comments made regarding reclamation of the RO Ponds still stand.

Response: Noted.

4. Other Components, Updated CCP RTC– Several additional components of the Updated CCP are almost exclusively related to the abatement requirements of AP-27 and DP-55, and the requirements of the WQCC regulations. This includes Appendix B, Updated Contingency Plan, and Appendix E, Open Pit evaluation report. NMED will provide comments on these two Appendices directly to the applicant and incorporate any necessary changes to AP-27 and DP-55 as appropriate. NMED will copy MMD on all comments provided to the applicant related to the appendices.

Response: Noted.

5. Financial Assurance - The Updated CCP does not include a proposed cost estimate for the proposed reclamation activities. Following agreement on the scope of required surface reclamation activities that need to be completed prior to completion of water quality abatement, the applicant is required to provide a reclamation cost estimate to the Agencies for review. Financial assurance for these activities will be held jointly by NMED and MMD. In addition, NMED has requested an updated cost estimate for abatement activities associated with AP-27 and DP-55 in the recent renewal of DP-55, contingent on approval of the Updated CCP. NMED recommends scheduling a meeting with the applicant prior to submittal of the Updated CCP cost estimate to ensure agreement between the Agencies and the applicant on what components should be included in each cost estimate.

Response: Noted. Draft financial assurance is included as Attachment 7.

The following comments are specific to the Updated CCP:

1. Section 6.1 – This section states that 14.60 acres of disturbance are included in the pit waiver. This also needs to include the acreage associated with the open pit water body.

Response: See comments to MMD.

2. Section 6.2 – The applicant discusses corrective actions that need to take place on the Waste Rock Pile. The applicant submitted an updated Waste Rock Pile Work Plan (WRPWP) on December 27, 2021 to both NMED and MMD for review and approval. The agencies are still in the process of reviewing this work plan, but the description of corrective actions on the Waste Rock Pile in Section 6.2 are not consistent with what is proposed in the WRPWP. Please address these inconsistencies in the Updated CCP. The WRPWP should be used as the basis for Section 6.2.

Response: The approved workplan has been attached to supplement CCP Section 6.2.

3. Section 6.3 – Pursuant to Condition C.106A in DP-55, closure of the ARD treatment ponds can commence when they are no longer required as a component of the groundwater abatement systems. DP-55 requirements are not referenced in this section.

Response: DP-55 requirements are included in the attached CCP supplemental information.

4. Appendix H – Open Pit Waiver Justification Report – In general, NMED supports a pit waiver. The pit lake water body and groundwater surrounding the Open Pit will continue to be regulated under AP-27, which may require perpetual water treatment of the open pit water body in order to meet abatement water quality standards. NMED recognizes that additional source control measures can be taken (see Comment 1 under the RTC section above) to improve water quality conditions in the Open Pit. NMED also acknowledges that reclamation of the Open Pit high walls is not feasible. A pit waiver will release the Open Pit from the Mining Act and allow for continued regulation under the Water Quality Act pursuant to AP-27. That being said, additional justification is needed in **Appendix F** to explain the need for a pit waiver. NMED understands that the reason for a pit waiver is because the pit lake water body will not reach the elevation in the Open Pit as previously modeled. The original pit lake model indicated that the acid generating pit walls would be inundated by the pit lake, thereby causing reducing conditions in the pit lake which would help to minimize acid generation, sulfate and total dissolved solids leachate. Given the pit lake will not significantly increase in elevation and the pit walls cannot be reclaimed, abatement of the pit lake water body and surrounding groundwater will continue into the future.

Response: CCP Appendix F is the closure plan for the RO Evaporation pond, NMED must be referring to Appendix H. See **Attachment 5** Revised Appendix H.

NMED Summary Comment

NMED is withholding issuance of the environmental determination pending satisfactory applicant response to the comments herein.

Response: Noted

Response to Comments from New Mexico Environment Department Surface Water Quality Bureau; Alan Klatt

Request for Review and Comment, Cunningham Hill Mine, Updated Closure/Closeout Plan and Financial Assurance, Revision 20-1, Santa Fe County, New Mexico Mining Act Permit No. SF002RE

SWQB reviewed the updated Closure/Closeout Plan (CCP) dated October 2021. LAC incorporated and addressed SWQB's previous comments dated March 16, 2021 regarding the revised CCP dated October 2020. LAC included a request for a pit waiver that is subject to 19.10.5.507.B NMAC in the October 2021 CCP. The open pit lake and surrounding groundwater are subject to AP-27 and 20.6.2.4103 NMAC. SWQB will continue to work with GWQB to ensure that the appropriate surface water standards are established and achieved through AP-27.

Response: Thank you, noted

Response to Comments from New Mexico Environment Department Air Quality Bureau, Sufi Mustafa

Re: Request for Review and Comment, Revision 20-1, Updated Closure/Closeout Plan and Financial Assurance, Cunningham Hill Mine, LAC Minerals (USA), LLC, Santa Fe County, New Mexico, Mining Act Permit No. SF002RE

Air Quality Requirements

The New Mexico Mining Act of 1993 states that "Nothing in the New Mexico Mining Act shall supersede current or future requirements and standards of any other applicable federal or state law." Thus, the applicant is expected to comply with all requirements of federal and state laws pertaining to air quality.

20.2.15 NMAC, Pumice, Mica and Perlite Processing. Including 20.2.15.110 NMAC, Other Particulate Control: "The owner or operator of pumice, mica or perlite process equipment shall not permit, cause, suffer or allow any material to be handled, transported, stored or disposed of or a building or road to be used, constructed, altered or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne."

Paragraph (1) of Subsection A of 20.2.72.200 NMAC, *Application for Construction, Modification, NSPS, and NESHAP - Permits and Revisions*, states that air quality permits must be obtained by:

"Any person constructing a stationary source which has a potential emission rate greater than 10 pounds per hour or 25 tons per year of any regulated air contaminant for which there is a National or New Mexico Ambient Air Quality Standard. If the specified threshold in this subsection is exceeded for any one regulated air contaminant, all regulated air contaminants with National or New Mexico Ambient Air Quality Standards emitted are subject to permit review."

Further, Paragraph (3) of this subsection states that air quality permits must be obtained by:

"Any person constructing or modifying any source or installing any equipment which is subject to 20.2.77 NMAC, *New Source Performance Standards*, 20.2.78 NMAC, *Emission Standards for Hazardous Air Pollutants*, or any other New Mexico Air Quality Control Regulation which contains emission limitations for any regulated air contaminant."

Also, Paragraph (1) of Subsection A of 20.2.73.200 NMAC, *Notice of Intent*, states that:

"Any owner or operator intending to construct a new stationary source which has a potential emission rate greater than 10 tons per year of any regulated air contaminant or 1 ton per year of lead shall file a notice of intent with the department."

The above is not intended to be an exhaustive list of all requirements that could apply. The applicant should be aware that this evaluation does not supersede the requirements of any current federal or state air quality requirement.

Response: Noted

Fugitive Dust

Air emissions from this project should be evaluated to determine if an air quality permit is required pursuant to 20.2.72.200.A NMAC (e.g. 10 lb/hour or 25 TPY). Fugitive dust is a common problem at mining sites and this project will temporarily impact air quality as a result of these emissions. However, with the appropriate dust control measures in place, the increased levels should be minimal. Disturbed surface areas, within and adjacent to the project area, should be reclaimed to avoid long-term problems with erosion and fugitive dust. EPA's *Compilation of Air Pollutant Emission Factors, AP-42, "Miscellaneous Sources"* lists a variety of control strategies that can be included in a comprehensive facility dust control plan. A few possible control strategies are listed below:

Paved roads: covering of loads in trucks to eliminate truck spillage, paving of access areas to sites, vacuum sweeping, water flushing, and broom sweeping and flushing.

Material handling: wind speed reduction and wet suppression, including watering and application of surfactants (wet suppression should not confound track out problems).

Bulldozing: wet suppression of materials to "optimum moisture" for compaction. Scraping: wet suppression of scraper travel routes.

Storage piles: enclosure or covering of piles, application of surfactants.

Miscellaneous fugitive dust sources: watering, application of surfactants or reduction of surface wind speed with windbreaks or source enclosures.

Response: Noted

Recommendation

The Air Quality Bureau has no objection to revised CCP and financial assurance.

This written evaluation does not supersede the applicability of any forthcoming state or federal regulations.

Response: Thank you, noted

Attachment 1.

Revised CCP Section 6.2 – Waste Rock Pile Reclamation Plan page 39
DP-55 Waste Rock Pile Workplan submitted December 27, 2021

LAC
MINERALS (USA) LLC
CUNNINGHAM HILL MINE
RECLAMATION PROJECT
582 COUNTY ROAD #55
CERRILLOS, NM 87010
TELEPHONE: 505.471.0434

December 27, 2021

CERTIFIED MAIL – RETURN RECEIPT REQUESTED
CERTIFIED NO. 7009 0960 0000 8419 0898

Mr. Brad Reid
New Mexico Environmental Department
Groundwater Quality Bureau
1190 South St. Francis Drive
Santa Fe, NM 87502

RE: Response to Condition C101.D, Waste Rock Pile Workplan
Discharge Permit 55 (DP-55)
Cunningham Hill Mine Reclamation Project

Mr. Reid,

On September 9, 2021, LAC Minerals USA LLC (LAC) received a letter in response to a request for approval for the Waste Rock Pile (WRP workplan submitted on April 12, 2021. In response to comments received from New Mexico Environmental Department and Energy, Minerals and Natural Resources Department, LAC has prepared the enclosed updated workplan for your approval.

Should you have any questions or require further information, you can contact me at (775) 385-6411 or at jennifer.ortega@barrick.com.

Sincerely,

Jennifer L Ortega
Health, Safety and Environmental Superintendent

Enclosure

ec: Clark Burton, LAC
Kevin Hamatake, LAC
Daniel Lattin, LAC
Brad Bingham, LAC
Carmen Rose, NMED
Ann Mauer, NMED
Friends of Santa Fe County

RE: Response to Condition C101.D, Waste Rock Pile Workplan, Discharge Permit 55 (DP-55), Cunningham Hill Mine Reclamation Project

On May 7, 2021, LAC Minerals USA LLC (LAC) received a letter in response to a request for approval for the Waste Rock Pile (WRP) work plan submitted on April 12, 2021. On September 9, 2021, NMED & EMNRD provided conditional approval contingent upon LAC responding to 6 joint agency comments. On October 12, 2021, LAC provided a letter responding to NMED & EMNRD September 9th comments. In response to the verbal feedback from agencies, LAC has prepared the following revised workplan, which incorporates response to agency comments for your approval.

1 Background

The Cunningham Hill Mine Reclamation Project (Site) is owned by LAC Minerals USA LLC (LAC) , a subsidiary of Barrick Gold Corporation and is regulated by NMED pursuant to Discharge Permit 55 (DP-55) and Abatement Plan 27 (AP-27). Areas covered under DP-55 and AP-27 are in an un-surveyed portion of Township 13 North, Range 8 East and an un-surveyed portion of Township 13 North, Range 7 East in Santa Fe County, New Mexico.

The Waste Rock Pile (WRP) was created during the Cunningham Hill Mine open pit mining and heap-leach operations between 1979 and 1987 and contains sulfide-bearing overburden removed from the Cunningham Hill Mine open pit. During 1991, Acid Rock Drainage (ARD) emerged at the toe of the un-reclaimed WRP. ARD was collected and pumped back to the top of the un-reclaimed WRP until an interceptor wall and french drain collection system were installed in 1992. Intercepted ARD collected at the interceptor wall was piped to two HDPE lined collection ponds for managing ARD flows.

To prevent further generation and discharge of ARD to Dolores Gulch, reclamation of the WRP was performed between 1992 and 1996, and included re-contouring, addition of lime, placement of soil cover, construction of 5,000 ft of geosynthetic lined groin storm-water channels, and re-vegetation. Comparison of pre-development topography and post-reclamation topography shows that the WRP covers an area of approximately 72 acres, has an average depth of 60 ft, and a total volume of approximately 7 million cubic yards.

1.1 Waste Rock Pile Reclamation, 1992 to 1996

The surface of the WRP was filled and re-contoured in 1992 to achieve a 3H:1V slope with benches. Benches on the north slope were constructed at intervals of approximately 35 vertical feet and graded to drain to the geosynthetic lined rip-rap channel along the east groin of the Waste Rock Pile. Approximately 300,000 cubic yards (yd^3) of rock fill material sourced from upper Cunningham Gulch were added to the Waste Rock Pile for re-contouring.

Approximately 8 to 10 inches of lime was applied to the re-contoured surface, followed by 18 inches of imported cover soil, spread evenly across the Waste Rock Pile. This cover was applied in two “lifts.” The lower lift consisted of 6 to 8 inches of caliche subsoil that was a coarser material high in natural lime, while the upper lift consisted of 10 to 12 inches of topsoil composed of a sandy-clay loam material. In 1995, an additional 19,800 yd^3 of cover soil was added to the north-slope area to improve storm-water runoff from the benches and replace eroded cover soil.

Approximately 13,300 tree and shrub seedlings were planted in 1994, and reclamation of the WRP was completed in 1996 when an additional 2,500 trees were planted along its north slope.

2 History of Improvements and Modifications:

2.1 Earthen Water Bars 2014

In 2014, to further reduce contact water, earthen water bars were added to the access road on the west side of the WRP. The 1-foot-high earthen water bars were installed at a 30° angle to divert stormwater away from the WRP into the natural drainage on the west groin.

2.2 Stormwater Collection System 2015

In April 2015, a stormwater collection system was constructed at the east end of four WRP benches (DBSA "As-Built Report, Stormwater Control Facilities and ARD Treatment Pond" May 15, 2015). The purpose of the system is to minimize infiltration of stormwater on the benches and at the east groin channel. The collection system was designed to capture stormwater flowing along the benches, place it in a pipeline, and convey it by gravity to a location downstream of the interceptor wall.

2.3 Waste Rock Pile Access Road 2015

In 2015, caliche was placed and compacted on approximately 1,000 ft of the WRP access roads at an average depth of 4 inches. Storm water controls were installed to reduce road maintenance and help preserve caliche on the road surface.

3 2019 JSAI Cover Evaluation and Recommendations

In response to increased ARD flows observed in the spring of 2019, John Shomaker & Associates, Inc (JSAI) was contracted to conduct an investigation and make recommendation to improve the facility performance and reduce ARD flows. The investigation included cross-sectional surveys of the East Groin drainage channel as well as a cover survey to assess the thickness of the cover on the north slope between the benches.

3.1 Key Observations

- Cover material has eroded in select areas of the North Slope resulting in rills in need of repair. Twenty-four soil borings were characterized across the North Slope of the WRP, with soil cover depths ranging from 6 to 32 inches with an average depth of 15 inches.
- Water bars on the west side of the North Slope are in good condition and appear to be working as designed.
- The storm-water benches on the North Slope are relatively flat and do not promote good drainage.
- The East Groin Drainage Channel geosynthetic clay liner (GCL), underlying the rip-rap channel, is in poor condition. The GCL was intended to prevent infiltration of surface water which runs off the WRP North Slope. There are observed holes in the liner, and the presence of moisture underneath the liner indicates it is no longer functioning as designed.

3.2 JSAI Recommendations

3.2.1 North Slope Cover

The thickness of the cover material is more important for the benches than the slopes due to the benches conveying storm water from the slopes and having relatively flat gradients that allow for infiltration of storm water. However, additional cover material should be installed where rills have locally eroded cover material from the slopes. The selection of replacement cover material should incorporate a combination of soil, angular aggregate, and mulch to minimize erosion and reestablish vegetation.

3.2.2 East Groin Drainage Channel

Repairs to the East Groin drainage are recommended to prevent infiltration of surface water into the WRP.

4 Waste Rock Pile Work Plan

4.1 East Groin Repair (completed)

In response to the recommendations made by JSAI, LAC initiated engineering of the East Groin repairs and submitted a proposed plan to inject chemical grout to seal the drainage channel and prevent infiltration. The work plan was submitted to NMED for approval on October 26, 2020. NMED approved the East Groin work plan on October 28, 2020, followed by approval from the Mining and Minerals Division (MMD) on November 2, 2020. Contractor proposals were solicited, and East Groin repair work commenced on Dec 14, 2020. Work was completed in April 2021.

Repairs completed on the East Groin are expected to significantly decrease surface water infiltration and the corresponding ARD flows at the interceptor wall.

4.2 North Slope

LAC Minerals and its contractors will visually inspect the benches and mark areas where rills require repair consistent with Site-Wide Performance Criteria SW-2: Erosion Control. Cover soil will be staged on the benches and rills on the North Slope will be repaired utilizing a skid-steer or similar equipment to complete repairs near the bench. Rills not accessible from the bench will be repaired by hand. Material will be compacted with hand tools and erosion control fabric will be deployed to minimize erosion until vegetation is reestablished on the slope.

Consistent with JSAI recommendations, no additional cover soil is proposed to be placed on the slopes, beyond the repair of rills. As indicated in the evaluation by JSAI, storm water sheds off the slopes and accumulates on the benches where infiltration is likely occurring. The proposed plan will maintain the integrity of the slope vegetation and minimize future erosion.

In addition to the JSAI recommendations, LAC also proposes to place additional cover material on North Slope benches and reestablish positive drainage on the benches. A survey of the benches has been completed for engineering of the bench re-sloping. The engineer will review the survey data in conjunction with the Isopach Map (Appendix 1) and evaluate the current drainage profiles and cross-sections along each bench to determine areas that will require additional fill to facilitate improved drainage across the benches. Benches will be designed to establish a nominal 1% slope to improve drainage to the East Groin.

LAC may also consider the feasibility of creating a grade breaks and re-sloping certain area of the benches towards the West Groin area if supported by survey data. Once grading plans have been completed, the team will calculate the amount of fill/borrow material required to achieve the proposed grades. This will be checked against calculations for available borrow material. Technical specifications will be developed for the cover soil and submitted with the design documentation for agency approval.

Additionally, LAC's internal hydrogeologist has completed a cover performance review (see Attachment 1) which concludes the cover system is performing well.

4.3 Cover Material

LAC will conduct an investigation of the existing stockpile materials located at the area identified in Appendix 2. A survey of the stockpile will be performed to determine available volume. Samples will be taken and tested for gradation and soil chemistry in order determine their ability to provide a suitable soil cover and growth medium.

Following is a list of tests that will be used to determine the suitability of the borrow material for the benches:

- ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
- Modified Sobek Acid Based Accounting
- MWMP (Meteoric Water Mobility Procedure)
- Extractable metals (As, Cd, Cu, Fe, Pb, Mn, Mo, Ni, B, Se and Zn), saturated paste pH and acid-based accounting.

The engineering design will include a materials handling plan that describes the existing stockpile materials and results of soil analysis testing listed above. Additionally, the engineering design will specify appropriate gradations for materials of construction and placement methods that are adequate to minimize infiltration, facilitate stormwater runoff and resist erosion.

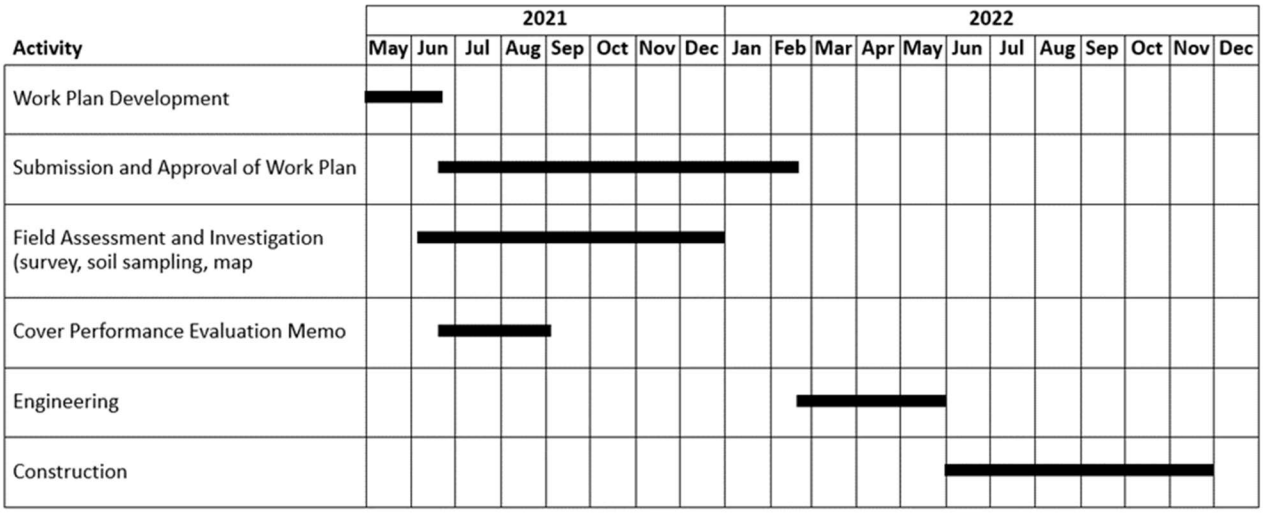
4.4 Stockpile Area Reclamation

Following completion of the bench re-sloping and rill repairs, the stockpile area will be reclaimed by regrading to ensure positive drainage. The regraded area will be reseeded consistent with the plan as outlined in 4.5.

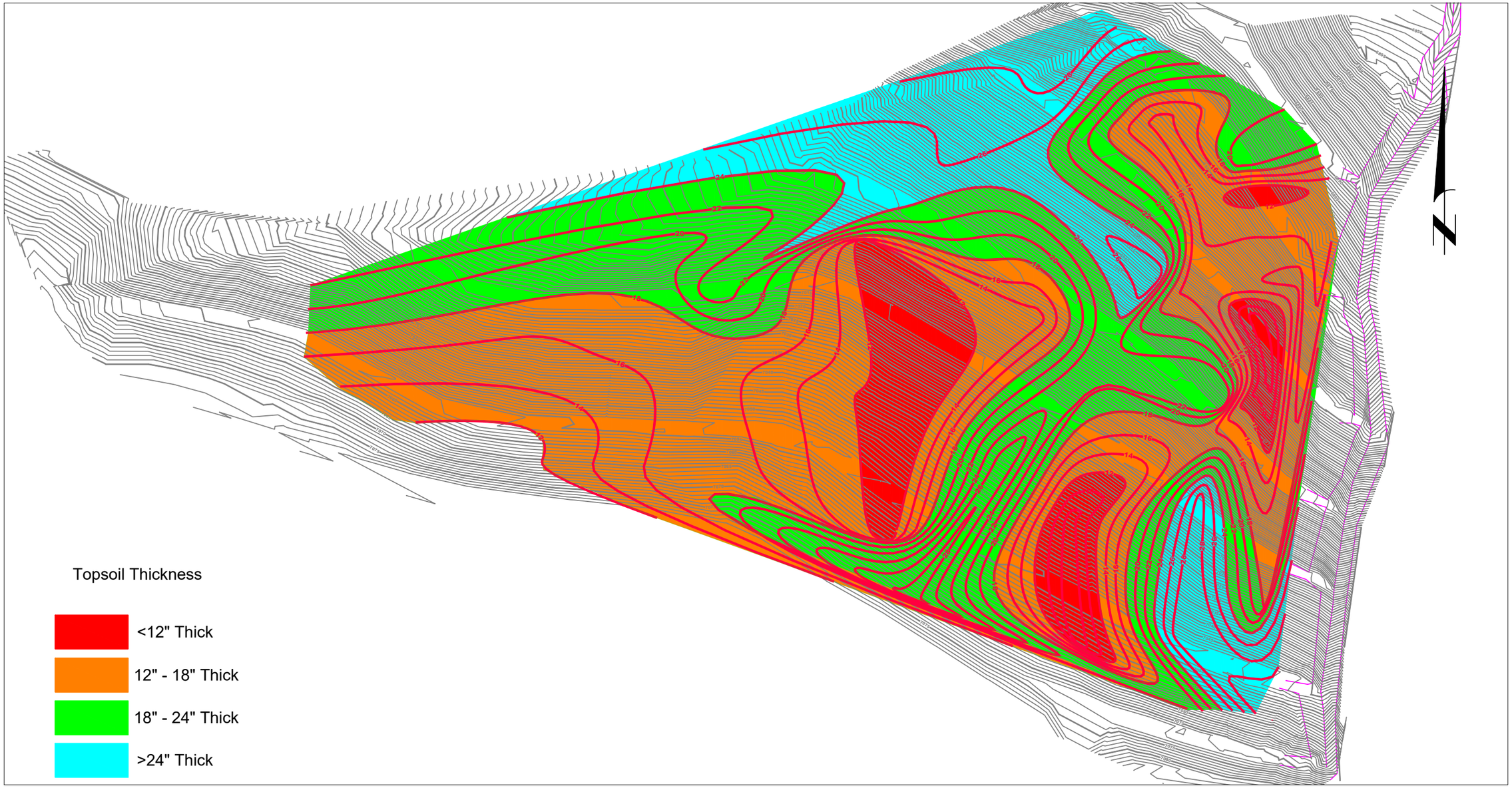
4.5 Seeding & Reclamation

LAC Minerals and its contractors will use the original seed mixes (Appendix 3) that was previously approved in the 1996 Closure/Closeout Plan (CCP) and proposed in the 2020 CCP. In addition, the team may submit recommendations for soil amendments, based on the results of the borrow material sampling program.

4.6 Schedule


2021
2022
Activity
May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Work Plan Development
Submission and Approval of Work Plan
Field Assessment and Investigation (survey, soil sampling, map
Cover Performance Evaluation Memo
Engineering
Construction

Appendix 1 – Isopach Map



	BY	DATE
DRAWN	DJD	12/22/21
CHECK	–	–
REV	0	00/00/00

CLIENT
LAC Minerals-Barrick North America
Cerrillos, New Mexico

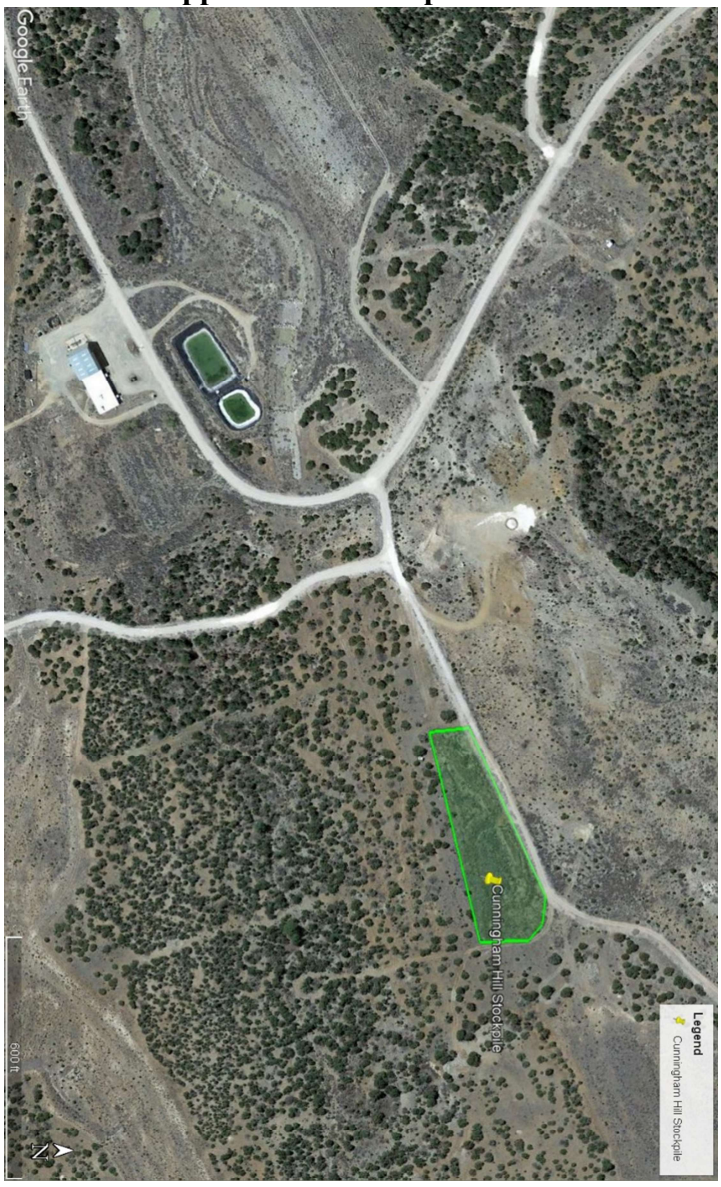
PROJECT NAME
Cunningham Hill
Waste Rock Pile

MERIDIAM PARTNERS, LLC
P.O. BOX 102380, DENVER COLORADO 80210 TEL: 303-815-9248

Topsoil Thickness Ispach

PROJECT NUMBER	SCALE	DRAWING NUMBER	REVISION
20-021	1" = 100'	2 of 5	0

Appendix 2 – Stockpile Location



Appendix 3 – Seed Mix

Cunningham Hill Mine Reclamation Project Seed Mix 1		
Species	**Drill seed rate pure live seed (lbs./acre)**	**Species Characteristics**
blue grama; *Bouteloua gracilis*	2.0	warm season
indian ricegrass; *Oryzopsis hymenoides*	1.0	warm season
sideoats grama; *Bouteloua curtipendula*	1.0	warm season
galleta; *Hilaria jamesii*	1.0	warm season
sand dropseed; *Sporobolus cryptandrus*	0.25	warm season
Great Basin wildrye; *Elymus cinereus*	2.0	cool season
purple prairie clover; *Petalostemum purpureum*	0.2	Forb
palmer penstemon; *Penstemon palmeri*	0.1	Forb
lewis flax; *Linum lewisii*	0.5	Forb
scarlet globemallow; *Sphaeralcea coccinea*	0.1	Forb
TOTAL	**8.15**	

Cunningham Hill Mine Reclamation Project Seed Mix 2 for wetter and cooler site conditions		
Species	**Drill seed rate pure live seed (lbs/acre)**	**Species Characteristics**
indian ricegrass; *Oryzopsis hymenoides*	2.0	cool season
lewis flax; *Linum lewisii*	0.5	Forb
purple prairie clover; *Pentalostemum purpureum*	0.5	Forb
Rocky Mountain penstemon ;*Penstemon strictus*	0.5	Forb
prairie coneflower; *Ratibida columnifera*	0.25	Forb
TOTAL	**6.25**	

References

[JSAI] John Shomaker & Associates, Inc., 2007, Evaluation of the effectiveness of existing remediation measures for the Waste Rock Pile and Dolores Gulch, as required by performance standards WRD-1 and WRD-4, and DP-55 Conditions 29, 30, and 42, Cunningham Hill Mine Reclamation Project: Consultant's report prepared by Steven T. Finch and Annie McCoy of John Shomaker & Associates, Inc. for LAC Minerals (USA) LLC, 37 p. plus illustrations and appendices.

[JSAI] John Shomaker & Associates, Inc., 2011, Performance evaluation of Waste Rock Pile cover system, Condition 30, DP-55, Cunningham Hill Mine Reclamation Project: Consultant's report prepared by Steven T. Finch, Michael Jones, and Annie McCoy of John Shomaker & Associates, Inc. for LAC Minerals (USA) LLC, 14 p. plus illustrations and appendices.

[JSAI] John Shomaker & Associates, Inc., 2019, 2018 Monitoring data review to evaluate the effectiveness of the grouted Interceptor Wall, Cunningham Hill Mine Reclamation Project, Santa Fe County, New Mexico: Consultant's report prepared by Annie McCoy and Steven T. Finch of John Shomaker & Associates

[DBSA]Daniel B. Stephens & Associates, Inc. (DBS&A), 2015 As-Built Report Stormwater Control Facilities and ARD Treatment Pond, Cunningham Hill Mine Reclamation Project, Santa Fe County, New Mexico

Attachment 1 – 2021 Cover Performance Review

BARRICK

MEMORANDUM

TO:	Clark Burton
COPY:	Kevin Hamatake
FROM:	Johnny Zhan, Ph.D.
DATE:	July 26, 2021
SUBJECT:	Cover Performance Review of the WRSF at Cunningham Mine (Final)

Background

The Cunningham Hill Mine (CHM) is located in Santa Fe County, New Mexico. The Waste Rock Storage facility (WRSF) was created during the Gold Fields CHM open-pit mining and heap-leach operations between 1979 and 1987, and contains 10 million tons of sulfide-bearing overburden removed from the CHM open pit. The WRSF covers an area of approximately 72 acres, has an average thickness of 60 ft, and a total volume of approximately 7 million yd^3 (JSAI, 2014).

In 1991 Acid Rock Drainage (ARD) was discovered at the toe of the unreclaimed WRSF. In 1992, an interceptor and treatment system was installed to intercept alluvial and surface water in Dolores Gulch moving downgradient from the waste rock pile and to chemically treat this low pH water. The system consists of the following (Figure 1):

- An interceptor wall installed in bedrock across Dolores Gulch below the toe of the waste rock pile
- A collection system to transfer ARD collected at the interceptor wall via gravity to a lined collection pond
- A lime treatment system with lined settling ponds, and
- Two lined ponds to evaporate lime-treated water

To reduce/limit further generation and discharge of ARD to Dolores Gulch, reclamation of the WRSF was performed between 1992 and 1996, and included re-contouring, addition of lime, placement of soil cover, construction of 5,000 ft of geosynthetically lined groin storm-water channels, and re-vegetation.

The surface of the WRSF was filled and re-contoured in 1992 to achieve a 3H:1V slope with benches. The WRSF was covered in two steps. First, a layer of lime at 20 to 60 tons per acre was spread over the surface of the waste rock pile and disked into the waste rock material, which resulted in an 8 to10-inch layer. Then an 18-inch thick layer of cover soil was applied and seeded (JSAI, 2020b).

In 1995, the north-slope area was re-contoured and an additional 19,800 yd^3 of lime and cover soil were added to 7.2 acres (Schafer and Associates, 1996). The purpose of the re-grade was to improve storm-water runoff from the benches, to replace eroded cover soil, and increase vegetative cover.

Four diversion structures were constructed to route surface water run-on from upgradient watersheds across and around the WRSF. Benches on the north slope were constructed at intervals of approximately 35 vertical feet and graded to drain to the rock-lined ditch along the east groin of the WRSF (JSAI, 2014; JSAI, 2020b).

During February 2010, a weir box equipped with a transducer was installed on the line to ARD Collection Pond A. Continuous monitoring of ARD flows has been ongoing since March 2010.

In 2015 storm-water runoff from the north slope of the WRSF was evaluated and improvements were made to shed stormwater to the west along the western edge and to convey collected storm water into HDPE piping along the East Groin Channel. North slope storm-water runoff direction is illustrated on Figure 1.

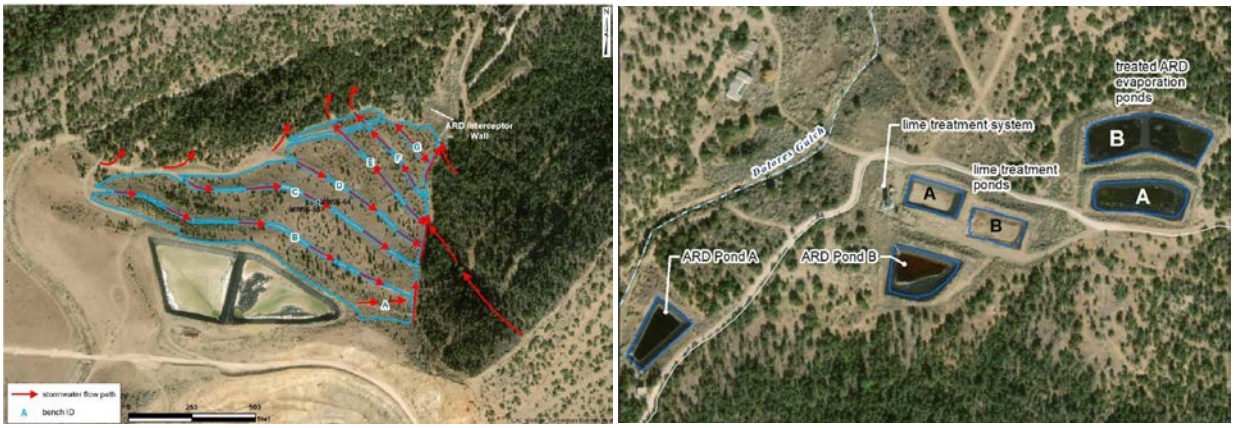


Figure 1. Stormwater flow diversion from benches on the north slope of the WRSF (left) and ARD Treatment Facilities (right)

This technical memorandum describes the working principals of a cover system and its controlling factors. It also reviews the cover performance and presents a loosely calibrated seepage model.

Cover Design Concept

A primary goal in cover design is that evapotranspiration (ET) from the cover will remove nearly all of the precipitation infiltrating into the cover each year, leaving an empty "sponge" that is able to store infiltrated water the following year. The "sponge" concept is illustrated on Figure 2.

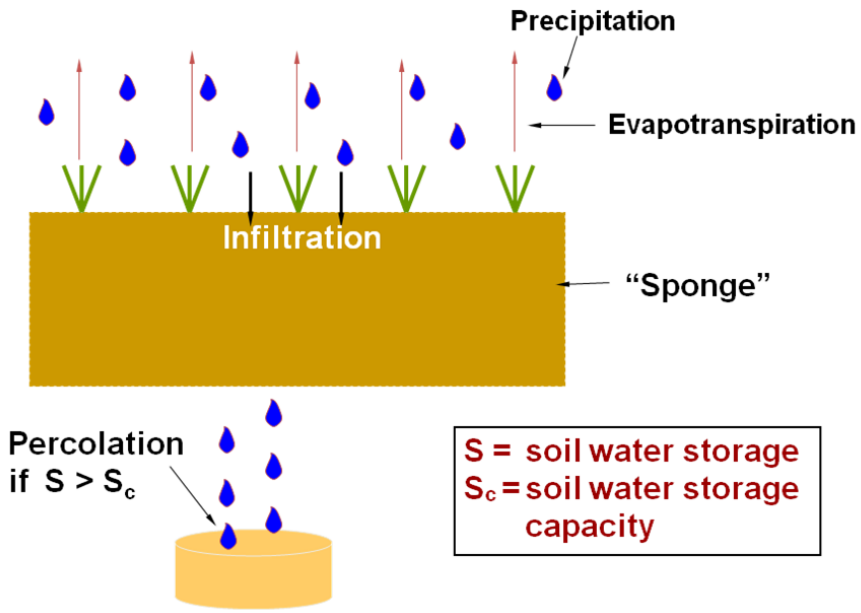


Figure 2. ET cover design - sponge concept

The cover was designed to reduce the infiltration of surface water into the waste rock pile and to provide the growth medium necessary to support revegetation. Seepage monitoring results since March 2010 indicate that seepage has been small and, most of the time, near zero. Vegetation monitoring results indicate that revegetation efforts have been successful.

Site Climate Conditions

The climate at CHM is semi-arid, characterized by dry, hot summers and cold winters. The region has medium annual precipitation, low relative humidity, clear skies, and large diurnal temperature variations because of the altitude and the dryness of the air. Monthly precipitation is relatively even through the year, with slightly higher precipitation in July and August.

CHM maintains a weather station on top of the reclaimed waste rock pile. Annual precipitation ranged from 8.72 to 18.55 inches per year with an average of 14.13 inches per year for the period 2011 – 2019 (JSAI, 2020a).

Access to the National Land Data Assimilation System (NLDAS) (Mitchell et al., 2004) gridded weather data on the Google Earth Engine (GEE) cloud computing platform provides an estimate of historical daily precipitation, reference evapotranspiration (ETo) and temperature from 1979 to present. ETo is calculated using the Penman-Monteith-FAO method (FAO, 1998). The Desert Research Institute (DRI) in Reno, Nevada has developed Python and JavaScript programs that are executed on the GEE to rapidly process NLDAS gridded weather data for estimating Precipitation, ETo and temperature (Huntington, personal communication, 2020).

Daily NLDAS weather data available on the GEE were spatially disaggregated to a 4 km spatial resolution by Abatzoglou (2011) based on the Parameter Regression on Independent Slopes Model (PRISM) (Daly, 2008).

Daily temperature, precipitation and ETo at CHM (-106.136 Longitude, 35.338 Latitude) were estimated using the DRI technique for the period of Jan, 1979 through May, 2021 by accessing the Climate Engine (http://clim-engine.appspot.com/).

The estimated average monthly precipitation, ETo and temperature are listed in Table 1 and illustrated on Figures 3 and 4. Figure 3 illustrates precipitation for the Water Year (WY), which begins October 1 of previous year and ends September 30 of the designated year.

Table 1: Estimated Average Monthly Precipitation, Potential Evapotranspiration (PET, or ETo) and Temperature at CHM using Climate Engine

Month	Precipitation (Inch)	Average Temperature (Degree C)	ETo (PET) (Inch)
Jan	0.8	-0.5	1.9
Feb	0.7	1.8	2.4
Mar	1.0	5.4	4.1
Apr	0.9	9.2	5.6
May	1.2	14.0	7.3
Jun	1.1	19.7	8.3
Jul	2.6	21.3	7.4
Aug	2.4	20.2	6.5
Sep	1.6	16.7	5.4
Oct	1.4	10.5	4.1
Nov	0.9	3.9	2.5
Dec	1.0	-0.4	1.8
Total /Average	15.7	10.2	57.3

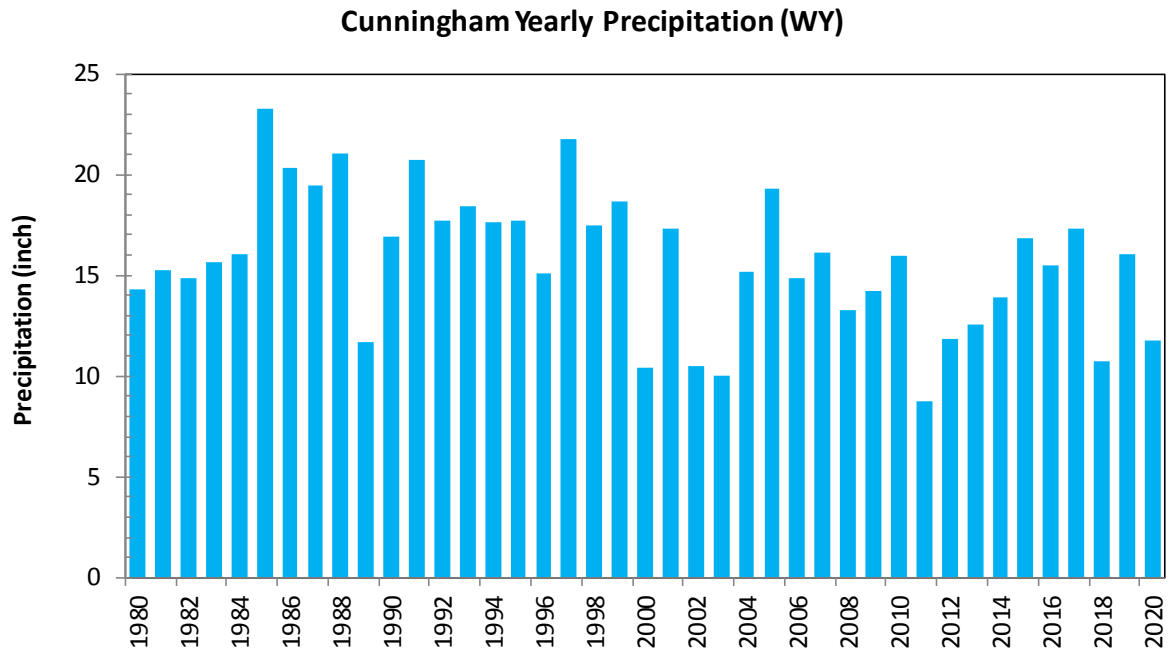


Figure 3: Estimated annual WY precipitation at CHM

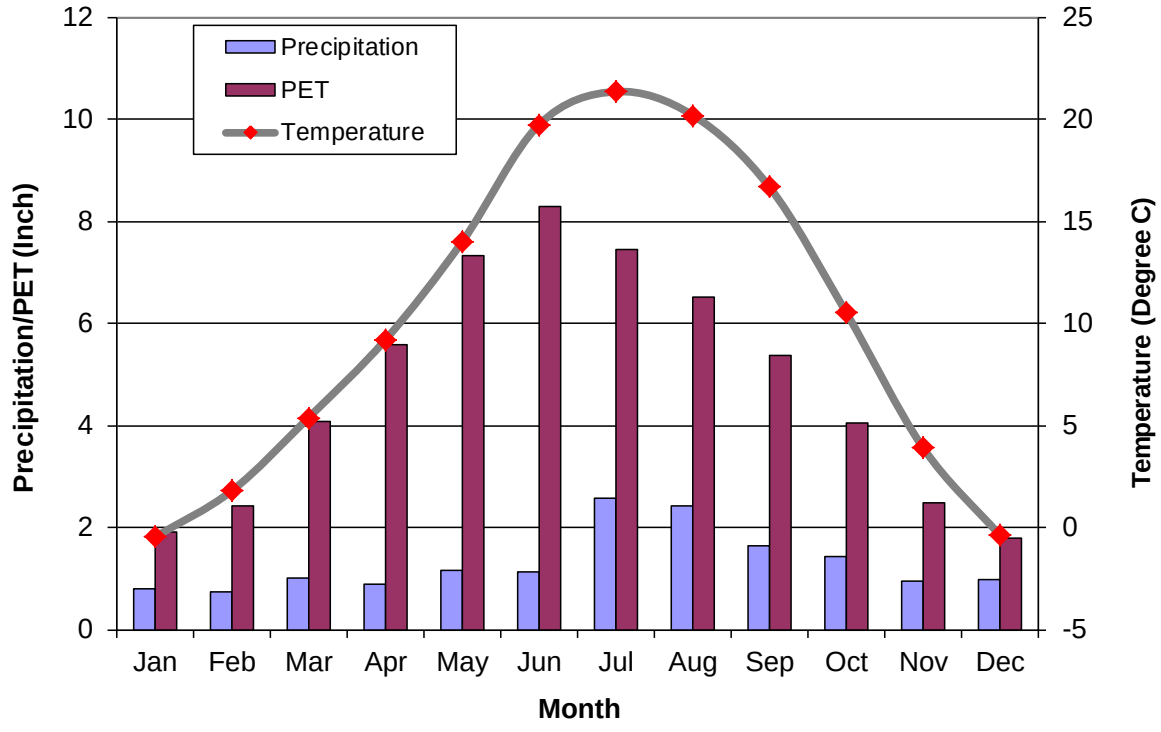


Figure 4. Estimated average monthly precipitation, ETo (PET) and temperature at CHM

Cover System

In 2007, JSAI performed a soil cover survey, total cover thickness survey, and visual inspection of storm-water controls on the WRP, and Cedar Creek Associates, Inc. performed a vegetative cover survey.

2007 Vegetative Cover Survey: The vegetative cover survey was performed at 20 survey locations, and the ground cover survey of live vegetation was measured as 37 percent, which is greater than the 34 percent required for reclamation (JSAI, 2014).

2007 Soil Cover Survey: The soil cover survey was performed at 20 survey stations (Fig. 5). Samples were taken at four stations for laboratory sieve analysis (JSAI, 2014). Eleven of the measurements were on benches, five of the measurements were on the slopes, and four of the measurements were on the top of the WRP.

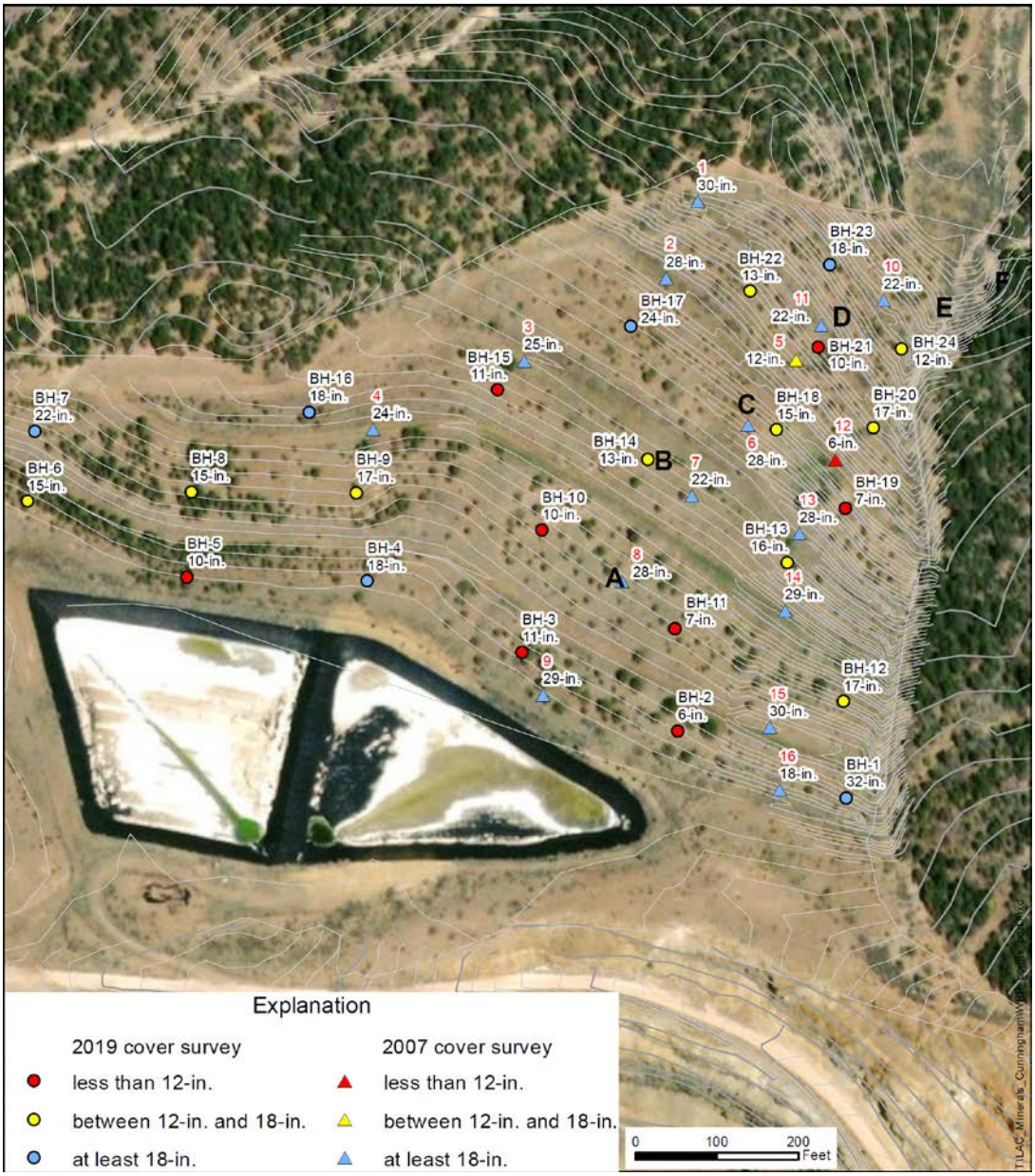


Figure 5. Aerial photograph of WRSF north slope area showing cover survey locations and results

Figure 6 shows the Particle Size Distribution (PSD) Curves of four samples. Soil was found to be moderately- to well-sorted and generally dominated by silt- and clay-size material (<0.074 mm). This very fine-grained material is likely to have low permeability and high water-holding capacity.

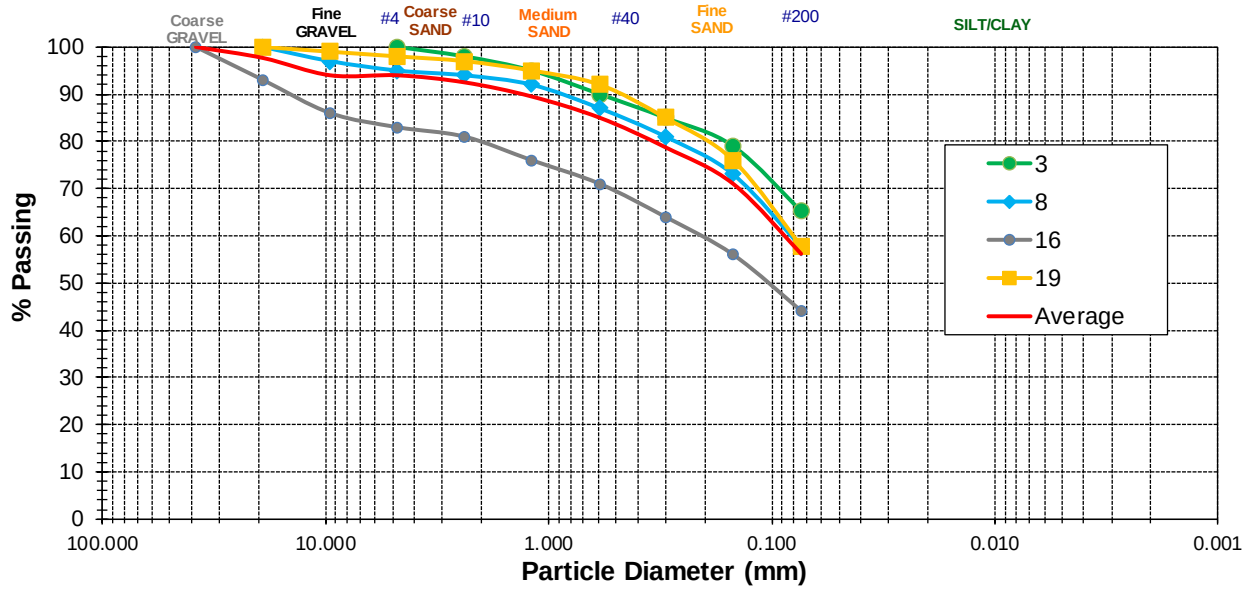


Figure 6. Individual and average PSD curves of 4 samples in 2007 soil survey

Total cover was found to be 1.5 ft thick or more at 18 out of 20 stations (Figure 7). The average thickness was about 24 inches. Other statistics of the 2007 cover thickness are shown on a box plot (Figure 8). Another WRSF soil survey was performed in 2019 by JSAI (JSAI, 2019), which primarily focused on the slopes (Figure 5). A comparison of 2007 and 2019 cover thickness measurements for similar locations on the slope indicates that the net difference is small, less than an inch.

Total cover generally consisted of at least 1 ft of soil dominated by clay and silt, with low permeability, and a coarser base material consisting of gravel and cobbles with a sand or clay matrix.

If water-holding capacity, the difference between field capacity and volumetric water content corresponding to wilting point, is conservatively assumed to be 8%, the cover can hold at least 2 in (24 x 8%) of precipitation in the cold season. Considering that monthly potential evapotranspiration exceeds average precipitation for each month of the year, including the cold season, 2 inches of water-holding capacity is sufficient to prevent significant percolation into the underlying waste rock.

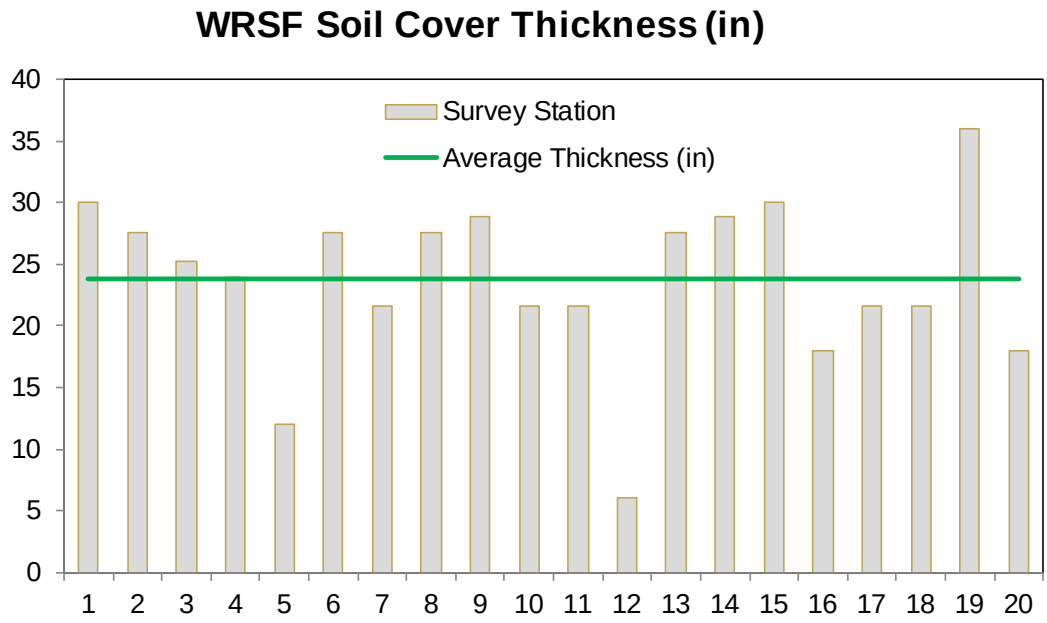


Figure 7. Cover thickness and average thickness at 20 stations in 2007 soil survey

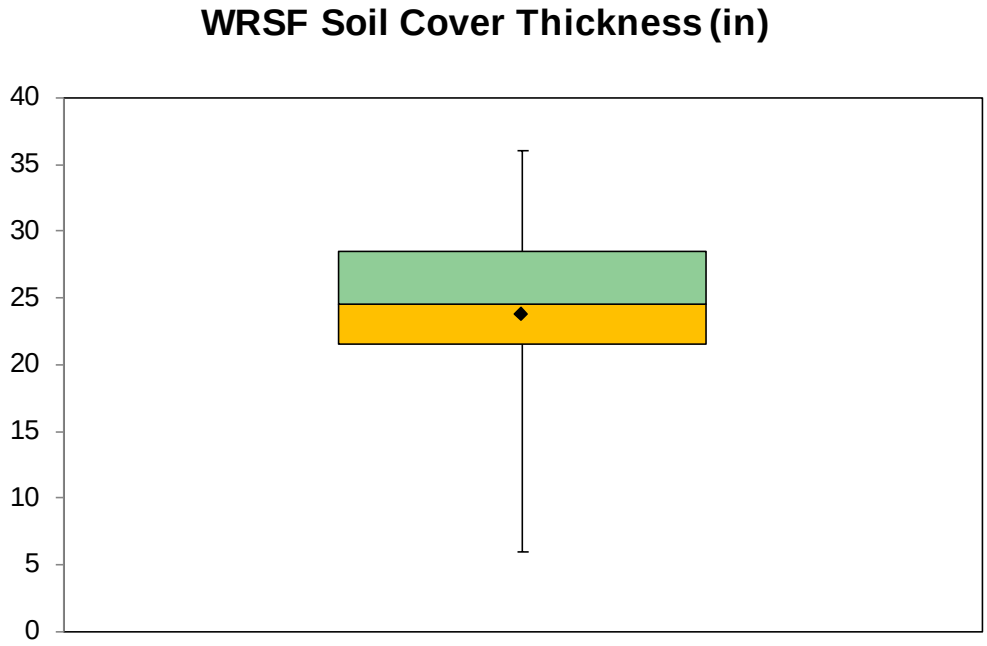


Figure 8. Box Plot of cover thickness at 20 stations in 2007 soil survey

Observed WRSF ARD Seepage

ARD seepage has been identified and collected since 1991. Continuous monitoring of ARD flows using a weir box equipped with a transducer has been ongoing since March 2010. Figure 9 shows monthly ARD

seepage from March 2010 to April 2021. Figure 10 shows the annual ARD seepage from WY 2011 to 2020.

