Promoting Healthy Communities by Protecting Our Environment Since 1998

August 31, 2020

Jerry Schoeppner, Director
Mining and Minerals Division
New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

Via e-mail: EMNRD.MMD2@state.nm.us

RE: Tyrone Closure/Closeout Plan Permit Revision 9-1, Tyrone Permit No. GR010RE

Dear Mr. Schoeppner:

On behalf of the Gila Resources Information Project (GRIP), I am submitting as part of the public comment period that ends today the following comments on the Tyrone Closure/Closeout Plan (CCP) Permit Revision 9-1, Tyrone Permit No. GR010RE.

<u>August 5, 2020 Virtual Public Meeting</u>

First, we would like to provide our input on the August 5 virtual public meeting held via Webex. GRIP is very disappointed with how Freeport-McMoRan took advantage of the public meeting approach and devoted more than its fair share of the two-hour virtual meeting to respond to points included in our presentation rather than to a sincere effort to educate the public on how it plans to reclaim the Tyrone mine.

Instead, Tyrone staff gave a cursory review of the Tyrone CCP and did not provide to the broader community and the residents who live adjacent to the mine much explanation about how Freeport plans to clean up and reclaim the Tyrone mine and protect ground and surface water quality, air quality, and wildlife at closure. Unfortunately, Tyrone demonstrated its disregard for the intent of the public meeting and for furthering public understanding of its operations.

Because Freeport's presentation went on for 45 minutes, GRIP's technical consultant Jim Kuipers had 15 minutes or so to race through his presentation before the conclusion of the meeting. By that time, attendees were dropping off the Webex, and there was no time for the public to ask questions.

Given the way in which the public meeting transpired, GRIP is unlikely to agree to a public meeting again and will instead continue to request a formal public hearing so that GRIP and the public at large are ensured sufficient time to provide input.

Tyrone Closure/Closeout Plan Technical Comments

In addition to his PowerPoint presentation (attached), GRIP's technical consultant, Jim Kuipers, prepared follow-up comments on the Tyrone CCP following the August 5 public meeting. They are attached to this cover letter along with some additional resources for MMD's consideration.

Tyrone Closure/Closeout Plan Financial Assurance

In addition to Mr. Kuipers' comments related to financial assurance, I would like to remind MMD of GRIP's continued concern with the use of collateral as financial assurance for Tyrone.

Acceptance of ranch properties as Tyrone Mine financial assurance is questionable. Although the Mining Act allows collateral to be used as a form of financial assurance, there are problems with ensuring the value of any form of collateral other than cash or equivalents.

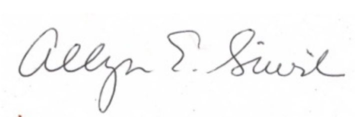
- In particular, real estate is vulnerable to changes in value and could be subject to lien.
- Freeport ranch properties represent 30% of the deeded land in Hidalgo County and 7.5% of the deeded land in Grant County. If the state had to liquidate ranch properties in the event of a Freeport default, putting that much land on the market at once would flood the market and depress prices.
- It is also unclear if collateral would be protected from bankruptcy court should Freeport default, calling into question whether or not the State of New Mexico would have access to the capital in the form of collateral.

GRIP requests access to the latest appraisals for ranch properties to be used for collateral once they are available. Digital files are preferable.

Finally, we reserve the right to request a public hearing under the Mining Act regulations NMAC 19.10.9.904E if any new information comes to light related to the financial assurance proposal, given that the form(s) of the financial assurance are not yet publicly available.

Thank you for your consideration of our input.

Sincerely,



Allyson Siwik
Executive Director

Cc: Jim Kuipers, Kuipers and Associates
Holland Shepherd, EMNRD/MMD
David Ohori, EMNRD/MMD
Kurt Vollbrecht, NMED/MECS
Keith Ehlert, NMED/MECS

GRIP Remarks
Tyrone CCP Public Meeting
August 5, 2020

I'm Allyson Siwik, Executive Director of Gila Resources Information Project, also referred to as GRIP.

Thank you to everyone for joining us tonight for this public meeting on the Tyrone Mine Reclamation Plan. Thank you to the Mining and Minerals Division for putting this online meeting together and for inviting us to participate as panelists

For those of you who aren't familiar with our organization, GRIP was founded in 1998 and we've worked on mining issues for more than 20 years.