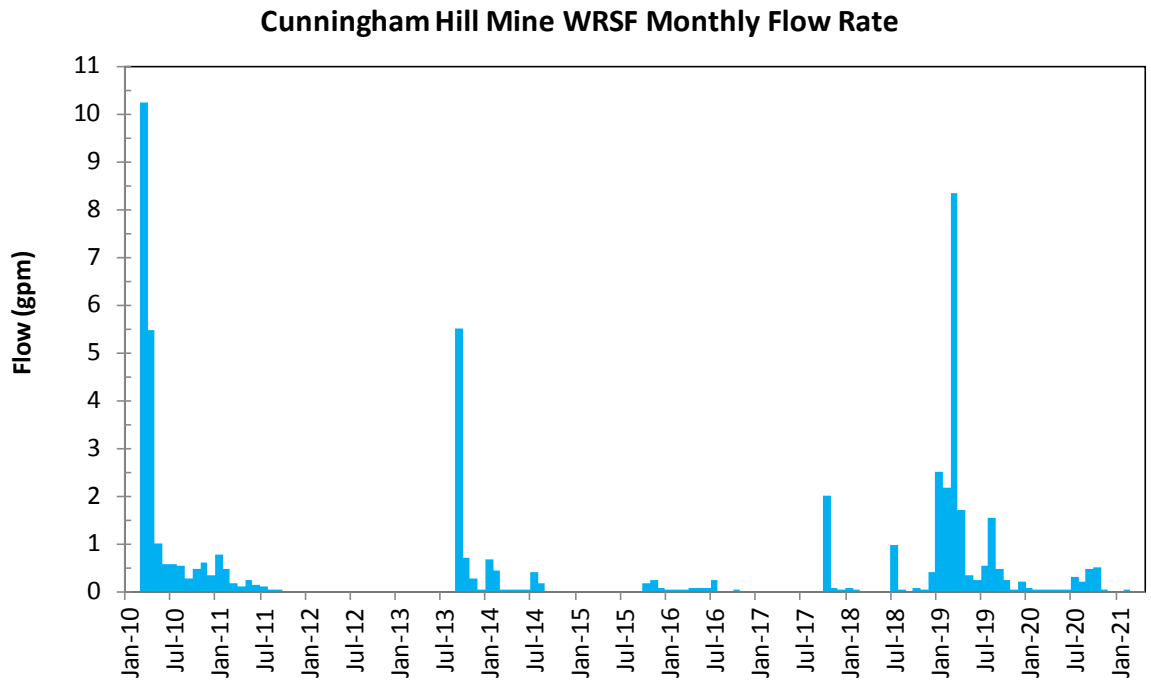


Figure 9. Monthly ARD seepage (March 2010 to April 2021)

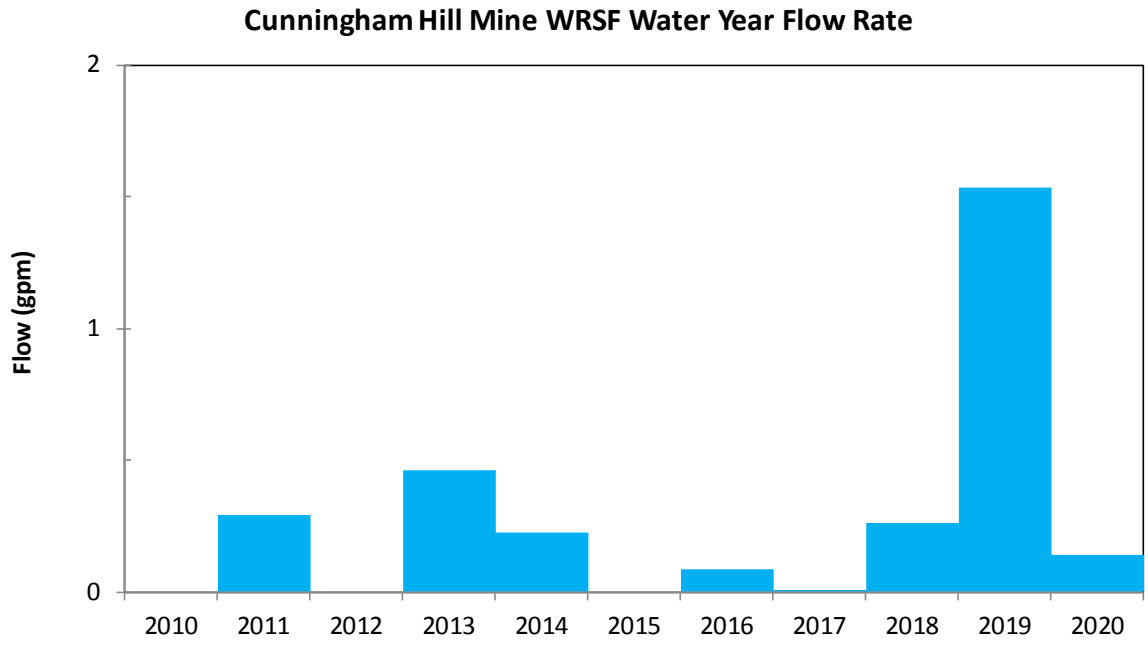


Figure 10. Annual ARD seepage (WY 2011 to 2020)

In most months there has been no seepage (Figure 9). For some entire years with low precipitation, no seepage was observed (Figure 10).

Average seepage is about 0.3 gpm, or 0.48 acre-ft/yr. Considering the facility footprint of 72 acres, the infiltration rate is only 0.08 in/yr (0.48/72x12), or 0.5% of precipitation (0.08/15.7). Meteoric infiltration is nearly eliminated.

WRSF ARD Seepage Modeling

Attempting to reproduce the observed seepage flows with a model, when flow is zero for many months and some entire years, is challenging, if not impossible. Recognizing the challenge, without overcomplicating the numerical model, a yearly time-step, spreadsheet-based water balance model (GR1A) was created.

The GR1A model is a single-parameter global rainfall-discharge model (Mouelhi et al., 2006). The model considers the close inter-relationship between precipitation, PET, and cover net infiltration on an annual scale with continuous feedback of water movement in the soil-plant-atmosphere continuum.

The structure of the model is a simple equation: The ARD seepage Q_k of WY k is proportional to the precipitation P_k of the same year, precipitation P_{k-1} in year k-1 and annual potential evapotranspiration PET of WY k. The model is written as:

$$Q_k = P_k \left\{ 1 - \frac{1}{\left[1 + \left(\frac{0.7P_k + 0.3P_{k-1}}{X * PET_k} \right)^2 \right]^{0.5}} \right\} \quad (1)$$

Where:

- Q_k is the simulated seepage of year k
- P_k is the observed precipitation of year k
- P_{k-1} is the observed precipitation of year k-1
- PET_k is the potential evapotranspiration of year k
- X is the parameter of the model to calibrate

The model has only one optimizable parameter, the dimensionless X, which appears as a modulating coefficient of potential evapotranspiration. It was found that the median of X is 0.7 and an interval of 90% confidence is given by the range of 0.13 to 3.5 (Mouelhi et al., 2006).

The model was calibrated to match the observed annual average flow rate of 0.3 gpm with X=2.05.

Considering the simplicity of the model, it does a reasonable job by producing same average flow (0.3 gpm) and a pattern mimicking wet/dry cycles (Figure 11).

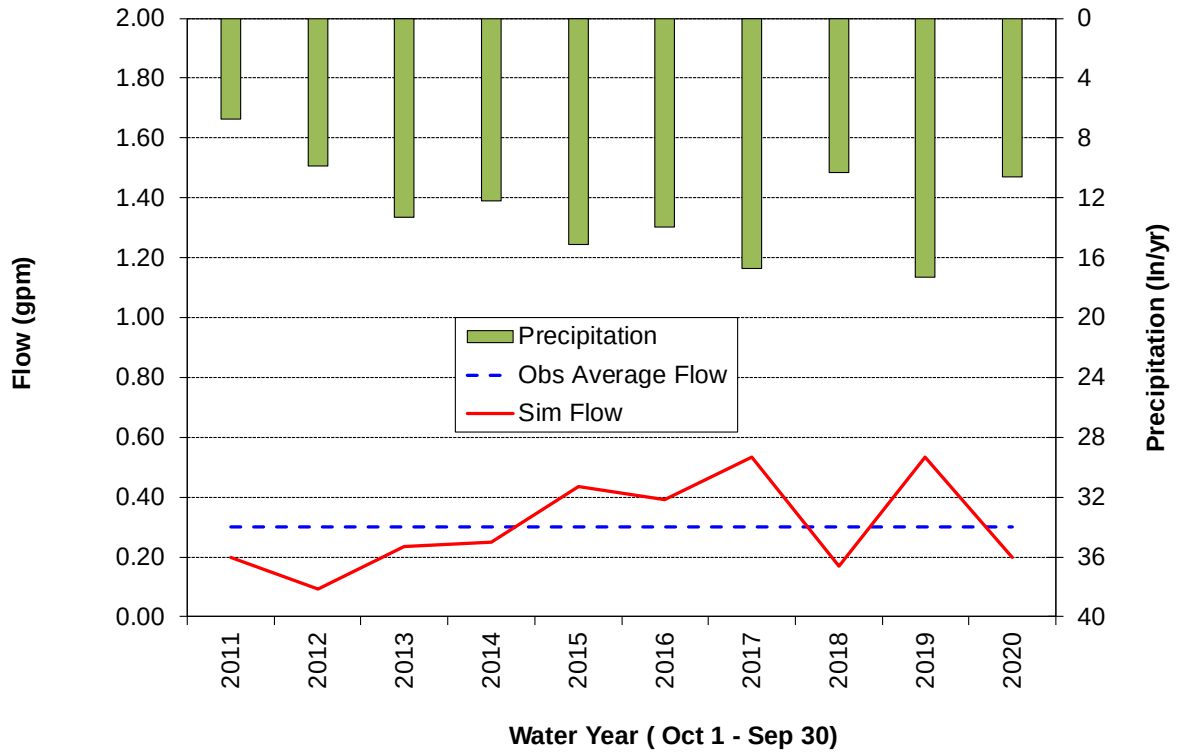


Figure 11. Observed average seepage and modeled annual seepage vs WY precipitation

Discussion and Summary

The Maxey-Eakin method (Maxey and Eakin, 1949) is an empirical groundwater recharge estimate approach widely used in the western US. The method assumes that no recharge occurs in areas receiving less than 8 in/yr of precipitation. When annual precipitation is greater than this threshold, groundwater recharge is a fraction of annual precipitation and the fraction increases with increasing precipitation, resulting in a hypothetical curve relating annual groundwater recharge to annual precipitation (Figure 12).

The observed seepage rate of 0.5% of precipitation during the period of WY 2011 to 2020 for average annual precipitation of 15.7 in/yr is much lower than the expected recharge (8%), indicating the cover system at CHM performs well.

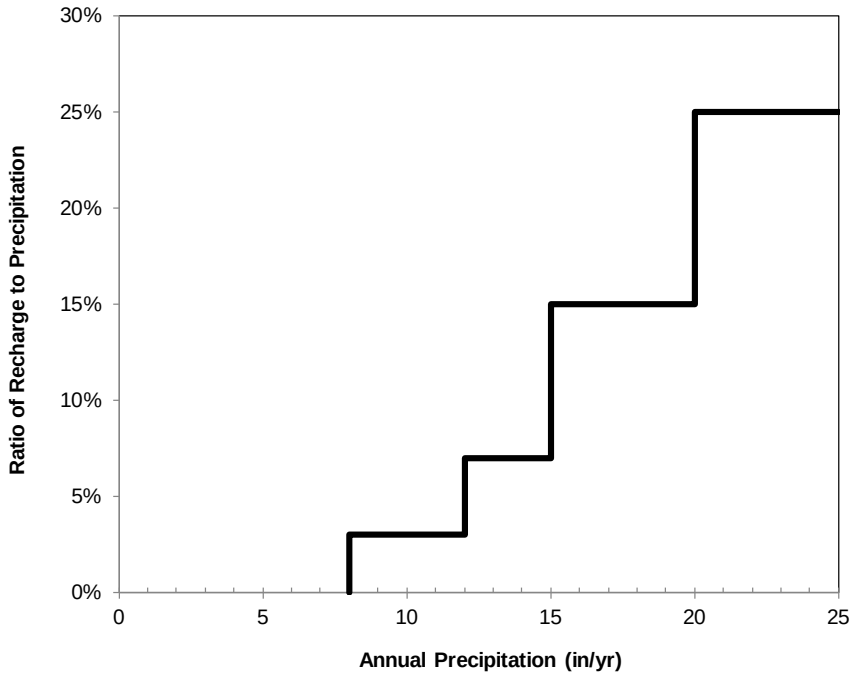


Figure 12. Maxey-Eakin Groundwater Recharge Rate

CHM is located in a relatively dry area with a precipitation to potential evapotranspiration (P/PET) ratio of 0.27 (15.7/57.3). Apiwantragoon et al. (2015) present a comprehensive review of the field-scale performance of landfill ET covers at 12 sites across the United States. Test sections were constructed at these sites with large (33 × 66 ft) drainage lysimeters for continuous and direct monitoring of the ET covers over a period of 3 to 6 years. The diversity in climates is evident in the range of average annual precipitation (4.72 to 49.61 inches) and the range in P/PET (0.06 to 1.10). The study concludes that net percolation is highly sensitive to the annual P/PET ratio. When P/PET is less than 0.30, net percolation is generally low.

Figure 13 is adapted from Apiwantragoon et al. (2015) and shows their data (named as ACAP) and other available field data measurements. When the P/PET ratio is 0.27, such as at CHM, the expected net percolation is in the range of 0.1 – 90 mm (0.004 – 3.54 inches) per year (redline on Figure 13). The simulated and measured net percolation at CHM of 2 mm (0.08 inch) per year is well within this range (green dot on Figure 13) and better than the expected 3 mm/yr for an optimum cover design.

In summary, the cover system installed at CHM WRSF is performing well, with only limited seepage occurring during wet periods. It is expected that the improvements to the East Groin Channel completed in 2020 and 2021 will further reduce the toe seepage to a minimal level (~ 0.2 gpm).

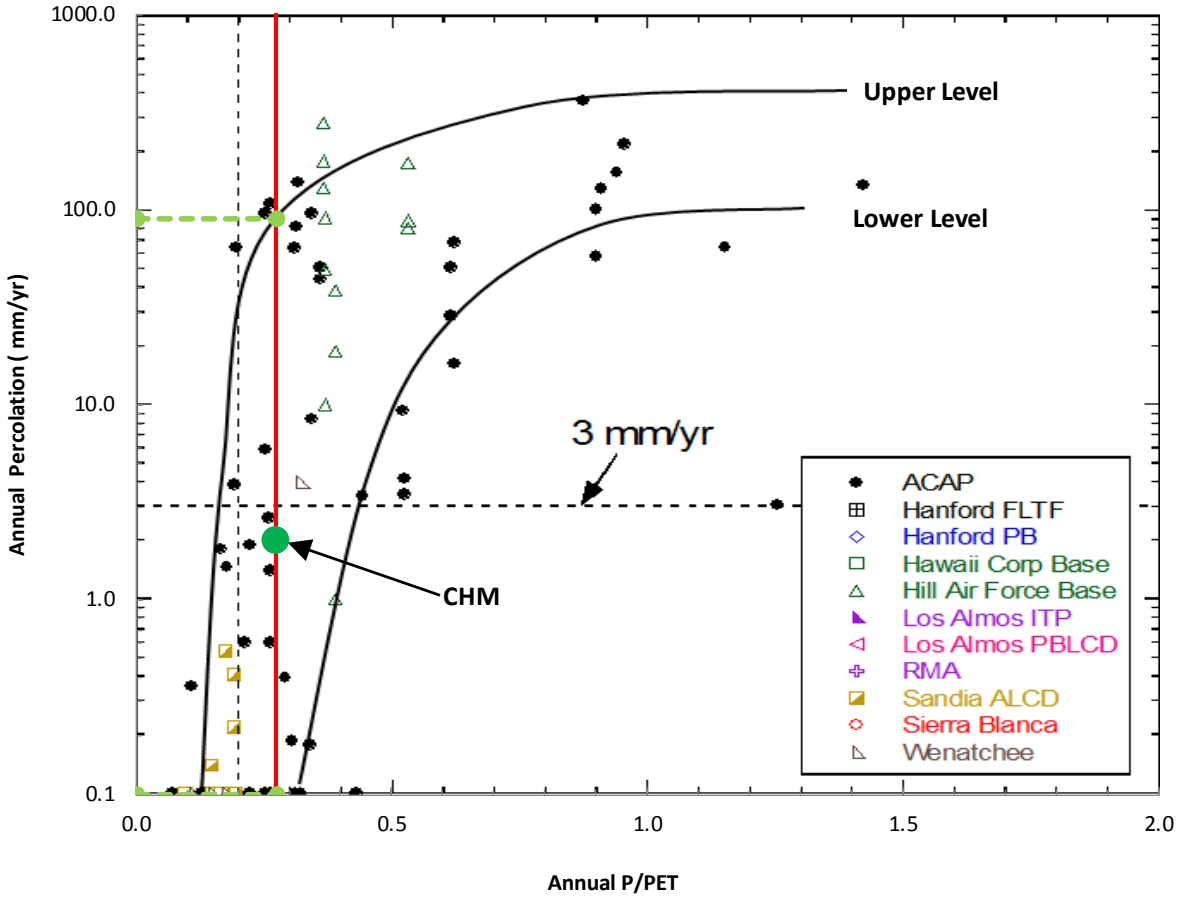


Figure 13. Annual percolation as a function of ratio of annual P/PET from CHM cover, ACAP covers and other studies (adapted from Apiwantragoon et al. 2015)

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Attachment 2.

Revised CCP Section 6.2 – Waste Rock Pile Reclamation Plan page 39
WRPWP timeline (approved)

LAC
MINERALS (USA) LLC
CUNNINGHAM HILL MINE
RECLAMATION PROJECT
582 COUNTY ROAD #55
CERRILLOS, NM 87010
TELEPHONE: 505.471.0434

March 1, 2022

CERTIFIED MAIL – RETURN RECEIPT REQUESTED
CERTIFIED NO. 7009 0960 0000 8419 0911

Ms. Anne Maurer
New Mexico Environmental Department
Groundwater Quality Bureau
1190 South St. Francis Drive
Santa Fe, NM 87502

CERTIFIED MAIL – RETURN RECEIPT REQUESTED
CERTIFIED NO. 7009 0960 0000 8419 0904

Ms. Carmen Rose
Mining and Minerals Division
Mining Act Reclamation Program
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Waste Rock Pile Workplan Updated Schedule
Discharge Permit 55 (DP-55) and Abatement Plan 27 (AP-27)
Cunningham Hill Mine Reclamation Project

Ms. Maurer and Ms. Rose,

On February 16, 2022, LAC Minerals USA LLC (LAC) received approval of the December 27, 2021 Waste Rock Pile Workplan. As requested in the approval letter enclosed is an updated schedule, which includes the completion of the Field Assessment and Investigation Report.

Should you have any questions or require further information, you can contact me at (775) 385-6411 or at jennifer.ortega@barrick.com.

Sincerely,

Jennifer Ortega

Jennifer L Ortega
Health, Safety and Environmental Superintendent

Enclosure

LAC
MINERALS (USA) LLC
CUNNINGHAM HILL MINE
RECLAMATION PROJECT
582 COUNTY ROAD #55
CERRILLOS, NM 87010
TELEPHONE: 505.471.0434

ec: Joe Fox, Acting Program Manager, NMED-MECS
Holland Shepherd, Program Manager, EMNRD-MMD
Kevin Myers, EMNRD-MMD
Dave Wycoff, LAC
Clark Burton, LAC
Friends of Santa Fe County
Clark Burton, LAC
Kevin Hamatake, LAC
Daniel Lattin, LAC
Brad Bingham, LAC

Cunningham Hill Waste Rock Pile Workplan Scheudle

Activity	2021	2022											
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Submission and Approval of Updated Work Plan													
Field Assessment and Investigation Report (soils data, engineering)													
Construction													

Attachment 3.

Revised CCP Section 6.5 – Growth Medium for Final Reclamation page 39
Revised Table 6

Revised Table 1. Growth medium volume requirements

area	total volume (yd^3)
Open Pit[1]	450
Waste Rock Pile[2]	700
RO Ponds	2,200
ARD Treatment Facility	2,420
Residue Pile Remediation Ponds	2,000

[1] imported caliche to complete in pit reclamation of western road
[2] includes material to complete WRPWP

Attachment 4.

Revised CCP Section 6.8.1 - grassland-revegetated vs. woodland-revegetated units of the remaining units in Permit No. SF002RE.
Cedar creek Associates (2021) report

Cunningham Hill Reclamation Project

LAC Minerals (USA) LLC

2020 REVEGETATION EVALUATION REPORT

DECEMBER, 2020

Table of Contents

In Text Tables, Charts, and Figures

LAC Minerals (USA) LLC

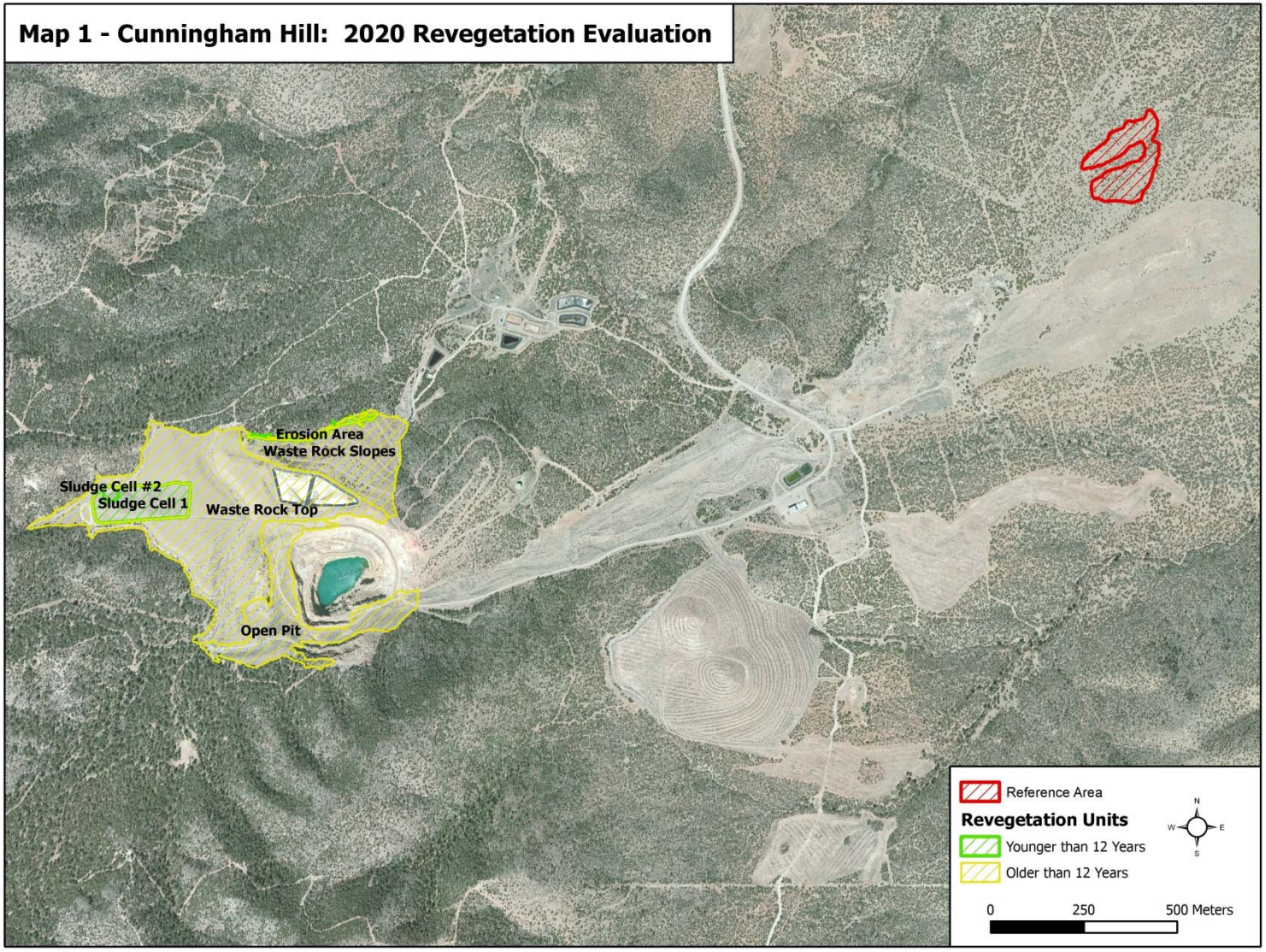
Cunningham Hill Reclamation Project

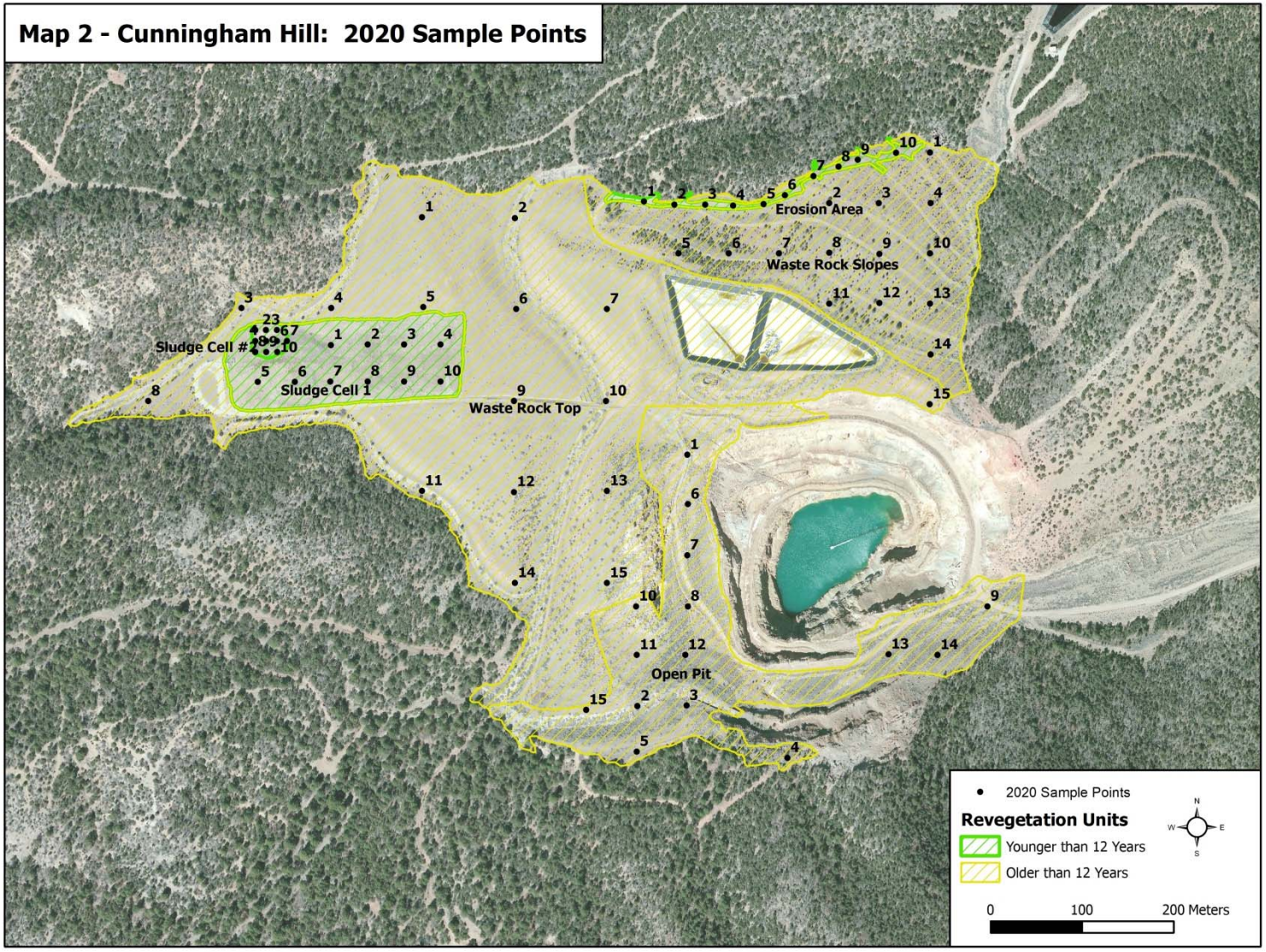
2020 REVEGETATION EVALUATION REPORT

1.0 INTRODUCTION

1.1 General

In 2020 LAC Minerals (USA) LLC's (LAC) retained Cedar Creek Associates, Inc. (Cedar Creek) to evaluate revegetation efforts across the mine site for monitoring purposes. A reference area, established and approved by the Mining and Minerals Division (MMD) in 1997, was sampled to facilitate comparison. Revegetation evaluation was conducted in accordance with the approved close-out plan for the Cunningham Hill Reclamation Project. Sampling was conducted on September 29, 2020 by or under the direct supervision of Cedar Creek's Senior Reclamation Ecologist, Mr. Jesse H. Dillon. Revegetation evaluation occurred in the following areas: Erosion Area, Sludge Cell Areas 1 and 2, Open Pit Area, Waste Rock Top Area, Waste Rock Slope Area, and Reference Area. Area locations are presented on Map 1; transect locations are noted on Map 2. Sampling methodologies are presented in Appendix A.


Map 1 - Cunningham Hill: 2020 Revegetation Evaluation
Erosion Area
Waste Rock Slopes
Sludge Cell #2
Sludge Cell 1
Waste Rock Top
Open Pit
Reference Area
Revegetation Units
Younger than 12 Years
Older than 12 Years
N
W
E
S
0
250
500 Meters


Map 2 - Cunningham Hill: 2020 Sample Points
Erosion Area
Waste Rock Slopes
Sludge Cell #2
Sludge Cell 1
Waste Rock Top
Open Pit
2020 Sample Points
Revegetation Units
Younger than 12 Years
Older than 12 Years
0
100
200 Meters
N
W
E
S

1.2 Precipitation

Table P presents precipitation accumulated annually at the Cunningham Hill Reclamation Project over the past 13 years. Chart P1 displays the seasonal precipitation over the historical record and Chart P2 displays 2019/2020 seasonal precipitation in comparison with the 12 year average. The overall average annual precipitation for the past 13 years is 13.36 inches while the monthly average precipitation levels ranges from 0.60 in April to 2.28 inches in August. This indicates that the growing season at Cunningham Hill Reclamation Project relies on monsoonal precipitation. Average winter precipitation is 2.52 inches while spring, summer, and fall averages 2.26, 4.95, and 3.75 inches, respectively.

Examination of Chart P2 indicates that precipitation for the seasons prior to sampling can be considered slightly below average (2019/2020 precipitation was 82% of 12 year average). The winter and summer of the 2019/2020 growing season received below average precipitation with 68% and 67% of normal levels, respectively. Spring and fall precipitation was approximately average, at 111% and 95%, respectively. The month preceding sampling in September was well below average with 0.18 inches (8% of average) of precipitation for August; however July was above average with 2.74 inches (126% of average). Overall, conditions should be considered somewhat less favorable for the revegetation progress with plants exhibiting slightly below average production and vigor.

Table P - Annual Precipitation at the Cunningham Hill, 2008 - 2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2008	1.52	0.95	0.33	0.27	0.47	0.73	2.07	3.85	2.21	2.34	0.11	1.13	**15.98**
2009	1.01	0.88	2.17	0.39	0.06	0.61	2.61	2.71	1.42	0.18	0.31	1.6	**13.95**
2010	0.03	0.64	0.72	1.36	1.01	1.91	1.7	1.07	2.23	0.95	0.28	4.45	**16.35**
2011*	0.03	0.45	0.2	0.21	0.07	0.04	1.92	3.58	0.65	2.29	0.38	1.44	**11.26**
2012*	0.54	0.47	0.3	0.53	0.31	0.15	1.82	1.22	0.97	0.23	0.08	1.18	**7.80**
2013*	0.37	0.49	0.28	0.08	0.17	0.72	3.02	2.46	3.38	1.05	2.08	0.55	**14.65**
2014*	0	0.33	0.78	0.20	2.17	0.08	2.35	2.32	0.65	0.60	0.78	1.15	**11.41**
2015*	0.86	0.89	0.52	0.59	3.22	1.01	3.07	0.60	0.98	2.78	1.36	1.34	**17.22**
2016*	0.64	0.82	0	1.27	1.04	1.22	0.59	4.17	1.95	0.14	2.03	0.78	**14.65**
2017*	2.29	0.47	0.4	1.66	0.19	0.33	2.53	2.48	2.87	0.98	0.20	0.08	**14.48**
2018^	0.18	0.61	0.33	0.00	0.65	0.39	1.67	2.46	1.45	3.16	0.34	1.11	**12.35**
2019^	1.12	0.56	1.71	0.95	1.05	0.51	2.22	2.55	0.78	0.50	2.28	0.63	**14.86**
2020^	0.37	0.71	0.85	0.30	1.37	0.40	2.74	0.18	0.69	0.87	0.21	-----	**8.69**
2008-2020 Avg.	**0.69**	**0.64**	**0.66**	**0.60**	**0.91**	**0.62**	**2.18**	**2.28**	**1.56**	**1.24**	**0.80**	**1.19**	**13.36**

***Precipitation data from Santa Fe Seton, NM NOAA Station- Closest proximity data available for dates listed**

^Precipitation data from Santa Fe 15.7 SSW, NM NOAA Station -Closest proximity data available for dates listed

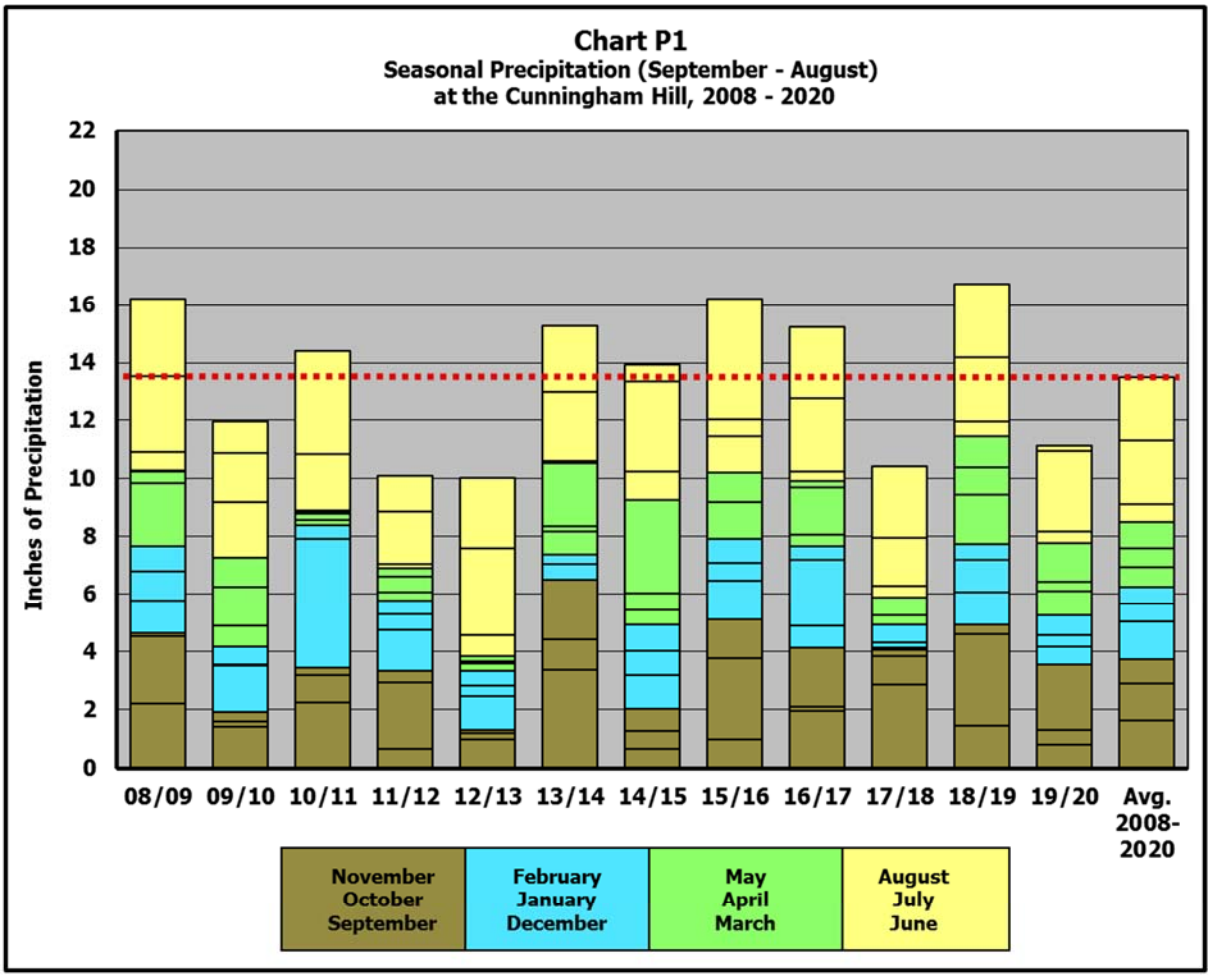


Chart P1
Seasonal Precipitation (September - August)
at the Cunningham Hill, 2008 - 2020
Inches of Precipitation
22
20
18
16
14
12
10
8
6
4
2
0
08/09
09/10
10/11
11/12
12/13
13/14
14/15
15/16
16/17
17/18
18/19
19/20
Avg. 2008-2020
November
October
September
February
January
December
May
April
March
August
July
June

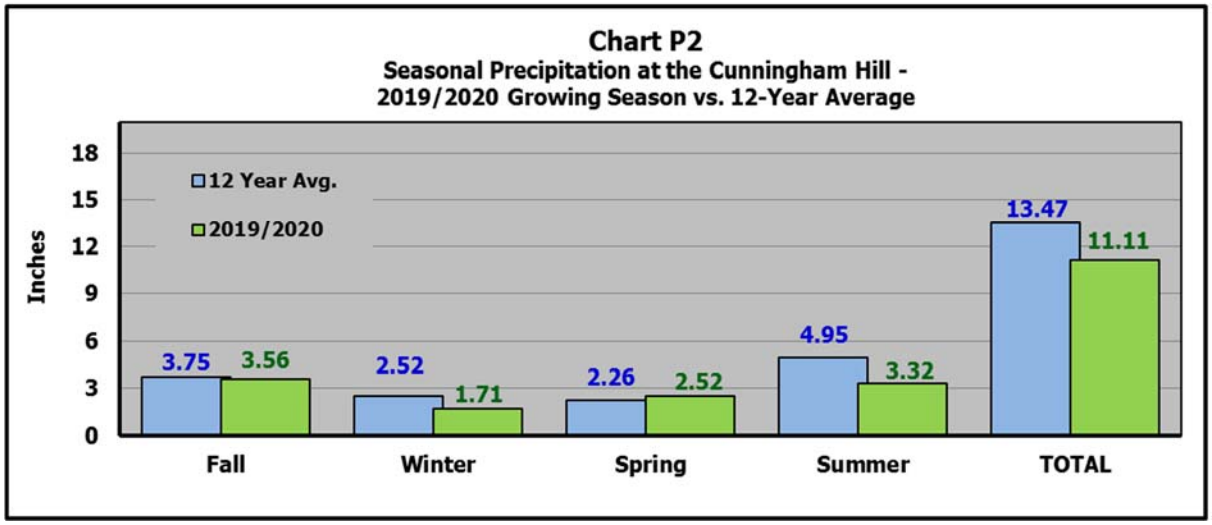


Chart P2
Seasonal Precipitation at the Cunningham Hill -
2019/2020 Growing Season vs. 12-Year Average
Inches
18
15
12
9
6
3
0
12 Year Avg.
2019/2020
3.75
3.56
2.52
1.71
2.26
2.52
4.95
3.32
13.47
11.11
Fall
Winter
Spring
Summer
TOTAL

2.0 REVEGETATION STANDARDS

In accordance with Cunningham Hill's Closeout Plan, revegetated units, planted as shrubland or woodland with woody plants for wildlife habitat, must meet performance standards for ground cover, species diversity, and woody plant density. Revegetation efforts will be considered successful when all standards have been met at the end of the 12-year liability period.

1. Vegetative Ground Cover Standard

Vegetative ground cover must meet at least one of the following two tests:

a) the total vegetative ground cover (exclusive of annual species) in the revegetated unit equals or exceeds 75 percent of the approved reference area's total vegetative ground cover (exclusive of annual species), with 90 percent statistical confidence; or

b) the total vegetative ground cover (exclusive of annual species) in the revegetated unit equals or exceeds 50 percent of the approved reference area's total vegetative cover (exclusive of annual species) with 90 percent statistical confidence, and predicted values of soil loss using the Revised Universal Soil Loss Equation (RUSLE) are equal to or less than the comparison "T" value, which essentially is the soil genesis rate in tons per acre per year.

2. Species Diversity Standard

Species Diversity Standard, as described in the close out plan, requires all non-annual (perennial and biennial) species that contribute at least 2% relative cover (composition) or at least 1% average cover must be tallied. Important species on revegetation units must be greater than 50% of the reference area's important species.

3. Woody Plant Density Standard

Woody Plant Density Standard requires the sampled area to exhibit 220 or more live woody plants per acre suitable for wildlife habitat.

3.0 RESULTS

3.1 Summary

Ground cover data and associated species diversity collected from the Erosion Area, Open Pit Area, Sludge Cell's 1 and 2, Waste Rock Top and Slope Areas, and the Reference Area have been organized, summarized, and presented on a variety of tables and charts at the rear of this document.

Review of the 2020 revegetation evaluation results indicate that the Open Pit Area and the Waste Rock Top and Slope Areas are in excellent condition and readily pass bond release standards for ground cover and species diversity. The Sludge Cell 1, Sludge Cell 2, and Erosion areas are exhibiting favorable plant community development and are progressing toward bond release standards. Summary comparison data presented on Tables 1 - 3 as well as Charts 1 - 5 indicate that in response to LAC's revegetation effort, these areas show excellent revegetation establishment and perennial plant community development. Raw data can be found in Appendix B.

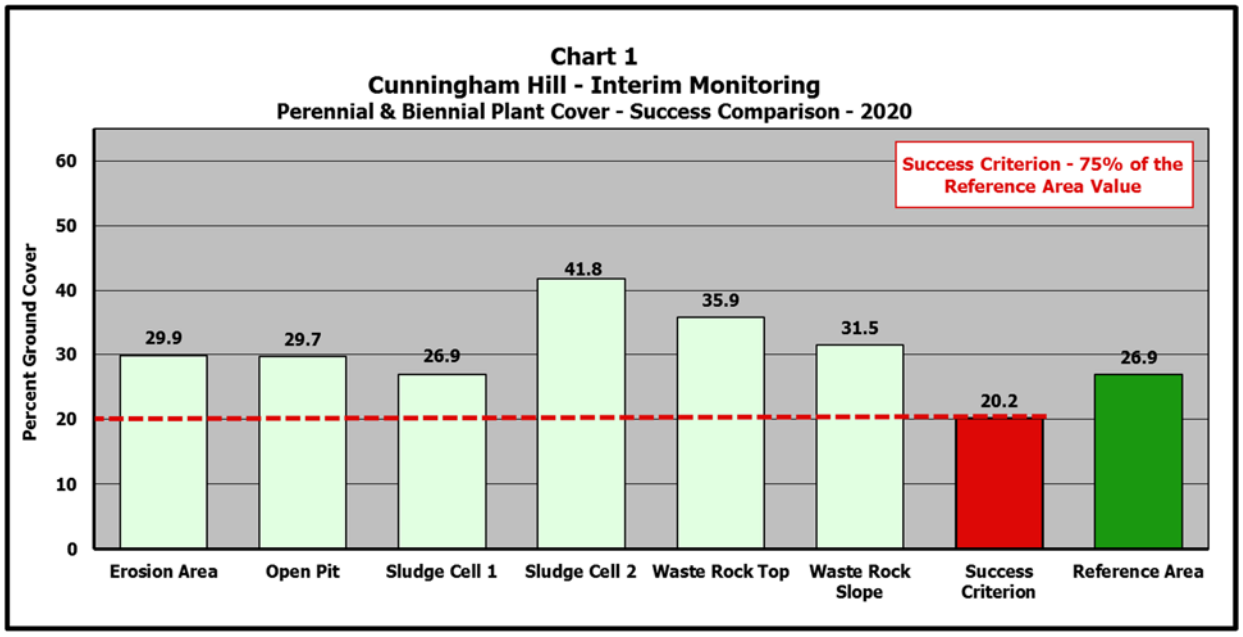


Chart 1
Cunningham Hill - Interim Monitoring
Perennial & Biennial Plant Cover - Success Comparison - 2020
Success Criterion - 75% of the Reference Area Value
Percent Ground Cover
0
10
20
30
40
50
60
29.9
29.7
26.9
41.8
35.9
31.5
20.2
26.9
Erosion Area
Open Pit
Sludge Cell 1
Sludge Cell 2
Waste Rock Top
Waste Rock Slope
Success Criterion
Reference Area

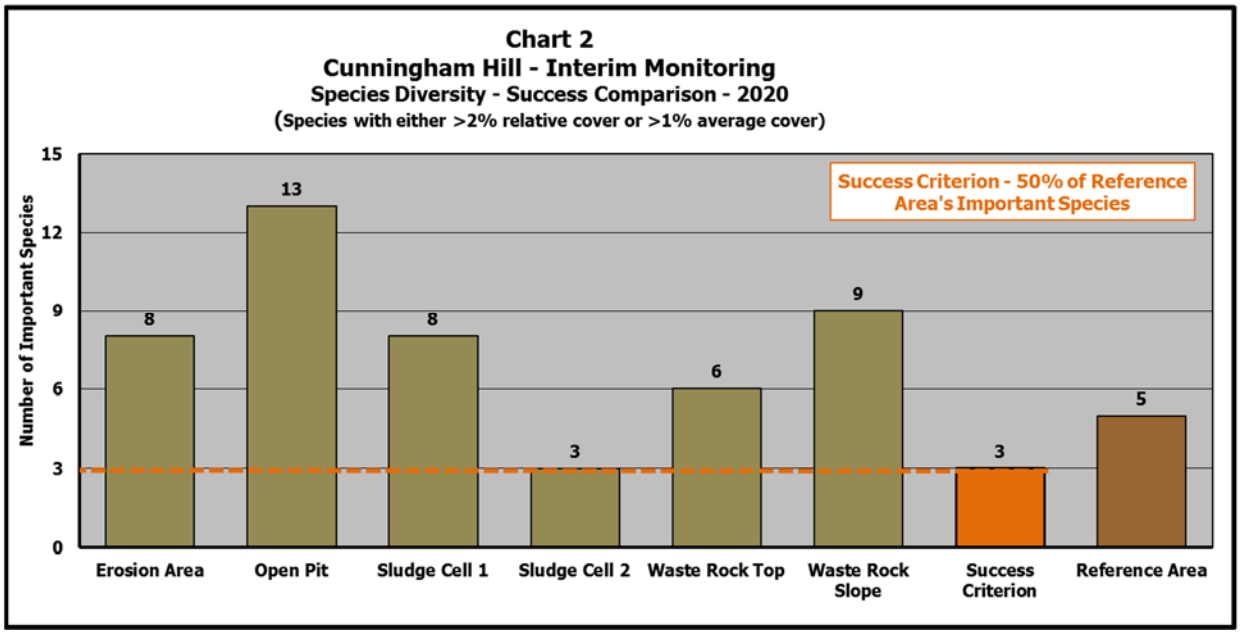


Chart 2
Cunningham Hill - Interim Monitoring
Species Diversity - Success Comparison - 2020
(Species with either >2% relative cover or >1% average cover)
Success Criterion - 50% of Reference Area's Important Species
Number of Important Species
0
3
6
9
12
15
8
13
8
3
6
9
3
5
Erosion Area
Open Pit
Sludge Cell 1
Sludge Cell 2
Waste Rock Top
Waste Rock Slope
Success Criterion
Reference Area

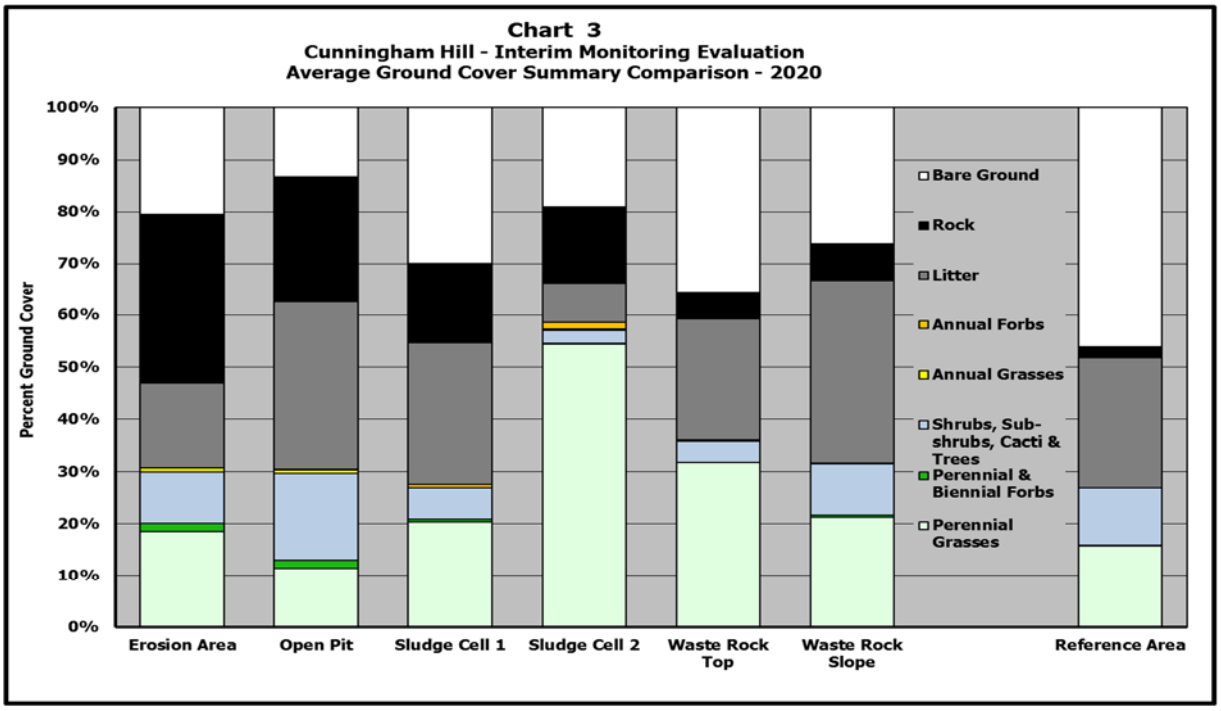


Chart 3
Cunningham Hill - Interim Monitoring Evaluation
Average Ground Cover Summary Comparison - 2020
Percent Ground Cover
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Erosion Area
Open Pit
Sludge Cell 1
Sludge Cell 2
Waste Rock Top
Waste Rock Slope
Reference Area
Bare Ground
Rock
Litter
Annual Forbs
Annual Grasses
Shrubs, Sub-shrubs, Cacti & Trees
Perennial & Biennial Forbs
Perennial Grasses

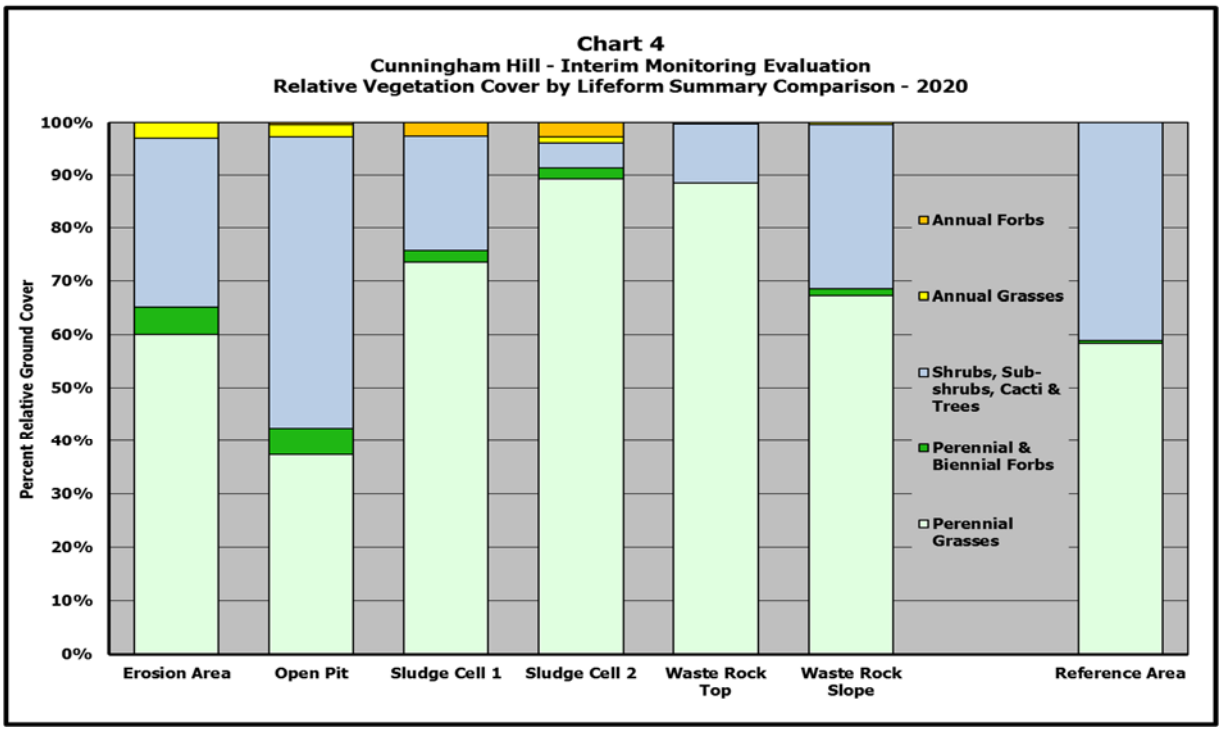


Chart 4
Cunningham Hill - Interim Monitoring Evaluation
Relative Vegetation Cover by Lifeform Summary Comparison - 2020
Percent Relative Ground Cover
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Erosion Area
Open Pit
Sludge Cell 1
Sludge Cell 2
Waste Rock Top
Waste Rock Slope
Reference Area
Annual Forbs
Annual Grasses
Shrubs, Sub-shrubs, Cacti & Trees
Perennial & Biennial Forbs
Perennial Grasses

Table 1 Cunningham Hill - 2020

Average Cover Summary - Interim Monitoring

Percent Ground Cover Based on Point-Intercept Sampling

	Area Sampled -->	Erosion Area	Open Pit	Sludge Cell 1	Sludge Cell 2	Waste Rock Top	Waste Rock Slope	Reference Area
	Scientific Name **Common Name**							
Grasses and Grass - likes								
P	*Agropyron dasystachyum* Thickspike wheatgrass	-	-	3.30	-	1.07	1.73	-
P	*Agropyron smithii* Western wheatgrass	0.40	0.67	3.00	3.80	2.73	0.60	-
P	*Agropyron spicatum* Bluebunch wheatgrass	-	-	-	-	-	0.87	-
P	*Aristida purpurea* Purple three - awn	0.20	0.07	0.10	-	-	-	-
P	*Bouteloua curtipendula* Sideoats grama	1.90	5.93	2.50	0.70	16.80	4.73	-
P	*Bouteloua gracilis* Blue grama	11.80	2.07	6.50	33.80	9.67	4.27	15.60
P	*Bromus inermis* Smooth Brome	-	0.07	0.20	0.20	1.47	0.20	-
A	*Bromus japonicus* Japanese Brome	0.90	-	-	-	-	0.13	-
A	*Bromus tectorum* Cheatgrass	-	0.67	-	0.50	0.07	-	-
P	*Elymus cinereus* Great basin wildrye	-	0.20	-	-	-	-	-
P	*Hilaria jamesii* Galleta	1.40	0.47	-	-	0.07	8.07	0.07
P	*Koeleria cristata* Prairie Junegrass	-	-	-	-	-	0.47	-
P	*Muhlenbergia wrightii* Spike muhly	-	0.27	-	-	-	-	-
P	*Oryzopsis hymenoides* Indian Ricegrass	0.30	-	1.10	0.40	-	-	-
P	*Schizachyrium scoparium* Little bluestem	2.00	-	-	-	-	0.27	-
P	*Sitanion hystrix* Bottlebrush Squirreltail	0.50	0.93	-	-	-	-	0.07
P	*Sporobolus airoides* Alkali Sacaton	-	0.73	0.50	0.10	-	-	-
P	*Stipa neomexicana* New Mexico Feathergrass	-	-	3.10	0.10	-	0.07	-
Forbs								
P	*Euphorbia sp.* Sandmat	-	0.07	-	-	-	-	-
A	*Ipomopsis longiflora* Flaxflowered ipomopsis	-	0.07	-	-	-	-	-
A	*Machaeranthera canescens* Hoary tansyaster	-	0.07	0.70	0.10	-	-	-
B	*Melilotus officinalis* Yellow Sweetclover	-	0.27	0.30	0.20	-	0.07	-
P	*Penstemon palmeri* Palmer Penstemon	0.20	1.20	-	-	-	0.20	-
P	*Petalostemon purpureum* Purple prairie clover	0.30	-	-	-	-	-	-
A	*Salsola tragus* Russian Thistle	-	-	-	1.10	-	-	-
P	*Solanum elaeagnifolium* Silverleaf nightshade	-	-	-	0.30	-	-	-
P	*Sphaeralcea coccinea* Scarlet Globemallow	1.10	-	0.30	0.40	-	0.07	0.13
B	*Tragopogon dubius* Yellow salsify		-		-	-	0.07	-
Shrubs, Sub-shrubs, Cacti & Trees								
P	*Atriplex canescens* Fourwing Saltbush	3.10	-	-	1.50	-	-	-
P	*Berberis fremontii* Fremont's Barberry	-	-	-	-	-	-	0.20
P	*Brickellia californica* California Brickellbush	-	0.47	-	-	-	-	-
P	*Cercocarpus ledifolius* Curl-leaf Mtn. Mahogany	-	1.13	-	-	-	-	-
P	*Cercocarpus montanus* Mountain Mahogany	-	0.20	-	-	-	-	-
P	*Chrysothamnus nauseosus* Rubber Rabbitbrush	2.30	3.13	2.40	-	-	1.80	-
P	*Fallugia paradoxa* Apache Plume	-	0.80	-	-	-	0.27	-
P	*Gutierrezia sarothrae* Broom Snakeweed	4.20	1.33	3.20	0.40	3.00	3.13	6.13
P	*Juniperus monosperma* One-seed Juniper	-	0.67	-	-	0.53	3.33	2.53
P	*Opuntia polyacantha* Plains Pricklypear	-	-	0.20	-	0.27	-	0.67
P	*Opuntia spinosior* Walkingstick Cactus	-	0.07	-	-	-	0.27	1.20
P	*Pinus edulis* Two-needle Pinyon	-	0.87	-	-	-	-	0.33
P	*Pinus ponderosa* Ponderosa pine	-	-	-	-	-	1.00	-
P	*Rhus trilobata* Skunkbush Sumac	-	8.07	-	-	-	-	-
P	*Senecio flaccidus var. f.* Threadleaf Ragwort	-	-	0.20	-	-	-	-
P	*Yucca glauca* Soapweed Yucca	0.20	-	-	0.20	0.27	-	-
	Total Plant Cover	**30.80**	**30.47**	**27.60**	**43.80**	**35.93**	**31.60**	**26.93**
	Rock	32.70	24.20	15.40	13.20	4.93	7.13	2.07
	Litter	16.10	32.13	27.10	22.20	23.40	35.13	24.87
	Bare ground	20.40	13.20	29.90	20.80	35.73	26.13	46.13
	Perennial & Biennial Plant Cover	**29.90**	**29.67**	**26.90**	**41.80**	**35.87**	**31.47**	**26.93**
Sampling Adequacy Calculations:	**variance =**	81.96	133.84	115.60	109.29	193.07	73.54	36.64
	n =	10	15	10	10	15	15	15
	n_{min} =	**29.03**	**44.73**	**50.99**	**19.14**	**46.39**	**22.85**	**15.67**

* P - Perennial, B - Biennial, A - Annual

Table 2 Cunningham Hill - 2020

Relative Cover Summary (Composition) - Interim Monitoring

Percent Ground Cover Based on Point-Intercept Sampling

	Scientific Name	Common Name	Erosion Area	Open Pit	Sludge Cell 1	Sludge Cell 2	Waste Rock Top	Waste Rock Slope	Reference Area
	Area Sampled -->								
Grasses and Grass - likes									
P	*Agropyron dasystachyum*	Thickspike wheatgrass	-	-	**11.96**	-	**2.97**	**5.49**	-
P	*Agropyron smithii*	Western wheatgrass	1.30	**2.19**	**10.87**	**8.68**	**7.61**	1.90	-
P	*Agropyron spicatum*	Bluebunch wheatgrass	-	-	-	**-**	-	**2.74**	-
P	*Aristida purpurea*	Purple three - awn	0.65	0.22	0.36	-	-	-	-
P	*Bouteloua curtipendula*	Sideoats grama	**6.17**	**19.47**	**9.06**	1.60	**46.75**	**14.98**	-
P	*Bouteloua gracilis*	Blue grama	**38.31**	**6.78**	**23.55**	**77.17**	**26.90**	**13.50**	**57.92**
P	*Bromus inermis*	Smooth Brome	-	0.22	0.72	0.46	**4.08**	0.63	-
A	*Bromus japonicus*	Japanese Brome	2.92	-	-	-	**-**	0.42	-
A	*Bromus tectorum*	Cheatgrass	-	2.19	-	1.14	0.19	-	-
P	*Elymus cinereus*	Great basin wildrye	-	0.66	-	-	-	-	-
P	*Hilaria jamesii*	Galleta	**4.55**	1.53	-	-	0.19	**25.53**	0.25
P	*Koeleria cristata*	Prairie Junegrass	-	-	-	-	-	1.48	-
P	*Muhlenbergia wrightii*	Spike muhly	-	0.88	-	-	-	-	-
P	*Oryzopsis hymenoides*	Indian Ricegrass	0.97	-	**3.99**	0.91	-	-	-
P	*Schizachyrium scoparium*	Little bluestem	**6.49**	-	-	-	-	0.84	-
P	*Sitanion hystrix*	Bottlebrush Squirreltail	1.62	**3.06**	-	-	-	-	0.25
P	*Sporobolus airoides*	Alkali Sacaton	-	**2.41**	1.81	0.23	-	-	-
P	*Stipa neomexicana*	New Mexico Feathergrass	-	-	**11.23**	0.23	-	0.21	-
Forbs									
P	*Euphorbia sp.*	Sandmat	-	0.22	-	-	-	-	-
A	*Ipomopsis longiflora*	Flaxflowered ipomopsis	-	0.22	-	-	-	-	-
A	*Machaeranthera canescens*	Hoary tansyaster	-	0.22	2.54	0.23	-	-	-
B	*Melilotus officinalis*	Yellow Sweetclover	-	0.88	1.09	0.46	-	0.21	-
P	*Penstemon palmeri*	Palmer Penstemon	0.65	**3.94**	-	-	-	0.63	-
P	*Petalostemon purpureum*	Purple prairie clover	0.97	-	-	-	-	-	-
A	*Salsola tragus*	Russian Thistle	-	-	-	2.51	-	-	-
P	*Solanum elaeagnifolium*	Silverleaf nightshade	-	-	-	0.68	-	-	-
P	*Sphaeralcea coccinea*	Scarlet Globemallow	**3.57**	-	1.09	0.91	-	0.21	0.50
B	*Tragopogon dubius*	Yellow salsify	-	-	-	-	-	0.21	-
Shrubs, Sub-shrubs, Cacti & Trees									
P	*Atriplex canescens*	Fourwing Saltbush	**10.06**	-	**-**	**3.42**	-	-	-
P	*Berberis fremontii*	Fremont's Barberry	**-**	-	**-**	**-**	-	-	0.74
P	*Brickellia californica*	California Brickellbush	**-**	1.53	**-**	**-**	-	-	-
P	*Cercocarpus ledifolius*	Curl-leaf Mtn. Mahogany	-	**3.72**	-	-	-	-	-
P	*Cercocarpus montanus*	Mountain Mahogany	-	0.66	-	-	-	-	-
P	*Chrysothamnus nauseosus*	Rubber Rabbitbrush	**7.47**	**10.28**	**8.70**	-	-	**5.70**	-
P	*Fallugia paradoxa*	Apache Plume	-	**2.63**	-	-	-	0.84	-
P	*Gutierrezia sarothrae*	Broom Snakeweed	**13.64**	**4.38**	**11.59**	0.91	**8.35**	**9.92**	**22.77**
P	*Juniperus monosperma*	One-seed Juniper	-	**2.19**	-	-	1.48	**10.55**	**9.41**
P	*Opuntia polyacantha*	Plains Pricklypear	-	-	0.72	-	0.74	-	**2.48**
P	*Opuntia spinosior*	Walkingstick Cactus	-	0.22	-	-	-	0.84	**4.46**
P	*Pinus edulis*	Two-needle Pinyon	-	**2.84**	-	-	-	-	1.24
P	*Pinus ponderosa*	Ponderosa pine	-	-	-	-	-	**3.16**	-
P	*Rhus trilobata*	Skunkbush Sumac	-	**26.48**	-	-	-	-	-
P	*Senecio flaccidus var. f.*	Threadleaf Ragwort	-	-	0.72	-	-	-	-
P	*Yucca glauca*	Soapweed Yucca	0.65	-	-	0.46	0.74	-	-
	Number of Species with > 2% Relative Cover or > 1% Absolute Cover (excluding annuals)		**8**	**13**	**8**	**3**	**6**	**9**	**5**

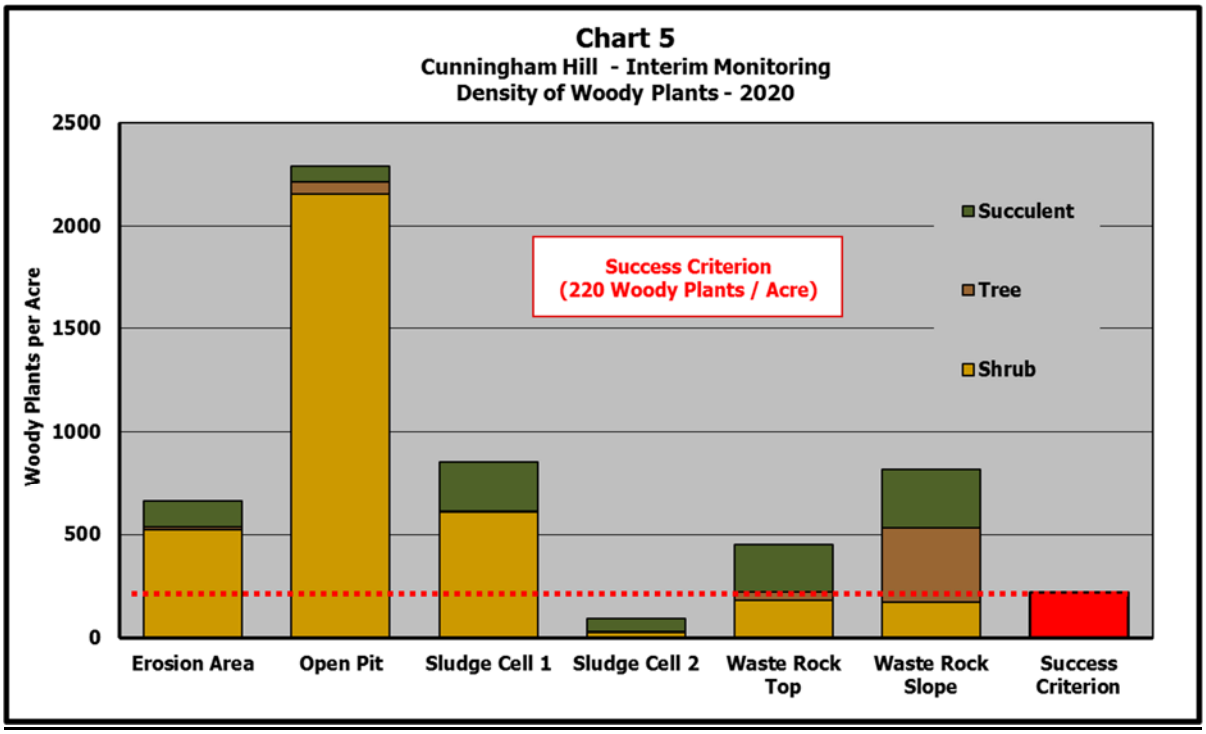
***** P - Perennial, B - Biennial, A - Annual

Table 3 Cunningham Hill - Vegetation Density - 2020

Woody Plant Density Summary - Interim Monitoring

Live Stems per Acre

Lifeform	Scientific name	Common Name	Erosion Area	Open Pit	Sludge Cell 1	Sludge Cell 2	Waste Rock Top	Waste Rock Slope
		Area Sampled -->						
S	*Atriplex canescens*	Fourwing Saltbush	186.2	59.4	85.0	28.3	43.2	45.9
S	*Brickellia californica*	California Brickellbush	-	8.1	8.1	-	78.2	-
S	*Cercocarpus ledifolius*	Curl-leaf Mtn. Mahogany	-	54.0	-	-	-	-
S	*Cercocarpus montanus*	Mountain Mahogany	4.0	59.4	-	-	-	2.7
S	*Chrysothamnus nauseosus*	Rubber Rabbitbrush	311.6	1,044.1	509.9	-	51.3	97.1
S	*Fallugia paradoxa*	Apache Plume	12.1	45.9	4.0	-	2.7	18.9
T	*Juniperus monosperma*	One-seed Juniper	-	24.3	4.0	4.0	27.0	137.6
Su	*Opuntia polyacantha*	Plains Pricklypear	52.6	24.3	105.2	16.2	148.4	126.8
Su	*Opuntia spinosior*	Walkingstick Cactus	4.0	37.8	28.3	4.0	45.9	107.9
T	*Pinus edulis*	Two-needle Pinyon	12.1	27.0	-	-	13.5	134.9
T	*Pinus ponderosa*	Ponderosa pine	-	2.7	-	-	-	83.6
T	*Quercus gambelii*	Gambels oak	-	8.1	-	-	-	2.7
S	*Rhus trilobata*	Skunkbush Sumac	-	884.9	-	-	2.7	2.7
S	*Senecio flaccidus var. flaccidus*	Threadleaf Ragwort	8.1	-	-	-	2.7	5.4
Nx	*Ulmus pumila*	Siberian elm	-	-	-	-	2.7	-
Su	*Yucca glauca*	Soapweed Yucca	72.8	13.5	109.3	44.5	35.1	54.0
Life Form		**Shrub (S)**	**522.0**	**2,155.6**	**607.0**	**28.3**	**180.8**	**172.7**
		Tree (T)	**12.1**	**62.1**	**4.0**	**4.0**	**40.5**	**358.8**
		Succulent (Su)	**129.5**	**75.5**	**242.8**	**64.7**	**229.3**	**288.7**
		Noxious (Nx)	**-**	**-**	**-**	**-**	**2.7**	**-**
Total Woody Plants per Acre (Excluding Noxious)			**663.7**	**2,293.2**	**853.9**	**97.1**	**450.6**	**820.2**
Sample Adequacy Calculations		**n =**	**10**	**15**	**10**	**Total Count**	**15**	**15**
		n_{min} =	**245.86**	**71.38**	**349.49**		**161.71**	**64.72**



3.2 Erosion Area

The Erosion Area was sampled with 10 cover transects in 2020 (see Map 2). Examination of Table 1 indicates that total plant cover was 30.8%, of which 29.9% was expressed as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 32.7%, 16.1%, and 20.4%, respectively. Total vegetative cover (exclusive of annual species) for Erosion Area exceeds the ground cover performance criterion (29.9% vs. 20.2% [75% of Reference Area Cover]). A total of 22 species were observed in the Erosion Area (Table A1), 8 of which are considered "important" species, exceeding the species diversity performance criterion (8 vs. 3 [50% of Reference Area "Important" Species]). Dominant taxa were blue grama (*Bouteloua gracilis*), broom snakeweed (*Gutierrezia sarothrae*), and fourwing saltbush (*Atriplex canescens*) with 11.8%, 4.2%, and 3.1% cover, respectively. Review of Table 3 and Chart 5 reveal that woody plant density (excluding noxious species) on this unit was 663 woody plants per acre. Dominant woody plants were rubber rabbitbrush (*Chrysothamnus nauseosus*) with 311 plants per acre and fourwing saltbush (*Atriplex canescens)* with 186 plants per acre. The Erosion Area exceeds the woody plant density performance criterion (663 live stems per acre vs 220 live stems per acre). These results indicate that the Erosion Area currently passes all bond release performance criteria for revegetation.

Photo 1. Erosion Area - 2020

3.3 Open Pit Area

The Open Pit Area was sampled with 15 cover transects in 2020 (see Map 2). Examination of Table 1 indicates that total plant cover was 30.5%, of which 29.7% was expressed as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 24.2%, 32.1%, and 13.2%, respectively. Total vegetative cover (exclusive of annual species) for Open Pit Area exceeds the ground cover performance criterion (29.7% vs. 20.2% [75% of Reference Area Cover]). A total of 31 species were observed in the Open Pit Area (Table A1), 13 of which are considered "important" species, exceeding the species diversity performance criterion (13 vs. 3 [50% of Reference Area "Important" Species]). Dominant taxa were skunkbush sumac (*Rhus trilobata*), sideoats grama (*Bouteloua curtipendula*), and rubber rabbitbrush with 8.0%, 5.9% and 3.1% cover, respectively. Review of Table 3 and Chart 5 reveal that woody plant density on this unit was 2,293 woody plants per acre (excluding noxious species). Dominant woody plants were rubber rabbitbrush and skunkbush sumac and with 1,044 and 884 plants per acre, respectively. The Open Pit Area significantly exceeds the woody plant density performance criterion (2,293 live stems per acre vs 220 live stems per acre). These results indicate that the Open Pit Area currently passes all bond release performance criteria for revegetation.

Photo 2. Open Pit Area - 2020

3.4 Sludge Cell 1 Area

The Sludge Cell 1 Area was sampled with 10 cover transects in 2020 (see Map 2). Examination of Table 1 indicates that total plant cover was 27.6%, of which 26.9% was expressed as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 15.4%, 27.1%, and 29.9%, respectively. Total vegetative cover (exclusive of annual species) for Sludge Cell 1 Area exceeds the ground cover performance criterion (26.9% vs. 20.2% [75% of Reference Area Cover]). A total of 21 species were observed in the Sludge Cell 1 Area (Table A1), 8 of which are considered "important" species, exceeding the species diversity performance criterion (8 vs. 3 [50% of Reference Area "Important" Species]). Dominant taxa were blue grama with 6.5% cover, thickspike wheatgrass (*Agropyron dasystachyum*) with 3.3% cover, western wheatgrass (*Agropyron smithii*) with 3.0% cover, new mexico feathergrass (*Stipa neomexicana*) with 3.1% cover and broom snakeweed with 3.2% cover. Review of Table 3 and Chart 5 reveal that woody plant density on this unit was 853 woody plants per acre (excluding noxious species). The dominant woody plant was rubber rabbitbrush with 509 plants per acre. The Sludge Cell 1 Area significantly exceeds the woody plant density performance criterion (853 live stems per acre vs 220 live stems per acre). These results indicate that the Sludge Cell 1 Area currently passes all bond release performance criteria for revegetation.

Photo 3. Sludge Cell 1 Area - 2020

3.5 Sludge Cell 2 Area

The Sludge Cell 2 Area was sampled with 10 cover transects in 2020 (see Map 2). Examination of Table 1 indicates that total plant cover was 43.8%, of which, 41.8% was expressed as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 13.2%, 22.2%, and 20.8%, respectively. Total vegetative cover (exclusive of annual species) for Sludge Cell 2 Area significantly exceeds the ground cover performance criterion (41.8% vs. 20.2% [75% of Reference Area Cover]). A total of 19 species were observed in the Sludge Cell 2 Area (Table A1), 3 of which are considered "important" species, this does not exceed the species diversity performance criterion (3 vs. 3 [50% of Reference Area "Important" Species]). Blue grama was the dominant taxon contributing 33.8% cover. Review of Table 3 and Chart 5 reveal that woody plant density on this unit was 97 woody plants per acre (excluding noxious species). The dominant woody plant was soapweed yucca (*Yucca glauca*) with 44.5 plants per acre. The Sludge Cell 2 Area does not exceed the woody plant density performance criterion (97 live stems per acre vs 220 live stems per acre). These results indicate that the Sludge Cell 2 Area is still progressing towards passing bond release performance criteria for revegetation.

Photo 4. Sludge Cell 2 Area - 2020

3.6 Waste Rock Top Area

The Waste Rock Top Area was sampled with 15 cover transects in 2020 (see Map 2). Examination of Table 1 indicates that total plant cover was 35.9%, of which 35.8% was expressed as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 4.9%, 23.4%, and 35.7%, respectively. Total vegetative cover (exclusive of annual species) for Waste Rock Top Area significantly exceeds the ground cover performance criterion (35.8% vs. 20.2% [75% of Reference Area Cover]). A total of 20 species were observed in the Waste Rock Top Area (Table A1), 6 of which are considered "important" species, exceeding the species diversity performance criterion (6 vs. 3 [50% of Reference Area "Important" Species]). Dominant taxa were sideoats grama, blue grama, and broom snakeweed with 16.8%, 9.6%, and 3% cover, respectively. Review of Table 3 and Chart 5 reveal that woody plant density on this unit was 450 woody plants per acre (excluding noxious species). Dominant woody plants were plains prickly pear (*Opuntia polyacantha*) and california brickellbush *(Brickellia californica*) with 148 and 78 plants per acre, respectively. The Waste Rock Top Area significantly exceeds the woody plant density performance criterion (450 live stems per acre vs 220 live stems per acre). These results indicate that the Waste Rock Top Area currently passes all bond release performance criteria for revegetation.

Photo 5. Waste Rock Top Area - 2020

3.7 Waste Rock Slope Area

The Waste Rock Slope Area was sampled with 15 cover transects in 2020 (see Map 2). Examination of Table 1 indicates that total plant cover was 31.6%, of which 31.4% was expressed as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 7.1%, 35.1%, and 26.1%, respectively. Total vegetative cover (exclusive of annual species) for Waste Rock Slope Area significantly exceeds the ground cover performance criterion (31.4% vs. 20.2% [75% of Reference Area Cover]). A total of 29 species were observed in the Waste Rock Slope Area (Table A1), 9 of which are considered "important" species, exceeding the species diversity performance criterion (9 vs. 3 [50% of Reference Area "Important" Species]). Dominant taxa were galleta (*Hilaria jamesii*), sideoats grama, and blue grama with 8.0%, 4.7 %, and 4.2% cover, respectively. Review of Table 3 and Chart 5 reveal that woody plant density on this unit was 820 woody plants per acre (excluding noxious species). Dominant woody plants were one-seed juniper (*Juniperus monosperma)* and two-needle pinon (*Pinus edulis*) with 137 and 134 plants per acre, respectively. The Waste Rock Slope Area significantly exceeds the woody plant density performance criterion (820 live stems per acre vs 220 live stems per acre). These results indicate that the Waste Rock Slope Area currently passes all bond release performance criteria for revegetation.

Photo 6. Waste Rock Slope Area - 2020

3.8 Reference Area

The approved reference area was sampled with 15 cover transects in 2020 (Map 2). Examination of Table 1 indicates that total plant cover was 26.9%, consisting entirely as perennial and biennial cover. Rock, litter, and bare ground exposure exhibited cover values of 2.0%, 24.8%, and 46.1%, respectively. Dominant taxa were blue grama, and broom snakeweed, with 15.6%, and 6.1% cover, respectively. A total of 10 species were observed in the reference area (Table A1), 5 which are considered "important" species.

Photo 7. Reference Area - 2020

4.0 RECOMMENDATIONS

Based on the results of this evaluation it is clear that all revegetation areas are exhibiting plant community development as expected. Therefore, Cedar Creek recommends that future monitoring efforts incorporate the smaller, younger areas (Erosion, Sludge Cell 1, and Sludge Cell 2) into the larger areas they are contained within. The Erosion area (0.72 acres) seeded in 2009 can be absorbed into the Waste Dump Slope area (14.43 acres) seeded in 1992. The Sludge Cell 1 (5.43 acres) and Sludge Cell 2 (0.33 acres) areas seeded in 2008 and 2011 respectively can be absorbed into the Waste Dump Top area (44.62 acres) seeded in 1992.

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Appendix A

Sampling Methods

Appendix A - Sampling Methods

INTRODUCTION

Cedar Creek's sampling protocols involve a concentration upon ground cover* to facilitate repeatable future statistical comparisons among treatment areas (or unique revegetation units) and over time. A concentration on ground cover is recommended for a multitude of reasons. First, concentration on a single variable of plant ecology facilitates improved comprehension and comparability over time and among treatment scenarios. Second, ground cover data, especially when determined using a very precise method such as the point-intercept procedure, provides some of the most important information regarding community variability that ecologists can evaluate. Such data facilitate the determination of the true species composition, relative health (condition), and successional status of the sampled area. Furthermore, the same data can be utilized to develop the additional variables of frequency and species composition if desired. Third, strong inferences can be developed with other reasonably correlated variables such as production when species composition is factored into the analysis. Fourth, ground cover is a preferred variable for monitoring because cover data can be readily obtained in a statistically adequate and cost-effective manner (using the proper procedures), has broad application for evaluation (including erosion control modeling), precisely reflects species' dominance of a given area, and when collected using bias-free techniques such as the point-intercept procedure is one of the most repeatable variables among independent observers. Finally, cover is the primary variable indicated for use by the company's Closeout Plan for determination of successful revegetation.

However, in addition to ground cover sampling, MMD and hence the Closeout Plan, require evaluation of woody plant density. In this regard, it was determined most appropriate to monitor the progress of woody plant establishment and development (for wildlife habitat considerations) utilizing density belts as detailed in Section A-3.

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* To avoid confusion, the term "ground cover" is utilized to indicate the variable of non-overlapping foliar cover (the percent of the ground occupied by all above ground live plant material) in addition to the ground surface covered by litter or rock. Non-overlapping means that only that cover which would be wetted by a light mist would be counted as opposed to that plant material which would not get wet due to overshadowing plant material. In this manner, total ground cover cannot exceed 100%. Other forms of "cover" would include: basal cover (the percent of the ground surface occupied by the living base of plants), crown or canopy cover (the percent of the ground occupied by the canopies of plants), or overlapping foliar cover (the percent of the ground occupied by all plant material allowing for overlapping vegetation - i.e., such cover can exceed 100%). Non-overlapping foliar cover is preferred because of its inherent repeatability among observers, resulting data are directly applicable to erosion control modeling efforts, and significant precedent has already been set in the industry. In contrast, the determination of the live portion of the base of a plant (as necessary for basal cover) becomes increasingly difficult given life forms such as certain bunch grasses and sod-formers.

A-1 Sample Site Selection / Location

As indicated in the revised Closeout Plan, sample site location for the reclaimed areas suggests use of a systematic procedure initiated in an unbiased manner for each unique revegetation unit investigated as well as the reference area. In this manner, "representation" from the entire reclaimed unit is "forced" rather than risking the chance that significant pockets are entirely missed, or over-emphasized, as may occur in strictly random sampling. This systematic procedure also provides proportionate representation from across the reclaimed unit for such characteristics as aspect and slope. An example of this procedure is indicated on Figure 1 and the actual results on Map 2.

The systematic procedure for sample location occurred in the following stepwise manner. First, a fixed point of reference was selected for each area to facilitate location of the systematic grid in the field. Second, a systematic grid of appropriate dimensions (e.g., 125' X 125') was selected by Cedar Creek to provide a minimum number of coordinate intersections within the reclaimed unit that could then be used for the initial set of sample sites. Third, a scaled representation of the grid was overlain on computer-generated field maps of each facility extending parallel to major compass axes. Fourth, unbiased placement of this grid was controlled by selection of two random numbers to be used as coordinates to establish a sampling starting point. Fifth, utilizing a handheld compass and pacing techniques or a handheld GPS, all of the initial sample points for each area were located in the field. The result of this activity is provided on Map 2. If the initial systematic samples had not been sufficient to provide an adequate ground cover or woody plant density sample for bond release evaluations, an "intergrid" would have been selected to provide additional systematically determined sample points.

The reference area to be utilized for comparison to the reclaimed areas was selected from an undisturbed area typical of the soils and other physical attributes of the reclaimed area (see Map 1). This area was approved by MMD on September 2, 1997. More important, however, is that this is one of the few areas sufficiently sizable (6.84 acres) in the project area that is dominated by a natural grassland community, the most appropriate and representative target for reclaimed communities. A few scattered junipers occur within the reference area but are exempted from sampling if mature. The other communities in the project area (primarily piñon - juniper woodland) are overwhelmingly dominated by woody species that take decades, perhaps centuries, to evolve. Furthermore, reference areas comprised of these "woody" communities would defeat certain fundamental assumptions necessary for a valid comparison the most primary of which is equivalence or similarity of form and function. In any event, sample site selection in the reference area occurred in a manner very similar to that for the reclaimed areas. The only difference being that the occasional mature junipers were specifically avoided as they are not representative of the grassland community. In this regard, where a ground cover transect intercepted a mature tree (greater than 5 feet in height), the cover transect was interrupted at the "drip line" of the

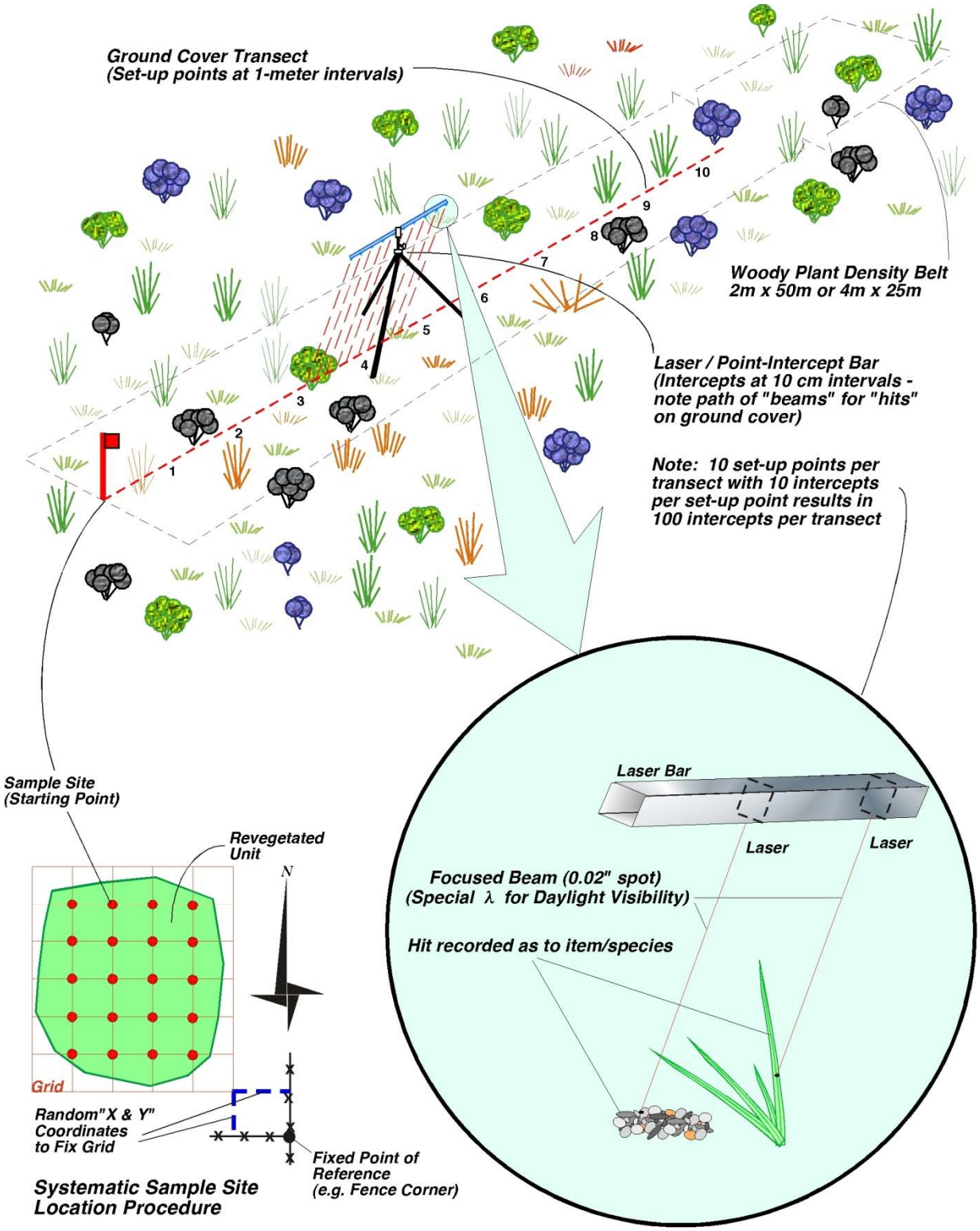


Figure 1

Sampling Procedure at a Systematic Sample Site Location

tree canopy and then resumed on the opposite side. Immature trees (less than 5 feet tall) that were intercepted by the cover transect were recorded along with all other vegetation. This process was deemed appropriate as young trees also occur in the reclamation.

A-2 Determination of Ground Cover

Ground cover at each sampling site was determined utilizing the point-intercept methodology (Bonham 1989) as illustrated on Figure 1. This methodology has been utilized for range studies for over eighty (80) years, however, Cedar Creek utilizes new state-of-the-art instrumentation which it has pioneered to facilitate much more rapid and accurate collection of data. Implementation of the technique for the sampling effort occurred as follows: First, one transect of 10 meters length was extended from the starting point of each sample site toward the direction of the next site to be sampled. Then, at each one-meter interval along the transect, a "laser point bar" was situated vertically above the ground surface, and a set of 10 readings recorded as to hits on vegetation (by species), litter, rock (>2mm), or bare soil. Hits were determined at each meter interval by activating a battery of 10 specialized lasers situated along the bar at 10 centimeter intervals and recording the variable intercepted by each of the narrow (0.02") focused beams (see Figure 1). In this manner, a total of 100 intercepts per transect were recorded resulting in 1 percent cover per intercept. This methodology and instrumentation facilitates the collection of the most unbiased, repeatable, precise, and cost-effective ground cover data possible. Furthermore, the point-intercept procedure has been widely accepted in the scientific community, especially the mining industry, as the protocol of choice for vegetation monitoring and bond release determination.

A-3 Determination of Woody Plant Density

Woody plant density at each sampling site was determined using fixed length / width belt transects extended from the starting point of each sample site toward the direction of the next site to be sampled. Each belt was a total of 100 m^2 and were either 2 meter by 50 meter or 4 meter by 25 meter, depending on the size of the unit. All live shrubs, sub-shrubs, cacti and trees rooted within the boundaries of these belts were counted and classified according to species. Determination of whether or not a plant could be counted was dependent upon the location of its main stem or root collar where it exited the ground surface with regard to belt limits. Entire plants rather than stems were counted to provide a more accurate representation of actual woody plant density.

A-4 Sample Adequacy Determination

Ground cover sampling within the reclaimed areas as well as the reference area was conducted to a minimum of 10 or 15 initial transects. Woody plant density sampling within the reclaimed areas sampled for interim monitoring were co-located with ground cover transects. From these preliminary efforts, a sample mean and standard deviation for total non-overlapping vegetation ground cover and woody plant density were calculated. These parameters were calculated in the field to insure collection of an adequate sample and once again by computer during final data analyses for each area. Sampling continued until an adequate ground cover or woody plant density sample, $\mathbf{n_{min}}$, had been collected in accordance with the Cochran formula (below) for determining sample adequacy, whereby the population would be estimated to within 10% of the true mean (μ) with 90% confidence. Sampling to these limits facilitates a very strong estimate of target populations. Cochran's formula was utilized as it is the procedure indicated for use in the new Section 4.4 of the Closeout Plan as well as in MMD's regulatory guidelines. Sample adequacy was calculated for informational purposes as achieving an adequate sample is not required for interim monitoring evaluations.

When the inequality ($\mathbf{n_{min}} \leq \mathbf{n}$) is true, sampling is adequate and $\mathbf{n_{min}}$ is determined as follows:

$$\mathbf{n_{min} = (t^2 s^2) / (0.1\ \bar{x})^2}$$

where: n = the number of actual samples collected (initial size = 10 or 15)

t = the value from the two-tailed t distribution for 90% confidence with n-1 degrees of freedom;

s^2 = the variance of the estimate as calculated from the initial samples;

$\bar{x}$ = the mean of the estimate as calculated from the initial samples.

A-5 Testing for Success

Following statistically adequate sampling, the comparison process is initiated by calculating the mean ground cover value for non-annual plants only (non-annual ground cover, or "NAGC") for each revegetated unit and the reference area. The test for revegetation success for ground cover includes the following steps.

Step 1: The first step is to determine whether the mean NAGC of the revegetated unit(s) ($\overline{x}_{(rv)}$) exceeds 75 percent of the mean NAGC for the reference area ($\overline{x}_{(co)}$). If $\overline{x}_{(rv)} \geq 0.75$ ($\overline{x}_{(co)}$), then the ground cover test has been passed and the soils are assumed to be stable.

Step 2: If the mean NAGC of the revegetated unit equals or exceeds 50% (but is less than 75%) of the mean NAGC for the reference area, then a "gray area" determination will be conducted to evaluate soil stability. The evaluation of soil stability using the RUSLE model is detailed in subsection 4.4.4 of the closeout plan.

Appendix B

Raw Data

Table A1 Cunningham Hill - 2020

Observed Species

	Scientific Name	*Area Sampled -->* Common Name	Erosion Area	Open Pit	Sludge Cell 1	Sludge Cell 2	Waste Rock Top	Waste Rock Slope	Reference Area
Grasses and Grass - likes									
P	*Agropyron dasystachyum*	Thickspike wheatgrass			X		X	X	
P	*Agropyron smithii*	Western wheatgrass	X	X	X	X	X	X	
P	*Agropyron spicatum*	Bluebunch wheatgrass						X	
P	*Aristida purpurea*	Purple three - awn	X	X	X				
P	*Bouteloua curtipendula*	Sideoats grama	X	X	X	X	X	X	
P	*Bouteloua gracilis*	Blue grama	X	X	X	X	X	X	X
P	*Bromus inermis*	Smooth Brome		X	X	X	X	X	
A	*Bromus japonicus*	Japanese Brome	X					X	
A	*Bromus tectorum*	Cheatgrass		X		X	X		
P	*Elymus cinereus*	Great basin wildrye		X					
P	*Hilaria jamesii*	Galleta	X	X			X	X	X
P	*Koeleria cristata*	Prairie Junegrass						X	
P	*Muhlenbergia wrightii*	Spike muhly		X					
P	*Oryzopsis hymenoides*	Indian Ricegrass	X		X	X			
P	*Schizachyrium scoparium*	Little bluestem	X					X	
P	*Sitanion hystrix*	Bottlebrush Squirreltail	X	X					X
P	*Sporobolus airoides*	Alkali Sacaton		X	X	X			
P	*Stipa neomexicana*	New Mexico Feathergrass			X	X		X	
Forbs									
P	*Euphorbia sp.*	Sandmat		X					
A	*Ipomopsis longiflora*	Flaxflowered ipomopsis		X					
A	*Machaeranthera canescens*	Hoary tansyaster		X	X	X			
B	*Melilotus officinalis*	Yellow Sweetclover		X	X	X		X	
P	*Penstemon palmeri*	Palmer Penstemon	X	X				X	
P	*Petalostemon purpureum*	Purple prairie clover	X						
A	*Salsola tragus*	Russian Thistle				X			
P	*Solanum elaeagnifolium*	Silverleaf nightshade				X			
P	*Sphaeralcea coccinea*	Scarlet Globemallow	X		X	X		X	X
B	*Tragopogon dubius*	Yellow salsify						X	
Shrubs, Sub-shrubs, Cacti & Trees									
P	*Atriplex canescens*	Fourwing Saltbush	X	X	X	X	X	X	
P	*Berberis fremontii*	Fremont's Barberry							X
P	*Brickellia californica*	California Brickellbush		X	X		X		
P	*Cercocarpus ledifolius*	Curl-leaf Mtn. Mahogany		X					
P	*Cercocarpus montanus*	Mountain Mahogany	X	X				X	
P	*Chrysothamnus nauseosus*	Rubber Rabbitbrush	X	X	X		X	X	
P	*Fallugia paradoxa*	Apache Plume	X	X	X		X	X	
P	*Gutierrezia sarothrae*	Broom Snakeweed	X	X	X	X	X	X	X
P	*Juniperus monosperma*	One-seed Juniper		X	X	X	X	X	X
P	*Opuntia polyacantha*	Plains Pricklypear	X	X	X	X	X	X	X
P	*Opuntia spinosior*	Walkingstick Cactus	X	X	X	X	X	X	X
P	*Pinus edulis*	Two-needle Pinyon	X	X			X	X	X
P	*Pinus ponderosa*	Ponderosa pine		X				X	
P	*Quercus gambelii*	Gambels oak		X				X	
P	*Rhus trilobata*	Skunkbush Sumac		X			X	X	
P	*Senecio flaccidus var. f.*	Threadleaf Ragwort	X				X	X	
Nx	*Ulmus pumila*	Siberian elm					X		
P	*Yucca glauca*	Soapweed Yucca	X	X	X	X	X	X	
		Total Species Encountered	**22**	**31**	**21**	**19**	**20**	**29**	**10**

***** P - Perennial, B - Biennial, A - Annual, Nx - Noxious

* Includes species found in both Cover & WPD transects

Table A2 Cunningham Hill - Vegetation Cover - 2020

Erosion Area - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes															
P	*Agropyron smithii*	Western wheatgrass			1	1			2				**0.40**	**1.30**	**30**
P	*Aristida purpurea*	Purple three - awn			2								**0.20**	**0.65**	**10**
P	*Bouteloua curtipendula*	Sideoats grama	5	6	6						2		**1.90**	**6.17**	**40**
P	*Bouteloua gracilis*	Blue grama	13	7	1	2	14	22	22	29	5	3	**11.80**	**38.31**	**100**
A	*Bromus japonicus*	Japanese brome								2		7	**0.90**	**2.92**	**20**
P	*Hilaria jamesii*	Galleta				2		8	4				**1.40**	**4.55**	**30**
P	*Oryzopsis hymenoides*	Indian Ricegrass		1					1	1			**0.30**	**0.97**	**30**
P	*Schizachyrium scoparium*	Little bluestem	5	4	3						8		**2.00**	**6.49**	**40**
P	*Sitanion hystrix*	Bottlebrush Squirreltail					2		3				**0.50**	**1.62**	**20**
Forbs															
P	*Penstemon palmeri*	Palmer Penstemon			2								**0.20**	**0.65**	**10**
P	*Petalostemon purpureum*	Purple prairie clover									3		**0.30**	**0.97**	**10**
P	*Sphaeralcea coccinea*	Scarlet Globemallow			2	8		1					**1.10**	**3.57**	**30**
Shrubs, Sub-shrubs, Cacti & Trees															
P	*Atriplex canescens*	Fourwing Saltbush					21					10	**3.10**	**10.06**	**20**
P	*Chrysothamnus nauseosus*	Rubber Rabbitbrush			3							20	**2.30**	**7.47**	**20**
P	*Gutierrezia sarothrae*	Broom Snakeweed		2	6	15	13				5	1	**4.20**	**13.64**	**60**
P	*Yucca glauca*	Soapweed Yucca				2							**0.20**	**0.65**	**10**
														Mean	
		Total Plant Cover	**23**	**20**	**26**	**30**	**50**	**31**	**32**	**32**	**23**	**41**		**30.80**	
		Rock	65	42	41	10	3	35	19	26	67	19		**32.70**	
		Litter	6	11	9	27	18	5	24	28	3	30		**16.10**	
		Bare ground	6	27	24	33	29	29	25	14	7	10		**20.40**	
		Total Perennial & Biennial Cover	**23**	**20**	**26**	**30**	**50**	**31**	**32**	**30**	**23**	**34**		**29.90**	

Sample Adequacy Calculations	***t* = 1.8331** **n = 10** **Variance = 81.96** **n_{min} = 29.03**
Diversity	**No. of Important Perennial or Biennial Sps. = 8** **(>2% Relative Cover or >1% Average Cover)**

* P - Perennial, B - Biennial, A - Annual

Table A3 Cunningham Hill - Vegetation Cover - 2020

Open Pit - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																				
P	*Agropyron smithii*	Western wheatgrass											7		1		2	**0.67**	**2.19**	**20**
P	*Aristida purpurea*	Purple three - awn							1									**0.07**	**0.22**	**7**
P	*Bouteloua curtipendula*	Sideoats grama		2		15	38			2		10					22	**5.93**	**19.47**	**40**
P	*Bouteloua gracilis*	Blue grama		3	2		1	1			9				9		6	**2.07**	**6.78**	**47**
P	*Bromus inermis*	Smooth Brome				1												**0.07**	**0.22**	**7**
A	*Bromus tectorum*	Cheatgrass							1			6	3					**0.67**	**2.19**	**20**
P	*Elymus cinereus*	Great basin wildrye		3														**0.20**	**0.66**	**7**
P	*Hilaria jamesii*	Galleta							1		2					4		**0.47**	**1.53**	**20**
P	*Muhlenbergia wrightii*	Spike muhly													4			**0.27**	**0.88**	**7**
P	*Sitanion hystrix*	Bottlebrush Squirreltail			3											11		**0.93**	**3.06**	**13**
P	*Sporobolus airoides*	Alkali Sacaton		2	1							4	4					**0.73**	**2.41**	**27**
Forbs																				
P	*Euphorbia sp.*	Sandmat		1														**0.07**	**0.22**	**7**
A	*Ipomopsis longiflora*	Flaxflowered ipomopsis		1														**0.07**	**0.22**	**7**
A	*Machaeranthera canescens*	Hoary tansyaster				1												**0.07**	**0.22**	**7**
B	*Melilotus officinalis*	Yellow Sweetclover								1			1			2		**0.27**	**0.88**	**20**
P	*Penstemon palmeri*	Palmer Penstemon	7					6	3						2			**1.20**	**3.94**	**27**
Shrubs, Sub-shrubs, Cacti & Trees																				
P	*Brickellia californica*	California Brickellbush									7							**0.47**	**1.53**	**7**
P	*Cercocarpus ledifolius*	Curl-leaf Mtn. Mahogany						5	10	2								**1.13**	**3.72**	**20**
P	*Cercocarpus montanus*	Mountain Mahogany								3								**0.20**	**0.66**	**7**
P	*Chrysothamnus nauseosus*	Rubber Rabbitbrush	12		6						7			9		13		**3.13**	**10.28**	**33**
P	*Fallugia paradoxa*	Apache Plume							8			4						**0.80**	**2.63**	**13**
P	*Gutierrezia sarothrae*	Broom Snakeweed			6		8				1		3				2	**1.33**	**4.38**	**33**
P	*Juniperus monosperma*	One-seed Juniper													10			**0.67**	**2.19**	**7**
P	*Opuntia spinosior*	Walkingstick Cactus									1							**0.07**	**0.22**	**7**
P	*Pinus edulis*	Two-needle Pinyon				13												**0.87**	**2.84**	**7**
P	*Rhus trilobata*	Skunkbush Sumac						6	5	22	9	20		40	11	8		**8.07**	**26.48**	**53**
																			Mean	
		Total Plant Cover	**19**	**12**	**18**	**30**	**47**	**18**	**29**	**30**	**36**	**44**	**18**	**49**	**37**	**38**	**32**		**30.47**	
		Rock	60	28	35	12	1	48	44	38	3	39	12	8	16	8	11		**24.20**	
		Litter	21	43	33	26	35	30	27	30	49	9	32	43	43	47	14		**32.13**	
		Bare ground	0	17	14	32	17	4	0	2	12	8	38	0	4	7	43		**13.20**	
		Total Perennial & Biennial Cover	**19**	**11**	**18**	**29**	**47**	**18**	**28**	**30**	**36**	**38**	**15**	**49**	**37**	**38**	**32**		**29.67**	

Sample Adequacy Calculations	t = 1.7613 n = 15 Variance = 133.84 n_{min} = 44.73
Diversity	No. of Important Perennial or Biennial Sps. = 13 (>2% Relative Cover or >1% Average Cover)

* P - Perennial, B - Biennial, A - Annual

Table A4 Cunningham Hill - Vegetation Cover - 2020

Sludge Cell 1 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																
P	*Agropyron dasystachyum*	Thickspike wheatgrass		17	9	4					1	2		**3.30**	**11.96**	**50**
P	*Agropyron smithii*	Western wheatgrass	20	10										**3.00**	**10.87**	**20**
P	*Aristida purpurea*	Purple three - awn					1							**0.10**	**0.36**	**10**
P	*Bouteloua curtipendula*	Sideoats grama			10	8							7	**2.50**	**9.06**	**30**
P	*Bouteloua gracilis*	Blue grama					12	22	17	8	6			**6.50**	**23.55**	**50**
P	*Bromus inermis*	Smooth Brome			2									**0.20**	**0.72**	**10**
P	*Oryzopsis hymenoides*	Indian Ricegrass						2					9	**1.10**	**3.99**	**20**
P	*Sporobolus airoides*	Alkali Sacaton	5											**0.50**	**1.81**	**10**
P	*Stipa neomexicana*	New Mexico Feathergrass								6	11	14		**3.10**	**11.23**	**30**
Forbs																
A	*Machaeranthera canescens*	Hoary tansyaster	3	4										**0.70**	**2.54**	**20**
B	*Melilotus officinalis*	Yellow Sweetclover								3				**0.30**	**1.09**	**10**
P	*Sphaeralcea coccinea*	Scarlet Globemallow				1					1	1		**0.30**	**1.09**	**30**
Shrubs, Sub-shrubs, Cacti & Trees																
P	*Chrysothamnus nauseosus*	Rubber Rabbitbrush	6					2		4	12			**2.40**	**8.70**	**40**
P	*Gutierrezia sarothrae*	Broom Snakeweed	6	6	1	1	1	3		3	1	10		**3.20**	**11.59**	**90**
P	*Opuntia polyacantha*	Plains Pricklypear		2										**0.20**	**0.72**	**10**
P	*Senecio flaccidus var. f.*	Threadleaf Ragwort									2			**0.20**	**0.72**	**10**
															Mean	
			Total Plant Cover	**40**	**39**	**22**	**14**	**14**	**29**	**17**	**25**	**35**	**41**		**27.60**	
			Rock	5	4	4	3	67	21	19	11	12	8		**15.40**	
			Litter	44	38	34	43	1	20	34	23	20	14		**27.10**	
			Bare ground	11	19	40	40	18	30	30	41	33	37		**29.90**	
			Total Perennial & Biennial Cover	**37**	**35**	**22**	**14**	**14**	**29**	**17**	**25**	**35**	**41**		**26.90**	

Sample Adequacy Calculations	t = 1.8331 n = 10 Variance = 115.60 n_{min} = 50.99
Diversity	No. of Important Perennial or Biennial Sps. = 8 (>2% Relative Cover or >1% Average Cover)

* P - Perennial, B - Biennial, A - Annual

Table A5 Cunningham Hill - Vegetation Cover - 2020

Sludge Cell 2 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																
P	*Agropyron smithii*	Western wheatgrass			6			15	17				**3.80**	**8.68**	**30**
P	*Bouteloua curtipendula*	Sideoats grama				3	2	2					**0.70**	**1.60**	**30**
P	*Bouteloua gracilis*	Blue grama	41	29	33	28	39	17	19	23	63	46	**33.80**	**77.17**	**100**
P	*Bromus inermis*	Smooth Brome	1			1							**0.20**	**0.46**	**20**
A	*Bromus tectorum*	Cheatgrass							5				**0.50**	**1.14**	**10**
P	*Oryzopsis hymenoides*	Indian Ricegrass					1	1			2		**0.40**	**0.91**	**30**
P	*Sporobolus airoides*	Alkali Sacaton								1			**0.10**	**0.23**	**10**
P	*Stipa neomexicana*	New Mexico Feathergrass									1		**0.10**	**0.23**	**10**
Forbs																
A	*Machaeranthera canescens*	Hoary tansyaster								1			**0.10**	**0.23**	**10**
B	*Melilotus officinalis*	Yellow Sweetclover					2						**0.20**	**0.46**	**10**
A	*Salsola tragus*	Russian Thistle							11				**1.10**	**2.51**	**10**
P	*Solanum elaeagnifolium*	Silverleaf nightshade								3			**0.30**	**0.68**	**10**
P	*Sphaeralcea coccinea*	Scarlet Globemallow							1	3			**0.40**	**0.91**	**20**
Shrubs, Sub-shrubs, Cacti & Trees																
P	*Atriplex canescens*	Fourwing Saltbush				7		8					**1.50**	**3.42**	**20**
P	*Gutierrezia sarothrae*	Broom Snakeweed				1	2		1				**0.40**	**0.91**	**30**
P	*Yucca glauca*	Soapweed Yucca								2			**0.20**	**0.46**	**10**
														Mean		
			Total Plant Cover	**42**	**29**	**39**	**40**	**46**	**43**	**54**	**33**	**66**	**46**	**43.80**		
			Rock	18	37	23	14	13	5	6	2	4	10	**13.20**		
			Litter	14	15	13	17	20	30	29	49	9	26	**22.20**		
			Bare ground	26	19	25	29	21	22	11	16	21	18	**20.80**		
			Total Perennial & Biennial Cover	**42**	**29**	**39**	**40**	**46**	**43**	**38**	**29**	**66**	**46**	**41.80**		

Sample Adequacy Calculations	**t = 1.8331 n = 10** **Variance = 109.29 n_{min} = 19.14**
Diversity	**No. of Important Perennial or Biennial Sps. = 3** **(>2% Relative Cover or >1% Average Cover)**

* P - Perennial, B - Biennial, A - Annual

Table A6 Cunningham Hill - Vegetation Cover - 2020

Waste Rock Top - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.—>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																					
P	*Agropyron dasystachyum*	Thickspike wheatgrass															16		**1.07**	**2.97**	**7**
P	*Agropyron smithii*	Western wheatgrass	2	6	33									49					**2.73**	**7.61**	**20**
P	*Bouteloua curtipendula*	Sideoats grama	18	4	37	21	11	3		31	6	8	49	9	10	23	22		**16.80**	**46.75**	**93**
P	*Bouteloua gracilis*	Blue grama	6	1		8	28	8	40		21			27	2		4		**9.67**	**26.90**	**67**
P	*Bromus inermis*	Smooth Brome		7						2		13							**1.47**	**4.08**	**20**
A	*Bromus tectorum*	Cheatgrass		1															**0.07**	**0.19**	**7**
P	*Hilaria jamesii*	Galleta						1											**0.07**	**0.19**	**7**
Forbs																					
	None																		**0.00**	**0.00**	**0**
Shrubs, Sub-shrubs, Cacti & Trees																					
P	*Gutierrezia sarothrae*	Broom Snakeweed		11			7	7	1		7	1	6		2	2	1		**3.00**	**8.35**	**67**
P	*Juniperus monosperma*	One-seed Juniper						4							4				**0.53**	**1.48**	**13**
P	*Opuntia polyacantha*	Plains Pricklypear			1						2			1					**0.27**	**0.74**	**20**
P	*Yucca glauca*	Soapweed Yucca								3							1		**0.27**	**0.74**	**13**
																			Mean		
			Total Plant Cover	**26**	**30**	**71**	**29**	**46**	**23**	**41**	**36**	**36**	**22**	**55**	**37**	**18**	**42**	**27**	**35.93**		
			Rock	4	0	0	3	2	5	2	0	0	40	1	3	8	0	6	**4.93**		
			Litter	19	27	24	18	12	33	26	41	25	20	12	26	32	12	24	**23.40**		
			Bare ground	51	43	5	50	40	39	31	23	39	18	32	34	42	46	43	**35.73**		
			Total Perennial & Biennial Cover	**26**	**29**	**71**	**29**	**46**	**23**	**41**	**36**	**36**	**22**	**55**	**37**	**18**	**42**	**27**	**35.87**		

Sample Adequacy Calculations	***t* = 1.7613** **n = 15** **Variance = 193.07** **n_{min} = 46.39**
Diversity	**No. of Important Perennial or Biennial Sps. = 6** **(>2% Relative Cover or >1% Average Cover)**

* P - Perennial, B - Biennial, A - Annual

Table A7 Cunningham Hill - Vegetation Cover - 2020

Waste Rock Slope - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																				
P	*Agropyron dasystachyum*	Thickspike wheatgrass														26		**1.73**	**5.49**	**7**
P	*Agropyron smithii*	Western wheatgrass		2							1		4	1			1	**0.60**	**1.90**	**33**
P	*Agropyron spicatum*	Bluebunch wheatgrass										9		4				**0.87**	**2.74**	**13**
P	*Bouteloua curtipendula*	Sideoats grama	13	8	10	19		7		5			3				6	**4.73**	**14.98**	**53**
P	*Bouteloua gracilis*	Blue grama		1			7	1	2	7	13	3	5		17		8	**4.27**	**13.50**	**67**
P	*Bromus inermis*	Smooth brome						3										**0.20**	**0.63**	**7**
A	*Bromus japonicus*	Japanese brome		2														**0.13**	**0.42**	**7**
P	*Hilaria jamesii*	Galleta		13	5		4	16	8	17	21	18		19				**8.07**	**25.53**	**60**
P	*Koeleria cristata*	Prairie Junegrass													2		5	**0.47**	**1.48**	**13**
P	*Schizachyrium scoparium*	Little bluestem								4								**0.27**	**0.84**	**7**
P	*Stipa neomexicana*	New Mexico Feathergrass		1														**0.07**	**0.21**	**7**
Forbs																				
B	*Melilotus officinalis*	Yellow Sweetclover													1			**0.07**	**0.21**	**7**
P	*Penstemon palmeri*	Palmer Penstemon											3					**0.20**	**0.63**	**7**
P	*Sphaeralcea coccinea*	Scarlet Globemallow							1									**0.07**	**0.21**	**7**
B	*Tragopogon dubius*	Yellow salsify		1														**0.07**	**0.21**	**7**
Shrubs, Sub-shrubs, Cacti & Trees																				
P	*Chrysothamnus nauseosus*	Rubber Rabbitbrush	3													24		**1.80**	**5.70**	**13**
P	*Fallugia paradoxa*	Apache Plume											4					**0.27**	**0.84**	**7**
P	*Gutierrezia sarothrae*	Broom Snakeweed	6	10		7		1					6			2	15	**3.13**	**9.92**	**47**
P	*Juniperus monosperma*	One-seed Juniper	14		12								9		15			**3.33**	**10.55**	**27**
P	*Opuntia spinosior*	Walkingstick Cactus	1				2					1						**0.27**	**0.84**	**20**
P	*Pinus ponderosa*	Ponderosa pine							15									**1.00**	**3.16**	**7**
																		Mean		
		Total Plant Cover	**37**	**38**	**27**	**26**	**13**	**28**	**26**	**33**	**35**	**31**	**34**	**24**	**35**	**52**	**35**	**31.60**		
		Rock	2	9	5	1	32	9	21	4	1	2	9	0	0	0	12	**7.13**		
		Litter	34	40	39	42	14	36	33	41	25	41	30	55	36	36	25	**35.13**		
		Bare ground	27	13	29	31	41	27	20	22	39	26	27	21	29	12	28	**26.13**		
		Total Perennial & Biennial Cover	**37**	**36**	**27**	**26**	**13**	**28**	**26**	**33**	**35**	**31**	**34**	**24**	**35**	**52**	**35**	**31.47**		