Our mission is to promote community health by protecting our environment and natural resources in southwestern New Mexico. GRIP's role has been to facilitate informed public participation in natural resource use decisions that will have profound and long-lasting impacts on the region's environmental and economic health.

For more than 20 years, we have worked to ensure that copper mining is done responsibly in Grant County. Although we recognize the economic importance of Freeport-McMoRan to local families and businesses, to Grant County and the state, as well as the significance of copper production to renewable energy development, we don't think that company profits should come at the expense of healthy communities and environmental quality.

GRIP is a new member of the internationally-recognized Initiative for Responsible Mining Assurance, or IRMA for short. IRMA's Standard for Responsible Mining defines good practices for what responsible mining should look like at the industrial-scale. It provides the list of expectations that independent auditors use as the benchmark for responsible mines. Our input on the reclamation plan, permits and financial assurance to regulatory agencies and Freeport has been consistent with IRMA's responsible mining standards. Jim Kuipers will talk more about this in his presentation.

With the update to the Tyrone reclamation permit and financial assurance more than a decade out of date, we are pleased that this permit revision is finally moving forward. The updated CCP and permit are critical to protecting our water, land, air and wildlife and ensuring a healthy community when the Tyrone mine closes at some point in the future.

GRIP, Freeport, the Mining and Minerals Division and NM Environment Department have been meeting quarterly for the past 2 years to work through comments on the updates to the reclamation plans for all three mine sites - Chino, Cobre, and the Tyrone mine – the reclamation cost estimates and financial assurance, and permitting. As was mentioned, Jim Kuipers representing GRIP has participated with Freeport and state agencies to reach consensus on the reclamation cost estimation methodology. We're pleased that differences have been resolved which is needed in order to get updated financial assurance in place.

As was mentioned by Mandy and David, I also want to call attention to the significant amount of reclamation work that the Tyrone folks completed under the discharge permit-27 settlement agreement between Freeport's predecessor, Phelps Dodge, state agencies and GRIP. This reclamation work will protect groundwater, air quality and wildlife and provided a significant number of reclamation jobs. It's important to note that these folks remained on the job working on reclamation projects at Tyrone and Chino during the shutdown due to the 2008 great recession.

Overall, we're looking forward to getting the reclamation plan approved. As David Ohori mentioned, GRIP has withdrawn its request for a hearing on the Tyrone reclamation plan. We have worked with Freeport and the agencies to get our issues addressed. We requested that we have a public meeting instead of a hearing to ensure that the public has an opportunity to learn about the reclamation plan, ask questions and make comments. We reserve our right to a hearing if any new information emerges especially with regard to the financial assurance proposal and instruments.

There is still work to be done in the next iteration of the reclamation plan and with that, I'd like to introduce GRIP's technical consultant Jim Kuipers of Kuipers and Associates who has been working with us since 1998. Jim will provide more detailed comments on behalf of our organization.

James Kuipers P.E.
Principal Consulting Engineer
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Kuipers & Associates, LLC

PO Box 145
Wisdom, MT 59761
406-689-3464

August 31, 2020

To: Allyson Siwik, Gila Resources Information Project (GRIP)

From: Jim Kuipers P.E., Kuipers & Associates

Re: **Response to FMI comments re MMD Tyrone CCP Public Meeting**

The following comments are provided in response to comments made by FMI during their presentation at the August 5th, 2020 New Mexico Mining and Minerals Division (MMD) Tyrone Closure/Closeout Plan (CCP) Public Meeting in response to my presentation. The comments address the three subjects identified by FMI in their rebuttal comments: Financial Assurance, Stormwater Design and Water Treatment Costs.

In addition to our comments we have also included references to the Initiative for Responsible Mining Assurance (IRMA) Standard for Responsible Mining (https://responsiblemining.net/about/). The IRMA Standard for Responsible Mining was developed through a collaborative process involving nongovernment organizations, businesses purchasing minerals and metals for resale in other products, affected communities, mining companies, and labor unions. IRMA's Standard for Responsible Mining defines good practices for what responsible mining should look like at the industrial-scale. It provides the list of expectations that are used as the benchmark for responsible mines.

Financial Assurance

FMI raised issues with respect to our recommendations for not allowing Third Party Guarantees and for using a period of greater than 100 years in the estimation of long-term monitoring, maintenance and water treatment operations costs.