Sample Adequacy Calculations	***t* = 1.7613** **n = 15** **Variance = 73.54** **n_{min} = 22.85**
Diversity	**No. of Important Perennial or Biennial Sps. = 9** **(>2% Relative Cover or >1% Average Cover)**

* P - Perennial, B - Biennial, A - Annual

Table A8 Cunningham Hill - Vegetation Cover - 2020

Reference Area- Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

		Transect No.——>	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Average Cover**	**Relative Cover**	**Freq.**
Grasses and Grass-likes																				
P	*Bouteloua gracilis*	Blue grama	26	6	13	15	20	22	10	19	4	17	10	22	23	8	19	**15.60**	**57.92**	**100**
P	*Hilaria jamesii*	Galleta													1			**0.07**	**0.25**	**7**
P	*Sitanion hystrix*	Bottlebrush Squirreltail				1												**0.07**	**0.25**	**7**
Forbs																				
P	*Sphaeralcea coccinea*	Scarlet Globemallow															2	**0.13**	**0.50**	**7**
Shrubs, Sub-shrubs, Cacti & Trees																				
P	*Berberis fremontii*	Fremont's Barberry			3													**0.20**	**0.74**	**7**
P	*Gutierrezia sarothrae*	Broom Snakeweed	8	2	13	6	4	8	6	2	1	8	9	5	6	1	13	**6.13**	**22.77**	**100**
P	*Juniperus monosperma*	One-seed Juniper		17						8	9	4						**2.53**	**9.41**	**27**
P	*Opuntia polyacantha*	Plains Pricklypear		1		2			5								2	**0.67**	**2.48**	**27**
P	*Opuntia spinosior*	Walkingstick Cactus													2	16		**1.20**	**4.46**	**13**
P	*Pinus edulis*	Two-needle Pinyon			5													**0.33**	**1.24**	**7**
																			Mean	
		Total Plant Cover	**34**	**26**	**34**	**24**	**24**	**30**	**21**	**29**	**14**	**29**	**19**	**27**	**32**	**25**	**36**		**26.93**	
		Rock	0	3	0	1	0	2	0	9	1	0	2	2	10	1	0		**2.07**	
		Litter	34	14	39	27	29	12	39	10	35	6	18	15	20	39	36		**24.87**	
		Bare ground	32	57	27	48	47	56	40	52	50	65	61	56	38	35	28		**46.13**	
		Total Perennial & Biennial Cover	**34**	**26**	**34**	**24**	**24**	**30**	**21**	**29**	**14**	**29**	**19**	**27**	**32**	**25**	**36**		**26.93**	

Sample Adequacy Calculations	***t* = 1.7613** **n = 15** **Variance = 36.64** **n_{min} = 15.67**
Diversity	**No. of Important Perennial or Biennial Sps. = 5** **(>2% Relative Cover or >1% Average Cover)**

* P - Perennial, B - Biennial, A - Annual

Table A9 Cunningham Hill - Vegetation Density - 2020

Erosion Area - Raw Data

Sampling Method: 2m x 50m Belt Transects

	Species	1	2	3	4	5	6	7	8	9	10	Total Count	Per Acre
S	*Atriplex canescens*				1	2	15	20		3	5	**46**	**186.16**
S	*Cercocarpus montanus*			1								**1**	**4.05**
S	*Chrysothamnus nauseosus*								4	24	49	**77**	**311.61**
S	*Fallugia paradoxa*								3			**3**	**12.14**
Su	*Opuntia polyacantha*	1			4	6	2					**13**	**52.61**
Su	*Opuntia spinosior*	1										**1**	**4.05**
T	*Pinus edulis*	3										**3**	**12.14**
S	*Senecio flaccidus var. flaccidus*	2										**2**	**8.09**
Su	*Yucca glauca*			12	6							**18**	**72.84**
	Total	**7**	**0**	**13**	**11**	**8**	**17**	**20**	**7**	**27**	**54**	**164**	**664**

Total by Lifeform	**Shrub (S) = 522.04**	**Tree (T) = 12.14**	
	Succulent (Su) = 129.50	**Noxious (Nx) = 0.00**	
Sample Adequacy Calc.	**t = 1.685**	**mean = 16.40**	**var. = 232.9**	**nmin = 245.86**

* S - Shrub, T - Tree, Su - Succulent, Nx - Noxious

Table A10 Cunningham Hill - Vegetation Density - 2020

Open Pit - Raw Data

Sampling Method: 2m x 50m Belt Transects

	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Count	Per Acre
S	*Atriplex canescens*	1		4						1	6	8	2				**22**	**59.4**
S	*Brickellia californica*			1							1	1					**3**	**8.1**
S	*Cercocarpus ledifolius*						4	2	6	3				1	4		**20**	**54.0**
S	*Cercocarpus montanus*	1					6	3	2	7			1	1	1		**22**	**59.4**
S	*Chrysothamnus nauseosus*	46	25	37	46	12	1	26	3	49	3	48	26	21	39	5	**387**	**1,044.1**
S	*Fallugia paradoxa*		3				1	1	7	1				1	3		**17**	**45.9**
T	*Juniperus monosperma*				2			2	1	3			1				**9**	**24.3**
Su	*Opuntia polyacantha*			3		2			2	1	1						**9**	**24.3**
Su	*Opuntia spinosior*			4	1			1				4	4				**14**	**37.8**
T	*Pinus edulis*				2	6	2										**10**	**27.0**
T	*Pinus ponderosa*												1				**1**	**2.7**
T	*Quercus gambelii*		3														**3**	**8.1**
S	*Rhus trilobata*		33		1		35	29	50	22	5	4	13	78	56	2	**328**	**884.9**
Su	*Yucca glauca*				2							3					**5**	**13.5**
	Total	**48**	**64**	**49**	**54**	**20**	**49**	**64**	**71**	**87**	**16**	**68**	**48**	**102**	**103**	**7**	**850**	**2,293.2**

Total by Lifeform	**Shrub (S) = 2,155.6**	**Tree (T) = 62.1**	**Succulent (Su) = 75.5**	**Noxious (Nx) = 0.0**
Sample Adequacy Calc.	**t = 1.685**	**mean = 56.67**	**var. = 807.4**	**nmin = 71.38**

* S - Shrub, T - Tree, Su - Succulent, Nx - Noxious

Table A11 Cunningham Hill - Vegetation Density - 2020

Sludge Cell 1 - Raw Data

Sampling Method: 2m x 50m Belt Transects

	Species	1	2	3	4	5	6	7	8	9	10	Total Count	Per Acre
S	*Atriplex canescens*				2		1	1	17			**21**	**85.0**
S	*Brickellia californica*						2					**2**	**8.1**
S	*Chrysothamnus nauseosus*		2	4	9	14	7	4	67	15	4	**126**	**509.9**
S	*Fallugia paradoxa*										1	**1**	**4.0**
T	*Juniperus monosperma*										1	**1**	**4.0**
Su	*Opuntia polyacantha*	10	1	12			1	2				**26**	**105.2**
Su	*Opuntia spinosior*	3	4									**7**	**28.3**
Su	*Yucca glauca*	1	6	3	5		5	4	3			**27**	**109.3**
	Total	**14**	**13**	**19**	**16**	**14**	**16**	**11**	**87**	**15**	**6**	**211**	**853.9**

Total by Lifeform	**Shrub (S) = 607.0**	**Tree (T) = 4.0**	
	Succulent (Su) = 242.8	**Noxious (Nx) = 0.0**	
Sample Adequacy Calc.	**t = 1.685**	**mean = 21.10**	**var. = 548.1** **nmin = 349.49**

* S - Shrub, T - Tree, Su - Succulent, Nx - Noxious

Table A12 Cunningham Hill - Vegetation Density - 2020

Sludge Cell 2 - Raw Data

Sampling Method: 2m x 50m Belt Transects

	Species	Total Count	Per Acre
S	*Atriplex canescens*	**7**	**28.3**
T	*Juniperus monosperma*	**1**	**4.0**
Su	*Opuntia polyacantha*	**4**	**16.2**
Su	*Opuntia spinosior*	**1**	**4.0**
Su	*Yucca glauca*	**11**	**44.5**
	Total	**24**	**97.1**

Total by Lifeform	**Shrub (S) = 28.3**	**Tree (T) = 4.0**
	Succulent (Su) = 64.7	**Noxious (Nx) = 0.0**

* S - Shrub, T - Tree, Su - Succulent, Nx - Noxious

Table A13 Cunningham Hill - Vegetation Density - 2020

Waste Rock Top - Raw Data

Sampling Method: 2m x 50m Belt Transects

	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Count	Per Acre
S	*Atriplex canescens*							1				2	8	4		1	**16**	**43.2**
S	*Brickellia californica*			24				5									**29**	**78.2**
S	*Chrysothamnus nauseosus*		1	2							2		5	4	3	2	**19**	**51.3**
S	*Fallugia paradoxa*															1	**1**	**2.7**
T	*Juniperus monosperma*	1					1							7	1		**10**	**27.0**
Su	*Opuntia polyacantha*	10	2	4	2	6	6		2	6	1	1	1	9		5	**55**	**148.4**
Su	*Opuntia spinosior*	4	1				2	1		4			2	1	1	1	**17**	**45.9**
T	*Pinus edulis*								4					1			**5**	**13.5**
S	*Rhus trilobata*								1								**1**	**2.7**
S	*Senecio flaccidus var. flaccidus*		1														**1**	**2.7**
Nx	*Ulmus pumila*			1													**1**	**2.7**
Su	*Yucca glauca*				1			2	1	6						3	**13**	**35.1**
	Total	**15**	**5**	**31**	**3**	**6**	**9**	**9**	**8**	**16**	**3**	**3**	**16**	**26**	**5**	**13**	**168**	**453.2**
	Total by Lifeform	**Shrub (S) = 180.8**						**Tree (T) = 40.5**				**Succulent (Su) = 229.3**					**Noxious (Nx) = 2.7**	
	Sample Adequacy Calc.	**t = 1.685**						**mean = 11.20**				**var. = 71.5**					**nmin = 161.71**	

* S - Shrub, T - Tree, Su - Succulent, Nx - Noxious

Table A14 Cunningham Hill - Vegetation Density - 2020

Waste Rock Slope - Raw Data

Sampling Method: 2m x 50m Belt Transects

	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Count	Per Acre
S	*Atriplex canescens*	1		1							3	1	3	2	1	5	**17**	**45.9**
S	*Cercocarpus montanus*									1							**1**	**2.7**
S	*Chrysothamnus nauseosus*	16			5							5		2	3	5	**36**	**97.1**
S	*Fallugia paradoxa*						4		1					1		1	**7**	**18.9**
T	*Juniperus monosperma*	12	4	3	5	4	1	4	2		6		4	3	2	1	**51**	**137.6**
Su	*Opuntia polyacantha*	5	1	9	9	4			1		2	3	5	2	3	3	**47**	**126.8**
Su	*Opuntia spinosior*	2	1	4		14					7	1	4	5		2	**40**	**107.9**
T	*Pinus edulis*	2	3	2	3	4	2	6	3	1	6	5	3	2	4	4	**50**	**134.9**
T	*Pinus ponderosa*	5	1		3		5	11	3	1		1			1		**31**	**83.6**
T	*Quercus gambelii*	1															**1**	**2.7**
S	*Rhus trilobata*														1		**1**	**2.7**
S	*Senecio flaccidus var. flaccidus*	2															**2**	**5.4**
Su	*Yucca glauca*			7				2	1	4						6	**20**	**54.0**
	Total	**46**	**10**	**26**	**25**	**26**	**12**	**23**	**11**	**7**	**24**	**16**	**19**	**17**	**15**	**27**	**304**	**820.2**
	Total by Lifeform	**Shrub (S) = 172.7**					**Tree (T) = 358.8**					**Succulent (Su) = 288.7**					**Noxious (Nx) = 0.0**	
	Sample Adequacy Calc.	**t = 1.685**					**mean = 20.27**					**var. = 93.6**					**nmin = 64.72**	

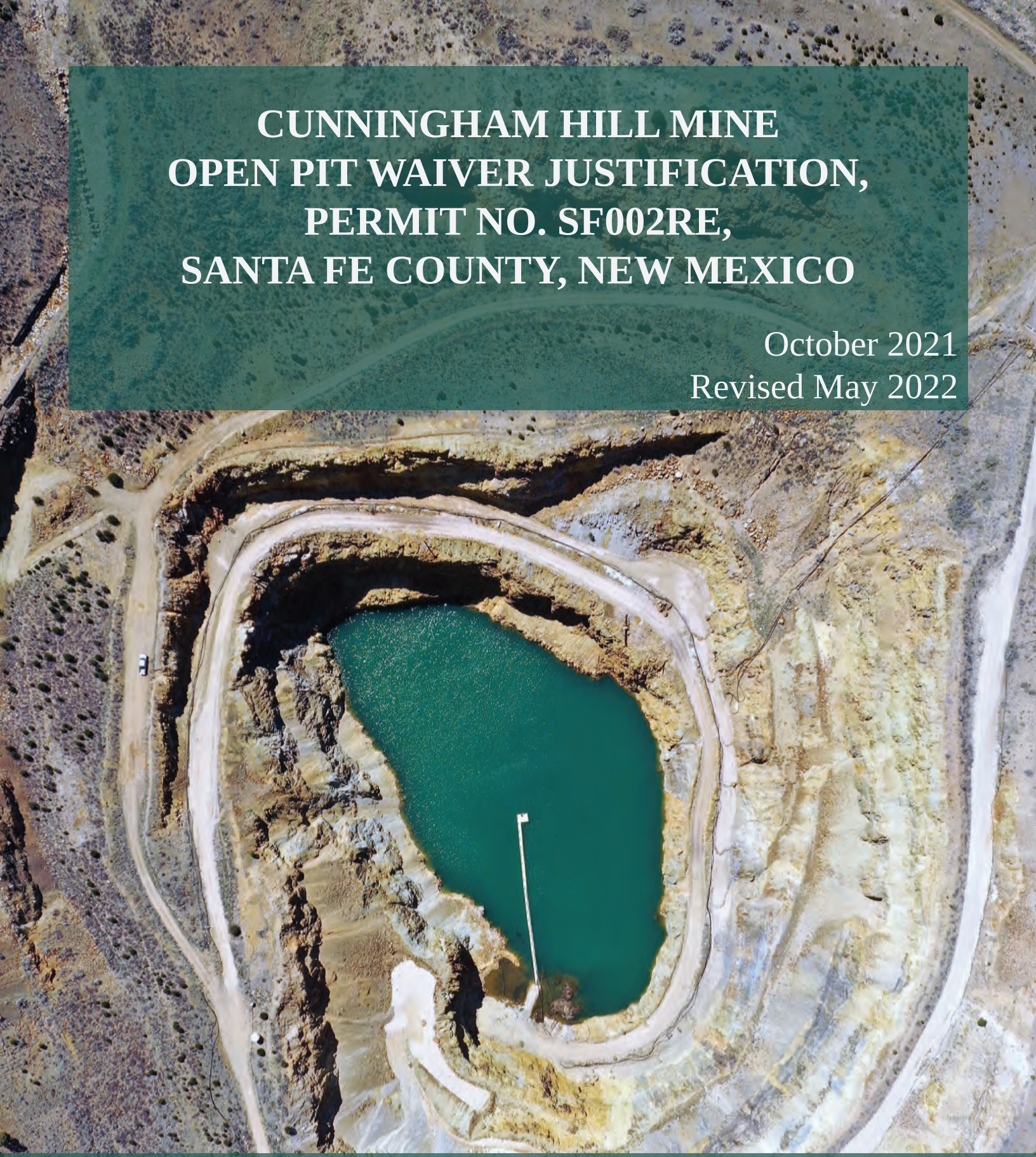
* S - Shrub, T - Tree, Su - Succulent, Nx - Noxious

Attachment 5.

Revised CCP Appendix H – pit waiver justification and request responses
Amended Appendix H

CUNNINGHAM HILL MINE
OPEN PIT WAIVER JUSTIFICATION, PERMIT NO. SF002RE, SANTA FE COUNTY, NEW MEXICO

October 2021
Revised May 2022



prepared for:

LAC Minerals (USA) LLC
582 COUNTY ROAD #55
CERRILLOS, NEW MEXICO 87010

prepared by:

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CUNNINGHAM HILL MINE
OPEN PIT WAIVER JUSTIFICATION, PERMIT NO. SF002RE,
SANTA FE COUNTY, NEW MEXICO

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ABBREVIATIONS

ac-ft	acre feet
ac-ft/yr	acre feet per year
ARD	acid rock drainage
AWS	acid wall seepage
CHMRP	Cunningham Hill Mine Reclamation Project
CCP	Closure/Closeout Plan
ft amsl	feet above mean sea level
gpm	gallons per minute
JSAI	John Shomaker & Associates, Inc.
LAC	LAC Minerals (USA), LLC
MMD	Mining and Minerals Division
NF	nanofiltration
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NMWQCC	New Mexico Water Quality Control Commission
PMLU	Post Mining Land Use
RO	reverse osmosis
SSE	self-sustaining ecosystem
TDS	total dissolved solids

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1.0 INTRODUCTION

This report was prepared for the Mining and Minerals Division (MMD) to provide technical and economic infeasibility and environmental unsoundness arguments in support of a request for a waiver from a self-sustaining ecosystem (SSE) for the LAC Minerals (USA), LLC (LAC) Cunningham Hill Mine Reclamation Project (CHMRP) reclaimed Open Pit (Fig. 1). This pit wavier justification report is based upon the requirements of the New Mexico Mining Act, New Mexico Statutes Annotated (NMSA) 1978, §69-36-1, et seq. (1993, as amended through 2001), particularly 19.10.5.507 of the New Mexico Administrative Code (NMAC). This report also addresses specific waiver-related comments in MMD's April 21, 2021, letter on CHMRP Updated Closure/Closeout Plan (CCP), Permit No. SF002RE (JSAI, 2020a).

1.1 CCP Background

In the original 1996 Closure-Closeout Plan (WESTEC, 1996), it was expected that the pit would recover to the pre-mining groundwater level condition of 6,900 feet above mean sea level (ft amsl), and that the addition of surface water from Upper Cunningham Gulch would cause the Open Pit to completely fill to the spill elevation of 6,990 ft amsl. The filling of the Open Pit with water would mitigate water-quality issues and reclaim pit benches and walls by submergence.

In 2002, Alternative Abatement Plan AP-27 was re-issued by the New Mexico Environment Department (NMED) which included alternative abatement standards for groundwater outside of the pit area, performance standards for pit filling by diverted stormwater, and a contingency plan. In addition, the NMED required reverse osmosis (RO) treatment of the Open Pit pool. In 2001, the CCP was updated (revision 96-1) to include the reclamation plan specified in AP-27.

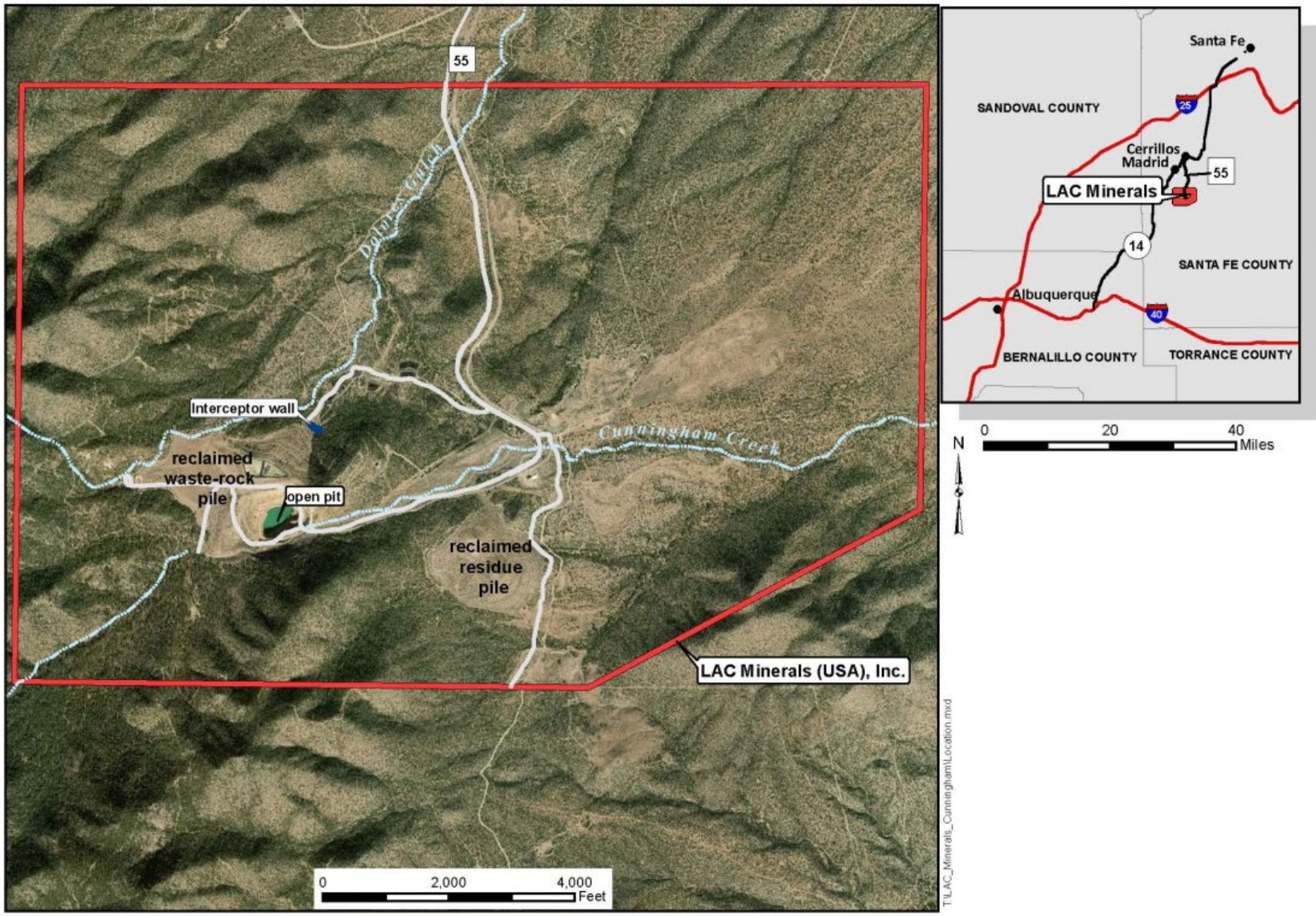

Figure 1. Aerial photograph of Cunningham Hill Mine Reclamation Project showing locations of LAC property boundary, Open Pit, and other reclaimed facilities.

Due to lingering drought conditions and the dewatering and geochemical effects of the required RO treatment in 2002, the Open Pit was not filling, RO treatment had stripped the Open Pit pool of alkalinity needed for buffering capacity, and water-quality triggers for sulfate and total dissolved solids (TDS) were enacted in 2009. A pilot program was implemented to determine if neutralization of in-pit generated acid wall seepage (AWS) could be remediated with alkaline water sources from the Residue Pile recovery system instead of imported hydrated lime (JSAI, 2010). It was recommended by JSAI (2010) to perform acid rock drainage (ARD) source control measures, and replace the use of hydrated lime for AWS mitigation with on-site alkaline water sources such as from Residue Pile recovery system and the Guest House Well.

JSAI (2011a) prepared a revised Open Pit waterbody reclamation plan for AP-27 to address source controls and Open Pit pool treatment to meet AP-27 water-quality standards. Implementation of source controls occurred between 2012 and 2018, and included: 1) repairs to the Upper Cunningham Gulch diversion, 2) stormwater controls in and around the Open Pit, and 3) resurfacing access roads and some bench areas with caliche. The revised AP-27 remediation plan does not rely on filling of the Open Pit with stormwater to meet water-quality standards; instead, the revised plan relies on source controls to minimize AWS. The revised AP-27 reclamation plan was approved by NMED (2012), and implemented as follows:

2012 – Evaluate and design stormwater runoff source controls

2014 – Obtain New Mexico Office of the State Engineer water right permit for the use of on-site alkaline water sources to add to Open Pit and build buffering capacity

2015 – Perform pilot program to evaluate addition of alkaline water sources

2016 – Repairs to Upper Cunningham Gulch Channel

2017 – Add caliche to all roads within the pit watershed and to selected benches

2018 – Performance monitoring of source controls

2019 – Design and install nanofiltration (NF) treatment system

2021 – Begin NF treatment

MMD letter dated September 26, 2019 stated "The current and original CCP for Cunningham Hill was submitted on March 1, 1996 and approved by the MMD in Permit Revision 96-1 to Permit No. SF002RE on December 13, 2002. The 1996 CCP describes a reclamation plan that is no longer accurate regarding the reclamation of the Open Pit, and will be changed significantly to meet the requirements of the New Mexico Mining Act, NMSA 1978, §69-36-1, et seq. (1993, as amended through 1999). The status of the Open Pit and the need to change the reclamation plan of the Open Pit in the 1996 CCP…"

The CCP was updated by JSAI (2020a), and included the Open Pit as achieving a self-sustaining ecosystem by completion of the AP-27 updated reclamation plan and additional reclamation measures of accessible disturbed areas by addition of caliche, growth medium, mulch, and seeding. On April 21, 2021, the MMD provided a letter to LAC regarding technical comments on application for revision 20-1 Closure/Closeout Plan Update, Cunningham Hill Mine, Permit No. SF002RE. The MMD does not consider the Open Pit a self-sustaining ecosystem as defined in 19.10.1.7 NMAC, and recommended modifying the application to request a pit waiver as described in 19.10.5.507.B NMAC.

1.2 Regulatory Requirements

The regulatory requirements for a pit waiver are defined in 19.10.5.507 NMAC Performance and Reclamation Standards and Requirements:

> **B. Waiver for Pits and Waste Units** An operator may apply for a waiver for open pits or waste units from the requirement of achieving a post-mining land use or self-sustaining ecosystem. The operator must show that achieving a post-mining land use or self-sustaining ecosystem is not technically or economically feasible or is environmentally unsound. The Director may grant the waiver for an open pit or waste unit if he finds:
>
> **(1)** measures will be taken to ensure that the open pit or waste unit will meet all applicable federal and state laws, regulations and standards for air, surface water and ground water protection following closure; and
>
> **(2)** the open pit or waste unit will not pose a current or future hazard to public health or safety. [7-12-94, 2-15-96; 19.10.5.507 NMAC Rn, 19 NMAC 10.2.5.507, 05-15-2001]

1.3 Objective

The objective of this report is to show that achieving a self-sustaining ecosystem (SSE) for the Open Pit is not technically or economically feasible, or is environmentally unsound as defined in 19.10.5.507.B NMAC. The Open Pit waiver would release LAC's requirements for SSE and Post Mining Land Use (PMLU) for the unreclaimed area. However, the CHMRP Open Pit water body will be maintained to meet applicable Open Pit water-quality standards for wildlife habitat and livestock watering established by the New Mexico Water Quality Control Commission (NMWQCC) and requirements defined in 19.10.5.507.B(2) NMAC.

The MMD, the New Mexico Mining Act, NMSA 1978, §69-36-1, et seq. (1993, as amended through 1999), has specific requirements for a SSE that cannot be met for an open pit that is not fully reclaimed by filling, backfilling, or reclamation of all pit walls and benches. The objective of this waiver justification is to demonstrate that it is technically infeasible to achieve SSE status for unreclaimed portion of the CHMRP Open Pit.

2.0 CHMRP OPEN PIT BACKGROUND

The CHMRP site is owned by LAC Minerals (USA) LLC, and the property boundary is defined by the red line on Figure 1. The Open Pit is within the CHMRP site boundary (Fig. 1).

2.1 Open Pit History

The CHMRP Open Pit was created during the Goldfields' mining operation that occurred between 1979 and 1987. The pit had been mined to a total depth of 536 ft, and consisted of 34.13 acres of disturbed area. The mined waste rock was deposited in Dolores Gulch which is now the reclaimed Waste Rock Pile, and the processed ore was deposited and formed the Residue Pile, which is also reclaimed.

After mining ceased in 1987, the Open Pit began to fill with groundwater and stormwater runoff generated from within the Open Pit watershed. In the 1990s, about 21 acres of the uppermost portions of the accessible areas of the Open Pit were reclaimed (Fig. 2) (also see JSAI, 2020a). The Open Pit pool is currently about an elevation of 6,800 ft amsl, and sediment has partially filled in about 35 ft of the pit bottom to where the maximum pool depth is currently about 100 ft.

2.2 Original Conceptual Closeout Design

The conceptual closeout design is described in the CCP (JSAI, 2020a), and AP-27 (NMED, 2002). Most of the remaining disturbed area, such as the pit walls and benches, would be reclaimed by filling with stormwater from Upper Cunningham Gulch (Adrian Brown Consultants, Inc., 1996) to the 6,945-ft-amsl elevation (Fig. 2). It was predicted that pit filling would take 35 years, provided that Upper Cunningham Gulch would generate an average of 101 acre-feet per year (ac-ft/yr) of stormwater. The filling of the Open Pit with stormwater was critical to reclamation of disturbed area and to improving water quality of the Open Pit. Environmental permits, water right permits, and infrastructure were in place for diversion of Upper Cunningham Gulch stormwater to the Open Pit by 2001. It was estimated that Open Pit filling would be completed by year 2036.

2.3 Relevant Studies

Since the issue of AP-27 in 2001, there have been a number of studies conducted by LAC to evaluate the feasibility of implementing the Open Pit reclamation and remediation specified in the CCP and AP-27 (JSAI, 2007; JSAI, 2009; JSAI, 2010; JSAI, 2011a; JSAI, 2014; and JSAI, 2020). The primary conclusion was, with source controls, the open pit did not have to fill to 6,945 ft to meet water quality standards.

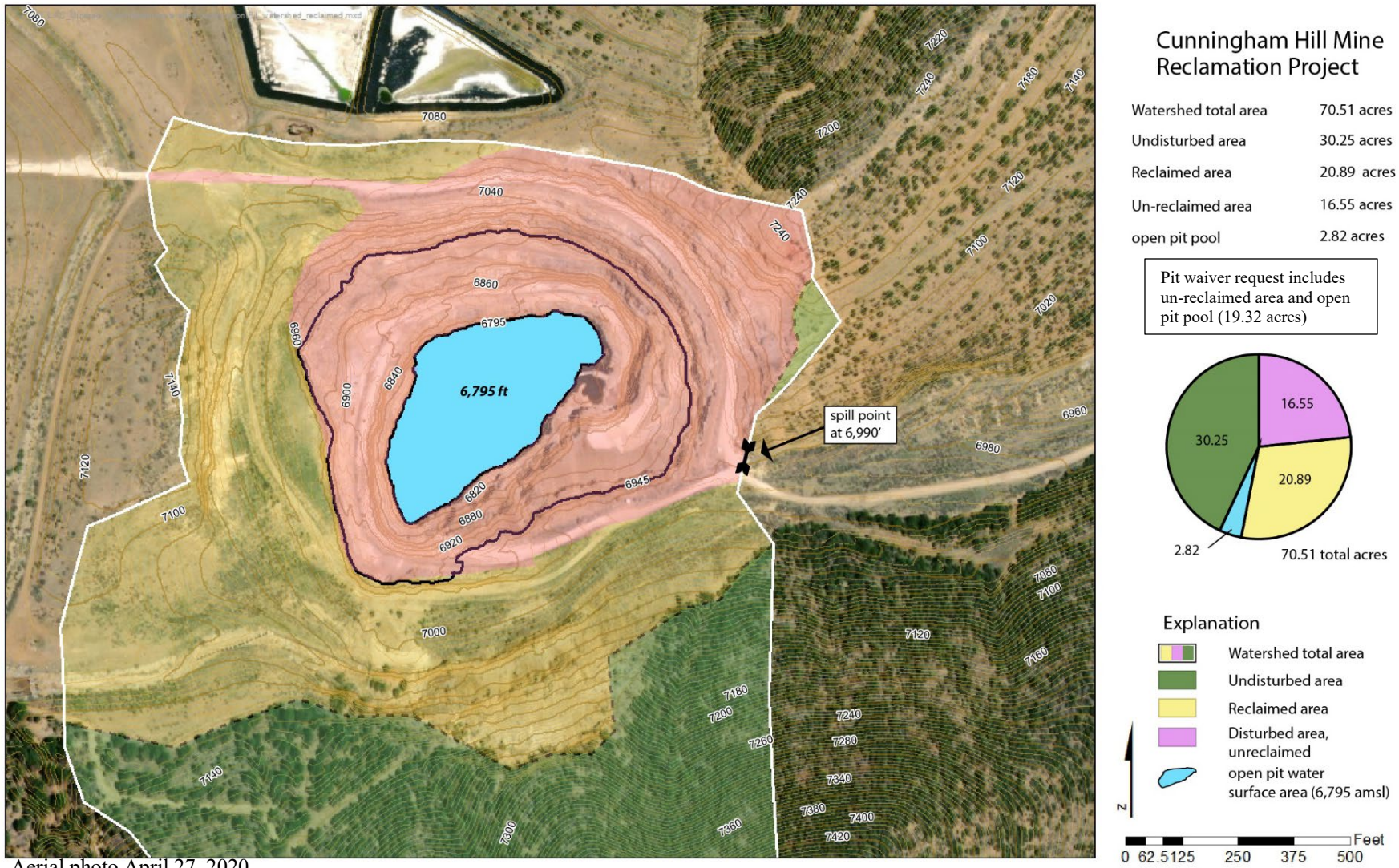

Figure 2. Aerial photograph of Open Pit showing undisturbed, disturbed, and reclaimed areas, Cunningham Hill Mine Reclamation Project.

2.3.1 Open Pit Pool Filling

A calibrated groundwater flow model was developed for AP-27 (JSAI, 1999). The model was updated in 2001 (JSAI, 2001) to evaluate the effects of NMED-required Open Pit RO treatment, and in 2011 (JSAI, 2011) when AP-27 Triggers 1 and 2 were enacted, and in 2020 (JSAI, 2020) as part of the CCP update.

Since about 2010, the Open Pit pool has been in pseudo-equilibrium with the surrounding water table where it may seasonally act as a sink, discharge to groundwater, or neither (JSAI, 2014). The addition of 82 ac-ft/yr of stormwater to the Open Pit would fill the pit while offsetting some loss to evaporation and groundwater outflow (JSAI, 2011) (Fig. 3). Model-simulated groundwater outflow has ranged between 4 to 8 gallons per minute (gpm). Figure 3 is a graph showing the observed and model-simulated Open Pit water level scenarios. Observed water levels have closely followed the "no diversion" simulation.

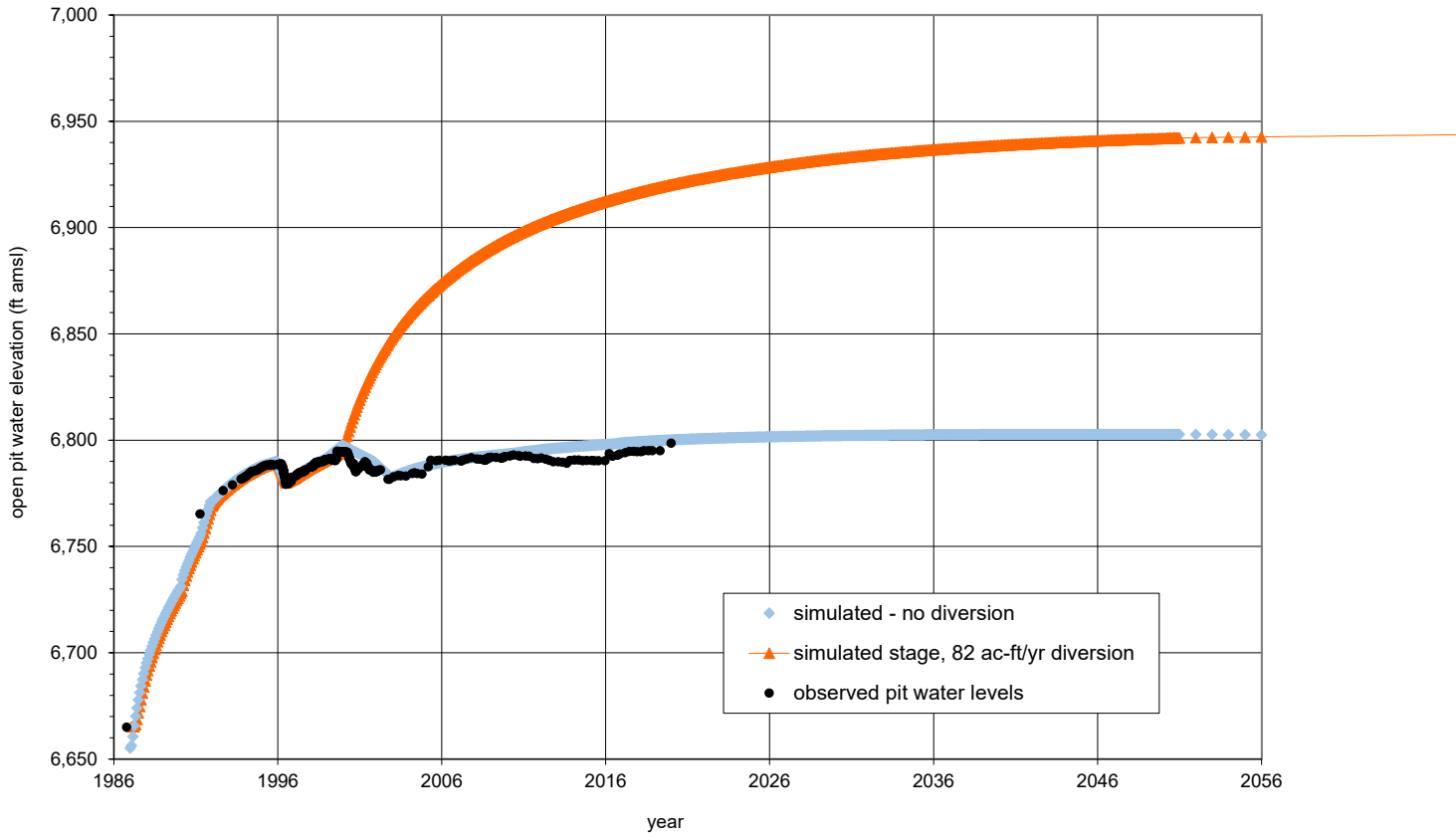

Figure 3. Graphs showing observed Open Pit water levels and model-simulated Open Pit water levels (with and without stormwater diversion).

Annual precipitation has significantly declined since the original 1996 CCP was developed and open pit filling was predicted. In the 1990s, the average annual precipitation was calculated to be 17 inches per year (JSAI, 1999). From 1998 to 2021, the average annual precipitation has been 13.05 in/yr (Fig. 4), with a maximum annual precipitation of 18.55 inches and a minimum annual precipitation of 7.49 inches. Climate change has significantly affected the ability for filling of the Open Pit with precipitation and runoff.

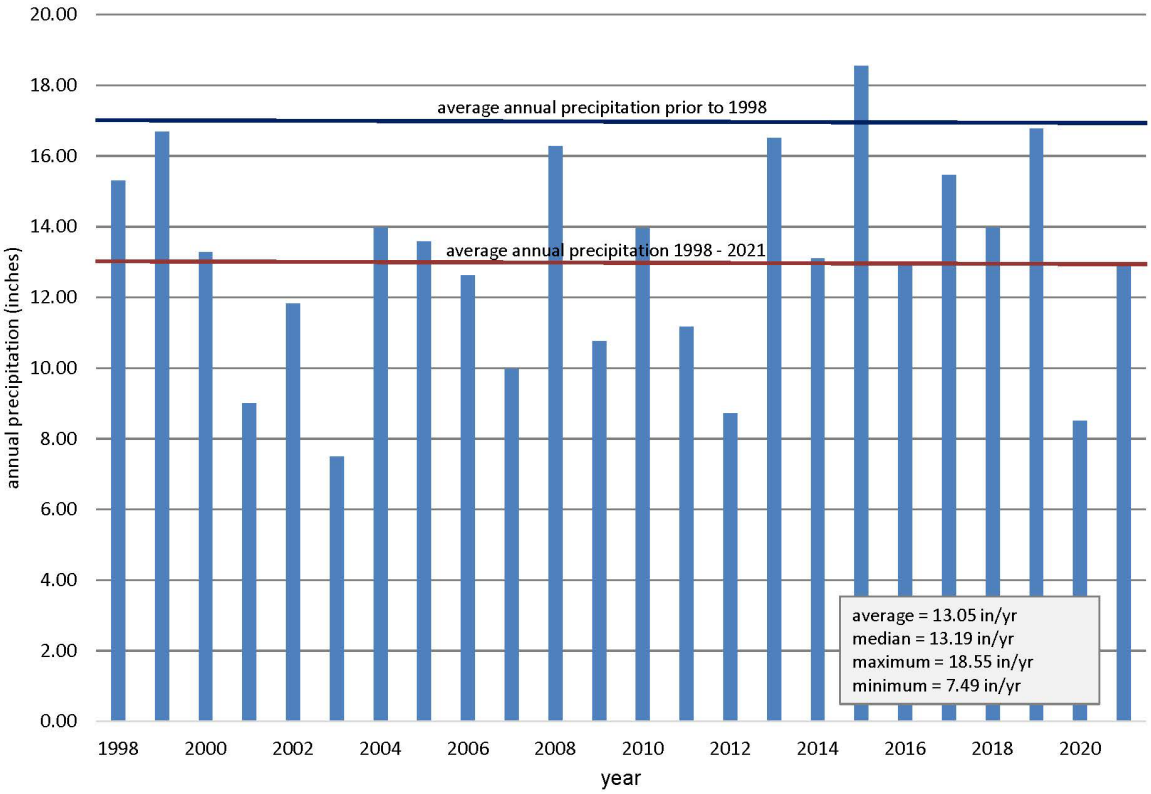

Figure 4. Bar graph of CHMRP annual precipitation for 1998 to 2021.

Currently, the Open Pit is filled with approximately 25 ac-ft of sediment and 205 ac-ft of water (Table 1). Considering there no losses to evaporation or groundwater outflow, approximately 890 acre-feet (ac-ft) of water is needed to fill the Open Pit from 6,800 to 6,945 ft amsl. Annual volumes of water would be required after filling to offset losses due to groundwater outflow and evaporation. JSAI (1999) estimated 64 ac-ft/yr of water would be required to maintain an open pit water level of 6,945 ft amsl, with 42 ac-ft/yr need to offset groundwater outflow and 22 ac-ft/yr needed to offset evaporation.

Table 1. Summary of Open Pit stage and fill volumes

stage	volume (ac-ft)	volume (yds^3)	comment
6,665	0	0	
6,675	5	8,661	
6,700	26	41,277	filled with sediment by 2021
6,725	57	92,644	
6,750	103	165,848	
6,775	162	260,890	
6,800	234	377,768	filled with water by 2021
6,825	321	517,361	
6,850	426	687,904	
6,875	557	898,933	
6,900	720	1,161,939	
6,925	926	1,493,314	
6,945	1,122	1,810,084	previous estimated fill elevation
6,975	1,476	2,380,669	
6,990	1,686	2,720,207	spill elevation

ac-ft - acre-feet

The Upper Cunningham Gulch watershed is not able to produce the needed runoff for pit filing under the current watershed and climate conditions (JSAI, 2010; 2011). The ongoing drought conditions and increase in vegetation are primary issues limiting runoff from Upper Cunningham Gulch and the ability to fill the pit with water. The effects of these conditions on runoff were extensively examined by JSAI (2011; 2020), and it was concluded that the Open Pit would fill to about 6,810-ft-amsl elevation rather than the originally modeled 6,945-ft-amsl elevation.

From 2011 to 2014, measured Upper Cunningham Gulch storm-water flows were zero (Table 2). Measureable storm-water flows occurred after channel liner repairs were made to the Upper Cunningham Gulch in 2015, and limited watershed thinning was performed on about 90 acres in 2017 and 2018 (Table 2). The maximum measured storm-water flow was 20.15 ac-ft for 2019, which is significantly less than the required average annual amount to fill the open pit.

The only existing groundwater sources on-site, not connected to the Open Pit, include Residue Pile plume recovery wells and the Guest House Well (JSAI, 2010; JSAI, 2014). The recovery wells yield approximately 4 gpm or less, and the maximum capacity of the Guest House Well is about 15 gpm. Neither of these sources are adequate for open pit filling.

Table 2. Summary of annual precipitation and measured Upper Cunningham Gulch storm-water diversions

year	total precipitation (inches)	Upper Cunningham Gulch diversion channel weir flow (ac-ft)	open pit watershed drain(s) (ac-ft)	comments
2011	11.17	0.00		
2012	8.72	0.00		
2013	16.51	0.01		
2014	13.09	0.00		
2015	18.55	0.79	1.13	fixed UCG diversion
2016	12.96	0.15	0.30	
2017	15.46	1.73		watershed thinning
2018	13.97	1.54		watershed thinning
2019	16.78	20.15		
2020	8.51	0.52		
2021	12.90	5.24		

ac-ft - acre-feet
UCG - Upper Cunningham Gulch

2.3.2 Open Pit Pool Water Quality

Extensive water-quality modeling of the Open Pit pool was initially performed by Adrian Brown Consultants, Inc. (1996), and solute-transport modeling of Open Pit pool discharges to groundwater was modeled by JSAI (1999; 2001). Additional Open Pit pool water-quality evaluations were performed by JSAI (2010; 2011a). It has always been recognized that past AWS discharges have suppressed Open Pit pool pH and contributed to elevated dissolved solids (particularly sulfate, TDS, and metals). Past geochemical modeling (Adrian Brown Consultants, Inc., 1996; JSAI, 2001; JSAI 2010) has considered the impact of AWS on the Open Pit pool chemistry. The buffering capacity of the Open Pit pool and the rate and volume of introduced AWS have been the primary factors controlling Open Pit pool chemistry. Prior to implementation of AWS source controls, maintaining pH control in the Open Pit pool was required for meeting water-quality standards.

Because the Open Pit was expected to fill with stormwater, interim AWS source controls were not considered as part of the original CCP and AP-27 plans. From 1997 to 2010, pH mitigation was performed by addition of hydrated lime (JSAI, 2011a). The Open Pit sulfate concentrations increased from 2003 to 2007, which initiated AP-27 Performance Standard APS-1 Trigger No. 1. A pilot remediation program was implemented to mitigate AWS effects on the Open Pit pool chemistry, and a detailed water-quality evaluation was performed (JSAI, 2010). It was concluded that source controls needed to be implemented before water-quality mitigation efforts can be effective and Open Pit pool chemistry could be predicted with confidence. Figure 5 is a time-series graph of Open Pit pool pH with notation regarding measures implemented for pH mitigation.

From 2015 to current, extensive AWS source-control measures were implemented as part of the revised AP-27 reclamation plan (JSAI, 2011a; 2014; 2020) (see Section 1.1). It was identified that the primary cause of AWS was the infiltration of stormwater from Upper Cunningham Gulch through the lined channel into waste rock because the liner was damaged and water infiltrated below the liner. Cunningham Gulch recharged the Golden Fault fracture system to the pit walls on the west side (JSAI, 2011). AWS has not been observed since the Upper Cunningham Gulch diversion channel liner was properly repaired, Open Pit watershed stormwater controls constructed, and covering selected benches and roads with caliche.

With AWS source controls successfully implemented, treatment of the Open Pit pool with Nano Filtration (NF) began in 2021. NF treatment is to primarily remove calcium and sulfate while preserving the Open Pit pool alkalinity. In addition, alkaline groundwater source from the Residue Pile plume recovery system and the Guest House well are added to the Open Pit to maintain chemical alkaline balance and to replace volume losses from the NF treatment process. It is anticipated that after completion of NF treatment, the Open Pit water chemistry will be maintained with implementation and maintenance of Open Pit source controls.

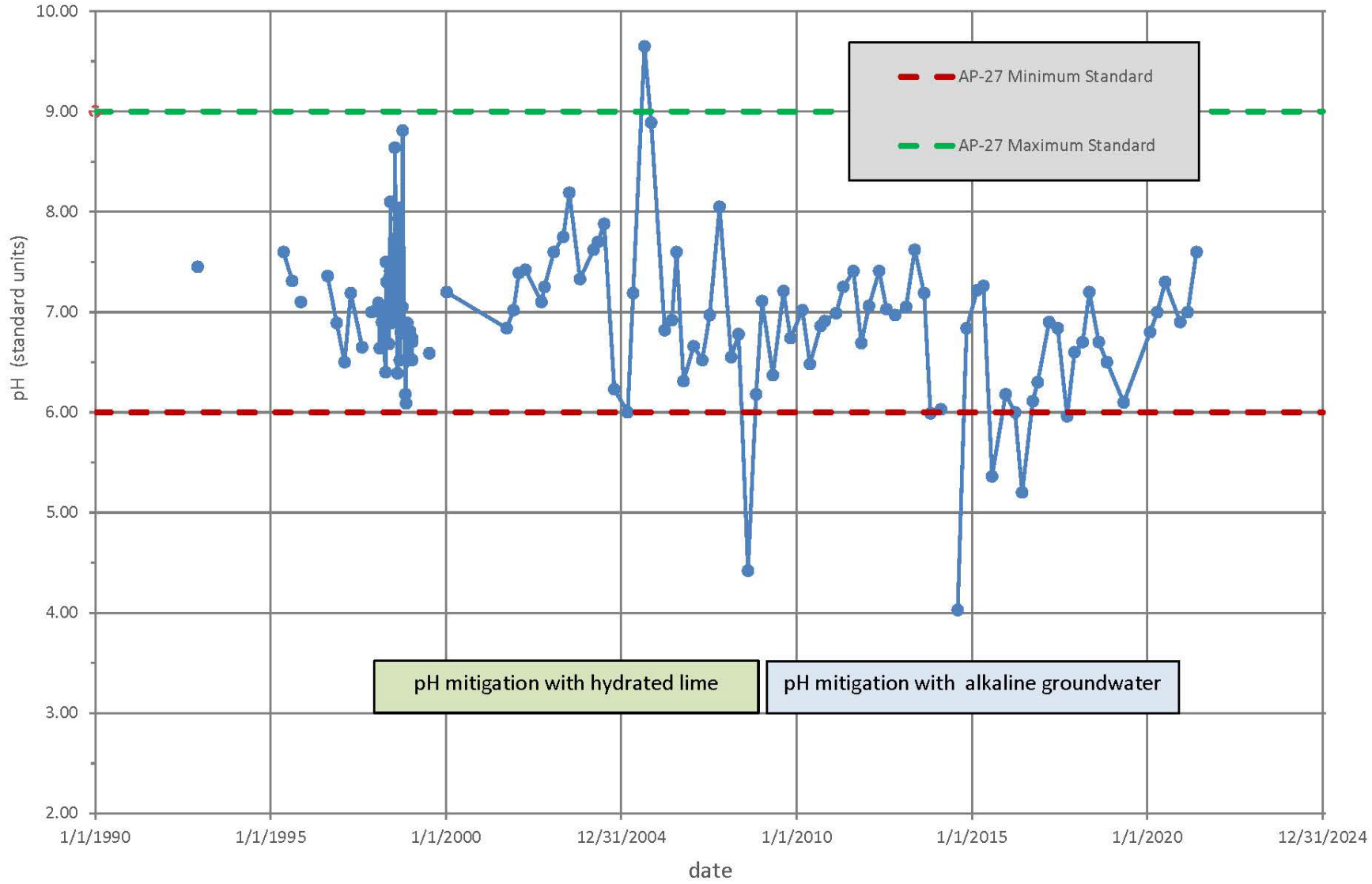

Figure 5. Time-series graph of Open Pit pool lab pH (4 ft depth) and pH mitigation measures.

2.4 Reclamation Efforts

As shown on Figure 2, approximately 21 acres around the Open Pit perimeter have been reclaimed by regrading, addition of cover soil, and re-vegetation.

JSAI (2011a) prepared a revised AP-27 reclamation plan that was based on pilot studies and Open Pit pool investigations between 2009 and 2011. The plan primarily included AWS source controls and water treatment (see Section 1.1). To date, the implemented source controls have eliminated AWS, and pH buffering has not been required for the past six years. The Open Pit waterbody currently meets the surface water quality standards for wildlife and livestock.

Ongoing reclamation efforts related to the CHMRP Open Pit revised plan (JSAI, 2011) primarily include assessment of AWS source controls and water treatment with NF. The NMED approved the water-treatment system workplan in 2018, and the system was constructed between 2019 and 2020. Water treatment began during the summer of 2021, with 1,582,560 gallons (4.9 ac-ft) treated as of August 2021. It was proposed to operate the treatment system seasonally, and the anticipated treatment goal of achieving AP-27 sulfate and TDS water quality criteria for groundwater discharges would be achieved in about 4 years (Jacobs, 2018).

An 8-ft chain-link fence will be installed around the Open Pit to restrict access to wildlife and humans. No other reclamation activities are currently planned, except monitoring the performance of and maintaining source controls and post-treatment Open Pit pool water quality.

With an approved pit waiver, the 16.55 acres of Open Pit walls and benches will remain unreclaimed. Open Pit access roads have been reclaimed by installation of stormwater controls and caliche cover. The Open Pit pool will likely stay around the current size of about 2.8 acres. The 0.56 acres of road along the west side of the Open Pit will be reclaimed with stormwater controls, caliche cover, and a seed mix. The repaired Upper Cunningham Gulch channel will remain in place to allow clean stormwater to flow to the Open Pit pool.

3.0 EVALUATION OF OPEN PIT RECLAMATION OPTIONS

The CHMRP Open Pit waiver justification for SSE requirements is based on a combination of economic and technical infeasibility, and environmental unsoundness considerations. The MMD (1998) published guidelines for SSE and how it is used in the context of the New Mexico Mining Act Rules. The MMD definition of SSE is as follows:

> **"Self-sustaining ecosystem"** means reclaimed land that is self-renewing without augmented seeding, amendments, or other assistance which is capable of supporting communities of living organisms and their environment. A self-sustaining ecosystem includes hydrologic and nutrient cycles functioning at levels of productivity sufficient to support biological diversity

The most important MMD factor for evaluating SSE is "any post-mine land use that will involve continued maintenance and input by man will not be considered self-sustaining ecosystems." In other words, perpetual care for achieving post-mining land use and maintenance of source controls is not self-sustaining.

3.1 Open Pit Filling with Stormwater

Revised stormwater runoff scenarios were evaluated by JSAI (2011; 2020), and none of the scenarios generated enough stormwater to fill the Open Pit to the 6,945-ft-amsl elevation as anticipated in the original CCP. Significant changes to watershed conditions and above-normal precipitation for a prolonged time are required to fill the Open Pit. Given climate change, it is technically infeasible to rely on prolong periods of above-normal precipitation to achieve reclamation goals with set schedules.

LAC has invested in a watershed restoration program that involves selective thinning (JSAI, 2020a); however, it is unknown how much additional yield can be generated by watershed restoration and management. In addition, LAC property only includes a portion of the Upper Cunningham Gulch watershed. With partial ownership of the watershed, it is technically not feasible to fully implement restoration programs for increasing watershed yield. Furthermore, recurring watershed management practices for maintaining yield to the Open Pit may not be considered as self-sustaining.

3.2 Open Pit Filling with Groundwater

There are no known on-site alternate water sources that can be used to fill the Open Pit. At a minimum, a groundwater source capable of continuously yielding more than 100 gpm for 10 years is needed to fill the Open Pit. In the last 22 years of investigation, no such groundwater source disconnected from the Open Pit has been identified in the area. The highest yield wells onsite were former open pit dewatering wells (PW77-01 and PW79-02) for the Gold Fields Cunningham Hill Mine operations. It would be technically infeasible to fill the Open Pit with wells hydraulically connected to the limited fractured area around the Open Pit, because within a short time period one would simply be pumping out the same water placed in the Open Pit. The Guest House Well is the highest yield onsite well that is not connected to the Open Pit. The Guest House Well has a capacity of about 15 gpm. LAC has secured water rights for required CHMRP reclamation which includes open pit filling, but there is not a viable groundwater source onsite that can achieve the production rates needed for pit filling.

Past projects by JSAI have involved locating an offsite water source for potential future mining operations in the Ortiz Mountains (JSAI, 1998), and for the nearby communities of Cerrillos, Madrid, and Galisteo Basin Preserve. Based on these past evaluations, there are no known water-supply wells capable of sustaining over 100 gpm within a 25-mile radius. The Galisteo Basin of the Middle Rio Grande Underground Water Basin is closed to new water right appropriations. If an offsite source was identified for open pit filling, it would also be required in perpetuity to maintain the Open Pit water level. Using groundwater to achieve the original reclamation goals of filling the pit and maintaining the pit water level is technically infeasible because it would not meet the requirements of a SSE.

3.3 Feasibility of Backfilling

The concept of backfilling the Open Pit involves reclaiming the unreclaimed pit walls and benches to an elevation of 6,945 ft without disturbing the reclaimed Open Pit perimeter. The 6,945-ft elevation contour is shown on Figure 2. The north and east pit walls and benches above 6945-ft elevation would remain unreclaimed as in the 1996 CCP. The volume of material would depend if the Open Pit was partially backfilled or completely backfilled to 6,945-ft elevation. Based on fill volumes in Table 1, a theoretical volume of at least 1.8 million cubic yards of material would be required for backfilling.

Identified sources of material for backfilling include:

a. Reclaimed Waste Rock Pile or Reclaimed Residue Pile
b. Material from a new borrow pit mine north of CHMRP Open Pit
c. Caliche imported from Moriarty, New Mexico

The Waste Rock Pile is the waste material that was mined from the Open Pit and placed in Dolores Gulch and then reclaimed. The waste rock material is poorly sorted consisting of boulders to clay (derived from weathered rock), and the volume is estimated at 7 million cubic yards (JSAI, 2007a). Excavating the Waste Rock Pile for Open Pit backfill material would create over 100 acres of disturbed land that would require reclamation of the remaining waste rock and disturbed area. The Waste Rock pile material is not suitable for Open Pit backfill due to the high sulfide content and acid generating characteristics as demonstrated by the acid rock drainage (ARD) generated from the toe of the Waste Rock Pile when infiltration of meteoric water has occurred in the past (see DP-55 annual reports). A backfilled Open Pit would behave as a flow through system, where recharge to the backfill material would generate ARD and discharge to groundwater which is environmentally unsound. Backfilling the Open Pit with waste rock is environmentally unsound, and would likely cause significant groundwater quality degradation.

The Residue Pile was created during the Gold Fields Mining Company Cunningham Hill Mine operations between 1979 and 1987. The Residue Pile contains processed rock (crushed and leached) originating from the Cunningham Hill Mine. Leachate from the Residue Pile contained the following constituents of concern: nitrate, cyanide, and cobalt. The Residue Pile contains about 1.2 million cubic yards of material. Backfilling the Open Pit with Residue Pile material is environmentally unsound, and would likely cause significant groundwater quality degradation.

Open Pit backfill material from an onsite borrow pit would require location of a material source, access to the borrow pit area, permitting of the borrow pit, and reclamation of borrow pit. Most all of the readily accessible on site soil has been used for reclamation of the Waste Rock Pile, Residue Pile, and Open Pit perimeter (see CCP fig 3). The geology underlying the soil horizon at the site is predominately igneous rocks of quartz monzonite and other intrusive rocks with varying amounts of sulfide content. Significant cover material would be required to reclaim a borrow pit and it is not available on site. Creating an onsite borrow mine pit to fill the Open Pit is technically infeasible because the solution creates the problem of an unreclaimed open pit that does not meet the MMD requirements for a SSE.

Caliche from a borrow pit near Moriarty, New Mexico has been used for Open Pit AP-27 reclamation efforts. Caliche consists of gravel, sand, silt, and a calcium carbonate cement matrix. The Moriarty caliche borrow pit contains more than 2 million cubic yards of material (personal communication with Sean Grossetete at EnviroWorks, LLC). The Moriarty caliche pit is 43 miles from the CHMRP Open Pit.

3.3.1 Backfilling to 6,945-ft Elevation

The concept of backfilling the Open Pit to 6,945-ft elevation is illustrated by the west to east Open Pit cross-section presented as Figure 6. Backfilling to 6,945-ft elevation would create a flat surface within the Open Pit to where the stormwater runoff would collect and likely infiltrate; there would be no outlet for stormwater flows. The Open Pit would need to be backfilled to the 6,990 ft elevation in order to create stormwater conveyance structures that exit the Open Pit area (Fig. 2).

The theoretical open pit fill volume to 6,945 ft elevation is 1,810,084 cubic yards (yd^3) (Table 1). Currently, the Open Pit contains approximately 41,000 yd^3 of accumulated sediment and 377,000 yd^3 of water (Table 1). The existing sediment and water would fill the pore spaces of the backfill as it is added. Considering 25 percent porosity for backfill, the pore space has a volume of about 452,500 yd^3. Backfilling the Open Pit to the 6,945 ft elevation would require at least 2,100,000 yd^3 of material when considering fill volume, 85 percent compaction factor, and incorporation of existing accumulated sediment and water. Backfilling and incorporation of the existing Open Pit waterbody will likely cause saturated conditions within the pit to rise to the 6,925 ft elevation (considering 25 percent porosity and 200 ac-ft of water).

3.3.2 Partial Backfilling

The concept of partial backfilling the Open Pit to 6,945 ft amsl elevation is illustrated by the west to east Open Pit cross-section presented as Figure 6. Partial backfilling to 6,945 ft amsl elevation would create a bowl-like surface within the Open Pit to where the stormwater runoff would collect and likely infiltrate; there would be no outlet for stormwater flows. The slopes of the reclaimed surface would be equivalent to 3H:1V from 6,945 ft amsl elevation along the pit walls to center of the Open Pit. The center of the Open Pit would have a final elevation of 6,860 ft amsl.

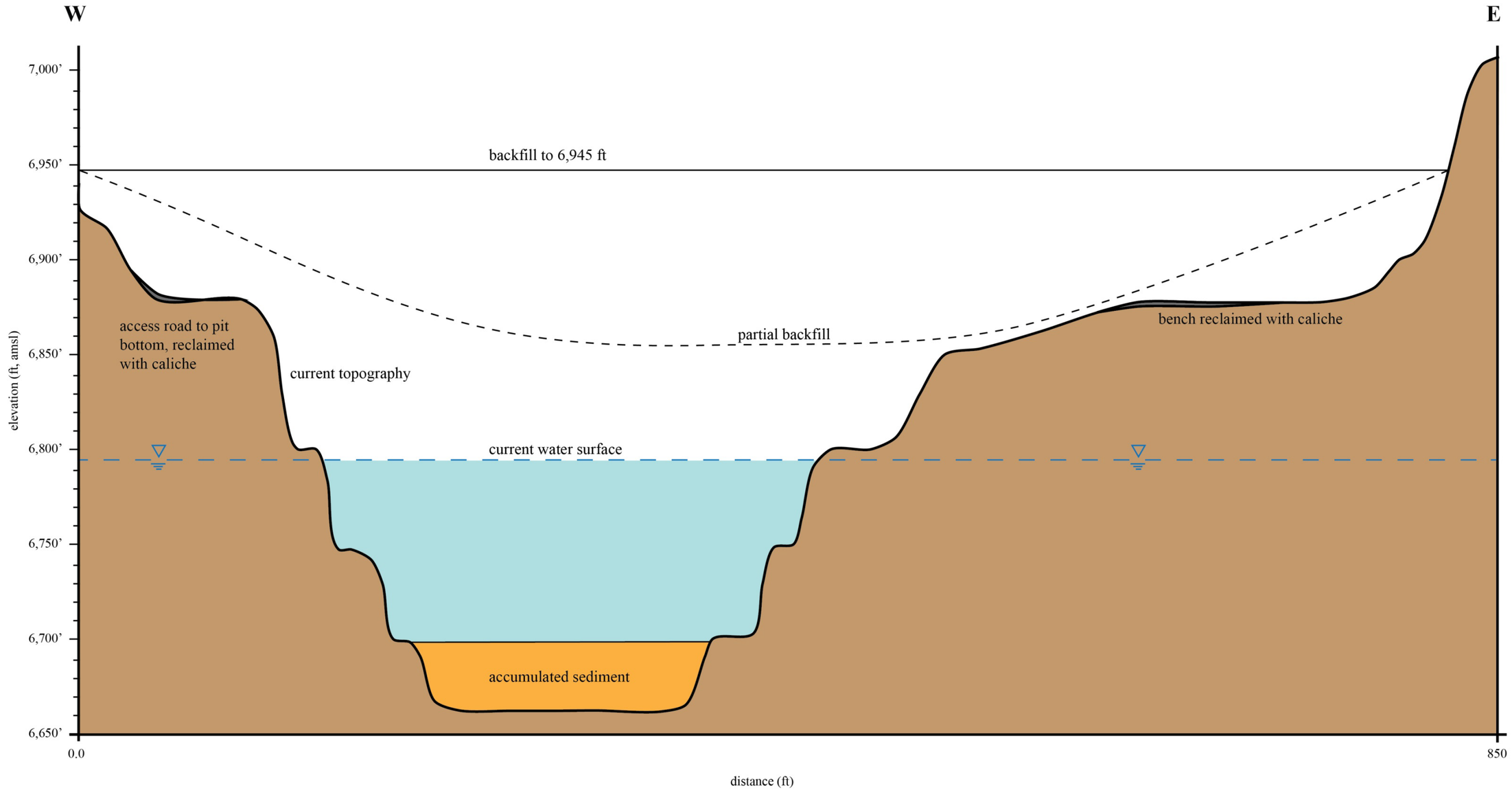

Figure 6. West-to-east cross-section schematic of the Cunningham Hill Mine Open Pit showing backfilling options.

The theoretical open pit partial backfill volume to 6,945-ft-amsl elevation at the Open Pit walls and 6,860 ft amsl at the Open Pit center is 1,206,723 cubic yards (yd^3). Currently, the Open Pit contains approximately 41,000 yd^3 of accumulated sediment and 377,000 yd^3 of water (Table 1). The existing sediment and water would fill the pore spaces of the backfill as it is added. Considering 25 percent porosity for backfill, the partial backfill pore space has a volume of about 200,000 yd^3 to an elevation of 6,860 ft amsl. The remaining 211,000 yd^3 (130 ac-ft) of water would form a pit lake to about the 6,900-ft elevation and then slowly drain to groundwater.

Partial backfilling the Open Pit to the 6,945 ft elevation would require at least 1,420,000 yd^3 of material when considering fill volume, 85 percent compaction factor, and incorporation of existing accumulated sediment and water. Backfilling and incorporation of the existing Open Pit waterbody will likely cause saturated conditions to rise within the pit to the 6,925 ft elevation (considering 25 percent porosity and 200 ac-ft of water). Depending on the need for construction water, it is possible a pit lake will form at the 6,900 ft elevation. The north and east side unreclaimed pit walls and benches would drain stormwater to the reclaimed pit bottom creating a similar condition that is observed today.

3.4 Economic Feasibility of Open Pit Filling Alternatives

Where hard-rock mine open pit backfilling is practical, it has typically occurred wither concurrently with the mining or upon completion of the mining phase of the operations (BLM Handbook H-3042-1, 1992). Cunningham Hill mine ceased operations around 1986, and a significant percentage of CHMRP disturbed areas has already undergone reclamation (this includes a significant area of the open pit perimeter) and have been released. For these reasons backfilling is not economically feasible.

There are no other viable sources for backfilling the Open Pit other than imported material. Presented in Table 3 is an estimate to import fill material from the Moriarty quarry, which is purely based on the cost of material, trucking, and placement; no other costs are included. The Standardized Reclamation Cost Estimator by Parshley et al. (2012) was used to calculate the costs in Table 3. Additional cost estimating details can be referenced from Attachment 1.

The time to backfill by importing material is estimate to take 15.4 years, which is based on trucking 500 yd^3/day for 5 days/week. The cost analysis demonstrates that backfill with imported material is economically infeasible, particularly when considering cost due to indirect effects such as damage to public roads. The trucking route would suffer significant damage, and communities along the trucking route, such as Madrid, would be significantly impacted (no cost is include in Table 3 for road repair). For the reasons stated above, importing 1.4 or 2.1 million cubic yards of material for Open Pit backfill would be economically infeasible.

Table 3. Estimated cost to backfill CHMRP Open Pit

item	unit	unit cost	quantity	cost*
Backfill to 6,945 ft elevation				
Mobilize/demobilize	lump sum	$36,947	1	$36,947
backfill material cost	yd^3	$40.00	2,100,000	$84,000,000
load/haul/place/reveg	yd^3	$43.96	2,100,000	$92,323,827
construction management/support	month	$102,166	195	$19,922,488
indirect items (engineering, contingency, insurance, contractor profit, contract admin)	lump sum	$44,743,678	1	$44,743,678
			TOTAL	$241,026,940
Partial Backfill to 6,945 ft elevation				
Mobilize/demobilize	lump sum	$36,947	1	$36,947
Backfill material cost	yd^3	$40.00	1,420,000	$56,800,000
load/haul/place/reveg	yd^3	$44.46	1,420,000	$63,134,227
construction management/support	month	$144,243	131	$18,895,812
indirect items	lump sum	$33,805,388	1	$33,805,388
			TOTAL	$172,672,374

SRCE Calculation tool Parshley et al., 2012

* SRCE costs are based on $2.13/gallon for diesel. Current diesel price is over $6.00/gallon

Onsite storm water would be economically feasible if there was an adequate quantity for pit filling that was also reoccurring to maintain the open pit water level. LAC has implemented significant watershed restoration efforts (90 acres) at a cost of about $1,500 per acre. Restoration of the 1,260 acre watershed would cost $1,890,000, which maybe economically feasible if the enough storm water was generated for open pit reclamation and maintaining a SSE.

The only known groundwater sources are more than 25 miles away. Filling with groundwater would require perpetual care because groundwater pumping would be required annually after filling to maintain pit water levels required to achieve a SSE. Perpetual care does not meet the requirement for SSE.

3.5 Technical Feasibility of Open Pit Filling Alternatives

As proven from the last 20 years of site data, storm-water management has been deemed technically infeasible, and is not a viable source for pit filling and maintaining the open pit water level. The largest watershed yield recorded in the last 10 years was 20.15 ac-ft in 2019; which was likely due to above average precipitation and restoration (thinning) of 90 acres. An average 82 ac-ft/yr of stormwater is required fill and maintain the open pit, which is does not possible by watershed restoration alone. Furthermore, watershed restoration would need to be performed every 20 years, which is not self-sustaining.

The use of offsite groundwater is technically feasible for pit filling, however offsite groundwater will be required to maintain the open pit water level, which results in perpetual care and technical infeasibility.

Backfilling scenarios for backfilling to 6,945 ft elevation and partial backfilling are technically possible, however both scenarios result in capture of stormwater flows from unreclaimed pit walls and benches, possible creation of a pit lake, and a flow through system to groundwater. Creation of a pit lake with unreclaimed pit walls and benches that drain to the pit lake is no different than the current open pit. Stormwater controls with a backfill that drains out of the reclaimed open pit would be required for water-quality standards that support a SSE. To do this the backfill would need to be to the 6,990 ft elevation, which would require over 2.7 million cubic yards of material. There is no known volume of available onsite material that is suitable for backfill.

3.6 Environmental Soundness of Open Pit Filling Alternatives

Filling the open pit with storm water is environmentally sound, if enough storm water were available to fill to the 6,945 ft elevation. Filling with groundwater is not environmentally sound because of perpetual care and associated perpetual groundwater pumping, which would cause streamflow depletions or groundwater mining from the over-appropriated Middle Rio Grande Underground Water Basin.

Backfilling with material from the Waste Rock Pile or Residue Pile is environmentally unsound because it would mobilize contaminants and create far worst water quality issues than what has already been observed at CHMRP.

Backfilling to 6,945 ft elevation would create a pit lake with unreclaimed pit walls and benches that drain to the pit lake is no different than the current open pit. Discharge of contaminants from stormwater runoff to the backfilled open pit creates discharges to surface water and groundwater that can be deemed environmentally unsound.

Backfilling scenarios require trucking and heavy equipment for at least a 15 year period. The carbon generated from backfilling would contribute to the currently defined climate crisis (Executive Order 14008). One liter of diesel generates 2.68 kg of carbon dioxide when consumed. Using an average fuel consumption of 6.5 miles per gallon, a total of 14,809 tons of carbon dioxide would be generated as a result of trucking to backfill the open pit with 2,100,000 yd^3 of offsite material. Generation of significant quantities of carbon dioxide is not environmentally sound and detrimental to the environment.

4.0 ENVIRONMENTAL CONTROL MEASURES

CHMRP Open Pit environmental control measures are specified in Alternative Abatement Plan AP-27 (NMED, 2002). AP-27 measures and future revisions of AP-27 measures will ensure that the Open Pit will meet all applicable federal and state laws, regulations and standards for air, surface water and ground water protection following closure.

4.1 Surface Water

The current Open Pit pool water chemistry meets applicable surface water standards (as defined by NMED, 2021) (see Table 4). With implemented Open Pit source controls (2012 to 2019) the concentration of dissolved metals are expected to be maintained at concentrations less than applicable surface water standards. Current, NF treatment is being performed to comply with AP-27 groundwater discharge standards (Table 4).

4.1.1 Chemical Treatment Methods

Surface water standards will also be maintained as a result of the implemented source control measures defined in the revised AP-27 remediation plan (JSAI, 2011). Open Pit pool chemical treatment methods include pH mitigation with alkaline groundwater sources and nanofiltration treatment. NMED issued permits DP-55 and AP-27 allow for the use of on-site alkaline groundwater sources from the Guest House well and Residue Pile Recovery wells for Open Pit pool pH mitigation.

4.2 Groundwater

The NMED approved membrane filtration treatment system work plan has been implemented, and the Open Pit pool is currently being treated to remove sulfate and TDS for compliance with AP-27 groundwater discharge standards. NF treatment is currently in progress, and is primarily for mitigating Open Pit pool sulfate and TDS concentrations so AP-27 standards for groundwater discharge are maintained. NF treatment is expected to be completed by 2024, at which time it is expected that pit-lake water quality will be sustained by the continued maintenance of source controls that are currently in place.

Table 4. Summary of AP-27 groundwater and surface-water quality standards and monitoring results

constituent	unit	AP-27 groundwater discharge Standard	surface water trigger level	Livestock Watering Standard	Wildlife Habitat Standard	Limited Aquatic Life - Acute Standard	Open Pit water body (4 ft depth) [2] May 2021	comment
alkalinity	mg/L		<20				37	
pH	S.U.	6 to 9					7.6	
chloride	mg/L	250					23.8	
sulfate	mg/L	1,200 b					**1,570**	
TDS	mg/L	2,000 b					**2,340**	
conductance	µS/cm		6,300				2,670	
aluminum [1]	mg/L	5				10.07	<0.40	
arsenic	mg/L	0.01		0.2		0.34	<0.125	
boron	mg/L	0.75		5.0				
cadmium [1]	mg/L	0.005		0.05		0.0065	0.000527	
chlorine residual	mg/L				0.011	0.019	<0.0002	January 2020 lab analysis
chromium III [1]	mg/L					1.77		total chromium is less than Cr III standard
chromium VI	mg/L					0.016	na	need lab analysis
chromium	mg/L	0.05		1.0			<0.030	
cobalt	mg/L	0.2 b		1.0			0.0469	
copper [1]	mg/L	1		0.5		0.05	0.04	January 2020 lab analysis
iron	mg/L	1					<0.50	
lead [1]	mg/L	0.002		0.1		0.28	<0.0075	January 2020 lab analysis
manganese [1]	mg/L	4.0 b				4.738	2.23	
mercury	mg/L	0.002			0.01	0.0014	<0.00020	
molybdenum	mg/L	1				7.920	<0.008	January 2020 lab analysis
nickel	mg/L	0.2				1.51	0.0237	January 2020 lab analysis
selenium	mg/L	0.05		0.05	0.005	0.02	<0.0030	
silver [1]	mg/L	0.05				0.035	na	need lab analysis
vanadium	mg/L			0.1			<0.005	January 2020 lab analysis
zinc [1]	mg/L	10		25		0.564	0.164	

b AP-27 groundwater discharge standard
red indicates exceedance of applicable standard
CHMRP - Cunningham Hill Mine Reclamation Project
TDS - total dissolved solids
mg/L - milligrams per liter
µS/cm - microsiemens per centimeter

4.3 CCP Reclamation Measures

Other environmental control and reclamation measures identified in the revised CCP include the following:

1. Open pit NF water treatment. Currently in progress.
2. Installation of open pit perimeter fence
3. Work with NMG&F to establish alternative water source for wildlife.
4. Reclamation of 0.56 acres related to west side open pit road by adding 450 yd^3 caliche with storm-water runoff controls.
5. Reclamation of RO ponds when NF treatment is no longer required for AP-27.
6. Reclamation of ARD ponds as defined in renewed DP-55.
7. Waste Rock Pile repairs as required by DP-55. In progress.

5.0 ACCESS CONTROLS

LAC owns the property containing the Open Pit, which allows for implementation of controls to ensure the Open Pit will not pose a current or future hazard to public health or safety.

5.1 Human Health and Safety

Human health and safety concerns regarding the Open Pit are primarily controlled by limited access to authorized personnel. The entrance to the LAC property is secured with a locking access gate and perimeter fencing with signs. The Open Pit access road is maintained to prevent hazards related to access for permit compliance. Installation of perimeter fencing is in the planning stages.

5.2 Wildlife and Stock

Measures to protect wildlife include those in AP-27 to maintain surface water quality standards and specific requires in the CCP, such as fencing. No other access controls are anticipated to protect wildlife. Currently, LAC does not graze livestock, and will likely not graze livestock in the future, unless it is determined to be beneficial for watershed health.

6.0 CONCLUSION

JSAI has evaluated four reclamation options for achieving a post-mining land use or self-sustaining ecosystem related to 19.38 acres of unreclaimed open pit walls and benches and the existing open pit waterbody. Each option was evaluated for technical feasibility, economical feasible, and environmentally soundness. As described in Section 3.0, the alternatives considered for reclamation of the Open Pit are summarized in Table 5.

Table 5. Summary of open pit reclamation options

Open Pit reclamation option	technically feasible	economically feasible	environmentally sound
Fill with storm water	no	yes	yes
Fill with groundwater	no	no	no
Partial backfill	no	no	no
Backfill to 6,945 ft elev	no	no	no
Backfill to 6,990 ft elev	no	no	no

All reclamation alternatives considered were deemed technically infeasible. There is not a demonstrated reliable and recurring source of storm-water flows, even with complete watershed restoration. Filling with groundwater results in a perpetual care condition where groundwater pumping is required to maintain the open pit water level, therefore does not achieve the SSE status. Backfilling options below 6,990 ft elevation potentially create a pit lake that receives stormwater runoff from the remaining unreclaimed open pit walls and benches. Infiltrated stormwater would also drain to groundwater (flow through system). Backfilling to 6,945 ft elevation is technical infeasible because it potentially creates that same present day condition without further reclamation. Backfilling to 6,990 ft elevation to allow stormwater to drain out of the open pit is technically infeasible because there is no known volume of suitable material, onsite or offsite.

Only filling with stormwater is considered economically feasible, if storm water were available. All other alternatives were considered economically infeasible due to the over burdensome costs. Likewise, all alternatives, other than filling with stormwater, are environmentally unsound, due to surface water and groundwater contamination issues or creating excessive carbon emissions.

7.0 REQUEST FOR WAIVER

As stated by 19.10.5.506.C NMAC *Upon a showing that achieving a post-mining land use or self-sustaining ecosystem is not technically or economically feasible or is environmentally unsound, the Director may waive the requirement to achieve a self-sustaining ecosystem or post-mining land use for an open pit or waste unit if measures will be taken to ensure that the Open Pit or waste unit will meet all applicable federal and state laws, regulations and standards for air, surface water and ground water protection following closure and will not pose a current or future hazard to public health or safety*.

LAC is requesting an SSE waiver for 19.38 acres of the Open Pit (Fig. 2), which includes the open pit waterbody and the unreclaimed walls and benches. Achieving a post-mining land use or self-sustaining ecosystem is not technically or economically feasible and environmentally unsound for the 19.28 acres of open pit. As required by AP-27, water quality standards for the open pit water body will be maintained. In addition, the following has been reclaimed to comply with applicable state laws, regulations, and standards:

- 20.89 acres of the pit perimeter has been recontoured with successfully established growth medium
- AWS source controls have been implemented
- The upper Cunningham Gulch stormwater water conveyance has been repaired and made functional
- Stormwater controls have been implemented, such as collection on the northside, and properly established in-pit drainage controls
- All access roads and some bench areas have been covered with caliche
- the Open Pit pool pH of 6 or greater is self -maintained

For the various reasons discussed in Section 3.0, LAC is requesting an SSE waiver for the open pit waterbody and the un-reclaimed Open Pit walls and benches, which consist of 19.38 acres.

8.0 REFERENCES

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Attachment 1.

Reclamation cost estimate details

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill to 6,945 ft
Project Date: May 25, 2022
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Backfill stf.xlsm

A. Earthwork/Recontouring	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment	$0	$0	$0	$0
Pits	$0	$0	N/A	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings	$0	$0	$0	$0
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$31,533,142	$60,782,616	$0	$92,315,758
Other User Costs (from Other User sheet)	$0	$0	$84,000,000	$84,000,000
Other**				$0
Subtotal	**$31,533,142**	**$60,782,616**	**$84,000,000**	**$176,315,758**
Mob/Demob if included in Other User sheet	$0	$0	$0	$0
Mob/Demob				$0
Subtotal "A"	**$31,533,142**	**$60,782,616**	**$84,000,000**	**$176,315,758**

B. Revegetation/Stabilization	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment				N/A
Pits	$0	$0	$0	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings				N/A
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$1,924	$687	$5,458	$8,069
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "B"	**$1,924**	**$687**	**$5,458**	**$8,069**

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor [1]	Equipment [2]	Materials	Total
Process Ponds/Sludge				$0
Heaps				$0
Dumps (Waste & Landfill)				$0
Tailings				$0
Surplus Water Disposal				$0
Monitoring				$0
Miscellaneous				$0
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "C"	**$0**	**$0**	**$0**	**$0**

D. Structure, Equipment and Facility Removal, and Misc.	Labor [1]	Equipment [2]	Materials	Total
Foundation & Buildings Areas	$0	$0	$0	$0
Other Demolition	$0	$0	$0	$0
Equipment Removal	$0	$0	$0	$0
Fence Removal	$0	$0		$0
Fence Installation	$0	$0	$0	$0
Culvert Removal	$0	$0	N/A	$0
Pipe Removal	$0	$0	N/A	$0
Powerline Removal	$0			$0
Transformer Removal	$0			$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Misc. Costs	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "D"	**$0**	**$0**	**$0**	**$0**

E. Monitoring	Labor [1]	Equipment [2]	Materials	Total
Reclamation Monitoring and Maintenance	$0	$0	$0	$0
Ground and Surface Water Monitoring	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Subtotal "E"	**$0**	**$0**	**$0**	**$0**

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill to 6,945 ft
Project Date: May 25, 2022
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Backfill stf.xlsm

F. Construction Management & Support	Labor	Equipment [2]	Materials	Total
Construction Management	$5,508,360	$992,160	N/A	$6,500,520
Construction Support	$0	$84,708	$0	$84,708
Road Maintenance	$5,928,000	$7,409,220	$0	$13,337,220
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "F"	**$11,436,360**	**$8,486,088**	**$0**	**$19,922,448**

Subtotal Operational & Maintenance Costs	Labor [1]	Equipment [2]	Materials [3]	Total
Subtotal A through F	**$42,971,426**	**$69,269,391**	**$84,005,458**	**$196,246,275**

** Other Operator supplied costs - additional documentation required.

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill to 6,945 ft
Project Date: May 25, 2022
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Backfill stf.xlsm

Indirect Costs			Include?	Total
1. Engineering, Design and Construction (ED&C) Plan (7)				$7,849,851
2. Contingency (8)				$7,849,851
3. Insurance (9)	$644,571			$644,571
4. Performance Bond (10)				
5. Contractor Profit (11)				$19,624,628
6. Contract Administration (12)				$11,774,777
7. Government Indirect Cost (13)				
Subtotal Add-On Costs				**$47,743,678**
Total Indirect Costs as % of Direct Cost				24%
GRAND TOTAL				**$243,989,953**

Administrative Cost Rates (%)

	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	$1,000,000	$25,000,000		$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
	<=	<=	<=	>	
2. Contingency (8)	$500,000	$5,000,000	$50,000,000	$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5%	of labor costs			
4. Bond (10)	3.0%	of the O&M costs if O&M costs are >$100,000			
5. Contractor Profit (11)	10%	of the O&M costs			
	<=	<=	<=	>	
6. Contract Administration (12)	$1,000,000	$25,000,000		$25,000,000	
Variable Rate	10%	8%		6%	
Government Indirect Cost (13)	21%	of contract administration			

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading, overhead
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the submitted
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced,
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a
13. Government indirect cost rate is 21% of the contract administration costs.

Closure Cost Estimate
Haul Material

Project Name: Open Pit Backfill to 6,945 ft - Reclamation Plan
Date of Submittal: May 25, 2022
File Name: Cunningham Hill Pit Backfill stf.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: 20210801_SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Generic Material Hauling - Cost Summary

	Labor	Equipment	Materials	Totals
Hauling/Crush/Screen/Compact	$30,791,582	$59,353,200	N/A	$90,144,782
Cover Placement Cost	$741,560	$1,429,416	N/A	$2,170,976
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$31,533,142**	**$60,782,616**	**$0**	**$92,315,758**
Revegetation Cost	$1,924	$687	$5,458	$8,069
TOTALS	**$31,535,066**	**$60,783,303**	**$5,458**	**$92,323,827**

Generic Material Hauling - User Input

	Facility Description			Physical		Hauled Material			Crushing & Screening					Cover			Growth Media		
	Description (required)	ID Code	Type	Final Surface Area acres	Average Ripping Distance ft	Material Volume Required cy	Distance from Borrow Source (1) ft	Slope to Borrow Source % grade	Crush Material	Screen Material	Loss to Crushing/ Screening %	Distance to Placement Location (2) ft	Slope to Placement % grade	Cover Thickness in	Distance to Cover Borrow ft	Slope to Borrow % grade	Growth Media Thickness in	Distance to Growth Material Stockpile ft	Slope to Stockpile % grade
1	**Cunningham Hill Pit**		**Quarry**	**13.88**		**2,100,000**	**227,040**	**-1.5**						**36**	**227,040**				

Notes:
1. Input distance to crusher if material to be crushed
2. Input distance from crusher to placement if material to be crushed
3. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)

Generic Material Hauling - User Input (cont.)

		Hauling Material				Cover			Growth Media			Revegetation				
	Description (required)	Haul Material Type (select)	Material Hauling Fleet (select)	Each Fleet Size (from/to crusher) (user override)	Compact After Placement?	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch Type (select)	Fertilizer Type (select)	Scarify/ Rip? (select)	Scarifying/ Ripping Fleet (select)
1	**Cunningham Hill Pit**	**LS - broken**	**Small Truck**	**17**	**No**	**Alluvium**	**Small Truck**	**17**				**Mix 4**	**None**	**None**	**Yes**	**Small Dozer**

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Generic Material Hauling - Load, Haul, Place and Grade

		Material Haulage								Crush and/or Compact			
	Description (required)	Material Volume to Crusher cy	Final Material Volume cy	Material Haulage Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Hauling Labor Cost $	Hauling Equipment Cost $	Total Crush/ Screen Cost $	Compact Labor Cost $	Compact Equipment Cost $	Total Load/Haul/ Place Cost $
1	**Cunningham Hill Pit**	2,100,000	2,100,000	725/966G/D7R	85	17	24,706	$30,791,582	$59,353,200	$0	$0	$0	$90,144,782
		2,100,000	2,100,000				24,706	**$30,791,582**	**$59,353,200**	**$0**	**$0**	**$0**	**$90,144,782**

Notes: Final Material Volume includes allowance for additional material hauled to crushing/screening plant based on Loss to Crushing/Screening input above.

Generic Material Hauling - Cover and Growth Media Costs

		Cover Placement								Growth Media Placement							
	Description (required)	Cover Volume cy	Cover Placement Fleet	Cover Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Placement Cost $	Growth Media Volume cy	Growth Media Placement Fleet	Growth Media Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**Cunningham Hill Pit**	67,179	725/966G/D7R	113	17	595	$741,560	$1,429,416	$2,170,976	0					$0	$0	$0
		67,179				595	**$741,560**	**$1,429,416**	**$2,170,976**						**$0**	**$0**	**$0**

Generic Material Hauling - Scarifying/Revegetation Costs

	Description (required)	Total Surface Area acres	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Cost $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Cost $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**Cunningham Hill Pit**	13.88	D7R				$0	$1,924	$687	$5,458	$8,069
		13.88			**$0**	**$0**	**$0**	**$1,924**	**$687**	**$5,458**	**$8,069**

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill 6,945 ft
Project Date: May 25, 2022
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Partial Backfill 6945 stf.xlsm

A. Earthwork/Recontouring	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment	$0	$0	$0	$0
Pits	$0	$0	N/A	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings	$0	$0	$0	$0
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$21,562,582	$41,563,576	$0	$63,126,158
Other User Costs (from Other User sheet)	$0	$0	$56,800,000	$56,800,000
Other**				$0
Subtotal	**$21,562,582**	**$41,563,576**	**$56,800,000**	**$119,926,158**
Mob/Demob if included in Other User sheet	$0	$0	$0	$0
Mob/Demob				$0
Subtotal "A"	**$21,562,582**	**$41,563,576**	**$56,800,000**	**$119,926,158**

B. Revegetation/Stabilization	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment				N/A
Pits	$0	$0	$0	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings				N/A
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$1,924	$687	$5,458	$8,069
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "B"	**$1,924**	**$687**	**$5,458**	**$8,069**

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor [1]	Equipment [2]	Materials	Total
Process Ponds/Sludge				$0
Heaps				$0
Dumps (Waste & Landfill)				$0
Tailings				$0
Surplus Water Disposal				$0
Monitoring				$0
Miscellaneous				$0
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "C"	**$0**	**$0**	**$0**	**$0**

D. Structure, Equipment and Facility Removal, and Misc.	Labor [1]	Equipment [2]	Materials	Total
Foundation & Buildings Areas	$0	$0	$0	$0
Other Demolition	$0	$0	$0	$0
Equipment Removal	$0	$0	$0	$0
Fence Removal	$0	$0		$0
Fence Installation	$0	$0	$0	$0
Culvert Removal	$0	$0	N/A	$0
Pipe Removal	$0	$0	N/A	$0
Powerline Removal	$0			$0
Transformer Removal	$0			$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Misc. Costs	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "D"	**$0**	**$0**	**$0**	**$0**

E. Monitoring	Labor [1]	Equipment [2]	Materials	Total
Reclamation Monitoring and Maintenance	$0	$0	$0	$0
Ground and Surface Water Monitoring	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Subtotal "E"	**$0**	**$0**	**$0**	**$0**

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill 6,945 ft
Project Date: May 25, 2022
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Partial Backfill 6945 stf.xlsm

F. Construction Management & Support	Labor	Equipment (2)	Materials	Total
Construction Management	$5,225,880	$941,280	N/A	$6,167,160
Construction Support	$0	$80,364	$0	$80,364
Road Maintenance	$5,621,486	$7,026,802	$0	$12,648,288
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "F"	**$10,847,366**	**$8,048,446**	**$0**	**$18,895,812**

Subtotal Operational & Maintenance Costs	Labor (1)	Equipment (2)	Materials (3)	Total
Subtotal A through F	**$32,411,872**	**$49,612,709**	**$56,805,458**	**$138,830,039**

** Other Operator supplied costs - additional documentation required.

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill 6,945 ft
Project Date: May 25, 2022
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Partial Backfill 6945 stf.xlsm

Indirect Costs				Include?	Total
1. Engineering, Design and Construction (ED&C) Plan (7)					$5,553,202
2. Contingency (8)					$5,553,202
3. Insurance (9)	$486,178				$486,178
4. Performance Bond (10)					
5. Contractor Profit (11)					$13,883,004
6. Contract Administration (12)					$8,329,802
7. Government Indirect Cost (13)					
Subtotal Add-On Costs					**$33,805,388**
Total Indirect Costs as % of Direct Cost					24%
GRAND TOTAL					**$172,635,427**

Administrative Cost Rates (%)

	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	$1,000,000	$25,000,000		$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
	<=	<=	<=	>	
2. Contingency (8)	$500,000	$5,000,000	$50,000,000	$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5%	of labor costs			
4. Bond (10)	3.0%	of the O&M costs if O&M costs are >$100,000			
5. Contractor Profit (11)	10%	of the O&M costs			
	<=	<=	<=	>	
6. Contract Administration (12)	$1,000,000	$25,000,000		$25,000,000	
Variable Rate	10%	8%		6%	
Government Indirect Cost (13)	21%	of contract administration			

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading, overhead
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the submitted
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced,
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a
13. Government indirect cost rate is 21% of the contract administration costs.

Closure Cost Estimate
Haul Material

Project Name: Open Pit Backfill 6,945 ft - Reclamation Plan
Date of Submittal: May 25, 2022
File Name: Cunningham Hill Pit Partial Backfill 6945 stf.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: 20210801_SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Generic Material Hauling - Cost Summary

	Labor	Equipment	Materials	Totals
Hauling/Crush/Screen/Compact	$20,821,022	$40,134,160	N/A	$60,955,182
Cover Placement Cost	$741,560	$1,429,416	N/A	$2,170,976
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$21,562,582**	**$41,563,576**	**$0**	**$63,126,158**
Revegetation Cost	$1,924	$687	$5,458	$8,069
TOTALS	**$21,564,506**	**$41,564,263**	**$5,458**	**$63,134,227**

Generic Material Hauling - User Input

	Facility Description			Physical		Hauled Material			Crushing & Screening					Cover			Growth Media		
	Description (required)	ID Code	Type	Final Surface Area acres	Average Ripping Distance ft	Material Volume Required cy	Distance from Borrow Source (1) ft	Slope to Borrow Source % grade	Crush Material	Screen Material	Loss to Crushing/ Screening %	Distance to Placement Location (2) ft	Slope to Placement % grade	Cover Thickness in	Distance to Cover Borrow ft	Slope to Borrow % grade	Growth Media Thickness in	Distance to Growth Material Stockpile ft	Slope to Stockpile % grade
1	**Cunningham Hill Pit**		**Quarry**	**13.88**		**1,420,000**	**227,040**	**-1.5**						**36**	**227,040**				

Notes:
1. Input distance to crusher if material to be crushed
2. Input distance from crusher to placement if material to be crushed
3. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)

Generic Material Hauling - User Input (cont.)

		Hauling Material				Cover			Growth Media			Revegetation				
	Description (required)	Haul Material Type (select)	Material Hauling Fleet (select)	Each Fleet Size (from/to crusher) (user override)	Compact After Placement?	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch Type (select)	Fertilizer Type (select)	Scarify/ Rip? (select)	Scarifying/ Ripping Fleet (select)
1	**Cunningham Hill Pit**	**LS - broken**	**Small Truck**	**17**	**No**	**Alluvium**	**Small Truck**	**17**				**Mix 4**	**None**	**None**	**Yes**	**Small Dozer**

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Generic Material Hauling - Load, Haul, Place and Grade

		Material Haulage								Crush and/or Compact			
	Description (required)	Material Volume to Crusher cy	Final Material Volume cy	Material Haulage Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Hauling Labor Cost $	Hauling Equipment Cost $	Total Crush/ Screen Cost $	Compact Labor Cost $	Compact Equipment Cost $	Total Load/Haul/ Place Cost $
1	**Cunningham Hill Pit**	1,420,000	1,420,000	725/966G/D7R	85	17	16,706	$20,821,022	$40,134,160	$0	$0	$0	$60,955,182
		1,420,000	1,420,000				16,706	**$20,821,022**	**$40,134,160**	**$0**	**$0**	**$0**	**$60,955,182**

Notes: Final Material Volume includes allowance for additional material hauled to crushing/screening plant based on Loss to Crushing/Screening input above.

Generic Material Hauling - Cover and Growth Media Costs

		Cover Placement								Growth Media Placement							
	Description (required)	Cover Volume cy	Cover Placement Fleet	Cover Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Placement Cost $	Growth Media Volume cy	Growth Media Placement Fleet	Growth Media Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**Cunningham Hill Pit**	67,179	725/966G/D7R	113	17	595	$741,560	$1,429,416	$2,170,976	0					$0	$0	$0
		67,179				595	**$741,560**	**$1,429,416**	**$2,170,976**						**$0**	**$0**	**$0**

Generic Material Hauling - Scarifying/Revegetation Costs

	Description (required)	Total Surface Area acres	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Cost $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Cost $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**Cunningham Hill Pit**	13.88	D7R				$0	$1,924	$687	$5,458	$8,069
		13.88			**$0**	**$0**	**$0**	**$1,924**	**$687**	**$5,458**	**$8,069**

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill 6,990 ft
Enter Submittal Date
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Backfill 6990 stf.xlsm

A. Earthwork/Recontouring	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment	$0	$0	$0	$0
Pits	$0	$0	N/A	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings	$0	$0	$0	$0
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$29,035,517	$55,968,247	$0	$85,003,764
Other User Costs (from Other User sheet)	$0	$0	$162,000,000	$162,000,000
Other**				$0
Subtotal	**$29,035,517**	**$55,968,247**	**$162,000,000**	**$247,003,764**
Mob/Demob if included in Other User sheet	$0	$0	$0	$0
Mob/Demob				$0
Subtotal "A"	**$29,035,517**	**$55,968,247**	**$162,000,000**	**$247,003,764**

B. Revegetation/Stabilization	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment				N/A
Pits	$0	$0	$0	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings				N/A
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$2,287	$817	$6,489	$9,593
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "B"	**$2,287**	**$817**	**$6,489**	**$9,593**

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor [1]	Equipment [2]	Materials	Total
Process Ponds/Sludge				$0
Heaps				$0
Dumps (Waste & Landfill)				$0
Tailings				$0
Surplus Water Disposal				$0
Monitoring				$0
Miscellaneous				$0
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "C"	**$0**	**$0**	**$0**	**$0**

D. Structure, Equipment and Facility Removal, and Misc.	Labor [1]	Equipment [2]	Materials	Total
Foundation & Buildings Areas	$0	$0	$0	$0
Other Demolition	$0	$0	$0	$0
Equipment Removal	$0	$0	$0	$0
Fence Removal	$0	$0		$0
Fence Installation	$0	$0	$0	$0
Culvert Removal	$0	$0	N/A	$0
Pipe Removal	$0	$0	N/A	$0
Powerline Removal	$0			$0
Transformer Removal	$0			$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Misc. Costs	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "D"	**$0**	**$0**	**$0**	**$0**

E. Monitoring	Labor [1]	Equipment [2]	Materials	Total
Reclamation Monitoring and Maintenance	$0	$0	$0	$0
Ground and Surface Water Monitoring	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Subtotal "E"	**$0**	**$0**	**$0**	**$0**

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill 6,990 ft
Enter Submittal Date
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Backfill 6990 stf.xlsm

F. Construction Management & Support	Labor	Equipment [2]	Materials	Total
Construction Management	$5,225,880	$941,280	N/A	$6,167,160
Construction Support	$0	$80,364	$0	$80,364
Road Maintenance	$5,621,486	$7,026,802	$0	$12,648,288
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "F"	**$10,847,366**	**$8,048,446**	**$0**	**$18,895,812**

Subtotal Operational & Maintenance Costs	Labor [1]	Equipment [2]	Materials [3]	Total
Subtotal A through F	**$39,885,170**	**$64,017,510**	**$162,006,489**	**$265,909,169**

** Other Operator supplied costs - additional documentation required.

Closure Cost Estimate
Cost Summary

Project Name: Open Pit Backfill 6,990 ft
Enter Submittal Date
Model Version: Version 1.4.1
File Name: Cunningham Hill Pit Backfill 6990 stf.xlsm

Indirect Costs			Include?	Total
1. Engineering, Design and Construction (ED&C) Plan (7)				$10,636,367
2. Contingency (8)				$10,636,367
3. Insurance (9)	$598,278			$598,278
4. Performance Bond (10)				
5. Contractor Profit (11)				$26,590,917
6. Contract Administration (12)				$15,954,550
7. Government Indirect Cost (13)				
Subtotal Add-On Costs				**$64,416,479**
Total Indirect Costs as % of Direct Cost				24%
GRAND TOTAL				**$330,325,648**

Administrative Cost Rates (%)

	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	$1,000,000	$25,000,000		$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
	<=	<=	<=	>	
2. Contingency (8)	$500,000	$5,000,000	$50,000,000	$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5%	of labor costs			
4. Bond (10)	3.0%	of the O&M costs if O&M costs are >$100,000			
5. Contractor Profit (11)	10%	of the O&M costs			
	<=	<=	<=	>	
6. Contract Administration (12)	$1,000,000	$25,000,000		$25,000,000	
Variable Rate	10%	8%		6%	
Government Indirect Cost (13)	21%	of contract administration			

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading, overhead
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the submitted
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced,
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a
13. Government indirect cost rate is 21% of the contract administration costs.

Attachment 6.

Revised CCP – applicable DP-55 permit conditions
DP-55 renewed 11/20/2020 Section C106 Closure

Summary of Renewed DP-55 Closure Requirements

C106 Closure

A. The permittee shall implement the approved closure plan for each mine unit once it is no longer required as a component of the groundwater abatement systems.

B. The permittee shall perform long-term monitoring until NMED determines that long-term monitoring is no longer required. The financial assurance described in C107 shall provide for a minimum of 100 years of long-term monitoring.

C. Upon NMED approval that long-term monitoring is complete, the permittee shall submit a schedule for abandonment of all appropriate monitoring wells. All monitoring wells shall be abandoned pursuant to NMED Monitoring Well Construction and Abandonment Guidelines and according to the regulations issued by the New Mexico Office of the State Engineer in 19.27.7 NMAC, unless an alternative completion is approved by NMED and the New Mexico Office of the State Engineer.

Attachment 7.

Draft Financial Assurance Cost Estimates

Cunningham Hill Mine Reclamation Project
New Mexico Environmental Department
AP-27 Reclamation Cost Estimate
May-22

Direct Costs				
Description	**Labor**	**Equipment**	**Materials**	**Total**
Earthwork/Recontouring - Well Abandonment	6,005	6,579	1,614	14,198
Water Treatment	421,893	-	251,298	673,191
Monitoring	266,477	35,530	90,561	392,568
Direct Costs Total	**$ 694,375**	**$ 42,109**	**$ 343,473**	**$ 1,079,957**

Indirect Costs	
Description	**Total**
Engineering, Design and Construction	64,797
Contingency	86,397
Insurance	10,416
Performance Bond	32,399
Contractor Profit	107,996
Contract Administration	86,397
Indirect Costs Total	**$ 388,402**

Grand Total $ 1,468,359

Enter Data Below in Green and Blue Spaces

STANDARDIZED RECLAMATION COST ESTIMATOR

Version 1.4.1
Build 017b (Revised 16 May 2019)
Approved for use in Nevada, August 1, 2012

COST DATA FILE INFORMATION

File Name:	AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Cost Data File:	SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Data Date:	August 1, 2021
Cost Data Basis:	User Data — Data Cost Units: Imperial
Author/Source:	Nevada Division of Environmental Protection (NDEP) & NV BLM

PROJECT INFORMATION

Property/Mine Name:	Cunningham Hill Mine Reclamation Proje — Property Code:
Project Name:	CHMRP AP-27 Reclamation Cost Estimate
Date of Submittal:	May 2022 — Average Altitude: 7100 ft.
Select One:	☐ Notice or Sm Exploration Plan ☐ Lg Exploration Plan ☑ Mine Operation
Select One:	☑ Private Land ☐ Public or Public/Private
Cost Estimate Type:	Surety
Cost Basis Category:	Southern Nevada
Cost Basis Description:	**Clark, Esmeralda, Lincoln and Nye Counties**

t Name: CHMRP AP-27 Reclamation Cost Estimate
Project Date: May 2022
_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Reclamation Plan

Table of Contents

Description

Closure Cost Estimate
Cost Summary

Project Name: CHMRP AP-27 Reclamation Cost Estimate
Project Date: May 2022
Model Version: Version 1.4.1
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm

A. Earthwork/Recontouring	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment	$6,005	$6,579	$1,614	$14,198
Pits	$0	$0	N/A	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings	$0	$0	$0	$0
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal	**$6,005**	**$6,579**	**$1,614**	**$14,198**
Mob/Demob if included in Other User sheet	$0	$0	$0	$0
Mob/Demob				$0
Subtotal "A"	**$6,005**	**$6,579**	**$1,614**	**$14,198**

B. Revegetation/Stabilization	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$0	$0	$0	$0
Well Abandonment				N/A
Pits	$0	$0	$0	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings				N/A
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$0	$0	$0	$0
Yards, Etc.	$0	$0	$0	$0
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "B"	**$0**	**$0**	**$0**	**$0**

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor [1]	Equipment [2]	Materials	Total
Process Ponds/Sludge				$0
Heaps				$0
Dumps (Waste & Landfill)				$0
Tailings				$0
Surplus Water Disposal				$0
Monitoring				$0
Miscellaneous				$0
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$421,893	$0	$251,298	$673,191
Other**				$0
Subtotal "C"	**$421,893**	**$0**	**$251,298**	**$673,191**

D. Structure, Equipment and Facility Removal, and Misc.	Labor [1]	Equipment [2]	Materials	Total
Foundation & Buildings Areas	$0	$0	$0	$0
Other Demolition	$0	$0	$0	$0
Equipment Removal	$0	$0	$0	$0
Fence Removal	$0	$0		$0
Fence Installation	$0	$0	$0	$0
Culvert Removal	$0	$0	N/A	$0
Pipe Removal	$0	$0	N/A	$0
Powerline Removal	$0			$0
Transformer Removal	$0			$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Misc. Costs	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "D"	**$0**	**$0**	**$0**	**$0**

E. Monitoring	Labor [1]	Equipment [2]	Materials	Total
Reclamation Monitoring and Maintenance	$60,976	$702	$0	$61,678
Ground and Surface Water Monitoring	$205,501	$34,828	$90,561	$330,890
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Subtotal "E"	**$266,477**	**$35,530**	**$90,561**	**$392,568**

F. Construction Management & Support	Labor	Equipment [2]	Materials	Total
Construction Management	$0	$0	N/A	$0
Construction Support	$0	$0	$0	$0
Road Maintenance	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "F"	**$0**	**$0**	**$0**	**$0**

Subtotal Operational & Maintenance Costs	Labor [1]	Equipment [2]	Materials [3]	Total
Subtotal A through F	**$694,375**	**$42,109**	**$343,473**	**$1,079,957**

Closure Cost Estimate
Cost Summary

Project Name: CHMRP AP-27 Reclamation Cost Estimate
Project Date: May 2022
Model Version: Version 1.4.1
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm

** Other Operator supplied costs - additional documentation required.

Indirect Costs				Include?	Total
1. Engineering, Design and Construction (ED&C) Plan (7)					$64,797
2. Contingency (8)					$86,397
3. Insurance (9)	$10,416				$10,416
4. Performance Bond (10)					$32,399
5. Contractor Profit (11)					$107,996
6. Contract Administration (12)					$86,397
7. Government Indirect Cost (13)					N/A
Subtotal Add-On Costs					**$388,402**
Total Indirect Costs as % of Direct Cost					36%
GRAND TOTAL					**$1,468,359**

Administrative Cost Rates (%)					
	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	$1,000,000	$25,000,000		$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
	<=	<=	<=	>	
2. Contingency (8)	$500,000	$5,000,000	$50,000,000	$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5%	of labor costs			
4. Bond (10)	3.0%	of the O&M costs if O&M costs are >$100,000			
5. Contractor Profit (11)	10%	of the O&M costs			
	<=	<=	<=	>	
6. Contract Administration (12)	$1,000,000	$25,000,000		$25,000,000	
Variable Rate	10%	8%		6%	
Government Indirect Cost (13)	21%	of contract administration			

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading,
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced,
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a
13. Government indirect cost rate is 21% of the contract administration costs.

Closure Cost Estimate
Other User

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Other Cost Items Calculated Elsewhere

	Description (required)	ID Code	Facility Type	Quantity	Units	Total Capital Cost $	Material Unit Cost $	Labor Unit Cost $	Equipment/ Operating Unit Cost $	Cost Type (select)	Total Cost $	Comments
1	Pit lake treatment		Water Treatment - Contac	3	years		$83,766.00	$140,631.00		C. Water Management	$673,191	
						$0	$251,298	$421,893	$0		$673,191	

Notes: Capital cost is lump sum (i.e. not multiplied by the quantity).
Material, Labor and Equipment/Operating costs are unit costs (i.e. multiplied by the quantity).
Tipping Fees not included for material sent to metal recycler

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Reclamation Monitoring & Maintenance - Cost Summary

	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	$0	$0	$0	$0
Erosion Maintenance	$0	$0	N/A	$0
Reclamation Monitoring	$60,976	$702	N/A	$61,678
Subtotal Reclamation Monitoring	**$60,976**	**$702**	**$0**	**$61,678**
Water Quality Monitoring	$205,501	$34,828	$90,561	$330,890
TOTAL MONITORING	**$266,477**	**$35,530**	**$90,561**	**$392,568**

Reclamation Maintenance

Description	Total Revegetation Surface Area (1,2) acres	% Area Requiring Reseeding	Seed Mix (select)	Area Requiring Reseeding acres	Seed $/acres	Labor $/acres	Equipment $/acres	Totals $
Revegetation Maintenance	0	**100%**	**User Mix 2**	0.0	$241.00	$138.59	$49.50	
Labor								$0
Equipment								$0
Materials								$0
Cost/Acre								$429
							Subtotal	**$0**

Notes: 1) Surface area is NOT the same as footprint disturbance area typically used for permitting purposes.