It is clear that the regulatory trend in the U.S. and elsewhere for some time now has been in the direction of eliminating Third Party Guarantees (TPGs) as a form of financial assurance. During the past 25 years various states such as Colorado and Nevada have eliminated their provisions for TPGs, and they are no longer allowed by the BLM or Forest Service. Where states allow discretion to the regulator, in places like Montana, the regulators have made clear that TPGs are no longer acceptable. Even where they have been allowed, such as in NM and in the case of FMI, the operators have recognized the social desirability, if not fiscal necessity, of providing real financial assurance, and reduced the amount of the TPG and instead replaced it with forms of cash. Similarly, the use of ranch land as collateral for financial assurance should be eliminated and replaced with cash. All we are recommending is that FMI continue, as it has done in the past, to accrue additional cash by making reasonable future annual investments in the existing cash trust. This could potentially be tied to future production, done over a reasonable period of time, so as to eliminate the future public liability for their mines as the resources become exhausted.

Our recommendation for 500 years in the estimation of long-term monitoring, maintenance and water treatment operations costs is similarly based on trends elsewhere in the U.S. While it is true that EPA's RCRA and CERCLA programs utilize 30-yr long-term time periods, those regulations and approaches were essentially developed in the early 1980's, and at the time represented the only recognition of long-term costs anywhere in mine remedial cost estimation. Subsequently, beginning in 1992 at the Golden Sunlight Mine in Montana, long-term water treatment was first recognized as part of permitting a mine under modern regulations by both the BLM and Montana Department of Environmental Quality. The financial assurance estimate used 100-yrs to approximate the costs for long-term treatment which established a precedent that is followed by most state and federal regulatory agencies, including New Mexico.

However, beginning in approximately 2010, the BLM initiated the use of 500-yr duration for long-term costs for mines involving heap leach pads or tailings facilities, acid rock drainage, groundwater contamination, and miscellaneous access/site work related to those aspects (see Attachment A – BLM Basis and Round Mountain Mine example). We would particularly note that BLM has explained that the approach in part was developed to address Native American Tribes' specific concerns related to long-term costs from a cultural perspective. Given that there is no U.S. State with a more significant proportion of its residents being Indigenous people, this approach would be particularly appropriate from a cultural perspective. Additionally, as was noted in our presentation, the actual additional cost to FMI is not significant, would indicate FMI is willing to be responsible for future costs, and would help ensure against long-term public liability.

IRMA Chapter 2.6 Planning and Financing Reclamation and Closure addresses these subjects based on the objective to protect long-term environmental and social values, and ensure that the costs of site reclamation and closure are not borne by affected communities or the wider public. The chapter is based on various sources[1], and includes the following requirements:

2.6.4.2. Financial surety instruments for shall be:

a. Independently guaranteed, reliable, and readily liquid;

b. Reviewed by third-party analysts, using accepted accounting methods, at least every five years or when there is a significant change to the mine plan;

c. In place before ground disturbance begins; and

d. Sufficient to cover the reclamation and closure expenses for the period until the next financial surety review is completed.

2.6.4.3. Self-bonding or corporate guarantees shall not be used.

[1] E.g., ICMM. 2005. Financial Assurance for Mine Closure and Reclamation. https://www.icmm.com/website/publications/pdfs/mineclosure/282.pdf;
ICMM. 2006. Financial Assurance for Mine Closure and Reclamation: Guidance Paper. https://www.icmm.com/website/publications/pdfs/mine-closure/23.pdf;
Sassoon, M. 2009. Financial Surety: Guidelines for the Implementation of Financial Surety for Mine Closure. (World Bank Group's Oil, Gas, and Mining Policy Division). pp. 7, 9, 10 and 41. http://siteresources.worldbank.org/INTOGMC/Resources/7_eifd_financial_surety.pdf;
Kuipers, J. 2000. Hardrock Reclamation Bonding Practices in the Western United States. https://www.csp2.org/files/reports/Hardrock%20Bonding%20Report.pdf;
USDA. 2004. Training Guide for Reclamation Bond Estimation and Administration. https://www.fs.fed.us/geology/bond_guide_042004.pdf

2.6.7.4. Long-term Net Present Value (NPV) calculations utilized to estimate the value of any financial surety shall use conservative assumptions, including:

a. A real interest rate of 3% or less; unless the entity holding the financial surety can document that a higher long-term real interest rate can be achieved; and

b. NPV calculation will be carried out until the difference in the NPV between the last two years in the calculations is US $10.00 or less (or its equivalent in other currencies).