	Total Volume Growth Media cy	% Volume Requiring Maintenance	Average Growth Media Placement Cost $/CY	Volume Requiring Replacement cy		Labor (assume: 25%) $/acres	Equipment (assume: 75%) $/acres	Total $
Erosion Maintenance	0	**20%**	$0.00	0		$0.00	$0.00	$0

Notes:

Reclamation Monitoring

Description	Hrs/Day	Days/Year	Number of Years	Rate $/hr		
Field Work						
Field Geologist/Engineer				$163.79		$0
Range Scientist	**8**	**1**	**12**	$143.79		$13,804
Reporting						
Field Geologist/Engineer	**8**	**3**	**12**	$163.79		$47,172
Range Scientist				$143.79		$0
					Subtotal	**$60,976**
Travel						
	Hrs/Trip hr	**Trips/Year**	**Years**	**Truck Cost** $/hr		
Travel	**2**	**1**	**12**	$29.26		$702
					Subtotal	**$702**
					Total Reclamation Monitoring	**$61,678**

Notes:

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Reclamation Monitoring & Maintenance - Cost Summary

	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	$0	$0	$0	$0
Erosion Maintenance	$0	$0	N/A	$0
Reclamation Monitoring	$60,976	$702	N/A	$61,678
Subtotal Reclamation Monitoring	**$60,976**	**$702**	**$0**	**$61,678**
Water Quality Monitoring	$205,501	$34,828	$90,561	$330,890
TOTAL MONITORING	**$266,477**	**$35,530**	**$90,561**	**$392,568**

Water and Rock Sample Analysis

Description	Samples #	Events/Year	No. Years	First Sample Year closure year (1-100)	No. of Samplers	Days/Event	Hrs/Day	Analysis Cost $/sample	Supplies $/sample	Lab Cost $	Material Cost $	Equipment Cost $	Labor Cost $	Cost $	Comments
Pit Lake	**4**	**4**	**12**	**1**	**1**	**1**	**8**	$257.10	$6.45	$49,363	$1,238	$9,769	$47,535	$107,905	
AP Wells	**2**	**4**	**12**	**1**	**1**	**1**	**8**	$84.30	$6.45	$8,093	$619	$9,769	$47,535	$66,016	
LAC Profile 1	**4**	**4**	**12**	**1**	**1**	**1**	**8**	$156.30	$6.45	$30,010	$1,238	$9,769	$47,535	$88,552	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
										$87,466.00	$3,095.00	$29,306.88	$142,606.08		
													Subtotal Sampling Costs	**$262,474**	

Notes: Sampling labor cost = No. Samplers x Years x Events/year x Days/event x Hour/Day x Labor Rate
Sampling equipment costs include 1 pickup truck for every two samplers

Ground & Surface Water Monitoring

Pump Costs

Description	No. of units		Years		Cost $
Pump (purchased)	**10**	Replacement period (yrs):	**10**	2760.425068	$5,521
				Subtotal Field Work	**$5,521**

Notes: Replacement period = frequency of pump replacement

Reporting

Description	Hrs/Event	Rate $/hr	Cost $
Field Geologist/Engineer	**8**	$163.79	$62,895
		Subtotal Reporting	**$62,895**

Notes:

Closure Cost Estimate
Labor Rates

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Color Code Key	
User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

ZONE ADJUSTMENTS			
Cost Basis/Project Region	Southern Nevada	Clark, Esmeralda, Lincoln and Nye Counties	
Power Equipment Operators	>60 miles	$0.00	
Truck Drivers	>70 miles	$0.00	
Laborers	>50 miles	$0.00	

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	12.00%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

EQUIPMENT TYPE (1) OR JOB DESCRIPTION	Labor Group	Base Rate ($/hr)	Zone Adjustment ($/hr)	Hourly Wage ($/hr)	Fringe ($/hr)	Retirement/ Medicare ($/hr)	Unemployment Insurance ($/hr)	Workman's Compensation ($/hr)	Other Indirect Costs ($/hr)	Total ($/hr)
Equipment Operators ($/hr) (2)										
Bulldozers										
D6R	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
D6R w/ Winch					$26.65					
D7R	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
D8R	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
D9R	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
D10R	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
D11R	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
Wheeled Dozers										
824G					$26.65					
834G					$26.65					
844					$26.65					
854G					$26.65					
Motor Graders										
120H	Group 10	$50.97	$0.00	$50.97	$26.65	$1.53	$3.90	$6.12	$0.00	$89.16
14G/H	Group 10	$50.97	$0.00	$50.97	$26.65	$1.53	$3.90	$6.12	$0.00	$89.16
16G/H	Group 10	$50.97	$0.00	$50.97	$26.65	$1.53	$3.90	$6.12	$0.00	$89.16
24M					$26.65					
Track Excavators										
312C	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
320C	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
325C	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
330C	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
345B	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
365BL					$26.65					
385BL	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
Scrapers										
631G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
637G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
Wheeled Loaders										
924G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
928G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
950G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
966G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
972G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
980G	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
988G	Group 10	$50.97	$0.00	$50.97	$26.65	$1.53	$3.90	$6.12	$0.00	$89.16
990					$26.65					
992G	Group 10	$50.97	$0.00	$50.97	$26.65	$1.53	$3.90	$6.12	$0.00	$89.16
994D					$26.65					
L2350					$26.65					
Shovels										
PC2000					$26.65					
PC3000					$26.65					
PC4000					$26.65					
PC5500					$26.65					
PC8000					$26.65					
Hydraulic Hammers										
H-120 (fits 325)										
H-160 (fits 345)										
H-180 (fits 365/385)										
Demolition Shears										
S340 (fits 322/325/330)										
S365 (fits 330/345)										
S390 (fits 365/385)										
Demolition Grapples										
G315 (fits 322/325)										
G320 (fits 325/330)										
G330 (fits 345/365)										

Closure Cost Estimate
Labor Rates

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Color Code Key	
User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

ZONE ADJUSTMENTS

Cost Basis/Project Region	Southern Nevada	Clark, Esmeralda, Lincoln and Nye Counties
Power Equipment Operators	>60 miles	$0.00
Truck Drivers	>70 miles	$0.00
Laborers	>50 miles	$0.00

INDIRECT COSTS

Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	12.00%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

Other Equipment

420D 4WD Backhoe	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
428D 4WD Backhoe	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
CS533E Vibratory Roller	Group 12A	$51.14	$0.00	$51.14	$26.65	$1.53	$3.91	$6.14	$0.00	$89.37
CS633E Vibratory Roller					$26.65					
CP533E Sheepsfoot Compactor					$26.65					
CP633E Sheepsfoot Compactor					$26.65					
Light Truck - 1.5 Ton					$26.65					
Supervisor's Truck					$26.65					
Flatbed Truck					$26.65					
Air Compressor + tools	Group 1	$47.79	$0.00	$47.79	$26.65	$1.43	$3.66	$5.73	$0.00	$85.26
Welding Equipment	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
Heavy Duty Drill Rig	Group 1	$47.79	$0.00	$47.79	$26.65	$1.43	$3.66	$5.73	$0.00	$85.26
Pump (plugging) Drill Rig	Group 1	$47.79	$0.00	$47.79	$26.65	$1.43	$3.66	$5.73	$0.00	$85.26
Concrete Pump					$26.65					
Gas Engine Vibrator	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
Generator 5KW					$26.65					
HDEP Welder (pipe or liner)					$26.65					
5 Ton Crane	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
20 Ton Crane	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
50 Ton Crane	Group 8A	$50.85	$0.00	$50.85	$26.65	$1.53	$3.89	$6.10	$0.00	$89.02
120 Ton Crane					$26.65					

NOTES:

(1) Equipment Type:	Catepillar model or equivalent, LeTourneau
(2) Equipment Operator Source:	D-B NV20210012 44393
(3) Zone Basis:	From Las Vegas City Hall

Truck Drivers ($/hr) (4)

725		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
730		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
735		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
740		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
769D		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
773E					$26.72					
777D		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
785C					$26.72					
793C					$26.72					
797B					$26.72					
613E (5,000 gal) Water Wagon		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
621E (8,000 gal) Water Wagon		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84
777D Water Truck					$26.72					
785C Water Truck					$26.72					
Dump Truck (10-12 yd3)		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$3.53	$0.00	$62.84

NOTES:

(4) Truck Driver Source:	D-B NV20210012 44393
(5) Zone Basis:	From Las Vegas City Hall

Closure Cost Estimate
Labor Rates

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Color Code Key	
User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

ZONE ADJUSTMENTS			
Cost Basis/Project Region	Southern Nevada	Clark, Esmeralda, Lincoln and Nye Counties	
Power Equipment Operators	>60 miles	$0.00	
Truck Drivers	>70 miles	$0.00	
Laborers	>50 miles	$0.00	

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	12.00%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

Laborers ($/hr) (6,7)

General Laborer	Group 1	$27.86	$0.00	$27.86	$28.79	$0.84	$2.13	$3.34	$0.00	$62.96
Skilled Laborer	Group 2	$27.96	$0.00	$27.96	$28.79	$0.84	$2.14	$3.36	$0.00	$63.08
Driller's Helper	Group 2	$27.96	$0.00	$27.96	$28.79	$0.84	$2.14	$3.36	$0.00	$63.08
Rodmen (reinforcing concrete)	Group 2	$27.96	$0.00	$27.96	$28.79	$0.84	$2.14	$3.36	$0.00	$63.08
Cement finisher	Group 2	$27.96	$0.00	$27.96	$28.79	$0.84	$2.14	$3.36	$0.00	$63.08
Carpenter		$42.28	$0.00	$42.28	$23.23	$1.27	$3.23	$5.07	$0.00	$75.09

NOTES:

(6) Laborer Source:	D-B LABO0872-015 44378
(7) Carpenter Source:	D-B CARP1977-003 44378
(8) Zone Basis:	From Las Vegas City Hall

Project Management and Technical Labor ($/hr) (9)

Project Manager		$91.69		$91.69	$28.79	$2.75	$7.01	$11.00	$0.00	$141.24
Foreman		$84.94		$84.94	$28.79	$2.55	$6.50	$10.19	$0.00	$132.97
Field Geologist/Engineer		$110.07		$110.07	$28.79	$3.30	$8.42	$13.21	$0.00	$163.79
Field Tech/Sampler		$77.46		$77.46	$28.79	$2.32	$5.93	$9.29	$0.00	$123.79
Range Scientist		$93.76		$93.76	$28.79	$2.81	$7.17	$11.25	$0.00	$143.79
Senior Planning Engineer					$28.79					
Project Engineer					$28.79					
Mechanic/Fitter					$28.79					
					$28.79					
					$28.79					
					$28.79					
					$28.79					

NOTES:

(9) Project Manager:	R.S.Means 2021 Q2 (01 31 1320 0200 Total Incl.O&P-10%) Adjusted for Elko, NV
(9) Foreman Source:	R.S.Means 2021 Q2 (01 31 1320 0200 Total Incl.O&P-10%) Adjusted for Elko, NV
(9) Techical Labor Source:	Wood plc 2021 Adjusted for Zone,Tax and Ins.
Other Labor Source:	
Other Labor Source:	
†Additional User Markups	
(These are added by the user to the	
base rate to account for site-specific	
conditions or corporate requirements)	

Closure Cost Estimate
Equipment Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Monthly Rental Basis: 160 hrs month

EQUIPMENT RENTAL RATE TABLE

EQUIPMENT TYPE (1)	Monthly Owner/Rental Rate	Equipment Hourly Rate	Fuel/Lube/ Wear	Total Rate
Bulldozers				
D6R	$10,185.00	$63.66	$26.51	$90.17
D6R w/ Winch			$13.31	$13.31
D7R	$11,575.00	$72.34	$29.18	$101.52
D8R	$21,150.00	$132.19	$39.43	$171.62
D9R	$28,400.00	$177.50	$55.94	$233.44
D10R	$39,360.00	$246.00	$72.04	$318.04
D11R	$52,785.00	$329.91	$104.83	$434.73
Wheeled Dozers				
824G			$22.90	$22.90
834G			$26.84	$26.84
844			$31.95	$31.95
854G			$40.47	$40.47
Motor Graders				
120H	$9,400.00	$58.75	$30.23	$88.98
14G/H	$13,515.00	$84.47	$44.06	$128.52
16G/H	$24,250.00	$151.56	$55.24	$206.80
24M			$33.02	$33.02
Track Excavators				
312C	$4,650.00	$29.06	$12.64	$41.71
320C	$5,245.00	$32.78	$20.02	$52.80
325C	$7,500.00	$46.88	$24.93	$71.80
330C	$10,575.00	$66.09	$30.06	$96.15
345B	$14,565.00	$91.03	$37.28	$128.31
365BL			$28.12	$28.12
385BL	$22,950.00	$143.44	$57.83	$201.26
Scrapers				
631G	$24,285.00	$151.78	$63.34	$215.12
637G	$28,520.00	$178.25	$89.52	$267.77
Wheeled Loaders				
924G	$4,230.00	$26.44	$20.19	$46.63
928G	$4,580.00	$28.63	$22.08	$50.70
950G	$7,440.00	$46.50	$28.45	$74.95
966G	$10,670.00	$66.69	$36.75	$103.44
972G	$13,515.00	$84.47	$41.51	$125.98
980G	$13,515.00	$84.47	$46.62	$131.08
988G	$22,525.00	$140.78	$65.60	$206.38
990			$36.21	$36.21
992G	$54,125.00	$338.28	$122.78	$461.06
994D			$76.68	$76.68
L2350			$140.58	$140.58
Shovels				
PC2000			$78.81	$78.81
PC3000			$106.50	$106.50
PC4000			$149.10	$149.10
PC5500			$253.47	$253.47
PC8000			$317.37	$317.37
Hydraulic Hammers				
H-120 (fits 325)	$4,460.00	$27.88	$5.79	$33.67
H-160 (fits 345)	$8,990.00	$56.19	$11.31	$67.50
H-180 (fits 365/385)	$12,385.00	$77.41	$13.40	$90.81
Demolition Shears				
S340 (fits 322/325/330)				$0.00
S365 (fits 330/345)				$0.00
S390 (fits 365/385)				$0.00
Demolition Grapples				
G315 (fits 322/325)				$0.00
G320 (fits 325/330)				$0.00
G330 (fits 345/365)				$0.00
Other Equipment				
420D 4WD Backhoe	$2,595.00	$16.22	$15.37	$31.58
428D 4WD Backhoe	$3,315.00	$20.72	$15.23	$35.94
CS533E Vibratory Roller	$8,250.00	$51.56	$7.99	$59.55
CS633E Vibratory Roller			$10.12	$10.12
CP533E Sheepsfoot Compactor			$7.99	$7.99
CP633E Sheepsfoot Compactor			$10.12	$10.12
Light Truck - 1.5 Ton	$4,122.80	$25.77	$3.49	$29.26
Supervisor's Truck	$3,682.80	$23.02	$2.42	$25.44
Flatbed Truck	$4,122.80	$25.77	$11.62	$37.39
Air Compressor + tools	$5,799.20	$36.25	$2.13	$38.38
Welding Equipment	$3,093.20	$19.33	$4.26	$23.59
Heavy Duty Drill Rig	$33,660.00	$210.38	$25.56	$235.94
Pump (plugging) Drill Rig	$33,660.00	$210.38	$21.30	$231.68
Concrete Pump	$8,800.00	$55.00	$21.30	$76.30
Gas Engine Vibrator	$564.08	$3.53	$2.13	$5.66
Generator 5KW	$1,675.52	$10.47	$3.20	$13.67
HDEP Welder (pipe or liner)	$8,712.00	$54.45	$4.26	$58.71
5 Ton Crane	$7,933.20	$49.58	$6.39	$55.97
20 Ton Crane	$12,122.00	$75.76	$8.52	$84.28
50 Ton Crane	$12,122.00	$75.76	$10.01	$85.77
120 Ton Crane			$11.08	$11.08
Trucks				
725	$14,690.00	$91.81	$37.45	$129.26
730	$14,690.00	$91.81	$38.52	$130.33
735	$14,690.00	$91.81	$52.19	$144.00
740	$14,690.00	$91.81	$53.48	$145.29
769D	$23,050.00	$144.06	$37.00	$181.06
773E	$29,300.00	$183.13	$50.10	$233.23
777D	$43,100.00	$269.38	$71.54	$340.91
785C			$51.65	$51.65
793C			$88.93	$88.93
797B			$125.14	$125.14
613E (5,000 gal) Water Wagon	$6,365.94	$39.79	$21.67	$61.46
621E (8,000 gal) Water Wagon	$10,773.13	$67.33	$38.07	$105.40
777D Water Truck			$35.68	$35.68
785C Water Truck			$51.65	$51.65
Dump Truck (10-12 yd^3)	$11,990.00	$74.94	$12.17	$87.11

NOTES:

(1) Power Equipment Source:	
(2) Power Equipment Type:	Catepillar model or equivalent, LeTourneau loader, Komatsu shovels
(3) Drilling Equipment Source:	RS Means Heavy Construction (2021 Q2)
(4) Other Equipment Source:	RS Means Heavy Construction (2021 Q2)

(5) Drill rig includes support (pipe) truck

Closure Cost Estimate
Equipment Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm

FUEL, LUBE AND WEAR CALCULATIONS

EQUIPMENT TYPE	PM Cost Per Hour (1)	Under carriage or Tires (2)	G.E.T Consumption (3)	Fuel Use Rate gal/hr (4)	Cost@ 2.13/gal	Total Hourly Equipment Cost
Bulldozers						
D6R	$7.86		$5.34	6.25	$13.31	$26.51
D6R w/ Winch				6.25	$13.31	$13.31
D7R	$7.86		$5.34	7.50	$15.98	$29.18
D8R	$8.29		$10.37	9.75	$20.77	$39.43
D9R	$9.46		$16.13	14.25	$30.35	$55.94
D10R	$11.12		$22.58	18.00	$38.34	$72.04
D11R	$15.15		$33.23	26.50	$56.45	$104.83
Wheeled Dozers						
824G		$0.00		10.75	$22.90	$22.90
834G		$0.00		12.60	$26.84	$26.84
844		$0.00		15.00	$31.95	$31.95
854G		$0.00		19.00	$40.47	$40.47
Motor Graders						
120H	$4.78	$5.83	$11.10	4.00	$8.52	$30.23
14G/H	$5.95	$8.74	$16.05	6.25	$13.31	$44.06
16G/H	$6.22	$11.13	$21.92	7.50	$15.98	$55.24
24M				15.50	$33.02	$33.02
Track Excavators						
312C	$4.49		$4.15	1.88	$4.00	$12.64
320C	$4.79		$4.79	4.90	$10.44	$20.02
325C	$4.82		$6.05	6.60	$14.06	$24.93
330C	$5.94		$6.65	8.20	$17.47	$30.06
345B	$7.89		$6.81	10.60	$22.58	$37.28
365BL				13.20	$28.12	$28.12
385BL	$6.61		$13.94	17.50	$37.28	$57.83
Scrapers						
631G	$7.97	$14.69	$8.73	15.00	$31.95	$63.34
637G	$13.26	$14.69	$10.98	23.75	$50.59	$89.52
Wheeled Loaders						
924G	$3.97	$5.60	$4.76	2.75	$5.86	$20.19
928G	$4.26	$5.60	$4.76	3.50	$7.46	$22.08
950G	$5.30	$5.77	$8.86	4.00	$8.52	$28.45
966G	$5.53	$7.87	$11.11	5.75	$12.25	$36.75
972G	$6.25	$7.87	$14.08	6.25	$13.31	$41.51
980G	$6.25	$10.31	$14.08	7.50	$15.98	$46.62
988G	$11.71	$13.02	$15.09	12.10	$25.77	$65.60
990				17.00	$36.21	$36.21
992G	$12.97	$26.18	$34.64	23.00	$48.99	$122.78
994D				36.00	$76.68	$76.68
L2350				66.00	$140.58	$140.58
Shovels						
PC2000				37.00	$78.81	$78.81
PC3000				50.00	$106.50	$106.50
PC4000				70.00	$149.10	$149.10
PC5500				119.00	$253.47	$253.47
PC8000				149.00	$317.37	$317.37
Hydraulic Hammers						
H-120 (fits 325)	N/A		$5.79			$5.79
H-160 (fits 345)	N/A		$11.31			$11.31
H-180 (fits 365/385)	N/A		$13.40			$13.40
Demolition Shears						
S340 (fits 322/325/330)	N/A					$0.00
S365 (fits 330/345)	N/A					$0.00
S390 (fits 365/385)	N/A					$0.00
Demolition Grapples						
G315 (fits 322/325)	N/A					$0.00
G320 (fits 325/330)	N/A					$0.00
G330 (fits 345/365)	N/A					$0.00
Other Equipment						
420D 4WD Backhoe	$4.42	$0.86	$3.70	3.00	$6.39	$15.37
428D 4WD Backhoe	$4.18	$0.86	$3.80	3.00	$6.39	$15.23
CS533E Vibratory Roller			N/A	3.75	$7.99	$7.99
CS633E Vibratory Roller			N/A	4.75	$10.12	$10.12
CP533E Sheepsfoot Compactor			N/A	3.75	$7.99	$7.99
CP633E Sheepsfoot Compactor			N/A	4.75	$10.12	$10.12
Light Truck - 1.5 Ton		$0.29	N/A	1.50	$3.20	$3.49
Supervisor's Truck		$0.29	N/A	1.00	$2.13	$2.42
Flatbed Truck		$1.61	N/A	4.70	$10.01	$11.62
Air Compressor + tools			N/A	1.00	$2.13	$2.13
Welding Equipment			N/A	2.00	$4.26	$4.26
Heavy Duty Drill Rig			N/A	12.00	$25.56	$25.56
Pump (plugging) Drill Rig			N/A	10.00	$21.30	$21.30
Concrete Pump			N/A	10.00	$21.30	$21.30
Gas Engine Vibrator			N/A	1.00	$2.13	$2.13
Generator 5KW			N/A	1.50	$3.20	$3.20
HDEP Welder (pipe or liner)			N/A	2.00	$4.26	$4.26
5 Ton Crane			N/A	3.00	$6.39	$6.39
20 Ton Crane			N/A	4.00	$8.52	$8.52
50 Ton Crane			N/A	4.70	$10.01	$10.01
120 Ton Crane			N/A	5.20	$11.08	$11.08
Trucks						
725	$8.79	$15.33	$3.32	4.70	$10.01	$37.45
730	$8.79	$15.33	$3.32	5.20	$11.08	$38.52
735	$8.79	$24.42	$3.32	7.35	$15.66	$52.19
740	$8.79	$25.71	$3.32	7.35	$15.66	$53.48
769D	$6.51	$7.08	$3.71	9.25	$19.70	$37.00
773E	$8.05	$12.86	$4.16	11.75	$25.03	$50.10
777D	$11.53	$19.68	$4.65	16.75	$35.68	$71.54
785C				24.25	$51.65	$51.65
793C				41.75	$88.93	$88.93
797B				58.75	$125.14	$125.14
613E (5,000 gal) Water Wagon	$5.27	$3.62		6.00	$12.78	$21.67
621E (8,000 gal) Water Wagon	$7.46	$7.71		10.75	$22.90	$38.07
777D Water Truck				16.75	$35.68	$35.68
785C Water Truck				24.25	$51.65	$51.65
Dump Truck (10-12 yd3) (5)	N/A	$1.09	N/A	5.20	$11.08	$12.17

Notes:

(1) PM Source:	Cashman Equipment Company () unless noted
(2) Undercarriage Source:	Purecell Tire Quote: 2021
(3) G.E.T. Source:	Cashman Equipment Company (July 2021) unless noted
(4) Fuel Use Source:	Caterpillar Handbook, Edition 35, Ch. 20; or estimated average for smaller vehicles
(5) Dump Truck Oper. Cost Source:	Means Heavy Construction (2008)

Closure Cost Estimate
Equipment Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm

TIRE COST TABLES

Equipment	Tire Size	# of Tires Per Piece of Equipment	Cost Per Tire	Tire Cost (1)(2)	Life Expectency Hours (Low/Zone A) (3)	Tire Cost per Hour
Bulldozers						
D6R			N/A			
D6R w/ Winch			N/A			
D7R			N/A			
D8R			N/A			
D9R			N/A			
D10R			N/A			
D11R			N/A			
Wheeled Dozers						
824G	29.5R25	4		$0.00	3,500	$0.00
834G	35/65-R33	4		$0.00	3,500	$0.00
844	45/65-R39	4		$0.00	3,500	$0.00
854G	45/65-R45	4		$0.00	3,500	$0.00
Motor Graders						
120H	13PR24	6	$3,400.00	$20,400.00	3,500	$5.83
14G/H	20.5R25	6	$5,100.00	$30,600.00	3,500	$8.74
16G/H	23.5R25	6	$6,490.00	$38,940.00	3,500	$11.13
24M	23.5R25	6		$0.00	3,500	
Track Excavators						
312C			N/A			
320C			N/A			
325C			N/A			
330C			N/A			
345B			N/A			
365BL			N/A			
385BL			N/A			
Scrapers						
631G	37.25R35	4	$14,690.00	$58,760.00	4,000	$14.69
637G	37.25R35	4	$14,690.00	$58,760.00	4,000	$14.69
Wheeled Loaders						
924G	17.5R25	4	$6,300.00	$25,200.00	4,500	$5.60
928G	17.5R25	4	$6,300.00	$25,200.00	4,500	$5.60
950G	26.5R25	4	$6,490.00	$25,960.00	4,500	$5.77
966G	26.5R25	4	$8,850.00	$35,400.00	4,500	$7.87
972G	26.5R25	4	$8,850.00	$35,400.00	4,500	$7.87
980G	29.5R25	4	$11,600.00	$46,400.00	4,500	$10.31
988G	35/65-33	4	$14,650.00	$58,600.00	4,500	$13.02
990	41.25/70-39	4		$0.00	4,500	
992G	45/65R45	4	$29,450.00	$117,800.00	4,500	$26.18
994D	55/85R57	4		$0.00	4,500	
L2350	55/85R57	4		$0.00	4,500	
Shovels						
PC2000			N/A			
PC3000			N/A			
PC4000			N/A			
PC5500			N/A			
PC8000			N/A			
Hydraulic Hammers						
H-120 (fits 325)			N/A			
H-160 (fits 345)			N/A			
H-180 (fits 365/385)			N/A			
Demolition Shears						
S340 (fits 322/325/330)			N/A			
S365 (fits 330/345)			N/A			
S390 (fits 365/385)			N/A			
Demolition Grapples						
G315 (fits 322/325)			N/A			
G320 (fits 325/330)			N/A			
G330 (fits 345/365)			N/A			
Other Equipment						
420D 4WD Backhoe	340/80R18-19.5LR24	2	$1,282.50	$2,565.00	3,000	$0.86
428D 4WD Backhoe	340/80R18-18.9R28	2	$1,282.50	$2,565.00	3,000	$0.86
CS533E Vibratory Roller			N/A			
CS633E Vibratory Roller			N/A			
CP533E Sheepsfoot Compactor			N/A			
CP633E Sheepsfoot Compactor			N/A			
Light Truck - 1.5 Ton		4	220	$880.00	3,000	$0.29
Supervisor's Truck		4	220	$880.00	3,000	$0.29
Flatbed Truck		22	220	$4,840.00	3,000	$1.61
Air Compressor + tools			N/A			
Welding Equipment			N/A			
Heavy Duty Drill Rig		4		$0.00	3,000	
Pump (plugging) Drill Rig		4		$0.00	3,000	
Concrete Pump			N/A			
Gas Engine Vibrator			N/A			
Generator 5KW			N/A			
HDEP Welder (pipe or liner)			N/A			
5 Ton Crane		4		$0.00	3,000	
20 Ton Crane		4		$0.00	3,000	
50 Ton Crane		6		$0.00	3,000	
120 Ton Crane		6		$0.00	3,000	
Trucks						
725	23.5R25	6	$5,110.00	$30,660.00	2,000	$15.33
730	23.5R25	6	$5,110.00	$30,660.00	2,000	$15.33
735	26.5R25	6	$8,140.00	$48,840.00	2,000	$24.42
740	29.5R25	6	$8,570.00	$51,420.00	2,000	$25.71
769D	18.00R33	6	$7,075.00	$42,450.00	6,000	$7.08
773E	24.00R35	6	$10,720.00	$64,320.00	5,000	$12.86
777D	27.00R49	6	$16,400.00	$98,400.00	5,000	$19.68
785C	33.00R51	6		$0.00	4,000	
793C	40.00R57	6		$0.00	4,000	
797B	40.00R57	6		$0.00	4,000	
613E (5,000 gal) Water Wagon	23.5R25	6	$3,620.00	$21,720.00	6,000	$3.62
621E (8,000 gal) Water Wagon	33.25R29	6	$10,282.00	$61,692.00	8,000	$7.71
777D Water Truck	27.00R49	6		$0.00	5,000	
785C Water Truck	33.00R51	6		$0.00	4,000	
Dump Truck (10-12 yd3)		10	$655.00	$6,550.00	6,000	$1.09

Notes:

(1) Unit Cost Basis:	Cost per set
(2) Cost Basis:	Total cost for all required tires.
(3) Tire Cost Source:	Purecell Tire Quote: 2021
(4) Tire Wear Source:	Caterpillar Handbook, Edition 35; Ch. 20

Closure Cost Estimate
Material Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
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Cost Estimate Type: Surety Cost Basis: Southern Nevada

Revegetation Materials

Seed Mixes

Seed Mix	Description		Cost/Acre
None			
Mix 1	Basins		$302.50
Mix 2	Low Hills		$332.75
Mix 3	Uplands		$363.00
Mix 4	Riparian or Custom		$393.25
User Mix 1	**Warmer/Drier**		**$239.50**
User Mix 2	**Wetter/Cooler**		**$241.00**
User Mix 3			
User Mix 4			
	Cost/lb	**lbs/Acre**	**Cost/Acre**
User Mix 5 (from Seed Mix sheet)	$0.00	$25.97	$0.00

Notes:

Mulch

Item	Cost/lb	lbs/Acre	Cost/Acre
None			
Straw Mulch	$0.18		
Hydro Mulch	$0.25		
Timber Mulch			

Notes:
Granite Seed $500 per Ton in 50 lb bag Wood (Hydro) Mulch (2021)

Closure Cost Estimate
Material Costs

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Amendments			
Item	**Cost/lb**	**lbs/Acre**	**Cost/Acre**
None			
Organic Matter	$0.70		$0.00
Treated Sludge			
Chemical	$0.60		$0.00
Notes:	Western Nevada Supply $30.13 per 50 lb. bag 15-15-15 (2021)		

Closure Cost Estimate
Material Costs

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Well Abandonment Materials

Description	Cost/50lb bag	Units	Cost/unit*
Cement	$7.95	cy	$37.87
Grout (Low Grade Bentonite)	$9.25	cy	$44.05
Inert Material/Cuttings		cy	
		cy	
		cy	

(1) Jentech Drilling Supply quote (2021) Type I,II Cement at $14.95 per 94 lb. bag
(2) Jentech Drilling Supply (2021) 3/8 in. Chunk Bentonite Hole Plug at $9.25 per 50 lb. bag (5.75 cf/bag at 43 gal

* Assumes 1 bag mixes with water to make 0.21 y3 or 0.16 m3 of grout/cement slurry.

Monitoring Costs

Description	Units	Cost/unit
Monitor Well Pump	ea.	$2,760.43
Sampling Supplies	ea.	$6.45
Water Analysis (Profile I) (1)	ea.	$411.00
Leach Test (MWMP) w/ analysis	ea.	$483.40
ABA + S speciation	ea.	$150.00
WAD Cyanide in water	ea.	$56.00
Water Analysis (Profile II) (1)	ea.	$461.00
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
LAC Profile 1	**ea.**	**$156.30**
Pit Lake	**ea.**	**$257.10**
AP Wells	**ea.**	**$84.30**

(1) WET Lab, Reno, Nevada (2021)
Well pump and Sample supply costs adjusted to 2021.
Original source unknown.

Closure Cost Estimate
Material Costs

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Cost Estimate Type: Surety Cost Basis: Southern Nevada

Fuel, Etc.

Description	Units	Cost/unit
Off-road Diesel - delivered (1)	$/gal	$2.130
Pickup Truck Mileage	$/mi	$0.560
Electical Power	$/kWh	$0.070
(1) Source: Oil Price Infomration Service , average annual cost including freight to Nevada (2021).		
Source: Federal Government Vehicle Allowance Rate 2021		
Source: NV Energy (2021) $0.07034		

Revegetation Method

Slopes

Disturbance Type	Seed Application Method	Labor Cost/Acre	Equipment Cost/Acre	Total Cost/Acre
Waste Rock Dumps	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Heap Leach	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Tailings	**Hand Broadcast**	$138.59	$49.50	$188.09
Quarries & Borrow Pits	**Mechanical Broadcast**	$138.59	$49.50	$188.09

Flat Areas and Undifferentiated

Disturbance Type	Seed Application Method	Labor Cost/Acre	Equipment Cost/Acre	Total Cost/Acre
Exploration Trenches	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Exploration Roads	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Waste Rock Dumps	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Heap Leach	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Tailings	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Quarries & Borrow Pits	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Roads	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Pits	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Haul Material	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Foundations & Buildings	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Sediment & Drainge Control	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Process Ponds	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Landfills	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Yards, Etc.	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Revegetation Maintenance	**Mechanical Broadcast**	$138.59	$49.50	$188.09

Closure Cost Estimate
Misc. Unit Costs

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Cost Estimate Type: Surety Cost Basis: Southern Nevada

Revegetation

	Means Number	Unit	Crew	Daily Output	Daily Output User	Materials	Labor	Equipment	Total	Notes
Seeding - Broadcast Hand (1)		acres					$138.59	$49.50	$188.09	
Seeding - Broadcast Mechanical (1)		acres					$138.59	$49.50	$188.09	
Seeding - Drill (1)		acres		365			$138.59	$118.80	$257.39	
Seeding - Hydroseeding (1)				365			$247.49	$148.49	$395.98	
Shrub Planting - bare root 6-10 in (150- 250mm) (2)	02910-400-0561	ea.	1 Clab	365					$0.00	
Tree Planting - bare root 11-16 in (270- 400mm) (3)	02910-400-0562	ea.	1 Clab	260					$0.00	
Cactus Planting (4)		ea.	1 Clab						$0.00	
NOTES:										
(1) Seeding Source:	Source: Kelley Erosion Control (Projected from 2020 quote).									
(2) Shrub Source:										
(3) Tree Source:										
(4) Cactus Source:										

Building and Wall Demolition

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets.

	Means Number	Unit	Crew	Daily Output	Daily Output User	Labor	Equipment	Premium	Total	Notes
Building Demolition										
Lg. steel	02220-110-0012	C.F.	B-8	21500		$0.21	$0.12		$0.33	
Lg. concrete	02220-110-0050	C.F.	B-8	15300		$0.29	$0.16		$0.45	
Lg. masonry	02220-110-0080	C.F.	B-8	20100		$0.22	$0.12		$0.34	
Lg. mixed	02220-110-0100	C.F.	B-8	20100		$0.22	$0.12		$0.34	
Sm. steel	02220-110-0500	C.F.	B-3	14800		$0.26	$0.12		$0.38	
Sm. concrete	02220-110-0600	C.F.	B-3	11300		$0.34	$0.16		$0.50	
Sm. masonry	02220-110-0650	C.F.	B-3	14800		$0.26	$0.12		$0.38	
Sm. wood	02220-110-0700	C.F.	B-3	14800		$0.26	$0.12		$0.38	
Wall Demolition										
Block 4 in (100 mm) thick	02220-130-2000	S.F.	1 Clab	180		$2.80	$0.00	20%	$3.36	
Block 6 in (150 mm) thick	02220-130-2040	S.F.	1 Clab	170		$2.96	$0.00	20%	$3.55	
Block 8 in (200 mm) thick	02220-130-2080	S.F.	1 Clab	150		$3.36	$0.00	20%	$4.03	
Block 12 in (300 mm) thick	02220-130-2100	S.F.	1 Clab	150		$3.36	$0.00	20%	$4.03	
Conc 6 in (150 mm) thick	02220-130-2400	S.F.	B-9	160		$23.50	$1.92	10%	$27.96	
Conc 8 in (200 mm) thick	02220-130-2420	S.F.	B-9	140		$26.86	$2.19	10%	$31.96	
Conc 10 in (250 mm) thick	02220-130-2440	S.F.	B-9	120		$31.34	$2.56	10%	$37.29	
Conc 12 in (300 mm) thick	02220-130-2500	S.F.	B-9	100		$37.61	$3.07	10%	$44.75	

Closure Cost Estimate
Misc. Unit Costs

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Cost Estimate Type: Surety Cost Basis: Southern Nevada

Waste Disposal

Unit rates from Means Heavy Construction 2006 Edition by permission of R.S.Means/Reed Construction Data .

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment		Total	Notes
Rubbish Handling										
Dumpster delivery (average for all sizes)	02220-350-0910	ea.			$49.00				$49.00	
Haul (average for all sizes)	02220-350-0920	ea.			$153.00				$153.00	
Rent per month (average for all sizes)	02220-350-0940	ea.			$52.00				$52.00	
Disposal fee per ton (tonne) (average for all sizes)	02220-350-0950	ton			$57.50				$57.50	
NOTES:										
Dumpster Cost Source	R.S. Means Heavy Construction (2021 Q2).									
Dumpster Disposal Fee Source:	R.S. Means Heavy Construction (2021 Q2).									
Hazardous Material Handling - Solids (+ Liquids in drums)										
Pickup fees 55 gal (200 L). drums	02110-300-1100	ea.			$249.00				$249.00	
Bulk material (average)	02110-300-1220/1230	ton			$406.00				$406.00	
Transport - truck load (80 drums, 25 cy (m3), 18 tons)	02110-300-1260/1270	mile			$5.84				$5.84	
Dump site solid disposal fee	02110-300-6000/6020	ton			$285.00				$285.00	
NOTES:										
Solid Handling Cost Source	R.S. Means Heavy Construction (2021 Q2).									
Solid Disposal Fee Source:	2021 Q2 R.S. Means Heavy Const. ave. 02 81									
Hazardous Material Handling - Liquids										
Vacuum Truck Pickup (2200 gal/8300 L)	02110-300-3110	hr.			$145.00				$145.00	
Vacuum Truck Pickup (5000 gal/19000 L)	02110-300-3120	hr.			$211.00				$211.00	
Dump site liquid disposal fee	02110-300-6000/6020	ton			$285.00				$285.00	
NOTES:										
Liquid Handling Cost Source	R.S. Means Heavy Construction (2021 Q2).									
Liquid Disposal Fee Source:	2021 Q2 R.S. Means Heavy Const. ave. 02 81									
Hydrocarbon Contaminated Soils (HCS)										
Insitu Biotreatment	02115-200-2020/2021	C.Y.			$16.14				$16.14	
HCS disposal fee	02115-200-2050/2055	C.Y.			$278.00				$278.00	
NOTES:										
Insitu Treatement Cost Source	2021 Q2 R.S. Means Heavy Const., ave. 02 65									
HCS Disposal Fee Source:	2021 Q2 R.S. Means Heavy Const., ave. 02 65									

Closure Cost Estimate
Misc. Unit Costs

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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Concrete Structure Installation

Weekly dumpster rental rates from Means Heavy Construction 2005 Edition with permission by R.S.Means/Reed Construction Data .
Weekly dumpster rental rates include haul to off-site disposal site and disposal fees

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Reinforced Concrete Bulkheads and Shaft Covers										
Grade walls - 15 in (400mm) thick, 8 ft (2.5m) high	03310-240-4300	C.Y.	C-14D	80.02	$157.00	$188.83	$10.74		$356.57	includes reinforcing
Grade walls - 15 in (400mm) thick, 12 ft (3.7m) high	03310-240-4350	C.Y.	C-14D	26.2	$157.00	$576.72	$32.79		$766.51	includes reinforcing
Elevated conc, 1-way beam & slab - 15ft (4.6m) span	03310-240-2700	C.Y.	C-14B	20.59	$310.00	$749.04	$41.73		$1,100.77	includes reinforcing
Elevated conc, 1-way beam & slab - 25ft (7.5m) span	03310-240-2750	C.Y.	C-14B	28.36	$287.00	$543.82	$30.30		$861.12	includes reinforcing
Bat Gate/Foam Plug Installation										
Bat Gate (5)		ea.			$3,333.80					materials $/ea. Installed
Culvert Gate (5)		ea.			$6,667.61					materials $/ea. Installed
Adit Foam Plug (6)		ea./C.Y.			$333.38					materials $/cy placed
Production Opening Foam Plug (6)		ea./C.Y.			$333.38					materials $/cy placed

NOTES:

(5) Bat Gate Source:	NV BLM, 2/2006: 8 hr + 1hr mob/demob + 1hr setup per gate (adjusted to 2021)
(6) Foam Plug Source:	NV BLM, 2/2006: 8 hr+ 1hr mob/demob + 1hr setup per adit; 16 hrs per production opening (adjusted to 2021)

Closure Cost Estimate
Misc. Unit Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Misc. Linear Projects

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Fencing Installation										
Barbed 3-strand	02820-170-1650	L.F.	B-80A	760	$0.54	$1.99	$0.31		$2.84	
Barbed 4-strand	extrapolated	L.F.	B-80A	570	$0.72	$2.65	$0.41		$3.78	
Barbed 5-strand	02820-130-0920	L.F.	B-80A	456	$0.90	$3.31	$0.51		$4.72	
Chain link 8-10ft (2.5-3m) Install	02820-130-0920	L.F.	B-80C	180	$43.50	$8.39	$1.30		$53.19	
Wood stockade fence 6 ft (2 m) high - Install	02820-510-1240	L.F.	B-80C	150	$17.15	$10.07	$1.56		$28.78	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
Fencing Removal										
Barbed 3-strand Removal	02220-220-1600	L.F.	2 Clab	430		$2.34	$0.54		$2.88	
Barbed 4-strand Removal	extrapolated	L.F.	2 Clab	355		$2.84	$0.66		$3.50	
Barbed 5-strand Removal	02220-220-1650	L.F.	2 Clab	280		$3.60	$0.84		$4.44	
Chain link 8-10 ft (2.5-3 m) Removal	02220-220-1700	L.F.	B-6	445		$3.86	$0.91		$4.77	
Wood, all types 4-6 ft ("1.5-2 m) high - Removal	02220-220-1775	L.F.	2 Clab	430		$2.34	$0.54		$2.88	
	user	L.F.								
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
Culvert Removal										
12 in (300 mm) Diameter	02220-220-2900	L.F.	B-6	175		$9.83	$2.32		$12.15	
18 in (450 mm) Diameter	02220-220-2930	L.F.	B-6	150		$11.46	$2.70		$14.16	
24 in (600 mm) Diameter	02220-220-2960	L.F.	B-6	120		$14.33	$3.38		$17.71	
36 in (1m) Diameter	02220-220-3000	L.F.	B-6	90		$19.11	$4.51		$23.62	
Pipeline Removal										
0.75 in (20mm) - 4 in (100 mm) diameter	02220-381-1600	L.F.	B-20	700		$2.96	$0.33		$3.29	
6 in (150 mm) - 8 in (200 mm)	02220-381-1700	L.F.	B-20	500		$4.14	$0.47		$4.61	
10 in (250 mm) - 18 in (450 mm)	02220-381-1800	L.F.	B-20	300		$6.91	$0.78		$7.69	
20 in (500 mm) - 36 in (1 m)	02220-381-1900	L.F.	B-20	200		$10.36	$1.17		$11.53	
Pipe and Drainpipe Installation										
Water 4in (100mm) 40ft (12m) length, welded HDPE	02510-760-0100	L.F.	B-22A	400	$3.01	$7.35	$4.69		$15.05	
Water 6in (150mm) 40ft (12m) length, welded HDPE	02510-760-0200	L.F.	B-22A	380	$5.25	$7.73	$4.94		$17.92	
Water 12in (300mm) 40ft (12m) length, welded HDPE	02510-760-0500	L.F.	B-22A	260		$11.30	$7.22		$18.52	
Drain 4in (100mm) perforated PVC	02620-630-2100	L.F.	B-14	315	$2.08	$12.04	$1.55		$15.67	
Drain 6in (150mm) perforated PVC	02620-630-2110	L.F.	B-14	300	$4.00	$12.64	$1.62		$18.26	
Drain 4in (100mm) corrugated, perf or plain	02620-660-0040	L.F.	2 Clab	1200	$0.76	$0.84	$0.20		$1.80	
Drain 6in (150mm) corrugated., perf or plain	02620-660-0060	L.F.	2 Clab	900	$1.71	$1.12	$0.26		$3.09	

Closure Cost Estimate
Misc. Unit Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Drain Rock Preparation										
Crushing		C.Y.							$0.50	
Screening		C.Y.							$0.50	
TOTAL									$1.00	
Misc.										
Backhoe work	02210-700-0120	C.Y.	B-11M	28		$25.53	$9.02		$34.55	
Powerline and Transformer Removal										
Single Pole		mile							$46,333.89	
Double Pole		mile							$52,953.02	
Transformer (9)		ea.							$58,405.11	
NOTES:										
(7) Single Pole Source:	NV Energy estimate (2009) Adjusted to 2021									
(8) Double Pole Source:	NV Energy estimate (2009) Adjusted to 2021									
(9) Transformer Source:	NV Energy estimate (2018) adjusted to 2021									
Erosion and Sedimentation Control										
Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .										
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets										
	Means Number	**Unit**	**Crew**	**Daily Output**	**Materials**	**Labor**	**Equipment**	**Premium**	**Total**	**Notes**
Rip-Rap & Rock Lining										
Rip-Rap 3/8 to 1/4 CY (m3) pieces, grouted	02370-450-0110	S.Y.	B-13	80	$24.00	$47.38	$8.43		$79.81	assumes on-site source of rip-rap
Rip-Rap 18 in (450 mm) min thick, no grout	02370-450-0200	S.Y.	B-13	53	$7.00	$71.52	$12.72		$91.24	assumes on-site source of rip-rap
Gabions, 6 in (150 mm) deep	02370-450-0400	S.Y.	B-13	200	$6.15	$18.95	$3.37		$28.47	assumes on-site source rock fill for gabions
Gabions, 9 in (250 mm) deep	02370-450-0500	S.Y.	B-13	163	$9.20	$23.26	$4.14		$36.60	assumes on-site source rock fill for gabions
Gabions, 12 in (300 mm) deep	02370-450-0200	S.Y.	B-13	153	$12.55	$24.78	$4.41		$41.74	assumes on-site source rock fill for gabions
Gabions, 18 in (450 mm) deep	02370-450-0200	S.Y.	B-13	102	$15.90	$37.16	$6.61		$59.67	assumes on-site source rock fill for gabions
Gabions, 36 in (1m) deep	02370-450-0200	S.Y.	B-13	60	$26.00	$63.18	$11.24		$100.42	assumes on-site source rock fill for gabions
HDEP Liner Installation										
Finish grading large area	2310-100-0100	S.F.	B-11L	18000		$0.07	$0.06		$0.13	
Compaction-riding, vibrating roller - 12in (300mm) lifts	2315-310-5100	C.Y.	B-10Y	2600		$0.47	$0.18		$0.65	
60 mil HDPE	2660-610-0010	S.F.	3 Skwk	1600	$0.44	$1.39	$0.45		$2.28	
80 mil HDPE	user	S.F.	3 Skwk	149		$14.96	$4.85		$19.81	
40 mil VLDPE	user	S.F.	3 Skwk	150		$14.86	$4.82		$19.68	
	user	S.F.	3 Skwk	149		$14.96	$4.85		$19.81	
	user	S.F.	3 Skwk	149		$14.96	$4.85		$19.81	

Closure Cost Estimate
Misc. Unit Costs

Project Name: CHMRP AP-27 Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: AP_27_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada

Construction Management Support											
Office Trailer, Furnished, no hook-ups		0150-500-0250	mo.			$199.00				$199.00	
Toilet Portable, chemical		1590-400-6410	mo.			$217.20				$217.20	
TOTAL						$416.20				$416.20	
Pump and Casing Removal											
	Pump Type	**Measurement**	**Unit**				**Labor**	**Equipment**		**Total**	**Notes**
Pump Removal											
Submersible		ft to pump	L.F.				$9.72	$22.82		$32.54	
Line Shaft		ft to pump	L.F.				$9.72	$22.82		$32.54	
NOTES:											
(10) Pump Removal Source:		Boart Longyear Quote: 2021									

Cunningham Hill Mine Reclamation Project
New Mexico Mining and Minerals Division
Surface Reclamation Cost Estimate
May-22

Direct Costs				
Description	**Labor**	**Equipment**	**Materials**	**Total**
Earthwork/Recontouring	95,801	157,280	6,101	259,182
Revegetation/Stabilization	2,892	1,024	2,853	6,769
Disposal of Wastes	5,349	14,802	-	20,151
Structure, Equipment and Facility Removal	94,477	25,941	134,250	254,668
Monitoring	108,084	15,906	34,099	158,089
Construction Management & Support	35,145	14,361	-	49,506
Mob/Demob	-	85,094	-	85,094
Direct Costs Total	**$ 341,748**	**$ 314,408**	**$ 177,303**	**$ 833,459**

Indirect Costs	
Description	**Total**
Engineering, Design and Construction	66,677
Contingency	66,677
Insurance	5,126
Performance Bond	25,004
Contractor Profit	83,346
Contract Administration	83,346
Indirect Costs Total	**$ 330,176**

Grand Total $ 1,163,635

Enter Data Below in Green and Blue Spaces

STANDARDIZED RECLAMATION COST ESTIMATOR

Version 1.4.1
Build 017b (Revised 16 May 2019)

Approved for use in Nevada, August 1, 2012

COST DATA FILE INFORMATION

File Name:	Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Cost Data File:	SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Data Date:	August 1, 2021
Cost Data Basis:	User Data — Data Cost Units: Imperial
Author/Source:	Nevada Division of Environmental Protection (NDEP) & NV BLM

PROJECT INFORMATION

Property/Mine Name:	Cunningham Hill Mine Reclamation Proje — Property Code:
Project Name:	CHMRP Surface Reclamation Cost Estimate
Date of Submittal:	May 2022 — Average Altitude: 7100 ft.
Select One:	☐ Notice or Sm Exploration Plan ☐ Lg Exploration Plan ☉ Mine Operation
Select One:	☉ Private Land ☐ Public or Public/Private
Cost Estimate Type:	Surety
Cost Basis Category:	Northern Nevada — Select Zone >>>
Cost Basis Description:	**Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, Washoe, and White Pine Counties**

Name: CHMRP Surface Reclamation Cost Estimate
Project Date: May 2022
eclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Reclamation Plan

Table of Contents

Description

Closure Cost Estimate
Cost Summary

Project Name: CHMRP Surface Reclamation Cost Estimate
Project Date: May 2022
Model Version: Version 1.4.1
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm

A. Earthwork/Recontouring	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$287	$776	$0	$1,063
Well Abandonment	$66,619	$106,766	$6,101	$179,486
Pits	$0	$0	N/A	$0
Quarries & Borrow Areas	$528	$1,160	$0	$1,688
Underground Openings	$0	$0	$0	$0
Process Ponds	$23,066	$36,971	$0	$60,037
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$2,421	$5,504	$0	$7,925
Yards, Etc.	$2,880	$6,103	$0	$8,983
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal	**$95,801**	**$157,280**	**$6,101**	**$259,182**
Mob/Demob if included in Other User sheet	$0	$0	$0	$0
Mob/Demob		$85,094		$85,094
Subtotal "A"	**$95,801**	**$242,374**	**$6,101**	**$344,276**

B. Revegetation/Stabilization	Labor [1]	Equipment [2]	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$323	$115	$562	$1,000
Well Abandonment				N/A
Pits	$0	$0	$0	$0
Quarries & Borrow Areas	$139	$49	$241	$429
Underground Openings				N/A
Process Ponds	$1,112	$392	$844	$2,348
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$0	$0	$0	$0
Landfills	$0	$0	$0	$0
Tailings	$0	$0	$0	$0
Foundation & Buildings Areas	$554	$198	$120	$872
Yards, Etc.	$764	$270	$1,086	$2,120
Drainage & Sediment Control	$0	$0	$0	$0
Generic Material Hauling	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "B"	**$2,892**	**$1,024**	**$2,853**	**$6,769**

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor [1]	Equipment [2]	Materials	Total
Process Ponds/Sludge				$0
Heaps				$0
Dumps (Waste & Landfill)				$0
Tailings				$0
Surplus Water Disposal				$0
Monitoring				$0
Miscellaneous				$0
Solid Waste - On Site	$5,349	$14,802	N/A	$20,151
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "C"	**$5,349**	**$14,802**	**$0**	**$20,151**

D. Structure, Equipment and Facility Removal, and Misc.	Labor [1]	Equipment [2]	Materials	Total
Foundation & Buildings Areas	$9,833	$4,412	$0	$14,245
Other Demolition	$0	$0	$0	$0
Equipment Removal	$17,974	$7,636	$0	$25,610
Fence Removal	$17,390	$5,293		$22,683
Fence Installation	$19,080	$3,900	$130,500	$153,480
Culvert Removal	$0	$0	N/A	$0
Pipe Removal	$30,200	$4,700	N/A	$34,900
Powerline Removal	$0			$0
Transformer Removal	$0			$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Misc. Costs	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$3,750	$3,750
Other**				$0
Subtotal "D"	**$94,477**	**$25,941**	**$134,250**	**$254,668**

E. Monitoring	Labor [1]	Equipment [2]	Materials	Total
Reclamation Monitoring and Maintenance	$58,444	$5,501	$2,851	$66,796
Ground and Surface Water Monitoring	$49,640	$10,405	$31,248	$91,293
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Subtotal "E"	**$108,084**	**$15,906**	**$34,099**	**$158,089**

F. Construction Management & Support	Labor	Equipment [2]	Materials	Total
Construction Management	$31,722	$8,141	N/A	$39,863
Construction Support	$0	$1,303	$0	$1,303
Road Maintenance	$3,423	$4,917	$0	$8,340
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "F"	**$35,145**	**$14,361**	**$0**	**$49,506**

Subtotal Operational & Maintenance Costs	Labor [1]	Equipment [2]	Materials [3]	Total
Subtotal A through F	**$341,748**	**$314,409**	**$177,303**	**$833,459**

** Other Operator supplied costs - additional documentation required.

Closure Cost Estimate
Cost Summary

Project Name: CHMRP Surface Reclamation Cost Estimate
Project Date: May 2022
Model Version: Version 1.4.1
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm

Indirect Costs				Include?	Total
1. Engineering, Design and Construction (ED&C) Plan (7)					$66,677
2. Contingency (8)					$66,677
3. Insurance (9)	$5,126				$5,126
4. Performance Bond (10)					$25,004
5. Contractor Profit (11)					$83,346
6. Contract Administration (12)					$83,346
7. Government Indirect Cost (13)					N/A
Subtotal Add-On Costs					**$330,176**
Total Indirect Costs as % of Direct Cost					40%
GRAND TOTAL					**$1,163,635**

Administrative Cost Rates (%)

	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	$1,000,000	$25,000,000		$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
	<=	<=	<=	>	
2. Contingency (8)	$500,000	$5,000,000	$50,000,000	$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5%	of labor costs			
4. Bond (10)	3.0%	of the O&M costs if O&M costs are >$100,000			
5. Contractor Profit (11)	10%	of the O&M costs			
	<=	<=	<=	>	
6. Contract Administration (12)	$1,000,000	$25,000,000		$25,000,000	
Variable Rate	10%	8%		6%	
Government Indirect Cost (13)	21%	of contract administration			

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading,
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced,
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a
13. Government indirect cost rate is 21% of the contract administration costs.

Closure Cost Estimate
Other User

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Other Cost Items Calculated Elsewhere

	Description (required)	ID Code	Facility Type	Quantity	Units	Total Capital Cost $	Material Unit Cost $	Labor Unit Cost $	Equipment/ Operating Unit Cost $	Cost Type (select)	Total Cost $	Comments
1	Pond Liner Landfill Tipping Fees		Ponds	50	cu-yd		$25.00			D. Facility & Equipment	$1,250	
2	Tipping Fees for General Solid Waste Disposal		Site Facilities - Wells	100	cu-yd		$25.00			D. Facility & Equipment	$2,500	
						$0	$3,750	$0	$0		$3,750	

Notes: Capital cost is lump sum (i.e. not multiplied by the quantity).
Material, Labor and Equipment/Operating costs are unit costs (i.e. multiplied by the quantity).
Tipping Fees not included for material sent to metal recycler

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Data Cost File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety **Cost Basis: Northern Nevada**

Reclamation Quantity Summary

	Description	Total Regrade or Haul Volume cy	Total Regrade or Haul Cost $	Total Cover Volume cy	Cover Placement Cost $	Total Growth Media Volume cy	Growth Media Placement Cost $	Total Surface Area acres	Total Scarify Cost $	Total Revetation Cost $	TOTALS $	Unit Costs: Regrade Unit Cost $/CY	Material Haul or Backfill Unit Cost $/CY	Cover Unit Cost $/CY	Growth Media Unit Cost $/CY	Scarify Unit Cost $/CY	Area Unit Cost $/acre
1	Waste Rock Dumps		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
2	Tailings Impoundments		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
3	Heap Leach Pads		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
5	Open Pits		$ -							$ -	$ -		N/A				
4	Quarries & Borrow Pits	1,000	$ -	807	$ 1,384		$ -	1	$ 304	$ 429	$ 2,117	$0.00	N/A	$1.71		$304.00	$2,117.50
6	Roads	102	$ 505				$ -	2.33	$ 558	$ 1,000	$ 2,063	$4.95	N/A			$239.48	$885.41
7	Landfills		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
8	Buildings			111	$ 4,469	323	$ 2,764	0.5	$ 692	$ 872	$ 8,797		N/A	$40.26	$8.56	$1,384.00	$17,594.74
9	Yards		$ -		$ -	3,630	$ 8,118	4.5	$ 865	$ 2,120	$ 11,103		N/A		$2.24	$192.22	$2,467.33
10	Ponds	22,707	$ 33,204			8,759	$ 17,273	3.5		$ 2,348	$ 52,825	N/A	$1.46		$1.97		$15,092.86
11	Exploration Roads		$ -				$ -		$ -	$ -	$ -		N/A				
12	Exploration Trenches		$ -							$ -	$ -		N/A				
13	Diversion Ditches		$ -							$ -	$ -		N/A				
14	Sediment Ponds		$ -				$ -		$ -	$ -	$ -						
15	Generic Haulage/Backfill		$ -		$ -		$ -		$ -	$ -	$ -	N/A					
16	Adit/Decline Backfilling1		$ -								$ -	N/A					
17	Shaft Backfilling		$ -								$ -	N/A					
	TOTALS	23,809	$ 33,709	918	$ 5,853	12,712	$ 28,155	11.83	$ 2,419	$ 6,770	$ 76,906						
	Average Costs	per CY	$1.42	per CY	$6.38	per CY	$2.21	per acre	$204.48	$2.80	$6,501	per acre					

Closure Cost Estimate
Roads

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Roads - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$143	$362	N/A	$505
Cover Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$144	$414	N/A	$558
Subtotal Earthworks	**$287**	**$776**		**$1,063**
Revegetation Cost	$323	$115	$562	$1,000
TOTALS	**$610**	**$891**	**$562**	**$2,063**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Roads - User Input

You must fill in ALL green cells and relevant blue cells in this section for each road

	Facility Description			Physical (1) - MANDATORY						User Overrides		Growth Media		
	Description (required)	ID Code	Type	Underlying Ground Slope % grade	Ungraded Slope _H:1V	Cut Slope degrees	Road Width ft	Road Length ft	Slope Replacement Percent %	Regrade Volume (if calculated elsewhere) cy	Disturbed Area (if calculated elsewhere) acres	Growth Media Thickness in	Haul Distance from Growth Media Stockpile ft	Slope from Road to Stockpile % grade
1	**Well Roads**	**R-2**	**Access Road**	**2.0**	**1.3**	**75.0**	**10.0**	**10,000**	**100%**			**0.0**	**0**	**0%**

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)
3. Because the work required for building roads with a dozer is similar to that required to regrade a road with a dozer, this sheet could be used to provide a rough estimate of road construction costs if a dozer is selected as the grading fleet.

All roads are relatively flat and will be scarified and seeded.

Roads - User Input (cont.)

		Haul Road Safety Berms				
	Description (required)	Berm Length ft	Berm Height ft	Berm Base Width ft	Berm Sideslope Angle _H:1V	Number of Berms (2) (1 or 2 sides)
1	**Well Roads**	**0.0**	**0.0**	**0.0**	**0.0**	**0**

(2) Enter 1 if berm on only one side of road, 2 if both sides of road are bermed.

Roads - User Input (cont.)

You must fill in ALL green cells and relevant blue cells in this section for each road

		Grading				Growth Media			Revegetation				
	Description (required)	Regrading Material Condition (select)	Regrading Material Type (select)	Regrading Equipment Fleet (select)	No. of Excavators if grade >30% (select)	Growth Media Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarifying/ Ripping? (select)	Ripping Fleet (select)
1	**Well Roads**	**1**	**LS - broken**	**Med Excavator**	**1**	**Alluvium**	**Small Truck**		**User Mix 2**	**None**	**None**	**Yes**	**Grader**

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table
2. If original slope >30% only excavators are allowed.

Closure Cost Estimate
Roads

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Roads - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$143	$362	N/A	$505
Cover Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$144	$414	N/A	$558
Subtotal Earthworks	**$287**	**$776**		**$1,063**
Revegetation Cost	$323	$115	$562	$1,000
TOTALS	**$610**	**$891**	**$562**	**$2,063**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Roads - Calculations

Regrading Volume and Footprint Volume

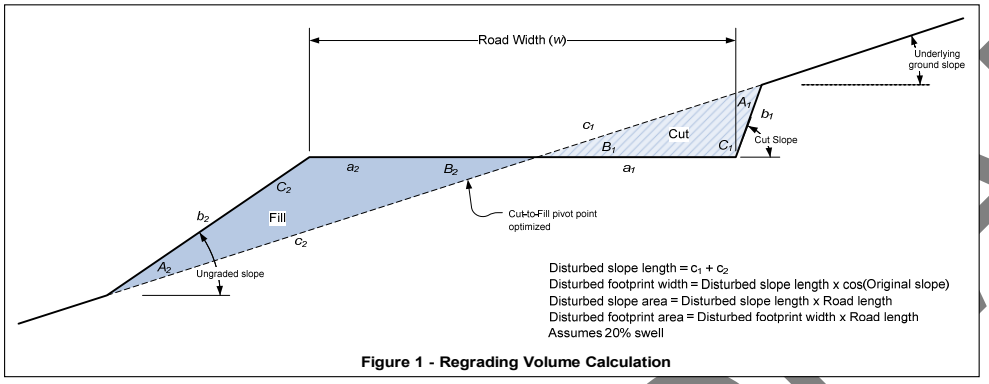


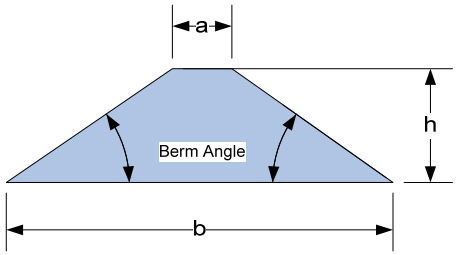
Figure 1 - Regrading Volume Calculation

Will not allow dozer for slopes greater than 30%
For dozer regrading push distance = road width
Assumes dozer push is uphill
Assumes minimum push distance of 100 ft

Safety Berm Volume Calculation

Cross Sectional Area = $\frac{(a+b)}{2} \times h$

Berm Volume = Berm Length x Cross Sectional Area x No. Sides



Total berm volume doubled if both sides of road are bermed.
If length of berm on each side of road is different, input total length of both berms and input 1 for number of sides

Ripping/Scarifying Calculations

Minimum 1 hr ripping/scarifying time per area
Number of passes = Final slope length ÷ Grader width
Travel distance = Number of passes x Road length
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)
For dozer regrading assumes push distance = 3 x road width

Revegetation Calculations

Minimum of 1 acre crew time per area

Closure Cost Estimate
Roads

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
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Roads - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$143	$362	N/A	$505
Cover Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$144	$414	N/A	$558
Subtotal Earthworks	**$287**	**$776**		**$1,063**
Revegetation Cost	$323	$115	$562	$1,000
TOTALS	**$610**	**$891**	**$562**	**$2,063**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Roads - Regrading Costs

	Description (required)	Regrading Volume cy	Recontouring Fleet	Fleet Productivity cy/hr	Total Fleet Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**Well Roads**	102	345B	480	1	$143	$362	$505
		102			1	**$143**	**$362**	**$505**

Roads - Growth Media Costs

	Description (required)	Growth Media Volume cy	Growth Media Replacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**Well Roads**						$0	$0	$0
							$0	**$0**	**$0**

Roads - Scarifying/Revegetation Costs

	Description (required)	Total Surface Area acres	Final Slope Length ft	Ripping/ Scarifying Fleet	Ripping Hours hrs	Ripping Labor Costs $	Ripping Equipment Cost $	Total Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**Well Roads**	2.33	10.0	16G/H	2	$144	$414	$558	$323	$115	$562	$1,000
		2.33			2	**$144**	**$414**	**$558**	**$323**	**$115**	**$562**	**$1,000**

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Waste Rock Dumps - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$0	$0	N/A	$0
Cover Placement Cost	$457	$927	N/A	$1,384
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$71	$233	N/A	$304
Safety Berm Construction Cost	$0	$0	N/A	$0
Subtotal Earthwork	**$528**	**$1,160**	**$0**	**$1,688**
Revegetation Cost	$139	$49	$241	$429
Safety Berm Revegetation Cost	$0	$0	$0	$0
	$139	**$49**	**$241**	**$429**
TOTALS	**$667**	**$1,209**	**$241**	**$2,117**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Quarries & Borrow Pits - User Input

You must fill in ALL green cells in this section for each dump, lift or dump category

	Facility Description			Physical - MANDATORY									Cover				Growth Media			
	Description (required)	ID Code	Type	Underlying Ground Slope % Grade	Ungraded Slope _H:1V	Final Slope _H:1V	Final Top Slope % Grade	Bench or Highwall Height ft	Mid-Bench Length ft	Average Flat Area Long Dimension (ripping distance) ft	Final (Regraded) Footprint acres	Regrade Volume (1) (if calculated elsewhere) cy	Cover Thickness Slopes in	Cover Thickness Flat Areas in	Distance from Cover Borrow ft	Slope from Dump to Cover Borrow % grade	Slope Growth Media Thickness in	Flat Area Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Dump to Stockpile % grade
1	**Borrow area**		**Borrow Pit**	**1.0**	**3.0**	**1.0**	**1.0**	**0**	**0**	**510**	**1.00**	**1000**	**6.0**	**6.0**	**0**	**1.0**	**0.0**	**0.0**	**0**	**0.0**

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)

Quarries & Borrow Pits - User Input (cont.)

You must fill in ALL green cells and relevant blue cells in this section for each dump, lift or dump category

		Grading				Cover		Growth Media		Revegetation								
	Description (required)	Regrading Material Condition (select)	Regrading Material Type (select)	Regrading Equipment Fleet (select)	Slot/Side-by-Side (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Seed Mix Slopes (select)	Seed Mix Flat Areas (select)	Mulch Slopes (select)	Mulch Flat Areas (select)	Fertilizer Slopes (select)	Fertilizer Flat Areas (select)	Slope Scarify/ Rip? (select)	Flat Area Scarify/ Rip? (select)	Scarify/ Ripping Fleet (select)
1	**Borrow area**	**1.2**	**Alluvium**	**Med**	**No**	**Alluvium**	**Small Truck**	**Alluvium**	**Small Truck**	**User Mix 2**	**User Mix 2**	**None**	**None**	**None**	**None**	**Yes**	**Yes**	**Med Dozer**

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Quarries & Borrow Pits - User Input (cont.)

	Facility Description	Highwall Berms					Berm Construction		Excavate or Doze	Hauling (if selected method)				Revegetation		
	Description (required)	Berm (or Highwall) Length ft	Berm Height ft	Berm Base Width ft	Berm Sideslope Angle _H:1V	Volume (if calculated elsewhere) cy	Construction Method (select)	Berm Material Type (select)	Berm Construction Equipment Fleet (select)	Berm Hauling Fleet (select)	Distance to Borrow Source ft	Slope to Borrow Source % grade	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)
1	**Borrow area**						**Dozer**	**Alluvium**	**Small**							

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Waste Rock Dumps - Cost Summary	Labor	Equipment	Materials	Totals
Grading Costs	$0	$0	N/A	$0
Cover Placement Cost	$457	$927	N/A	$1,384
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$71	$233	N/A	$304
Safety Berm Construction Cost	$0	$0	N/A	$0
Subtotal Earthwork	**$528**	**$1,160**	**$0**	**$1,688**
Revegetation Cost	$139	$49	$241	$429
Safety Berm Revegetation Cost	$0	$0	$0	$0
	$139	**$49**	**$241**	**$429**
TOTALS	**$667**	**$1,209**	**$241**	**$2,117**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)
3. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Quarries & Borrow Pits - Calculations

Regrading Volume Calculation

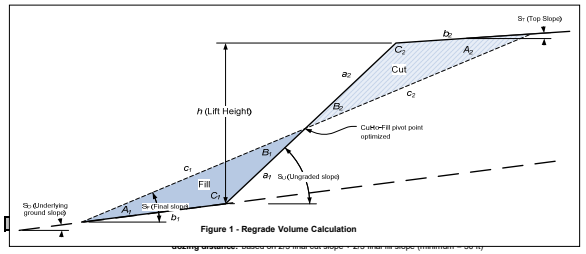


Figure 1 - Regrade Volume Calculation

Dozing distance: based on 2:1 final cut slope + 2:1 final fill slope (minimum = 30 ft)

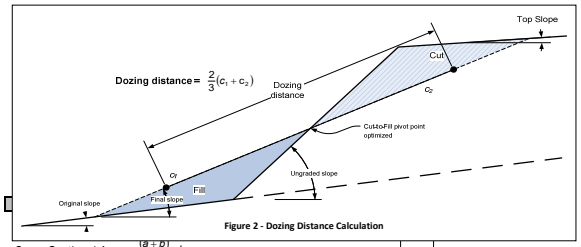
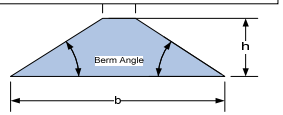


Figure 2 - Dozing Distance Calculation

Cross Sectional Area = $\frac{(a+b)}{2} \times h$

Berm Volume = Berm Length x Cross Sectional Area



Dozer productivity assumes push distance of:
100 feet

Dozer:
Length x (Berm Base Width + Dozer Push Distance) - accounts for disturbance created in borrow area

Excavator:
Length x (Berm Base Width + (2 x Excavator Track Width) - accounts for disturbance created in borrow area

Haul & Place:
Length x Berm Base Width - if necessary use Yards sheet to account for disturbance created in borrow area

Final Slope Area and Footprint Area Calculations

Final slope length = $c_1 + c_2$
Final slope area = Final slope length x Mid-bench Length
Final lift height (h_{final}) = $(c_1 + c_2) \times \sin$(Final slope)
Final slope width (d) = $(c_1 + c_2) \times \cos$(Final slope)
Final slope footprint = Final slope width x Mid-bench Length
Final flat area = Final footprint – Final slope footprint

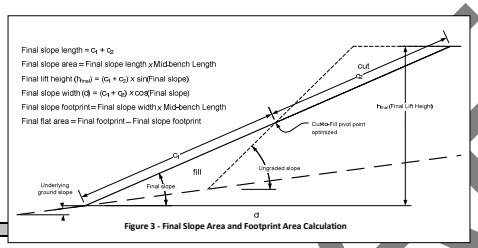


Figure 3 - Final Slope Area and Footprint Area Calculation

Minimum 1 hr ripping/scarifying time per dump

Slopes:
Number of passes = Final slope length ÷ Grader width
Travel distance = Number of passes x Mid-bench length
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)
Minimum 1 hr

Flat Areas:
Flat area width = Final flat area ÷ Average long dimensions
Number of passes = Flat area width ÷ Grader width
Travel distance = Number of passes x Average long dimensions
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)

Revegetation: Minimum 1 acre revegetation crew time per area

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Waste Rock Dumps - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$0	$0	N/A	$0
Cover Placement Cost	$457	$927	N/A	$1,384
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$71	$233	N/A	$304
Safety Berm Construction Cost	$0	$0	N/A	$0
Subtotal Earthwork	**$528**	**$1,160**	**$0**	**$1,688**
Revegetation Cost	$139	$49	$241	$429
Safety Berm Revegetation Cost	$0	$0	$0	$0
	$139	**$49**	**$241**	**$429**
TOTALS	**$667**	**$1,209**	**$241**	**$2,117**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Quarries & Borrow Pits - Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83) x (Slot/Side-by-Side) x (Altitude Deration)

	Description (required)	Regrading Volume cy	Dozing Distance (see above) ft	Regrading Fleet	Uncorrected Dozer Productivity cy/hr	Grade Correction	Dozing Material	Density Correction	Side-by-Side or Slot Dozing	Total Hourly Productivity cy/hr	Total Dozer Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**Borrow area**	1,000	#VALUE!	D9R	#VALUE!	1.6	1.2	0.79	1.0			$0	$0	
		1,000										**$0**	**$0**	**$0**

Quarries & Borrow Pits - Cover and Growth Media Costs

		Cover (lower layer)								Growth Media Placement							
	Description (required)	Cover Volume cy	Cover Replacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Cover Labor Cost $	Cover Equipment Cost $	Total Cover Cost $	Growth Media Volume cy	Growth Media Replacement Fleet	Fleet Productivity BCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**Borrow area**	807	725/966G/D7R	503	2	2	$457	$927	$1,384	0					$0	$0	$0
		807				2	**$457**	**$927**	**$1,384**						**$0**	**$0**	**$0**

Quarries & Borrow Pits - Scarifying/Revegetation Costs

	Description (required)	Slope Area acres	Flat Area acres	Total Surface Area acres	Final Slope Length ft	Flat Area Long Dimension ft	Ripping/ Scarifying Fleet	Slope Scarifying/ Ripping Hours hrs	Flat Area Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revegetation Material Cost $	Total Revegetation Cost $
1	**Borrow area**	0.00	1.00	1.00		510	D9R	0	1	$71	$233	$304	$139	$49	$241	$429
			1.00	1.00					1	**$71**	**$233**	**$304**	**$139**	**$49**	**$241**	**$429**

Notes: 1) Minimum total ripping hours = 1 (i.e. If total ripping hrs (slope + flat) < 1, then one hour of fleet time is assumed, regardless of acres shown in in scarifying table.)

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Buildings & Foundation Demolition Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Materials	Totals
Building Demolition Cost	$3,918	$2,474	N/A	$6,392
Wall Demolition Cost	$5,343	$582	N/A	$5,925
Slab Demolition	$572	$1,356	N/A	$1,928
Subtotal Demolition	**$9,833**	**$4,412**	**$0**	**$14,245**
Cover Placement Cost	$1,281	$3,188	N/A	$4,469
Growth Media Placement Cost	$856	$1,908	N/A	$2,764
Ripping/Scarifying Cost	$284	$408	N/A	$692
Subtotal Earthworks	**$2,421**	**$5,504**	**$0**	**$7,925**
Revegetation Cost	$554	$198	$120	$872
TOTALS	**$12,808**	**$10,114**	**$120**	**$23,042**

Buildings & Foundation - User Input

You must fill in ALL green cells and relevant blue cells in this section for each building or facility

	Facility Description			Physical - MANDATORY								Foundation Cover (1)			Growth Media (1) (entire footprint)		
	Description (required)	ID Code	Type	Length ft	Width ft	Eve Height ft	Slab Thickness in	Foundation Wall Thickness in	Foundation Wall Height ft	Average Flat Area Long Dimension (ripping distance) ft	Building Area Footprint (including surrounding facilities) acres	Foundation Cover Thickness in	Distance from Foundation Cover Borrow Area ft	Slope from Facility to Borrow Area % grade	Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Facility to Stockpile % grade
1	**Lime Silo**		**Process - Other**	**30**	**16**	**24**	**12**	**6**	**3**	**30**	**0.01**	**60**	**5,100**	**3.0**			
2	**ARD Pumphouse**		**Site Facilities - Buildings**	**25**	**15**	**20**	**12**	**0**	**0**	**25**	**0.20**	**12**	**5,280**	**2.0**	**6**	**5,280**	**2.0**
3	**ARD Storage Shed**		**Site Facilities - Buildings**	**10**	**10**	**8**	**6**	**0**	**0**	**10**	**0.10**	**12**	**2,640**	**2.0**	**6**	**2,640**	**2.0**
4	**CN Pond Pumphouse**		**Site Facilities - Buildings**	**10**	**10**	**8**	**6**	**0**	**0**	**10**	**0.10**	**12**	**2,640**	**2.0**	**6**	**2,640**	**2.0**

Notes:
1. Foundation cover only calculated to cover slab. Growth media estimated over entire footprint area
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)

Buildings & Foundation - User Input (cont.)

You must fill in ALL green cells and relevant blue cells in this section for each building or facility

		Construction Materials		Slab Demolition		Foundation Cover			Growth Media			Revegetation				
	Description (required)	Building Type (select)	Foundation Wall Type (select)	Slab Demo Method (select)	Slab Breaking Equipment Fleet (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarify/ Rip? (select)	Ripping Fleet (select)
1	**Lime Silo**	**Sm. steel**	**Conc 6 in (150 mm) thick**	**Break & bury**	**Sm Excavator**	**Alluvium**	**Scraper Dozer**					**User Mix 2**			**Yes**	**Small Dozer**
2	**ARD Pumphouse**	**Sm. steel**	**Conc 6 in (150 mm) thick**	**Break & bury**	**Sm Excavator**	**Alluvium**	**Small Truck**		**Alluvium**	**Small Truck**		**User Mix 2**	**None**	**None**	**Yes**	**Small Dozer**
3	**ARD Storage Shed**	**Sm. wood**	**Conc 6 in (150 mm) thick**	**Break & bury**	**Sm Excavator**	**Alluvium**	**Small Truck**		**Alluvium**	**Small Truck**		**User Mix 2**	**None**	**None**	**Yes**	**Small Dozer**
4	**CN Pond Pumphouse**	**Sm. wood**	**Conc 6 in (150 mm) thick**	**Break & bury**	**Sm Excavator**	**Alluvium**	**Small Truck**		**Alluvium**	**Small Truck**		**User Mix 2**	**None**	**None**	**Yes**	**Small Dozer**

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Buildings & Foundation Demolition Cost Summary

	Labor	Equipment	Materials	Totals
Building Demolition Cost	$3,918	$2,474	N/A	$6,392
Wall Demolition Cost	$5,343	$582	N/A	$5,925
Slab Demolition	$572	$1,356	N/A	$1,928
Subtotal Demolition	**$9,833**	**$4,412**	**$0**	**$14,245**
Cover Placement Cost	$1,281	$3,188	N/A	$4,469
Growth Media Placement Cost	$856	$1,908	N/A	$2,764
Ripping/Scarifying Cost	$284	$408	N/A	$692
Subtotal Earthworks	**$2,421**	**$5,504**	**$0**	**$7,925**
Revegetation Cost	$554	$198	$120	$872
TOTALS	**$12,808**	**$10,114**	**$120**	**$23,042**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Buildings & Foundation - Calculations

Building Volume Calculations

Using Means Heavy Construction Cost Data (2004) calculates cubic feet from building dimensions
Estimage slab thickness and wall thickness if not known
Assumes that all concrete slabs are reinforced
Productivity for crew from Means Heavy Construction Cost Data (2004) adjusted for supervision
(addressed in Misc. Costs) and Davis-Bacon Wage Rates
Demolition costs do not include hauling or disposing if debris - Use Waste Disposal module

Slab Demolition Calculations

Minimum 1 hr excavator time for slab demolition

Cover Volume Calculation

Foundation area x cover thickness
If "Bury in Place" is selected as slab demolition method, cover thickness is adjusted such that
total cover (cover + growth media) equals value entered in "Minimum thickness of cover over unbroken slab" cell above

Ripping/Scarifying Calculations

Flat area width = Final flat area ÷ Average long dimensions
Number of passes = Flat area width ÷ Grader width
Travel distance = Number of passes x Average long dimensions
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)

Revegetation

Minimum 1 acre revegetation crew time per area

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
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Buildings & Foundation Demolition Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Materials	Totals
Building Demolition Cost	$3,918	$2,474	N/A	$6,392
Wall Demolition Cost	$5,343	$582	N/A	$5,925
Slab Demolition	$572	$1,356	N/A	$1,928
Subtotal Demolition	**$9,833**	**$4,412**	**$0**	**$14,245**
Cover Placement Cost	$1,281	$3,188	N/A	$4,469
Growth Media Placement Cost	$856	$1,908	N/A	$2,764
Ripping/Scarifying Cost	$284	$408	N/A	$692
Subtotal Earthworks	**$2,421**	**$5,504**	**$0**	**$7,925**
Revegetation Cost	$554	$198	$120	$872
TOTALS	**$12,808**	**$10,114**	**$120**	**$23,042**

Building & Foundation Demolition Costs

Uses RS Means Heavy Construction Cost Data for building and wall demolition cost calculations. Uses CAT Handbook for slab breaking production.

								Building Demolition			Wall Demolition			Slab Demolition			Total Costs		
	Description (required)	Building Footprint (slab area) sqft	Building Volume cu ft	Wall Length ft	Wall Area sq ft	Slab Demolition Fleet	Slab Volume cy	Total Labor Cost $	Total Equipment Cost $	Total Building Demolition Cost $	Total Labor Cost $	Total Equipment Cost $	Total Wall Demolition Cost $	Total Labor Cost $	Total Equipment Cost $	Total Slab Breaking Cost $	Total Labor Cost $	Total Equipment Cost $	Total Demolition Costs $
1	**Lime Silo**	480	11,520	92	276	325C	18	$2,189	$1,382	$3,571	$5,343	$582	$5,925	$143	$339	$482	$7,675	$2,303	$9,978
2	**ARD Pumphouse**	375	7,500	80	0	325C	14	$1,425	$900	$2,325	$0	$0	$0	$143	$339	$482	$1,568	$1,239	$2,807
3	**ARD Storage Shed**	100	800	40	0	325C	2	$152	$96	$248	$0	$0	$0	$143	$339	$482	$295	$435	$730
4	**CN Pond Pumphouse**	100	800	40	0	325C	2	$152	$96	$248	$0	$0	$0	$143	$339	$482	$295	$435	$730
			20,620				36	**$3,918**	**$2,474**	**$6,392**	**$5,343**	**$582**	**$5,925**	**$572**	**$1,356**	**$1,928**	**$9,833**	**$4,412**	**$14,245**

Building & Foundation - Foundation Cover and Growth Media Costs

		Foundation Cover								Growth Media								Total Cover & Growth Media Costs		
	Description (required)	Cover Volume cy	Cover Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Cost $	Growth Media Volume cy	Growth Media Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $	Total Labor Cost $	Total Equipment Cost $	Total Costs $
1	**Lime Silo**	89	631G/D10R/D7R	1,148	4	1	$425	$1,280	$1,705						$0	$0	$0	$425	$1,280	$1,705
2	**ARD Pumphouse**	14	725/966G/D7R	445	4	1	$314	$722	$1,036	161	725/966G/D7R	445	4	1	$314	$722	$1,036	$628	$1,444	$2,072
3	**ARD Storage Shed**	4	725/966G/D7R	448	3	1	$271	$593	$864	81	725/966G/D7R	448	3	1	$271	$593	$864	$542	$1,186	$1,728
4	**CN Pond Pumphouse**	4	725/966G/D7R	448	3	1	$271	$593	$864	81	725/966G/D7R	448	3	1	$271	$593	$864	$542	$1,186	$1,728
		111				4	**$1,281**	**$3,188**	**$4,469**	323				3	**$856**	**$1,908**	**$2,764**	**$2,137**	**$5,096**	**$7,233**

Building & Foundation - Scarifying/Revegetation Costs

					Scarifying/Ripping			Revegetation				Total Scarify & Revegation Costs			
	Description (required)	Flat Area acres	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $	Total Labor Cost $	Total Equipment Cost $	Total Material Cost $	Total Costs $
1	**Lime Silo**	0.10	D7R	1	$71	$102	$173	$139	$49	$24	$212	$210	$151	$24	$385
2	**ARD Pumphouse**	0.20	D7R	1	$71	$102	$173	$139	$49	$48	$236	$210	$151	$48	$409
3	**ARD Storage Shed**	0.10	D7R	1	$71	$102	$173	$139	$49	$24	$212	$210	$151	$24	$385
4	**CN Pond Pumphouse**	0.10	D7R	1	$71	$102	$173	$139	$49	$24	$212	$210	$151	$24	$385
		0.50		4	**$284**	**$408**	**$692**	**$554**	**$198**	**$120**	**$872**	**$838**	**$606**	**$120**	**$1,564**

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Other Demoltion and Equipment Removal - Cost Summary

Go To Labor Rates sheet and select Zone for Each La

	Labor	Equipment	Materials	Totals
Other Demolition	$0	$0	$0	$0
Equipment Removal	$17,974	$7,636	$0	$25,610
TOTALS	**$17,974**	**$7,636**	**$0**	**$25,610**

Other Demolition

Facility Description

	Description (required)	ID Code	Type	Quantity	Units	Labor Unit Cost $	Equipment Unit Cost $	Material Unit Cost $	Total Cost $
						$0	**$0**	**$0**	

Notes:

Equipment & Material Removal

Facility Description

	Description (required)	ID Code	Type	Quantity	Units	Labor Unit Cost ($)	Equipment Unit Cost ($)	Material Unit Cost ($)	Total Cost ($)
1	**Air compressors**		**Site Facilities - Mobile/Fixed Equipr**	**31**	**hrs**	**$289.90**	**$123.16**		$12,805
2	**Weather Station**		**Site Facilities - Structures**	**31**	**hrs**	**$289.90**	**$123.16**		$12,805
						$17,974	**$7,636**	**$0**	**$25,610**

Notes: **4 laborers, 1 crane operator, 1 truck driver; 1 flatbed truck, 1 50-ton crane**

Closure Cost Estimate
Process Ponds

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
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Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Process Ponds - Cost Summary

	Labor	Equipment	Materials	Totals
Backfilling Costs	$10,958	$22,246	N/A	$33,204
Growth Media Placement Costs	$5,420	$11,853	N/A	$17,273
Liner Cutting & Folding Costs	$6,688	$2,872	N/A	$9,560
Subtotal Earthworks	**$23,066**	**$36,971**	**$0**	**$60,037**
Revegetation Costs	$1,112	$392	$844	$2,348
TOTALS	**$24,178**	**$37,363**	**$844**	**$62,385**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Process Ponds - User Input

You must fill in ALL green cells and relevant blue cells in this section for each pond

	Facility Description		Pond Dimensions (1)					Backfill - (If trucks are used) (1)				Growth Media		
	Description (required)	ID Code	Pond Length ft	Pond Width ft	Pond Depth ft	Pond Sideslope Angle _H:1V	Disturbed Area (if calculated elsewhere) acres	Percent Backfill (100% if blank)	Distance from Backfill Borrow ft	Slope from Facility to Borrow Area % grade	Pond Volume (if calculated elsewhere) cy	Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Facility to Stockpile % grade
1	WRF Pond #1 (keystone)		175	85	5.0	2.5			150	2%		18	2,640	2%
2	WRF Pond #2 (Ahead of Lime treatment)		165	135	5.0	2.5			150	2%		18	2,640	2%
3	Pond Across from Office (Larger)		165	100	3.0	2.5			150	2%		18	2,640	2%
4	Pond Across from Office (Smaller)		100	100	3.0	2.5			150	2%		18	2,640	2%
5	ARD Collection Pond A		180	102	5.0	2.5			150	2%		18	2,640	2%
6	ARD Collection Pond B		182	130	5.0	2.5			150	2%		18	2,640	2%
7	Treated ARD Evap Pond A		238	92	5.0	2.5			150	2%		18	2,640	2%
8	Treated ARD Evap Pond B		304	99	5.0	2.5			150	2%		18	2,640	2%

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)

Ponds 1-8 will be partially backfilled with local material will be daylighted to drain stormwater.

Process Ponds - User Input (cont.)

		Liner	Backfill			Growth Media			Revegetation		
	Description (required)	Crew Cut & Fold Time (2) hrs	Backfill Material Type (select)	Backfill Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)
1	WRF Pond #1 (keystone)	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
2	WRF Pond #2 (Ahead of Lime treatment)	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
3	Pond Across from Office (Larger)	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
4	Pond Across from Office (Smaller)	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
5	ARD Collection Pond A	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
6	ARD Collection Pond B	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
7	Treated ARD Evap Pond A	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None
8	Treated ARD Evap Pond B	5.0	Alluvium	Small Truck		Alluvium	Small Truck		User Mix 2	None	None

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table
(2) Pond liner removal crew (2Clab + excavator) = 2 General Laborers + 325C Excavator

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

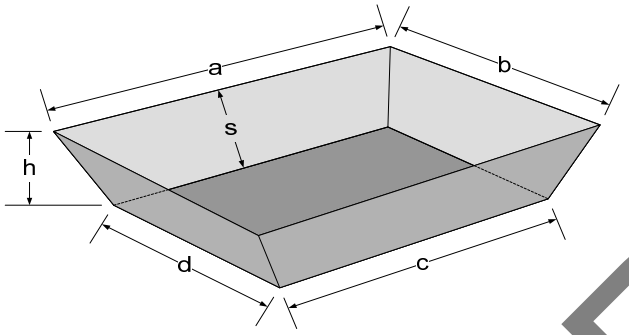
Process Ponds - Cost Summary

	Labor	Equipment	Materials	Totals
Backfilling Costs	$10,958	$22,246	N/A	$33,204
Growth Media Placement Costs	$5,420	$11,853	N/A	$17,273
Liner Cutting & Folding Costs	$6,688	$2,872	N/A	$9,560
Subtotal Earthworks	**$23,066**	**$36,971**	**$0**	**$60,037**
Revegetation Costs	$1,112	$392	$844	$2,348
TOTALS	**$24,178**	**$37,363**	**$844**	**$62,385**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Process Ponds - Calculations

Pond Volume Calculation



Area and Volume of the Frustrum of a Pyramid

$$\text{Surface Area} = ab + cd + (a+b+c+d) \times \frac{s}{2}$$

$$\text{Volume} = \frac{h\,(ab + cd + \sqrt{abcd}\,)}{3}$$

Revegetation Calculations

Minimum 1 acre revegetation crew time per area

Closure Cost Estimate
Process Ponds

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Go To Labor Rates sheet and select Zone for Each Labor Classification

Process Ponds - Cost Summary

	Labor	Equipment	Materials	Totals
Backfilling Costs	$10,958	$22,246	N/A	$33,204
Growth Media Placement Costs	$5,420	$11,853	N/A	$17,273
Liner Cutting & Folding Costs	$6,688	$2,872	N/A	$9,560
Subtotal Earthworks	**$23,066**	**$36,971**	**$0**	**$60,037**
Revegetation Costs	$1,112	$392	$844	$2,348
TOTALS	**$24,178**	**$37,363**	**$844**	**$62,385**

Process Ponds - Liner Cutting and Folding

	Description (required)	Crew Hours hrs	Total Labor Cost $	Total Equipment Cost $	Total Liner Removal Cost $
1	**WRF Pond #1 (keystone)**	5	$836	$359	$1,195
2	**WRF Pond #2 (Ahead of Lime treatment)**	5	$836	$359	$1,195
3	**Pond Across from Office (Larger)**	5	$836	$359	$1,195
4	**Pond Across from Office (Smaller)**	5	$836	$359	$1,195
5	**ARD Collection Pond A**	5	$836	$359	$1,195
6	**ARD Collection Pond B**	5	$836	$359	$1,195
7	**Treated ARD Evap Pond A**	5	$836	$359	$1,195
8	**Treated ARD Evap Pond B**	5	$836	$359	$1,195
		40	**$6,688**	**$2,872**	**$9,560**

Process Ponds - Backfill and Growth Media Costs

		Pond Backfill								Growth Media							
	Description (required)	Backfill Volume cy	Backfill Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours hrs	Total Labor Cost $	Total Equipment Cost $	Total Backfill Cost $	Growth Media Volume cy	Growth Media Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**WRF Pond #1 (keystone)**	2,188	725/966G/D7R	476	2	5	$1,141	$2,317	$3,458	826	725/966G/D7R	461	3	2	$542	$1,185	$1,727
2	**WRF Pond #2 (Ahead of Lime treatment)**	3,469	725/966G/D7R	476	2	7	$1,598	$3,244	$4,842	1,238	725/966G/D7R	461	3	3	$813	$1,778	$2,591
3	**Pond Across from Office (Larger)**	1,621	725/966G/D7R	476	2	3	$685	$1,390	$2,075	917	725/966G/D7R	461	3	2	$542	$1,185	$1,727
4	**Pond Across from Office (Smaller)**	953	725/966G/D7R	476	2	2	$457	$927	$1,384	556	725/966G/D7R	461	3	1	$271	$593	$864
5	**ARD Collection Pond A**	2,784	725/966G/D7R	476	2	6	$1,370	$2,781	$4,151	1,020	725/966G/D7R	461	3	2	$542	$1,185	$1,727
6	**ARD Collection Pond B**	3,697	725/966G/D7R	476	2	8	$1,826	$3,708	$5,534	1,314	725/966G/D7R	461	3	3	$813	$1,778	$2,591
7	**Treated ARD Evap Pond A**	3,324	725/966G/D7R	476	2	7	$1,598	$3,244	$4,842	1,216	725/966G/D7R	461	3	3	$813	$1,778	$2,591
8	**Treated ARD Evap Pond B**	4,671	725/966G/D7R	476	2	10	$2,283	$4,635	$6,918	1,672	725/966G/D7R	461	3	4	$1,084	$2,371	$3,455
		22,707				48	**$10,958**	**$22,246**	**$33,204**	8,759				20	**$5,420**	**$11,853**	**$17,273**

Process Ponds - Revegetation Costs

	Description (required)	Surface Area acres	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revegetation Material Cost $	Total Revegetation Cost $
1	**WRF Pond #1 (keystone)**	0.30	$139	$49	$72	$260
2	**WRF Pond #2 (Ahead of Lime treatment)**	0.50	$139	$49	$121	$309
3	**Pond Across from Office (Larger)**	0.40	$139	$49	$96	$284
4	**Pond Across from Office (Smaller)**	0.20	$139	$49	$48	$236
5	**ARD Collection Pond A**	0.40	$139	$49	$96	$284
6	**ARD Collection Pond B**	0.50	$139	$49	$121	$309
7	**Treated ARD Evap Pond A**	0.50	$139	$49	$121	$309
8	**Treated ARD Evap Pond B**	0.70	$139	$49	$169	$357
		3.50	**$1,112**	**$392**	**$844**	**$2,348**

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Yards, Etc. - Cost Summary

	Labor	Equipment	Materials	Totals
Regrading Cost	$0	$0	N/A	$0
Cover Placement Cost	$0	$0	N/A	$0
Growth Media Placement Cost	$2,525	$5,593	N/A	$8,118
Ripping/Scarifying Cost	$355	$510	N/A	$865
Subtotal Earthworks	**$2,880**	**$6,103**		**$8,983**
Revegetation Cost	$764	$270	$1,086	$2,120
TOTALS	**$3,644**	**$6,373**	**$1,086**	**$11,103**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Yards, Etc. - User Input

You must fill in ALL green cells and relevant blue cells in this section for each building or facility

	Facility Description			Physical			Cover			Growth Media		
	Description (required)	ID Code	Type	Area acres	Average Flat Area Long Dimension (ripping distance) ft	Regrade Volume (calculated elsewhere) cy	Cover Thickness in	Distance from Cover Borrow Area ft	Slope from Facility to Borrow Area % grade	Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Facility to Stockpile % grade
1	ARD Treatment Area		Other Facilities	0.50	300					6	2,640	2.0
2	ARD Treatment Area		Other Facilities	0.50	300					6	2,640	2.0
3	Lime Treatment area		Other Facilities	1.50	500					6	2,640	2.0
4	Evaporation Pond area		Other Facilities	1.00	400					6	2,640	2.0
5	RO Pond area		Other Facilities	1.00	700					6	5,280	2.0

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)

Yards, Etc. - User Input (cont.)

You must fill in ALL green cells and relevant blue cells in this section for each building or facility

		Grading			Cover			Growth Media			Revegetation				
	Description (required)	Regrading Material Condition (select)	Regrading Material Type (select)	Regrading Equipment Fleet (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarify/ Rip? (select)	Ripping Fleet (select)
1	ARD Treatment Area	1	LS - broken	Small				Alluvium	Small Truck		User Mix 2			Yes	Small Dozer
2	ARD Treatment Area	1	LS - broken	Small				Alluvium	Small Truck		User Mix 2			Yes	Small Dozer
3	Lime Treatment area	1	LS - broken	Small				Alluvium	Small Truck		User Mix 2			Yes	Small Dozer
4	Evaporation Pond area	1	LS - broken	Small				Alluvium	Small Truck		User Mix 2			Yes	Small Dozer
5	RO Pond area	1	LS - broken	Small				Alluvium	Small Truck		User Mix 2			Yes	Small Dozer

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
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Yards, Etc. - Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Materials	Totals
Regrading Cost	$0	$0	N/A	$0
Cover Placement Cost	$0	$0	N/A	$0
Growth Media Placement Cost	$2,525	$5,593	N/A	$8,118
Ripping/Scarifying Cost	$355	$510	N/A	$865
Subtotal Earthworks	**$2,880**	**$6,103**		**$8,983**
Revegetation Cost	$764	$270	$1,086	$2,120
TOTALS	**$3,644**	**$6,373**	**$1,086**	**$11,103**

Yards, Etc. - Calculations

Grading Calculations

Average push distance assumed to be 2/3 of the 600 feet maximum from Catepillar Handbook or 400 feet
Material assumed to be loose stockile (1.2 productivity factor)
Slope assumed to be 0 to 5% (1.0 productivity factor)

Cover Volume Calculation

Yard area x cover thickness

Ripping/Scarifying Calculations

Flat area width = Final flat area ÷ Average long dimensions
Number of passes = Flat area width ÷ Grader width
Travel distance = Number of passes x Average long dimensions
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)
Minimum 1 hr ripping/scarifying per area

Revegetation

Minimum 1 acre revegetation crew time per area

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Yards, Etc. - Cost Summary

	Labor	Equipment	Materials	Totals
Regrading Cost	$0	$0	N/A	$0
Cover Placement Cost	$0	$0	N/A	$0
Growth Media Placement Cost	$2,525	$5,593	N/A	$8,118
Ripping/Scarifying Cost	$355	$510	N/A	$865
Subtotal Earthworks	**$2,880**	**$6,103**		**$8,983**
Revegetation Cost	$764	$270	$1,086	$2,120
TOTALS	**$3,644**	**$6,373**	**$1,086**	**$11,103**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Yards, Etc. - Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83) x (Slot/Side-by-Side)

	Description (required)	Regrading Volume cy	Dozing Distance (see above) ft	Regrading Fleet	Uncorrected Dozer Productivity cy/hr	Grade Correction	Dozing Material	Density Correction	Total Hourly Productivity cy/hr	Total Dozer Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**ARD Treatment Area**			D7R							$0	$0	$0
2	**ARD Treatment Area**			D7R							$0	$0	$0
3	**Lime Treatment area**			D7R							$0	$0	$0
4	**Evaporation Pond area**			D7R							$0	$0	$0
5	**RO Pond area**			D7R							$0	$0	$0
											$0	**$0**	**$0**

Yards, Etc. - Cover and Growth Media Costs

		Cover								Growth Media							
	Description (required)	Cover Volume cy	Topsoil Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Cost $	Growth Media Volume cy	Growth Media Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**ARD Treatment Area**						$0	$0	$0	403	725/966G/D7R	448	3	1	$271	$593	$864
2	**ARD Treatment Area**						$0	$0	$0	403	725/966G/D7R	448	3	1	$271	$593	$864
3	**Lime Treatment area**						$0	$0	$0	1,210	725/966G/D7R	448	3	3	$813	$1,778	$2,591
4	**Evaporation Pond area**						$0	$0	$0	807	725/966G/D7R	448	3	2	$542	$1,185	$1,727
5	**RO Pond area**						$0	$0	$0	807	725/966G/D7R	445	4	2	$628	$1,444	$2,072
							$0	**$0**	**$0**	3,630				9	**$2,525**	**$5,593**	**$8,118**

Yards, Etc. - Scarifying/Revegetation Costs

	Description (required)	Surface Area acres	Area Long Dimension ft	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**ARD Treatment Area**	0.50	300	D7R	1	$71	$102	$173	$139	$49	$121	$309
2	**ARD Treatment Area**	0.50	300	D7R	1	$71	$102	$173	$139	$49	$121	$309
3	**Lime Treatment area**	1.50	500	D7R	1	$71	$102	$173	$208	$74	$362	$644
4	**Evaporation Pond area**	1.00	400	D7R	1	$71	$102	$173	$139	$49	$241	$429
5	**RO Pond area**	1.00	700	D7R	1	$71	$102	$173	$139	$49	$241	$429
		4.50			5	**$355**	**$510**	**$865**	**$764**	**$270**	**$1,086**	**$2,120**

Closure Cost Estimate
Waste Disposal

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Waste Disposal - Cost Summary

	Labor	Equipment	Fees	Totals
Solid Waste - On Site	$5,349	$14,802	N/A	$20,151
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
TOTALS	**$5,349**	**$14,802**	**$0**	**$20,151**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Waste Disposal - User Input - Solid Waste

	Description (required)	ID Code	Waste Type (select)	Disposal Method (select)	Quantity cy	Landfill (Bulk) Disposal: Distance to Landfill ft	Landfill (Bulk) Disposal: Slope to Landfill % grade	Landfill (Bulk) Disposal: Number of Trucks (user override)	Dumpster: Months Dumpster Rental months
1	**Pond liner haul to landfill**		**Process - Other**	**Landfill (bulk)**	**25**	**264000**	**2.0**		**1**
2	**Building Disposal**		**Other Facilities**	**Landfill (bulk)**	**100**	**264000**	**2.0**		**2**

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)

Waste Disposal - User Input - Hazardous Materials

	Description (required)	ID Code	Waste Type (select)	Container Type (select)	Vacuum Truck Size (select)	Liquid Quantity gallons	Soild Quantity cy	One Way Travel Distance to Disposal Site mi	One Way Travel Time to Disposal Site hr

Notes:
1. Use Other Demo & Equip Removal Sheet for tank removal

Closure Cost Estimate
Waste Disposal

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Go To Labor Rates sheet and select Zone for Each Labor Classification

Waste Disposal - Cost Summary

	Labor	Equipment	Fees	Totals
Solid Waste - On Site	$5,349	$14,802	N/A	$20,151
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
TOTALS	**$5,349**	**$14,802**	**$0**	**$20,151**

Waste Disposal - User Input - Hydrocarbon Contaminated Soils

	Description (required)	ID Code	Waste Type (select)	Disposal Method (select)	Quantity cy	Travel Distance to Offsite Disposal mi

Notes:
1. Use Yards or Landfills Sheets for bioremediation facility reclamation

Closure Cost Estimate
Waste Disposal

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Waste Disposal - Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Fees	Totals
Solid Waste - On Site	$5,349	$14,802	N/A	$20,151
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
TOTALS	**$5,349**	**$14,802**	**$0**	**$20,151**

Waste Disposal - Assumptions & Calculations

Solid Waste Disposal

Off site disposal assumes use of average rolloff dumpster [30 cy (m3), 10 ton (tonne)]
On site disposal assumes use of small loader/truck fleet for haulage
Average density for on site disposal = 2,600 lb/cy (1,540 kg/m3)
For on site disposal only 1 truck is required unless total truck hours > 8, only 2 trucks unless total truck hours are > 16

Hazardous Materials Disposal

Assumes all hazardous materials are known
Enter EITHER solid or liquid quantity each line.
If container type = 55 gallon (200 liter) drum then solid waste hauling costs apply
Average density for solids assumed to be 2,600 lb/cy (1,540 kg/m3)
Vacuum truck sizes: small = 2,200 gal (~8,300 litres), large = 5,000 gal (~19,000 litres)
Vacuum truck on site for 4 hours for each load

Hydrocarbon Contaminated Soils Disposal

Assumes all hazardous materials are known
On site disposal assumes biopad treatment
Exavation productivity =45 cy./hr (35 m3/hr) (Means Heavy Construction, 2006: 02315-424-0360)

Closure Cost Estimate
Waste Disposal

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Waste Disposal - Cost Summary

	Labor	Equipment	Fees	Totals
Solid Waste - On Site	$5,349	$14,802	N/A	$20,151
Solid Waste - Off Site				$0
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
TOTALS	**$5,349**	**$14,802**	**$0**	**$20,151**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Waste Disposal - Solid Waste Disposal

	Description (required)	Waste Volume cy	Number of Off Site Dumpster Loads	Landfill Fleet Equipment	Landfill Fleet Productivity LCY/hr	Number of Trucks	Total Fleet Hours	Total Dumpster Cost $	Total Labor Cost $	Total Equipment Cost $	Total Waste Disposal Cost $
1	**Pond liner haul to landfill**	25		725/966G/D7R	5	1	5	$0	$927	$1,671	$2,598
2	**Building Disposal**	100		725/966G/D7R	500	100	1	$0	$4,422	$13,131	$17,553
		125					6	**$0**	**$5,349**	**$14,802**	**$20,151**

Waste Disposal - Hazardous Materials Disposal

	Description (required)	Liquid Waste Volume gallons	Solid Waste Volume cy	Number of Truck Loads	Tons of Waste Tons	Pick-up Fees $	Transport Fees $	Disposal Fees $	Total Hazardous Material Cost $
						$0	**$0**	**$0**	**$0**

Waste Disposal - Hydrocarbon Contaminated Soils

	Description (required)	Quantity cy	Disposal Equipment Fleet	Total Fleet Hours	Treatment Cost $	Transport Fees $	Disposal Fees $	Total Labor Cost $	Total Equipment Cost $	Total Waste Disposal Cost $
					$0	**$0**	**$0**	**$0**	**$0**	**$0**

Closure Cost Estimate
Well Abandonment

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Well Abandonment	Labor	Equipment	Materials	Totals
Production, Dewatering, Infiltration Wells	$35,676	$63,789	$1,319	$100,784
Monitoring Wells	$30,943	$42,977	$4,782	$78,702
TOTALS	**$66,619**	**$106,766**	**$6,101**	**$179,486**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Production, Dewatering and Infiltration Well Closure

	Description (required)	ID Code	Number of Holes	Casing Diam in	Average Depth[1] ft bgs	Depth to First Water ft bgs	Original Static Water Level ft bgs	Top of Slotted Casing[2] ft bgs	Blank Casing Below Top of Screen[2] ft	Type of Pump (if any) (select)	Depth to Pump ft bgs	Hole Plug Method (select)	Casing Volume per ft cf	Perforation Length[3,4] ft	Grout Volume per Hole[4,5] cy	Cement Volume per Hole[6] cy	Inert Media Volume per Hole[7] cy	Pump Removal Labor Cost $	Pump Removal Equip Cost $	Perf Labor Cost $	Perf Equip Cost[8] $	Grout + Cement Labor Cost[9] $	Grout + Cement Equip Cost[9] $	Grout + Cement Material Cost $	Inert Media Labor Cost[10] $	Inert Media Equip Cost[9] $	Total Cost $
1	**Guest House Well**		**1**	**6.0**	**280**	**150**	**150**	**150**	**0**	**Submersit**	**250**	**Grout + Ba**	0.200	50	2.70	0.10	0.40	$2,430	$5,705	$500	$833	$601	$849	$123	$359	$95	$11,494
2	**Production Wells**		**2**	**6.0**	**622**	**322**	**322**	**470**	**0**	**Submersit**	**250**	**Grout + Ba**	0.200	198	5.20	0.10	1.60	$4,860	$11,410	$1,768	$3,491	$1,401	$1,982	$466	$109	$29	$25,516
3	**Recovery Wells**		**10**	**8.0**	**115**	**110**	**90**	**100**	**0**	**Submersit**	**100**	**Grout + Ba**	0.350	40	1.40	0.30	0.10	$9,720	$22,820	$5,004	$8,078	$5,338	$7,550	$730	$3,587	$947	$63,774
																		$17,010	**$39,935**	**$7,272**	**$12,402**	**$7,340**	**$10,381**	**$1,319**	**$4,054**	**$1,071**	**$100,784**

(1) For previously abandoned holes enter "0" for depth
(2) Wells abandoned per Nevada Administrative Code (NAC 534.420). Hole grouted and perforated from bottom to 50 feet (15.24m) above the top of the screen, or first water encountered or original static water level, depending on vertical hydraulic gradient and well construction parameters. Inert media (cuttings or alluvium) used from top of grout to top seal.
(3) Perforation length = amount of blank casing below first water (for confined aquifers) or predicted recovered water table (unconfined aquifers) + 50 feet (15.24m) of blank casing above water table
(4) Assumes 50' (15.24m) sanitary seal at top of hole. Therefore, perforation and grouting only required to bottom of sanitary seal.
(5) Assumes 100% loss to formation for grout (abandonite) for screened and perforated sections.
(6) Assumes 20' (6m) top seal of cement in casing only. See note 4.
(7) Inert material is cuttings or alluvium sourced locally.
(8) Includes perforation tool wear cost/ft of perforation (see Productivty Sheet).
(9) See Productivity Sheet for hourly production. Minimum 1 hr per hole + fixed hours per hole for move and setup. If no perforation required, use standard drill rig.
(10) See Productivity Sheet for hourly production. Minimum 1 hr per hole.

Notes:

Closure Cost Estimate
Well Abandonment

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
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Well Abandonment	Labor	Equipment	Materials	Totals
Production, Dewatering, Infiltration Wells	$35,676	$63,789	$1,319	$100,784
Monitoring Wells	$30,943	$42,977	$4,782	$78,702
TOTALS	**$66,619**	**$106,766**	**$6,101**	**$179,486**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Monitoring Well Closure

	Description (required)	ID Code	Number of Holes	Casing Diam in	Average Depth ft bgs	Top of Screen[1] ft bgs	Hole Plug Method (select)	Casing Volume per ft ft3	Grout Volume/ Well[2,3] cy	Cement Volume per Hole[4] cy	Inert Backfill Volume per Hole[5] cy	Total Grouting Hours/ Hole hr	Total Inert Media Hours/ Hole hr	Grout + Cement Labor Cost[6] $	Grout + Cement Equip Cost[6] $	Grout + Cement Material Cost $	Inert Material Labor Cost[7] $	Inert Material Equip Cost[7] $	Total Cost $
1	**Residue Pile Active 2021**		**6**	**8.0**	**150**		**Grout + Ba**	0.350	2.11	0.32		3.3		$3,303	$4,587	$630	$0	$0	$8,520
2	**Residue Pile Inactive 2021**		**14**	**8.0**	**150**		**Grout + Ba**	0.350	2.11	0.32		3.3		$7,707	$10,704	$1,471	$0	$0	$19,882
3	**Residue Pile Active 2121**		**3**	**8.0**	**270**		**Grout + Ba**	0.350	4.05	0.32		3.5		$1,752	$2,433	$572	$0	$0	$4,757
4	**WRF Active 2021**		**1**	**8.0**	**15**		**Grout + Ba**	0.350	-0.08	0.32		3.0		$500	$695	$9	$0	$0	$1,204
5	**WRF Inactive 2021**		**4**	**8.0**	**98**		**Grout + Ba**	0.350	1.26	0.32		3.2		$2,135	$2,966	$270	$0	$0	$5,371
6	**WRF Active 2121**		**27**	**8.0**	**82**		**Grout + Ba**	0.350	1.00	0.32		3.2		$14,412	$20,017	$1,516	$0	$0	$35,945
7	**WRF Inactive 2121**		**2**	**8.0**	**223**		**Grout + Ba**	0.350	3.29	0.32		3.4		$1,134	$1,575	$314	$0	$0	$3,023
														$30,943	**$42,977**	**$4,782**	**$0**	**$0**	**$78,702**

Wells abandoned per NAC 534.420 with bentonite grout placed to 50 feet above the top of the screen (see note 1).
(1) Assumes top of screen is at or above the static water level (in unconfined aquifers) or the depth of first water encountered (in confined aquifers).
(2) Assumes 25% loss to formation for grouting
(3) Grouting only required to 50' (15.24m) above the top of screen because monitor wells are constructed with a seal in the annular space.
(4) Assumes top 20' (6m) plugged with cement.
(5) Assumes hole plugged with inert material (cuttings or alluvium) above grout up to cement surface plug.
(6) See Productivity Sheet for hourly production. Minimum 1 hr per hole + fixed hours per hole for move and setup (see Productivty Sheet).
(7) See Productivity Sheet for hourly production. Minimum 1 hr per hole.

Notes:

Closure Cost Estimate
Well Abandonment

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Well Abandonment	Labor	Equipment	Materials	Totals
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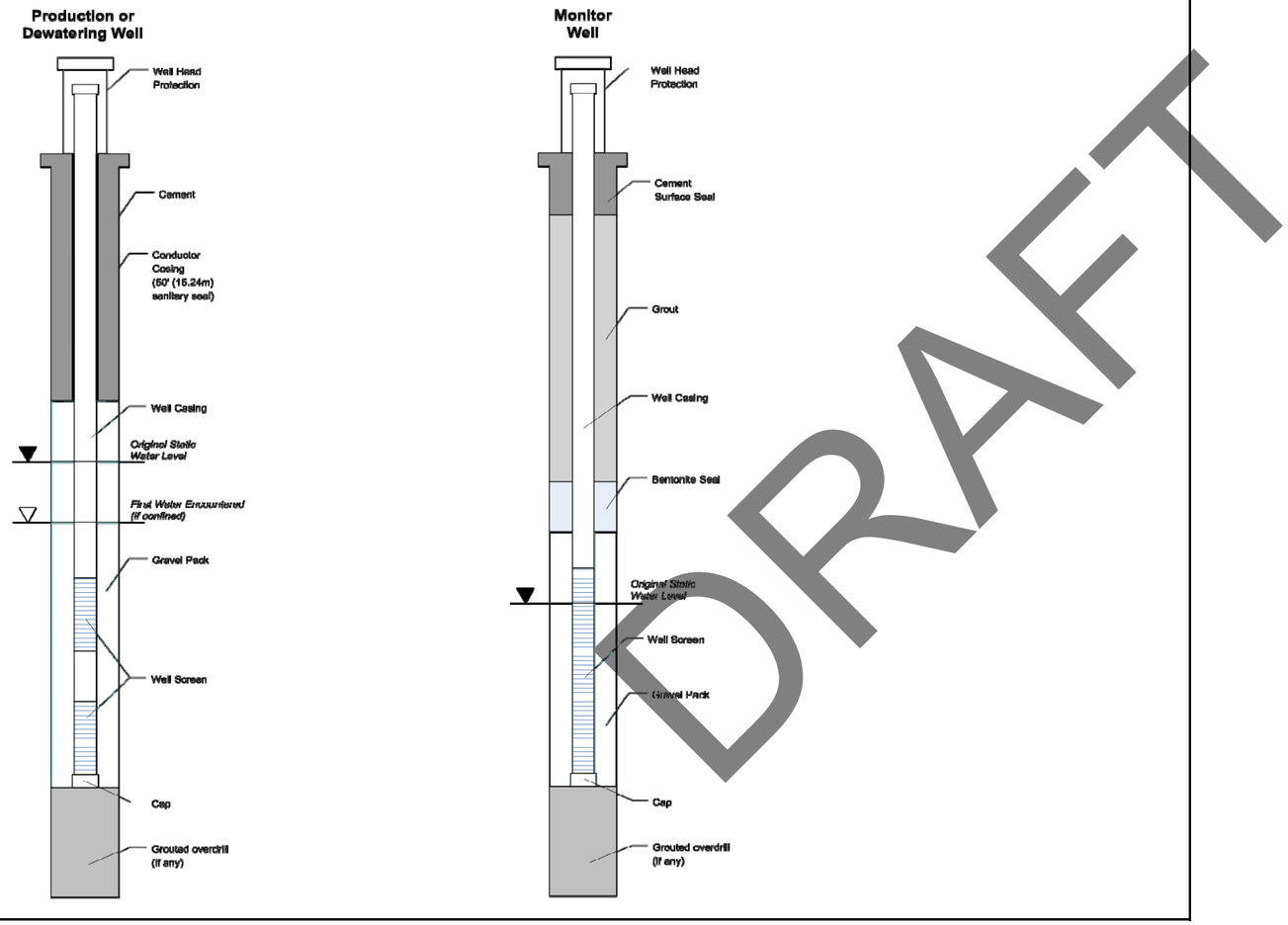
Monitoring Wells	$30,943	$42,977	$4,782	$78,702
TOTALS	**$66,619**	**$106,766**	**$6,101**	**$179,486**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Well Construction



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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Miscellaneous Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Materials	Totals
Fence Removal	$17,390	$5,293	N/A	$22,683
Fence Installation	$19,080	$3,900	$130,500	$153,480
Culvert & Buried Pipe Removal	$0	$0	N/A	$0
Surface Pipe Removal	$30,200	$4,700	N/A	$34,900
Power Lines	$0	N/A	N/A	$0
Substations/Transformers	$0	N/A	N/A	$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Costs	$0	$0	$0	$0
TOTALS	**$66,670**	**$13,893**	**$130,500**	**$211,063**

Fence Removal

You must fill in ALL green and blue cells

	Description (required)	ID Code	Length ft	Type (select type)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Total Cost $
1	ARD Pond A Fencing		610	Chain link 8-10 ft	$1,824	$555	$2,379
2	ARD Treatment Ponds		1148	Chain link 8-10 ft	$3,433	$1,045	$4,478
3	Residue Pile Ponds		764	Chain link 8-10 ft	$2,284	$695	$2,979
4	ARD Pond B and Lime Treatment Ponds Fencing		1301	Chain link 8-10 ft	$3,890	$1,184	$5,074
5	Brine Ponds		1993	Chain link 8-10 ft	$5,959	$1,814	$7,773
					$17,390	**$5,293**	**$22,683**

Notes:

Fence Installation

You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Length ft	Input: Type (select type)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Material Cost ($)	Costs: Total Cost $
1	Open Pit Fencing		3000	Chain link 8-10ft	$19,080	$3,900	$130,500	$153,480
					$19,080	**$3,900**	**$130,500**	**$153,480**

Notes:

Closure Cost Estimate
Misc. Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Miscellaneous Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Materials	Totals
Fence Removal	$17,390	$5,293	N/A	$22,683
Fence Installation	$19,080	$3,900	$130,500	$153,480
Culvert & Buried Pipe Removal	$0	$0	N/A	$0
Surface Pipe Removal	$30,200	$4,700	N/A	$34,900
Power Lines	$0	N/A	N/A	$0
Substations/Transformers	$0	N/A	N/A	$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Costs	$0	$0	$0	$0
TOTALS	**$66,670**	**$13,893**	**$130,500**	**$211,063**

Culvert & Buried Pipe Removal

You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Length ft	Input: Type (select type)	Input: Location (select)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Total Cost $
						$0	**$0**	**$0**

Notes:

Surface Pipe Removal

You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Length ft	Input: Type (select type)	Input: Location (select)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Total Cost $
1	**Guest House Well Piping**		**10000**	**6 in (150 mm) - 8 in (200 mm)**		$30,200	$4,700	$34,900
						$30,200	**$4,700**	**$34,900**

Notes:

Closure Cost Estimate
Misc. Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Miscellaneous Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Materials	Totals
Fence Removal	$17,390	$5,293	N/A	$22,683
Fence Installation	$19,080	$3,900	$130,500	$153,480
Culvert & Buried Pipe Removal	$0	$0	N/A	$0
Surface Pipe Removal	$30,200	$4,700	N/A	$34,900
Power Lines	$0	N/A	N/A	$0
Substations/Transformers	$0	N/A	N/A	$0
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Costs	$0	$0	$0	$0
TOTALS	**$66,670**	**$13,893**	**$130,500**	**$211,063**

Power Line and Substation Removal

You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Power Line Length miles	Input: Power Line Type (select)	Input: Number of Substations #	Input: Location (select)	Costs: Power Line Removal $	Costs: Substation Removal $	Costs: Total Cost $	Cost Breakdown: Labor Cost $	Cost Breakdown: Equipment Cost $
							$0	$0	$0	$0	$0

Notes: If substation owned by operator, use Other Demo & Equipment Removal sheet
User may need to add line items in Foundations & Buildings for substation slab demolition and fence removal
Labor/Equipment costs assume approximately 80% of cost are equipment and 20% are labor related costs

Rip-Rap & Rock Lining

You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Area S.Y.	Input: Type (select type)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Material Cost $	Costs: Total Cost $
					$0	$0	$0	$0

Notes:

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Reclamation Monitoring & Maintenance - Cost Summary

Go To Labor Rates sheet and select Zone for Each Labor Classification

	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	$1,640	$586	$2,851	$5,077
Erosion Maintenance	$1,404	$4,213	N/A	$5,617
Reclamation Monitoring	$55,400	$702	N/A	$56,102
Subtotal Reclamation Monitoring	**$58,444**	**$5,501**	**$2,851**	**$66,796**
Water Quality Monitoring	$49,640	$10,405	$31,248	$91,293
TOTAL MONITORING	**$108,084**	**$15,906**	**$34,099**	**$158,089**

Reclamation Maintenance

Description	Total Revegetation Surface Area (1,2) acres	% Area Requiring Reseeding	Seed Mix (select)	Area Requiring Reseeding acres	Seed $/acres	Labor $/acres	Equipment $/acres	Totals $
Revegetation Maintenance	12	**100%**	**User Mix 2**	11.8	$241.00	$138.59	$49.50	
Labor								$1,640
Equipment								$586
Materials								$2,851
Cost/Acre								$429
							Subtotal	**$5,077**

Notes: 1) Surface area is NOT the same as footprint disturbance area typically used for permitting purposes.