The use of the existing third party guarantees from FMI, which are the same as corporate guarantees, together with collateral, as it is not readily liquid, are contradictory to the IRMA Standard for Responsible Mining. Similarly, the NPV calculation term of 100 years does not result in the IRMA recommendation for $10 or less, whereas the 500-year approach we recommend more closely achieves this result.

Stormwater Design

FMI objected to our recommendation to FMI and MMD/NMED that 200-yr 24-hr design criteria maximum precipitation estimates be applied to stormwater in respect of and to attempt to address climate change considerations. In addition to our previous comments the following is offered in response to FMI's comments which suggested we do not have scientific evidence for our recommendations.

The general scientific consensus is that anthropogenically caused climate change is very likely to cause increases in frequency of hot extremes, heat waves and heavy precipitation, with greater potential for extra-tropical storm tracks, in New Mexico (Intergovernmental Panel on Climate Change (IPCC, 2007)[2]. This translates for the Chino-Tyrone-Cobre-Little Rock Mines in Grant County, NM into an increased likelihood of heavy and prolonged precipitation events. Further, as noted by the Union of Concerned Scientists (2016)[3]:

> "New Mexicans are accustomed to extreme rainfall, with much of the state's precipitation generally falling in July and August, associated with the North American monsoon system. However, climate projections across the United States suggest that even as total annual precipitation decreases in places like the Southwest, the heaviest annual rainfall events may become more intense (Walsh et al. 2014). When heavier precipitation falls on drought-hardened or wildfire-transformed soil, which has a reduced ability to absorb moisture, more of the water runs off into streams instead of percolating into the ground (Chief et al. 2008). This can lead to flash floods, as occurred in 2014, when 90 percent of New Mexico experienced extreme or exceptional drought (Crimmins et al. 2014). The monsoon rains, which arrived late that year, dropped an average of three to six inches of rain across the state over just five days in September, with some areas receiving more than 10 inches (NWS ABQ 2015). Albuquerque received nearly half of its expected annual rainfall in a single deluge (Albuquerque Journal 2013). As a result, river floods and crests were exceptional in downstream areas. Such extreme

[2] Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: Synthesis Report - Summary for Policy Makers.* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

[3] Union of Concerned Scientists (2016). *Confronting Climate Change in New Mexico: Action needed today to prepare the state for a hotter, drier future.* https://www.ucsusa.org/sites/default/files/attach/2016/04/Climate-Change-New-Mexico-fact-sheet.pdf

events are projected to become more common, forcing communities to prepare for both extreme droughts and extreme floods."

The suggestion by FMI that the data accounts for climate change or that there is no evidence of climate change in the NOAA data is facetious. As noted by NOAA (2011)[4] "Precipitation frequency studies make the implicit assumption that the past is prologue for the future, i.e. that climate is stationary." "The estimates presented in this Atlas make the necessary assumption that there is no effect of climate change in future years on precipitation frequency estimates. The estimates will need to be modified if that assumption proves quantifiably incorrect." Likewise, the suggestion that NOAA precipitation frequency estimates are current when they were last updated in 2011, and incorporate the potential for future climate change, is incorrect. Further, FMI's assertion that the climate data do not show a positive trend in precipitation based on an unidentified figure, is not supported by NOAA, with the Silver City NM area showing upward or no trend and no downward trends in the attached Figure A.3.1. from NOAA (2011).

However, we do not have to contend that there is or will be an upward or downward trend. Since it is not possible to quantify the future effects of climate change on flood flows with any confidence, an uplift of 10% to 20% is often applied to design storms or peak flows in response to this uncertainty (EGBC, 2018)[5]. If FMI and the NMED and MMD were to address this matter conservatively, as has been the case by more progressive mining companies in the U.S., they would adopt the use of a 200-yr 24-hr flood event as the stormwater design standard.