	Total Volume Growth Media cy	% Volume Requiring Maintenance	Average Growth Media Placement Cost $/CY	Volume Requiring Replacement cy		Labor (assume: 25%) $/acres	Equipment (assume: 75%) $/acres	Total $
Erosion Maintenance	12,712	**20%**	$2.21	2,542		$1,404.00	$4,213.00	$5,617

Notes:

Reclamation Monitoring

Description	Hrs/Day	Days/Year	Number of Years	Rate $/hr		
Field Work						
Field Geologist/Engineer				$149.27		$0
Range Scientist	**8**	**1**	**12**	$129.27		$12,410
Reporting						
Field Geologist/Engineer	**8**	**3**	**12**	$149.27		$42,990
Range Scientist				$129.27		$0
					Subtotal	**$55,400**
Travel						
	Hrs/Trip hr	Trips/Year	Years	Truck Cost $/hr		
Travel	**2**	**1**	**12**	$29.26		$702
					Subtotal	**$702**
					Total Reclamation Monitoring	**$56,102**

Notes:

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Reclamation Monitoring & Maintenance - Cost Summary

	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	$1,640	$586	$2,851	$5,077
Erosion Maintenance	$1,404	$4,213	N/A	$5,617
Reclamation Monitoring	$55,400	$702	N/A	$56,102
Subtotal Reclamation Monitoring	**$58,444**	**$5,501**	**$2,851**	**$66,796**
Water Quality Monitoring	$49,640	$10,405	$31,248	$91,293
TOTAL MONITORING	**$108,084**	**$15,906**	**$34,099**	**$158,089**

Go To Labor Rates sheet and select Zone for Each Labor Classification

Water and Rock Sample Analysis

Description	Samples #	Events/Year	No. Years	First Sample Year closure year (1-100)	No. of Samplers	Days/Event	Hrs/Day	Analysis Cost $/sample	Supplies $/sample	Lab Cost $	Material Cost $	Equipment Cost $	Labor Cost $	Cost $	Comments
LAC Profile 1	**8**	**2**	**12**	**1**	**1**	**1**	**8**	$156.30	$6.45	$30,010	$1,238	$4,884	$20,980	$57,112	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
										$30,010.00	$1,238.00	$4,884.48	$20,979.84		
													Subtotal Sampling Costs	**$57,112**	

Notes: Sampling labor cost = No. Samplers x Years x Events/year x Days/event x Hour/Day x Labor Rate
Sampling equipment costs include 1 pickup truck for every two samplers

Ground & Surface Water Monitoring

Pump Costs

Description	No. of units		Years		Cost $
Pump (purchased)	**10**	Replacement period (yrs):	**10**	2760.425068	$5,521
				Subtotal Field Work	**$5,521**

Notes: Replacement period = frequency of pump replacement

Reporting

Description	Hrs/Event	Rate $/hr	Cost $
Field Geologist/Engineer	**8**	$149.27	$28,660
		Subtotal Reporting	**$28,660**

Notes:

Closure Cost Estimate
Constr. Mgmt

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Go To Labor Rates sheet ar

Construction Management & Road Maintenance - Cost Summary	Labor	Equipment	Materials	Totals
Construction Management	$31,722	$8,141	N/A	$39,863
Construction Support		$1,303		$1,303
Road Maintenance	$3,423	$4,917	$0	$8,340
TOTAL CONSTRUCTION MANAGEMENT	**$35,145**	**$14,361**	**$0**	**$49,506**

Construction Management

Construction Management Staff

Description	Duration mo.	Hours/ Month hr.	Number of Supervisors	Supervisor Rate $/hr	Labor Cost $	Equipment Cost[1] $	Totals $
Active Reclamation	2	160	1	$99.13	$31,722	$8,141	$39,863
Monitoring & Maintenance					$0	$0	$0
				Total Staff	**$31,722**	**$8,141**	**$39,863**

Construction Management Support

Description	Duration mo.	Number of Units		Rental Rate $/mo	Generator Cost $/mo	Equipment Cost[1] $	Totals $
Temporary Office Rental						$0	$0
Temporary Toilets	2	3		$217		$1,303	$1,303
					Total Support	**$1,303**	**$1,303**

Notes: Office rental assumes only 1 generator required for every 4 trailers

Total Construction Management	**$41,166**

Road Maintenance

Description	Fleet Size (select)	Number	Duration mo.	Hours/ Month hr.	Labor Cost $	Equipment Cost $	Totals $
Active Reclamation							
Water Truck	Small	1	2	40	$3,423	$4,917	$8,340
Grader	Medium				$0	$0	$0
Monitoring & Maintenance							
Water Truck					$0	$0	$0
Grader					$0	$0	$0

Description	Gallons/ Day	Days/ Month	Duration mo.	Cost/ Gallon $			Totals $
Water Fees							
Water Fees							$0
				Total Project Maintenance	**$3,423**	**$4,917**	**$8,340**

Notes: 1) Supervisor equipment = pickup truck

Closure Cost Estimate
Labor Rates

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
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Color Code Key	
User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

Go To Labor Rates sheet and select Zone for Each Labor Classi

ZONE ADJUSTMENTS		
Cost Basis/Project Region	Northern Nevada	Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, Washoe, and White Pine Counties
Power Equipment Operators	>60 miles	Invalid Zone
Truck Drivers	>70 miles	Invalid Zone
Laborers	>50 miles	Invalid Zone

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	12.00%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

EQUIPMENT TYPE (1) OR JOB DESCRIPTION	Labor Group	Base Rate ($/hr)	Zone Adjustment ($/hr)	Hourly Wage ($/hr)	Fringe ($/hr)	Retirement/ Medicare ($/hr)	Unemployment Insurance ($/hr)	Workman's Compensation ($/hr)	Other Indirect Costs ($/hr)	Total ($/hr)
Equipment Operators ($/hr) (2)										
Bulldozers										
D6R		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
D6R w/ Winch					$24.80					
D7R		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
D8R		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
D9R		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
D10R		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
D11R		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
Wheeled Dozers										
824G					$24.80					
834G					$24.80					
844					$24.80					
854G					$24.80					
Motor Graders										
120H		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
14G/H		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
16G/H		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
24M					$24.80					
Track Excavators										
312C		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
320C		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
325C		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
330C		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
345B		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
365BL					$24.80					
385BL		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
Scrapers										
631G		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
637G		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
Wheeled Loaders										
924G		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
928G		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
950G		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
966G		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
972G		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
980G		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
988G		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
990					$24.80					
992G		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
994D					$24.80					
L2350					$24.80					
Shovels										
PC2000					$24.80					
PC3000					$24.80					
PC4000					$24.80					
PC5500					$24.80					
PC8000					$24.80					
Hydraulic Hammers										
H-120 (fits 325)										
H-160 (fits 345)										
H-180 (fits 365/385)										
Demolition Shears										
S340 (fits 322/325/330)										
S365 (fits 330/345)										
S390 (fits 365/385)										
Demolition Grapples										
G315 (fits 322/325)										
G320 (fits 325/330)										
G330 (fits 345/365)										

Closure Cost Estimate
Labor Rates

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
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Color Code Key	
User Input - Direct Input	Direct Input
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Go To Labor Rates sheet and select Zone for Each Labor Classi

ZONE ADJUSTMENTS		
Cost Basis/Project Region	Northern Nevada	Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, Washoe, and White Pine Counties
Power Equipment Operators	>60 miles	Invalid Zone
Truck Drivers	>70 miles	Invalid Zone
Laborers	>50 miles	Invalid Zone

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	12.00%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

Other Equipment										
420D 4WD Backhoe		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
428D 4WD Backhoe		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
CS533E Vibratory Roller		$36.92	Invalid Zone	$36.92	$24.80	$1.11	$2.82	$4.43	$0.00	$70.08
CS633E Vibratory Roller					$24.80					
CP533E Sheepsfoot Compactor					$24.80					
CP633E Sheepsfoot Compactor					$24.80					
Light Truck - 1.5 Ton					$24.80					
Supervisor's Truck					$24.80					
Flatbed Truck					$24.80					
Air Compressor + tools		$35.46	Invalid Zone	$35.46	$24.80	$1.06	$2.71	$4.26	$0.00	$68.29
Welding Equipment		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
Heavy Duty Drill Rig		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
Pump (plugging) Drill Rig		$37.51	Invalid Zone	$37.51	$24.80	$1.13	$2.87	$4.50	$0.00	$70.81
Concrete Pump					$24.80					
Gas Engine Vibrator		$36.92	Invalid Zone	$36.92	$24.80	$1.11	$2.82	$4.43	$0.00	$70.08
Generator 5KW					$24.80					
HDEP Welder (pipe or liner)					$24.80					
5 Ton Crane		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
20 Ton Crane		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
50 Ton Crane		$38.37	Invalid Zone	$38.37	$24.80	$1.15	$2.94	$4.60	$0.00	$71.86
120 Ton Crane					$24.80					

NOTES:

(1) Equipment Type:	Catepillar model or equivalent, LeTourneau
(2) Equipment Operator Source:	D-B NV20210002 44379
(3) Zone Basis:	From Washoe Co. Courthouse

Truck Drivers ($/hr) (4)										
725	ruck Driver > 25 yds	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
730	ruck Driver > 25 yds	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
735	ruck Driver > 25 yds	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
740	ruck Driver > 25 yds	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
769D	ruck Driver > 25 yds	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
773E					$4.16					
777D	ruck Driver > 60 yds	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
785C					$4.16					
793C					$4.16					
797B					$4.16					
613E (5,000 gal) Water Wagon	ter Truck > 2,500 gall	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
621E (8,000 gal) Water Wagon	ter Truck > 2,500 gall	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79
777D Water Truck					$4.16					
785C Water Truck					$4.16					
Dump Truck (10-12 yd3)	Truck Driver > 8 yds <	$31.50	Invalid Zone	$31.50	$4.16	$0.95	$2.41	$3.78	$0.00	$42.79

NOTES:

(4) Truck Driver Source:	D-B SUNV2017-001 10/1/2018
(5) Zone Basis:	From Washoe Co. Courthouse

Closure Cost Estimate
Labor Rates

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Color Code Key	
User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

Go To Labor Rates sheet and select Zone for Each Labor Classi

ZONE ADJUSTMENTS		
Cost Basis/Project Region	Northern Nevada	Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, Washoe, and White Pine Counties
Power Equipment Operators	>60 miles	Invalid Zone
Truck Drivers	>70 miles	Invalid Zone
Laborers	>50 miles	Invalid Zone

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	12.00%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

Laborers ($/hr) (6,7)

General Laborer	Group 1	$27.25	Invalid Zone	$27.25	$14.27	$0.82	$2.08	$3.27	$0.00	$47.69
Skilled Laborer	Group 4	$27.75	Invalid Zone	$27.75	$14.27	$0.83	$2.12	$3.33	$0.00	$48.31
Driller's Helper	Group 3	$27.50	Invalid Zone	$27.50	$14.27	$0.83	$2.10	$3.30	$0.00	$48.00
Rodmen (reinforcing concrete)	Group 1	$27.25	Invalid Zone	$27.25	$14.27	$0.82	$2.08	$3.27	$0.00	$47.69
Cement finisher	Group 3	$27.50	Invalid Zone	$27.50	$14.27	$0.83	$2.10	$3.30	$0.00	$48.00
Carpenter		$36.10	Invalid Zone	$36.10	$13.98	$1.08	$2.76	$4.33	$0.00	$58.26

NOTES:

(6) Laborer Source:	D-B LABO0169-034 10/1/2020
(7) Carpenter Source:	D-B CARP0971-013 7/1/2020
(8) Zone Basis:	From Washoe Co. Courthouse

Project Management and Technical Labor ($/hr) (9)

Project Manager		$69.19		$69.19	$14.27	$2.08	$5.29	$8.30	$0.00	$99.13
Foreman		$64.13		$64.13	$14.27	$1.92	$4.91	$7.70	$0.00	$92.92
Field Geologist/Engineer		$110.07		$110.07	$14.27	$3.30	$8.42	$13.21	$0.00	$149.27
Field Tech/Sampler		$77.46		$77.46	$14.27	$2.32	$5.93	$9.29	$0.00	$109.27
Range Scientist		$93.76		$93.76	$14.27	$2.81	$7.17	$11.25	$0.00	$129.27
Senior Planning Engineer					$14.27					
Project Engineer					$14.27					
Mechanic/Fitter					$14.27					
					$14.27					
					$14.27					
					$14.27					
					$14.27					

NOTES:

(9) Project Manager:	R.S.Means 2021 Q2 (01 31 1320 0200 Total Incl.O&P-10%) Adjusted for Elko, NV
(9) Foreman Source:	R.S.Means 2021 Q2 (01 31 1320 0200 Total Incl.O&P-10%) Adjusted for Elko, NV
(9) Techical Labor Source:	Wood plc 2021 Adjusted for Zone,Tax and Ins.
Other Labor Source:	
Other Labor Source:	
†Additional User Markups	
(These are added by the user to the	
base rate to account for site-specific	
conditions or corporate requirements)	

Closure Cost Estimate
Equipment Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Monthly Rental Basis: 160 hrs month

EQUIPMENT RENTAL RATE TABLE

EQUIPMENT TYPE (1)	Monthly Owner/Rental Rate	Equipment Hourly Rate	Fuel/Lube/ Wear	Total Rate
Bulldozers				
D6R	$10,185.00	$63.66	$26.51	$90.17
D6R w/ Winch			$13.31	$13.31
D7R	$11,575.00	$72.34	$29.18	$101.52
D8R	$21,150.00	$132.19	$39.43	$171.62
D9R	$28,400.00	$177.50	$55.94	$233.44
D10R	$39,360.00	$246.00	$72.04	$318.04
D11R	$52,785.00	$329.91	$104.83	$434.73
Wheeled Dozers				
824G			$22.90	$22.90
834G			$26.84	$26.84
844			$31.95	$31.95
854G			$40.47	$40.47
Motor Graders				
120H	$9,400.00	$58.75	$30.23	$88.98
14G/H	$13,515.00	$84.47	$44.06	$128.52
16G/H	$24,250.00	$151.56	$55.24	$206.80
24M			$33.02	$33.02
Track Excavators				
312C	$4,650.00	$29.06	$12.64	$41.71
320C	$5,245.00	$32.78	$20.02	$52.80
325C	$7,500.00	$46.88	$24.93	$71.80
330C	$10,575.00	$66.09	$30.06	$96.15
345B	$14,565.00	$91.03	$37.28	$128.31
365BL			$28.12	$28.12
385BL	$22,950.00	$143.44	$57.83	$201.26
Scrapers				
631G	$24,285.00	$151.78	$63.34	$215.12
637G	$28,520.00	$178.25	$89.52	$267.77
Wheeled Loaders				
924G	$4,230.00	$26.44	$20.19	$46.63
928G	$4,580.00	$28.63	$22.08	$50.70
950G	$7,440.00	$46.50	$28.45	$74.95
966G	$10,670.00	$66.69	$36.75	$103.44
972G	$13,515.00	$84.47	$41.51	$125.98
980G	$13,515.00	$84.47	$46.62	$131.08
988G	$22,525.00	$140.78	$65.60	$206.38
990			$36.21	$36.21
992G	$54,125.00	$338.28	$122.78	$461.06
994D			$76.68	$76.68
L2350			$140.58	$140.58
Shovels				
PC2000			$78.81	$78.81
PC3000			$106.50	$106.50
PC4000			$149.10	$149.10
PC5500			$253.47	$253.47
PC8000			$317.37	$317.37
Hydraulic Hammers				
H-120 (fits 325)	$4,460.00	$27.88	$5.79	$33.67
H-160 (fits 345)	$8,990.00	$56.19	$11.31	$67.50
H-180 (fits 365/385)	$12,385.00	$77.41	$13.40	$90.81
Demolition Shears				
S340 (fits 322/325/330)				$0.00
S365 (fits 330/345)				$0.00
S390 (fits 365/385)				$0.00
Demolition Grapples				
G315 (fits 322/325)				$0.00
G320 (fits 325/330)				$0.00
G330 (fits 345/365)				$0.00
Other Equipment				
420D 4WD Backhoe	$2,595.00	$16.22	$15.37	$31.58
428D 4WD Backhoe	$3,315.00	$20.72	$15.23	$35.94
CS533E Vibratory Roller	$8,250.00	$51.56	$7.99	$59.55
CS633E Vibratory Roller			$10.12	$10.12
CP533E Sheepsfoot Compactor			$7.99	$7.99
CP633E Sheepsfoot Compactor			$10.12	$10.12
Light Truck - 1.5 Ton	$4,122.80	$25.77	$3.49	$29.26
Supervisor's Truck	$3,682.80	$23.02	$2.42	$25.44
Flatbed Truck	$4,122.80	$25.77	$11.62	$37.39
Air Compressor + tools	$5,799.20	$36.25	$2.13	$38.38
Welding Equipment	$3,093.20	$19.33	$4.26	$23.59
Heavy Duty Drill Rig	$33,660.00	$210.38	$25.56	$235.94
Pump (plugging) Drill Rig	$33,660.00	$210.38	$21.30	$231.68
Concrete Pump	$8,800.00	$55.00	$21.30	$76.30
Gas Engine Vibrator	$564.08	$3.53	$2.13	$5.66
Generator 5KW	$1,675.52	$10.47	$3.20	$13.67
HDEP Welder (pipe or liner)	$8,712.00	$54.45	$4.26	$58.71
5 Ton Crane	$7,933.20	$49.58	$6.39	$55.97
20 Ton Crane	$12,122.00	$75.76	$8.52	$84.28
50 Ton Crane	$12,122.00	$75.76	$10.01	$85.77
120 Ton Crane			$11.08	$11.08
Trucks				
725	$14,690.00	$91.81	$37.45	$129.26
730	$14,690.00	$91.81	$38.52	$130.33
735	$14,690.00	$91.81	$52.19	$144.00
740	$14,690.00	$91.81	$53.48	$145.29
769D	$23,050.00	$144.06	$37.00	$181.06
773E	$29,300.00	$183.13	$50.10	$233.23
777D	$43,100.00	$269.38	$71.54	$340.91
785C			$51.65	$51.65
793C			$88.93	$88.93
797B			$125.14	$125.14
613E (5,000 gal) Water Wagon	$6,365.94	$39.79	$21.67	$61.46
621E (8,000 gal) Water Wagon	$10,773.13	$67.33	$38.07	$105.40
777D Water Truck			$35.68	$35.68
785C Water Truck			$51.65	$51.65
Dump Truck (10-12 yd^3)	$11,990.00	$74.94	$12.17	$87.11

NOTES:

(1) Power Equipment Source:	
(2) Power Equipment Type:	Catepillar model or equivalent, LeTourneau loader, Komatsu shovels
(3) Drilling Equipment Source:	RS Means Heavy Construction (2021 Q2)
(4) Other Equipment Source:	RS Means Heavy Construction (2021 Q2)

(5) Drill rig includes support (pipe) truck

Closure Cost Estimate
Equipment Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm

FUEL, LUBE AND WEAR CALCULATIONS

EQUIPMENT TYPE	PM Cost Per Hour (1)	Under carriage or Tires (2)	G.E.T Consumption (3)	Fuel Use Rate gal/hr (4)	Cost@ 2.13/gal	Total Hourly Equipment Cost
Bulldozers						
D6R	$7.86		$5.34	6.25	$13.31	$26.51
D6R w/ Winch				6.25	$13.31	$13.31
D7R	$7.86		$5.34	7.50	$15.98	$29.18
D8R	$8.29		$10.37	9.75	$20.77	$39.43
D9R	$9.46		$16.13	14.25	$30.35	$55.94
D10R	$11.12		$22.58	18.00	$38.34	$72.04
D11R	$15.15		$33.23	26.50	$56.45	$104.83
Wheeled Dozers						
824G		$0.00		10.75	$22.90	$22.90
834G		$0.00		12.60	$26.84	$26.84
844		$0.00		15.00	$31.95	$31.95
854G		$0.00		19.00	$40.47	$40.47
Motor Graders						
120H	$4.78	$5.83	$11.10	4.00	$8.52	$30.23
14G/H	$5.95	$8.74	$16.05	6.25	$13.31	$44.06
16G/H	$6.22	$11.13	$21.92	7.50	$15.98	$55.24
24M				15.50	$33.02	$33.02
Track Excavators						
312C	$4.49		$4.15	1.88	$4.00	$12.64
320C	$4.79		$4.79	4.90	$10.44	$20.02
325C	$4.82		$6.05	6.60	$14.06	$24.93
330C	$5.94		$6.65	8.20	$17.47	$30.06
345B	$7.89		$6.81	10.60	$22.58	$37.28
365BL				13.20	$28.12	$28.12
385BL	$6.61		$13.94	17.50	$37.28	$57.83
Scrapers						
631G	$7.97	$14.69	$8.73	15.00	$31.95	$63.34
637G	$13.26	$14.69	$10.98	23.75	$50.59	$89.52
Wheeled Loaders						
924G	$3.97	$5.60	$4.76	2.75	$5.86	$20.19
928G	$4.26	$5.60	$4.76	3.50	$7.46	$22.08
950G	$5.30	$5.77	$8.86	4.00	$8.52	$28.45
966G	$5.53	$7.87	$11.11	5.75	$12.25	$36.75
972G	$6.25	$7.87	$14.08	6.25	$13.31	$41.51
980G	$6.25	$10.31	$14.08	7.50	$15.98	$46.62
988G	$11.71	$13.02	$15.09	12.10	$25.77	$65.60
990				17.00	$36.21	$36.21
992G	$12.97	$26.18	$34.64	23.00	$48.99	$122.78
994D				36.00	$76.68	$76.68
L2350				66.00	$140.58	$140.58
Shovels						
PC2000				37.00	$78.81	$78.81
PC3000				50.00	$106.50	$106.50
PC4000				70.00	$149.10	$149.10
PC5500				119.00	$253.47	$253.47
PC8000				149.00	$317.37	$317.37
Hydraulic Hammers						
H-120 (fits 325)	N/A		$5.79			$5.79
H-160 (fits 345)	N/A		$11.31			$11.31
H-180 (fits 365/385)	N/A		$13.40			$13.40
Demolition Shears						
S340 (fits 322/325/330)	N/A					$0.00
S365 (fits 330/345)	N/A					$0.00
S390 (fits 365/385)	N/A					$0.00
Demolition Grapples						
G315 (fits 322/325)	N/A					$0.00
G320 (fits 325/330)	N/A					$0.00
G330 (fits 345/365)	N/A					$0.00
Other Equipment						
420D 4WD Backhoe	$4.42	$0.86	$3.70	3.00	$6.39	$15.37
428D 4WD Backhoe	$4.18	$0.86	$3.80	3.00	$6.39	$15.23
CS533E Vibratory Roller			N/A	3.75	$7.99	$7.99
CS633E Vibratory Roller			N/A	4.75	$10.12	$10.12
CP533E Sheepsfoot Compactor			N/A	3.75	$7.99	$7.99
CP633E Sheepsfoot Compactor			N/A	4.75	$10.12	$10.12
Light Truck - 1.5 Ton		$0.29	N/A	1.50	$3.20	$3.49
Supervisor's Truck		$0.29	N/A	1.00	$2.13	$2.42
Flatbed Truck		$1.61	N/A	4.70	$10.01	$11.62
Air Compressor + tools			N/A	1.00	$2.13	$2.13
Welding Equipment			N/A	2.00	$4.26	$4.26
Heavy Duty Drill Rig			N/A	12.00	$25.56	$25.56
Pump (plugging) Drill Rig			N/A	10.00	$21.30	$21.30
Concrete Pump			N/A	10.00	$21.30	$21.30
Gas Engine Vibrator			N/A	1.00	$2.13	$2.13
Generator 5KW			N/A	1.50	$3.20	$3.20
HDEP Welder (pipe or liner)			N/A	2.00	$4.26	$4.26
5 Ton Crane			N/A	3.00	$6.39	$6.39
20 Ton Crane			N/A	4.00	$8.52	$8.52
50 Ton Crane			N/A	4.70	$10.01	$10.01
120 Ton Crane			N/A	5.20	$11.08	$11.08
Trucks						
725	$8.79	$15.33	$3.32	4.70	$10.01	$37.45
730	$8.79	$15.33	$3.32	5.20	$11.08	$38.52
735	$8.79	$24.42	$3.32	7.35	$15.66	$52.19
740	$8.79	$25.71	$3.32	7.35	$15.66	$53.48
769D	$6.51	$7.08	$3.71	9.25	$19.70	$37.00
773E	$8.05	$12.86	$4.16	11.75	$25.03	$50.10
777D	$11.53	$19.68	$4.65	16.75	$35.68	$71.54
785C				24.25	$51.65	$51.65
793C				41.75	$88.93	$88.93
797B				58.75	$125.14	$125.14
613E (5,000 gal) Water Wagon	$5.27	$3.62		6.00	$12.78	$21.67
621E (8,000 gal) Water Wagon	$7.46	$7.71		10.75	$22.90	$38.07
777D Water Truck				16.75	$35.68	$35.68
785C Water Truck				24.25	$51.65	$51.65
Dump Truck (10-12 yd3) (5)	N/A	$1.09	N/A	5.20	$11.08	$12.17

Notes:

(1) PM Source:	Cashman Equipment Company () unless noted
(2) Undercarriage Source:	Purecell Tire Quote: 2021
(3) G.E.T. Source:	Cashman Equipment Company (July 2021) unless noted
(4) Fuel Use Source:	Caterpillar Handbook, Edition 35, Ch. 20; or estimated average for smaller vehicles
(5) Dump Truck Oper. Cost Source:	Means Heavy Construction (2008)

Closure Cost Estimate
Equipment Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm

TIRE COST TABLES

Equipment	Tire Size	# of Tires Per Piece of Equipment	Cost Per Tire	Tire Cost (1)(2)	Life Expectency Hours (Low/Zone A) (3)	Tire Cost per Hour
Bulldozers						
D6R			N/A			
D6R w/ Winch			N/A			
D7R			N/A			
D8R			N/A			
D9R			N/A			
D10R			N/A			
D11R			N/A			
Wheeled Dozers						
824G	29.5R25	4		$0.00	3,500	$0.00
834G	35/65-R33	4		$0.00	3,500	$0.00
844	45/65-R39	4		$0.00	3,500	$0.00
854G	45/65-R45	4		$0.00	3,500	$0.00
Motor Graders						
120H	13PR24	6	$3,400.00	$20,400.00	3,500	$5.83
14G/H	20.5R25	6	$5,100.00	$30,600.00	3,500	$8.74
16G/H	23.5R25	6	$6,490.00	$38,940.00	3,500	$11.13
24M	23.5R25	6		$0.00	3,500	
Track Excavators						
312C			N/A			
320C			N/A			
325C			N/A			
330C			N/A			
345B			N/A			
365BL			N/A			
385BL			N/A			
Scrapers						
631G	37.25R35	4	$14,690.00	$58,760.00	4,000	$14.69
637G	37.25R35	4	$14,690.00	$58,760.00	4,000	$14.69
Wheeled Loaders						
924G	17.5R25	4	$6,300.00	$25,200.00	4,500	$5.60
928G	17.5R25	4	$6,300.00	$25,200.00	4,500	$5.60
950G	26.5R25	4	$6,490.00	$25,960.00	4,500	$5.77
966G	26.5R25	4	$8,850.00	$35,400.00	4,500	$7.87
972G	26.5R25	4	$8,850.00	$35,400.00	4,500	$7.87
980G	29.5R25	4	$11,600.00	$46,400.00	4,500	$10.31
988G	35/65-33	4	$14,650.00	$58,600.00	4,500	$13.02
990	41.25/70-39	4		$0.00	4,500	
992G	45/65R45	4	$29,450.00	$117,800.00	4,500	$26.18
994D	55/85R57	4		$0.00	4,500	
L2350	55/85R57	4		$0.00	4,500	
Shovels						
PC2000			N/A			
PC3000			N/A			
PC4000			N/A			
PC5500			N/A			
PC8000			N/A			
Hydraulic Hammers						
H-120 (fits 325)			N/A			
H-160 (fits 345)			N/A			
H-180 (fits 365/385)			N/A			
Demolition Shears						
S340 (fits 322/325/330)			N/A			
S365 (fits 330/345)			N/A			
S390 (fits 365/385)			N/A			
Demolition Grapples						
G315 (fits 322/325)			N/A			
G320 (fits 325/330)			N/A			
G330 (fits 345/365)			N/A			
Other Equipment						
420D 4WD Backhoe	340/80R18-19.5LR24	2	$1,282.50	$2,565.00	3,000	$0.86
428D 4WD Backhoe	340/80R18-18.9R28	2	$1,282.50	$2,565.00	3,000	$0.86
CS533E Vibratory Roller			N/A			
CS633E Vibratory Roller			N/A			
CP533E Sheepsfoot Compactor			N/A			
CP633E Sheepsfoot Compactor			N/A			
Light Truck - 1.5 Ton		4	220	$880.00	3,000	$0.29
Supervisor's Truck		4	220	$880.00	3,000	$0.29
Flatbed Truck		22	220	$4,840.00	3,000	$1.61
Air Compressor + tools			N/A			
Welding Equipment			N/A			
Heavy Duty Drill Rig		4		$0.00	3,000	
Pump (plugging) Drill Rig		4		$0.00	3,000	
Concrete Pump			N/A			
Gas Engine Vibrator			N/A			
Generator 5KW			N/A			
HDEP Welder (pipe or liner)			N/A			
5 Ton Crane		4		$0.00	3,000	
20 Ton Crane		4		$0.00	3,000	
50 Ton Crane		6		$0.00	3,000	
120 Ton Crane		6		$0.00	3,000	
Trucks						
725	23.5R25	6	$5,110.00	$30,660.00	2,000	$15.33
730	23.5R25	6	$5,110.00	$30,660.00	2,000	$15.33
735	26.5R25	6	$8,140.00	$48,840.00	2,000	$24.42
740	29.5R25	6	$8,570.00	$51,420.00	2,000	$25.71
769D	18.00R33	6	$7,075.00	$42,450.00	6,000	$7.08
773E	24.00R35	6	$10,720.00	$64,320.00	5,000	$12.86
777D	27.00R49	6	$16,400.00	$98,400.00	5,000	$19.68
785C	33.00R51	6		$0.00	4,000	
793C	40.00R57	6		$0.00	4,000	
797B	40.00R57	6		$0.00	4,000	
613E (5,000 gal) Water Wagon	23.5R25	6	$3,620.00	$21,720.00	6,000	$3.62
621E (8,000 gal) Water Wagon	33.25R29	6	$10,282.00	$61,692.00	8,000	$7.71
777D Water Truck	27.00R49	6		$0.00	5,000	
785C Water Truck	33.00R51	6		$0.00	4,000	
Dump Truck (10-12 yd3)		10	$655.00	$6,550.00	6,000	$1.09

Notes:

(1) Unit Cost Basis:	Cost per set
(2) Cost Basis:	Total cost for all required tires.
(3) Tire Cost Source:	Purecell Tire Quote: 2021
(4) Tire Wear Source:	Caterpillar Handbook, Edition 35; Ch. 20

Closure Cost Estimate
Material Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

Revegetation Materials

Seed Mixes

Seed Mix	Description	Cost/Acre
None		
Mix 1	Basins	$302.50
Mix 2	Low Hills	$332.75
Mix 3	Uplands	$363.00
Mix 4	Riparian or Custom	$393.25
User Mix 1	**Warmer/Drier**	**$239.50**
User Mix 2	**Wetter/Cooler**	**$241.00**
User Mix 3		
User Mix 4		

	Cost/lb	lbs/Acre	Cost/Acre
User Mix 5 (from Seed Mix sheet)	$0.00	$25.97	$0.00

Notes:

Mulch

Item	Cost/lb	lbs/Acre	Cost/Acre
None			
Straw Mulch	$0.18		
Hydro Mulch	$0.25		
Timber Mulch			

Notes: Granite Seed $500 per Ton in 50 lb bag Wood (Hydro) Mulch (2021)

Amendments

Item	Cost/lb	lbs/Acre	Cost/Acre
None			
Organic Matter	$0.70		$0.00
Treated Sludge			
Chemical	$0.60		$0.00

Notes: Western Nevada Supply $30.13 per 50 lb. bag 15-15-15 (2021)

Closure Cost Estimate
Material Costs

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Well Abandonment Materials

Description	Cost/50lb bag	Units	Cost/unit*
Cement	$7.95	cy	$37.87
Grout (Low Grade Bentonite)	$9.25	cy	$44.05
Inert Material/Cuttings		cy	
		cy	
		cy	

(1) Jentech Drilling Supply quote (2021) Type I,II Cement at $14.95 per 94 lb. bag
(2) Jentech Drilling Supply (2021) 3/8 in. Chunk Bentonite Hole Plug at $9.25 per 50 lb. bag (5.75 cf/bag at 43 gall

* Assumes 1 bag mixes with water to make 0.21 y3 or 0.16 m3 of grout/cement slurry.

Monitoring Costs

Description	Units	Cost/unit
Monitor Well Pump	ea.	$2,760.43
Sampling Supplies	ea.	$6.45
Water Analysis (Profile I) (1)	ea.	$411.00
Leach Test (MWMP) w/ analysis	ea.	$483.40
ABA + S speciation	ea.	$150.00
WAD Cyanide in water	ea.	$56.00
Water Analysis (Profile II) (1)	ea.	$461.00
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
LAC Profile 1	**ea.**	**$156.30**
Pit Lake	**ea.**	**$257.10**
AP Wells	**ea.**	**$84.30**

(1) WET Lab, Reno, Nevada (2021)
Well pump and Sample supply costs adjusted to 2021.
Original source unknown.

Closure Cost Estimate
Material Costs

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Fuel, Etc.

Description	Units	Cost/unit
Off-road Diesel - delivered (1)	$/gal	$2.130
Pickup Truck Mileage	$/mi	$0.560
Electical Power	$/kWh	$0.070

(1) Source: Oil Price Infomration Service , average annual cost including freight to Nevada (2021).
Source: Federal Government Vehicle Allowance Rate 2021
Source: NV Energy (2021) $0.07034

Revegetation Method

Slopes

Disturbance Type	Seed Application Method	Labor Cost/Acre	Equipment Cost/Acre	Total Cost/Acre
Waste Rock Dumps	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Heap Leach	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Tailings	**Hand Broadcast**	$138.59	$49.50	$188.09
Quarries & Borrow Pits	**Mechanical Broadcast**	$138.59	$49.50	$188.09

Flat Areas and Undifferentiated

Disturbance Type	Seed Application Method	Labor Cost/Acre	Equipment Cost/Acre	Total Cost/Acre
Exploration Trenches	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Exploration Roads	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Waste Rock Dumps	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Heap Leach	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Tailings	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Quarries & Borrow Pits	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Roads	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Pits	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Haul Material	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Foundations & Buildings	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Sediment & Drainge Control	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Process Ponds	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Landfills	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Yards, Etc.	**Mechanical Broadcast**	$138.59	$49.50	$188.09
Revegetation Maintenance	**Mechanical Broadcast**	$138.59	$49.50	$188.09

Closure Cost Estimate
Misc. Unit Costs

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Revegetation

	Means Number	Unit	Crew	Daily Output	Daily Output User	Materials	Labor	Equipment	Total	Notes
Seeding - Broadcast Hand (1)		acres					$138.59	$49.50	$188.09	
Seeding - Broadcast Mechanical (1)		acres					$138.59	$49.50	$188.09	
Seeding - Drill (1)		acres		365			$138.59	$118.80	$257.39	
Seeding - Hydroseeding (1)				365			$247.49	$148.49	$395.98	
Shrub Planting - bare root 6-10 in (150- 250mm) (2)	02910-400-0561	ea.	1 Clab	365					$0.00	
Tree Planting - bare root 11-16 in (270- 400mm) (3)	02910-400-0562	ea.	1 Clab	260					$0.00	
Cactus Planting (4)		ea.	1 Clab						$0.00	
NOTES:										
(1) Seeding Source:	Source: Kelley Erosion Control (Projected from 2020 quote).									
(2) Shrub Source:										
(3) Tree Source:										
(4) Cactus Source:										

Building and Wall Demolition

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets

	Means Number	Unit	Crew	Daily Output	Daily Output User	Labor	Equipment	Premium	Total	Notes
Building Demolition										
Lg. steel	02220-110-0012	C.F.	B-8	21500		$0.15	$0.12		$0.27	
Lg. concrete	02220-110-0050	C.F.	B-8	15300		$0.22	$0.16		$0.38	
Lg. masonry	02220-110-0080	C.F.	B-8	20100		$0.17	$0.12		$0.29	
Lg. mixed	02220-110-0100	C.F.	B-8	20100		$0.17	$0.12		$0.29	
Sm. steel	02220-110-0500	C.F.	B-3	14800		$0.19	$0.12		$0.31	
Sm. concrete	02220-110-0600	C.F.	B-3	11300		$0.24	$0.16		$0.40	
Sm. masonry	02220-110-0650	C.F.	B-3	14800		$0.19	$0.12		$0.31	
Sm. wood	02220-110-0700	C.F.	B-3	14800		$0.19	$0.12		$0.31	
Wall Demolition										
Block 4 in (100 mm) thick	02220-130-2000	S.F.	1 Clab	180		$2.12	$0.00	20%	$2.54	
Block 6 in (150 mm) thick	02220-130-2040	S.F.	1 Clab	170		$2.24	$0.00	20%	$2.69	
Block 8 in (200 mm) thick	02220-130-2080	S.F.	1 Clab	150		$2.54	$0.00	20%	$3.05	
Block 12 in (300 mm) thick	02220-130-2100	S.F.	1 Clab	150		$2.54	$0.00	20%	$3.05	
Conc 6 in (150 mm) thick	02220-130-2400	S.F.	B-9	160		$17.60	$1.92	10%	$21.47	
Conc 8 in (200 mm) thick	02220-130-2420	S.F.	B-9	140		$20.11	$2.19	10%	$24.53	
Conc 10 in (250 mm) thick	02220-130-2440	S.F.	B-9	120		$23.46	$2.56	10%	$28.62	
Conc 12 in (300 mm) thick	02220-130-2500	S.F.	B-9	100		$28.16	$3.07	10%	$34.35	

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Cost Estimate Type: Surety Cost Basis: Northern Nevada

Waste Disposal

Unit rates from Means Heavy Construction 2006 Edition by permission of R.S.Means/Reed Construction Data .

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment		Total	Notes
Rubbish Handling										
Dumpster delivery (average for all sizes)	02220-350-0910	ea.			$49.00				$49.00	
Haul (average for all sizes)	02220-350-0920	ea.			$153.00				$153.00	
Rent per month (average for all sizes)	02220-350-0940	ea.			$52.00				$52.00	
Disposal fee per ton (tonne) (average for all sizes)	02220-350-0950	ton			$57.50				$57.50	
NOTES:										
Dumpster Cost Source	R.S. Means Heavy Construction (2021 Q2).									
Dumpster Disposal Fee Source:	R.S. Means Heavy Construction (2021 Q2).									
Hazardous Material Handling - Solids (+ Liquids in drums)										
Pickup fees 55 gal (200 L). drums	02110-300-1100	ea.			$249.00				$249.00	
Bulk material (average)	02110-300-1220/1230	ton			$406.00				$406.00	
Transport - truck load (80 drums, 25 cy (m3), 18 tons)	02110-300-1260/1270	mile			$5.84				$5.84	
Dump site solid disposal fee	02110-300-6000/6020	ton			$285.00				$285.00	
NOTES:										
Solid Handling Cost Source	R.S. Means Heavy Construction (2021 Q2).									
Solid Disposal Fee Source:	2021 Q2 R.S. Means Heavy Const. ave. 02 81									
Hazardous Material Handling - Liquids										
Vacuum Truck Pickup (2200 gal/8300 L)	02110-300-3110	hr.			$145.00				$145.00	
Vacuum Truck Pickup (5000 gal/19000 L)	02110-300-3120	hr.			$211.00				$211.00	
Dump site liquid disposal fee	02110-300-6000/6020	ton			$285.00				$285.00	
NOTES:										
Liquid Handling Cost Source	R.S. Means Heavy Construction (2021 Q2).									
Liquid Disposal Fee Source:	2021 Q2 R.S. Means Heavy Const. ave. 02 81									
Hydrocarbon Contaminated Soils (HCS)										
Insitu Biotreatment	02115-200-2020/2021	C.Y.			$16.14				$16.14	
HCS disposal fee	02115-200-2050/2055	C.Y.			$278.00				$278.00	
NOTES:										
Insitu Treatement Cost Source	2021 Q2 R.S. Means Heavy Const., ave. 02 65									
HCS Disposal Fee Source:	2021 Q2 R.S. Means Heavy Const., ave. 02 65									

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Concrete Structure Installation

Weekly dumpster rental rates from Means Heavy Construction 2005 Edition with permission by R.S.Means/Reed Construction Data .
Weekly dumpster rental rates include haul to off-site disposal site and disposal fees

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Reinforced Concrete Bulkheads and Shaft Covers										
Grade walls - 15 in (400mm) thick, 8 ft (2.5m) high	03310-240-4300	C.Y.	C-14D	80.02	$157.00	$145.01	$10.74		$312.75	includes reinforcing
Grade walls - 15 in (400mm) thick, 12 ft (3.7m) high	03310-240-4350	C.Y.	C-14D	26.2	$157.00	$442.88	$32.79		$632.67	includes reinforcing
Elevated conc, 1-way beam & slab - 15ft (4.6m) span	03310-240-2700	C.Y.	C-14B	20.59	$310.00	$573.99	$41.73		$925.72	includes reinforcing
Elevated conc, 1-way beam & slab - 25ft (7.5m) span	03310-240-2750	C.Y.	C-14B	28.36	$287.00	$416.73	$30.30		$734.03	includes reinforcing
Bat Gate/Foam Plug Installation										
Bat Gate (5)		ea.			$3,333.80					materials $/ea. Installed
Culvert Gate (5)		ea.			$6,667.61					materials $/ea. Installed
Adit Foam Plug (6)		ea./C.Y.			$333.38					materials $/cy placed
Production Opening Foam Plug (6)		ea./C.Y.			$333.38					materials $/cy placed

NOTES:
(5) Bat Gate Source: NV BLM, 2/2006: 8 hr + 1hr mob/demob + 1hr setup per gate (adjusted to 2021)
(6) Foam Plug Source: NV BLM, 2/2006: 8 hr+ 1hr mob/demob + 1hr setup per adit; 16 hrs per production opening (adjusted to 2021)

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Misc. Linear Projects

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
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	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Fencing Installation										
Barbed 3-strand	02820-170-1650	L.F.	B-80A	760	$0.54	$1.51	$0.31		$2.36	
Barbed 4-strand	extrapolated	L.F.	B-80A	570	$0.72	$2.01	$0.41		$3.14	
Barbed 5-strand	02820-130-0920	L.F.	B-80A	456	$0.90	$2.51	$0.51		$3.92	
Chain link 8-10ft (2.5-3m) Install	02820-130-0920	L.F.	B-80C	180	$43.50	$6.36	$1.30		$51.16	
Wood stockade fence 6 ft (2 m) high - Install	02820-510-1240	L.F.	B-80C	150	$17.15	$7.63	$1.56		$26.34	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
Fencing Removal										
Barbed 3-strand Removal	02220-220-1600	L.F.	2 Clab	430		$1.77	$0.54		$2.31	
Barbed 4-strand Removal	extrapolated	L.F.	2 Clab	355		$2.15	$0.66		$2.81	
Barbed 5-strand Removal	02220-220-1650	L.F.	2 Clab	280		$2.73	$0.84		$3.57	
Chain link 8-10 ft (2.5-3 m) Removal	02220-220-1700	L.F.	B-6	445		$2.99	$0.91		$3.90	
Wood, all types 4-6 ft ("1.5-2 m) high - Removal	02220-220-1775	L.F.	2 Clab	430		$1.77	$0.54		$2.31	
	user	L.F.								
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
Culvert Removal										
12 in (300 mm) Diameter	02220-220-2900	L.F.	B-6	175		$7.60	$2.32		$9.92	
18 in (450 mm) Diameter	02220-220-2930	L.F.	B-6	150		$8.86	$2.70		$11.56	
24 in (600 mm) Diameter	02220-220-2960	L.F.	B-6	120		$11.08	$3.38		$14.46	
36 in (1m) Diameter	02220-220-3000	L.F.	B-6	90		$14.77	$4.51		$19.28	
Pipeline Removal										
0.75 in (20mm) - 4 in (100 mm) diameter	02220-381-1600	L.F.	B-20	700		$2.16	$0.33		$2.49	
6 in (150 mm) - 8 in (200 mm)	02220-381-1700	L.F.	B-20	500		$3.02	$0.47		$3.49	
10 in (250 mm) - 18 in (450 mm)	02220-381-1800	L.F.	B-20	300		$5.04	$0.78		$5.82	
20 in (500 mm) - 36 in (1 m)	02220-381-1900	L.F.	B-20	200		$7.56	$1.17		$8.73	
Pipe and Drainpipe Installation										
Water 4in (100mm) 40ft (12m) length, welded HDPE	02510-760-0100	L.F.	B-22A	400	$3.01	$5.73	$4.69		$13.43	
Water 6in (150mm) 40ft (12m) length, welded HDPE	02510-760-0200	L.F.	B-22A	380	$5.25	$6.03	$4.94		$16.22	
Water 12in (300mm) 40ft (12m) length, welded HDPE	02510-760-0500	L.F.	B-22A	260		$8.81	$7.22		$16.03	
Drain 4in (100mm) perforated PVC	02620-630-2100	L.F.	B-14	315	$2.08	$9.03	$1.55		$12.66	
Drain 6in (150mm) perforated PVC	02620-630-2110	L.F.	B-14	300	$4.00	$9.48	$1.62		$15.10	
Drain 4in (100mm) corrugated, perf or plain	02620-660-0040	L.F.	2 Clab	1200	$0.76	$0.64	$0.20		$1.60	
Drain 6in (150mm) corrugated., perf or plain	02620-660-0060	L.F.	2 Clab	900	$1.71	$0.85	$0.26		$2.82	

Closure Cost Estimate
Misc. Unit Costs

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Drain Rock Preparation										
Crushing		C.Y.							$0.50	
Screening		C.Y.							$0.50	
TOTAL									$1.00	
Misc.										
Backhoe work	02210-700-0120	C.Y.	B-11M	28		$20.53	$9.02		$29.55	
Powerline and Transformer Removal										
Single Pole		mile							$46,333.89	
Double Pole		mile							$52,953.02	
Transformer (9)		ea.							$58,405.11	
NOTES:										
(7) Single Pole Source:	NV Energy estimate (2009) Adjusted to 2021									
(8) Double Pole Source:	NV Energy estimate (2009) Adjusted to 2021									
(9) Transformer Source:	NV Energy estimate (2018) adjusted to 2021									

Erosion and Sedimentation Control

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
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	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Rip-Rap & Rock Lining										
Rip-Rap 3/8 to 1/4 CY (m3) pieces, grouted	02370-450-0110	S.Y.	B-13	80	$24.00	$35.55	$8.43		$67.98	assumes on-site source of rip-rap
Rip-Rap 18 in (450 mm) min thick, no grout	02370-450-0200	S.Y.	B-13	53	$7.00	$53.67	$12.72		$73.39	assumes on-site source of rip-rap
Gabions, 6 in (150 mm) deep	02370-450-0400	S.Y.	B-13	200	$6.15	$14.22	$3.37		$23.74	assumes on-site source rock fill for gabions
Gabions, 9 in (250 mm) deep	02370-450-0500	S.Y.	B-13	163	$9.20	$17.45	$4.14		$30.79	assumes on-site source rock fill for gabions
Gabions, 12 in (300 mm) deep	02370-450-0200	S.Y.	B-13	153	$12.55	$18.59	$4.41		$35.55	assumes on-site source rock fill for gabions
Gabions, 18 in (450 mm) deep	02370-450-0200	S.Y.	B-13	102	$15.90	$27.89	$6.61		$50.40	assumes on-site source rock fill for gabions
Gabions, 36 in (1m) deep	02370-450-0200	S.Y.	B-13	60	$26.00	$47.41	$11.24		$84.65	assumes on-site source rock fill for gabions
HDEP Liner Installation										
Finish grading large area	2310-100-0100	S.F.	B-11L	18000		$0.05	$0.06		$0.11	
Compaction-riding, vibrating roller - 12in (300mm) lifts	2315-310-5100	C.Y.	B-10Y	2600		$0.36	$0.18		$0.54	
60 mil HDPE	2660-610-0010	S.F.	3 Skwk	1600	$0.44	$1.08	$0.45		$1.97	
80 mil HDPE	user	S.F.	3 Skwk	149		$11.64	$4.85		$16.49	
40 mil VLDPE	user	S.F.	3 Skwk	150		$11.56	$4.82		$16.38	
	user	S.F.	3 Skwk	149		$11.64	$4.85		$16.49	
	user	S.F.	3 Skwk	149		$11.64	$4.85		$16.49	

Construction Management Support

Office Trailer, Furnished, no hook-ups	0150-500-0250	mo.			$199.00				$199.00	
Toilet Portable, chemical	1590-400-6410	mo.			$217.20				$217.20	
TOTAL					$416.20				$416.20	

Pump and Casing Removal

Pump Type	Measurement	Unit				Labor	Equipment		Total	Notes
Pump Removal										
Submersible	ft to pump	L.F.				$9.72	$22.82		$32.54	
Line Shaft	ft to pump	L.F.				$9.72	$22.82		$32.54	
NOTES:										
(10) Pump Removal Source:	Boart Longyear Quote: 2021									

Closure Cost Estimate
User 1

Project Name: CHMRP Surface Reclamation Cost Estimate - Reclamation Plan
Date of Submittal: May 2022
File Name: Surface Reclamation_SRCE_Version_1_4_1_017_NV_2021_Costs.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_Data_File_1_12_Std_2021.xlsm
Cost Estimate Type: Surety Cost Basis: Northern Nevada

2021 MOB/DEMOB using R.S. MEANS and SRCE equipment and DAVIS-BACON wages

blue font is for project specific user input

Miles from Washoe County Courthouse to project, one way: 25
Miles from equipment rental yard to project, one way (3): 53
Cunningham Hill Surface Reclamation — Hours travel time @ 55 MPH: 0.96

Equipment	Mobilization $/hour (1)	$ Flat Rate load & unload (2)	$/hour Deadhead (empty return cost (3)	Disassembly and assembly (4)	Permit cost $ (5)	Pilot car costs	# of units	One Way Mob Cost	Total Mob and Demob Cost
Bulldozers									
D6R	$ 100	$ 100	$ 100	$ -	$ -	$ -		$ -	$ -
D7R	$ 130	$ 130	$ 130	$ -	$ 25	$ 98	4	$ 2,011	$ 4,022
D8R	$ 152	$ 152	$ 152	$ -	$ 25	$ 196		$ -	$ -
D9R	$ 152	$ 152	$ 152	$ -	$ 25	$ 196		$ -	$ -
D10R	$ 152	$ 152	$ 152	$ 67,200	$ 25	$ 294	1	$ 67,965	$ 68,729
D11R (two transports) (7)	$ 152	$ 152	$ 152	$ 139,200	$ 25	$ 196		$ -	$ -
Motor Graders									
14G/H	$ 100	$ 100	$ 100	$ -	$ -	$ -		$ -	$ -
16G/H	$ 130	$ 130	$ 130	$ -	$ 25	$ 98	1	$ 503	$ 1,006
Track Excavators									
320C	$ 130	$ 130	$ 130	$ -	$ -	$ -		$ -	$ -
325C	$ 130	$ 130	$ 130	$ -	$ -	$ -		$ -	$ -
345B	$ 152	$ 152	$ 152	$ -	$ 25	$ 196	1	$ 667	$ 1,333
385BL	$ 152	$ 152	$ 152	$ 49,200	$ 25	$ 196		$ -	$ -
Scrapers									
631G	$ 152	$ 152	$ 152	$ -	$ 25	$ 196	4	$ 2,666	$ 5,333
637G PP	$ 152	$ 152	$ 152	$ -	$ 25	$ 196		$ -	$ -
Wheeled Loaders									
928G	$ 100	$ 100	$ 100	$ -	$ -	$ -		$ -	$ -
966G	$ 100	$ 100	$ 100	$ -	$ -	$ -	4	$ 1,168	$ 2,336
972G	$ 130	$ 130	$ 130	$ -	$ -	$ -		$ -	$ -
988G	$ 130	$ 130	$ 130	$ -	$ 25	$ 98		$ -	$ -
992G (two transports) (7)	$ 152	$ 152	$ 152	$ 78,000	$ 25	$ 196		$ -	$ -
Hydraulic Hammers									
H-120 (fits 325) no charge, mobilize with mach	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -
H-160 (fits 345) no charge, mobilize with mach	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -
H-180 (fits 365/385) no charge, mobilize with n	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -
Other Equipment									
420D 4WD Backhoe	$ 100	$ 100	$ 100	$ -	$ -	$ -		$ -	$ -
CS563E Vibratory Roller	$ 100	$ 100	$ 100	$ -	$ -	$ -		$ -	$ -
Light Truck - 1.5 Ton	$ 74	$ 74	$ -	$ -	$ -	$ -		$ -	$ -
Supervisor's Truck	$ 72	$ 72	$ -	$ -	$ -	$ -		$ -	$ -
Air Compressor + tools	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
Welding Equipment	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
Heavy Duty Drill Rig	$ 268	$ 268	$ -	$ -	$ -	$ -		$ -	$ -
Pump (plugging) Drill Rig	$ 268	$ 268	$ -	$ -	$ -	$ -		$ -	$ -
Concrete Pump	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
Gas Engine Vibrator	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
Generator 5KW	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
HDEP Welder (pipe or liner)	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
5 Ton Crane Truck	$ 123	$ 123	$ -	$ -	$ -	$ -		$ -	$ -
25 Ton Crane	$ 146	$ 146	$ -	$ -	$ -	$ -		$ -	$ -
Trucks									
725	$ 100	$ 100	$ 100	$ -	$ -	$ -	4	$ 1,168	$ 2,336
740	$ 130	$ 130	$ 130	$ -	$ 25	$ 98		$ -	$ -
769D	$ 130	$ 130	$ 130	$ -	$ 25	$ 196		$ -	$ -
777D (two transports) (8)	$ 162	$ 162	$ 162	$ 74,400	$ 25	$ 294		$ -	$ -
613E (5,000 gal) Water Wagon	$ 152	$ 152	$ 152	$ -	$ -	$ -		$ -	$ -
621E (8,000 gal) Water Wagon	$ 152	$ 152	$ 152	$ -	$ 25	$ 196		$ -	$ -
Dump Truck (10-12 yd^3)	$ 112	$ 112	$ 112	$ -	$ -	$ -		$ -	$ -
Miscellaneous									
Equipment for dry hole abandonment (420D 4W	$ 100	$ 100	$ 100	$ -	$ -	$ -		$ -	$ -
Pilot car (Light Truck)	$ 73	$ 73	$ 73	$ -	$ -	$ -		$ -	$ -
Truck Tractor + Lowbed Trailer 75 ton	$ 152	$ 152	$ 152	$ -	$ -	$ -		$ -	$ -
Truck Tractor + Flatbed Trailer 40 ton	$ 130	$ 130	$ 130	$ -	$ -	$ -		$ -	$ -
Light Truck + Flatbed Trailer 25 ton	$ 83	$ 83	$ 83	$ -	$ -	$ -		$ -	$ -
							19		$ 85,094

Footnotes and explanations of assumptions

(1) The sum of the cost of equipment from either the SRCE or RSM equipment tab plus Davis-Bacon labor tab
(2) Assumes minimum of 30 minutes load and secure and 30 minutes unsecure and unload machine.
(3) No "Deadhead" (empty) charge for Mob up to 50 miles. More than 50 miles the cost of deadhead same rate as loaded miles.
(4) Only large equipment requires disassembly for transport. Includes cost of mechanic + mechanic's truck + crane operator + crane.
(5) Nevada Dept. of Transportation overdimensional permits are $25 per trip or $60 per year.
(6) Sum of mobilization plus all ancillary costs for one way loaded and return empty.
(7) Two transports are required but the second transport does not need pilot cars or permits or a heavy duty trailer.
(8) Two transports required with both requiring full complement of pilot cars and permits.
(9) For large mining operations, mobilization may be required from more than one location. For example, the Elko yard may not have four 631 scrapers. Additional equipment may need to mobilize from Reno, Las Vegas, or Salt Lake City. Input the further distance here.
(10) Pilot Car costs based on SRCE light truck costs and Davis-Bacon wages
(11) SRCE costs based on July 2021 vendor quotes.
(12) RS Means costs based on R.S. Means Heavy Construction Cost Data, 2021 Q2
(13) Davis Bacon wages based on 2021 determination.