We recommend that MMD review the report released on August 1, 2019 by the American Geophysical Union that concluded: "*Extreme weather events are on the rise, but U.S. water management systems use outdated design guidelines. New research, published in the AGU journal Geophysical Research Letters, analyzed data from multiple regions throughout the U.S. and found the rising number of extreme storms combined with outdated building criteria could overwhelm hydrologic structures like stormwater systems.......... Though trends in rainfall extremes have not yet translated into observable increases in flood risks, these results nonetheless point to the need for prompt updating of hydrologic design standards, taking into consideration recent changes in extreme rainfall properties*."[6]

We also recommend FMI, MMD and ED consider the following additional information on climate change and stormwater design criteria:

Applying Climate Change Information to Hydrologic and Coastal Design of Transportation Infrastructure Design Practices PREPARED FOR THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM TRANSPORTATION RESEARCH BOARD
http://onlinepubs.trb.org/Onlinepubs/nchrp/docs/NCHRP1561_DesignProcedures.pdf

Estimating Projected Precipitation for Hydrologic Design with a Changing Climate
https://ascelibrary.org/doi/abs/10.1061/9780784482346.021

[4] NOAA 2011. NOAA Atlas 14 Volume 1 Version 5.0.
[5] Engineers and Geoscientists British Columbia (EGBC), 2018. *Legislated Flood Assessments in a Changing Climate in BC, Professional Practice Guidelines*. August 28. Version 2.1. British Columbia.
[6] https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019GL083235

Assessment of Changes in Flood Frequency Due to the Effects of Climate Change: Implications for Engineering Design *Hydrology* **2018**, *5*(1), 19. https://www.mdpi.com/2306-5338/5/1/19/htm

The authors explore the uncertainty implied in the estimation of changes in flood frequency due to climate change at the basins of the Cedar River and Skunk River in Iowa, United States. The study focuses on the influence of climate change on the 100-year flood, used broadly as a reference flow for civil engineering design. Downscaled rainfall projections between 1960–2099 were used as forcing into a hydrological model for producing discharge projections at locations intersecting vulnerable transportation infrastructure. The annual maxima of the discharge projections were used to conduct flood frequency analyses over the periods 1960–2009 and 1960–2099. The analysis of the period 1960–2009 is a good predictor of the observed flood values for return periods between 2 and 200 years in the studied basins. The findings show that projected flood values could increase significantly in both basins. Between 2009 and 2099, 100-year flood could increase between 47% and 52% in Cedar River, and between 25% and 34% in South Skunk River. The study supports a recommendation for assessing vulnerability of infrastructure to climate change, and implementation of better resiliency and hydraulic design practices. It is recommended that engineers update existing design standards to account for climate change by using the upper-limit confidence interval of the flood frequency analyses that are currently in place.

Public Tools Developed by US Army Corps of Engineers -- Climate-Impacted Hydrology https://www.usace.army.mil/corpsclimate/Public_Tools_Dev_by_USACE/Climate-Impacted_Hydrology/

It is important that the next iteration of the CCP include a precipitation analysis, frequency data on extreme precipitation events, and provide an evaluation of the reliability of infrastructure designs using more conservative design standards.

IRMA Chapter 4.1 Waste and Materials Management addresses these subjects based on the objective to manage wastes and materials in a manner that minimizes their short- and long-term physical and chemical risks, and protects the health and safety of communities and future land and water uses. The chapter includes the following requirements:

4.1.3.2. The operating company shall perform a detailed characterization for each mine waste facility that has associated chemical risks. Characterization shall include: a. A detailed description of the facility that includes geology, hydrogeology and hydrology, climate change projections, and all potential sources of mining impacted water (MIW);

Water Treatment Costs

FMI either misunderstood or mischaracterized our comments with respect to long-term water treatment costs. First, it should be noted that in the interest of completing the financial assurance estimates in a timely manner, we did not undertake to provide detailed comments on long-term water treatment costs, but instead asked for FMI (or their consultants) to explain their rationale for reducing the costs. As I recall the discussion that did take place, their explanation is that it was primarily based on reduced flow rates over time reducing power, chemical and other costs. I also recall we discussed it was a matter of identifying fixed costs (e.g. costs regardless of flow rates) versus variable costs (costs that could be influenced by reduced flow rates such as power or chemicals). I mentioned that while reductions could be justified in some cases, assumptions such as for reduced monitoring requirements had no basis in water quality predictions, and therefore should not be reduced until the need becomes actually evident over time. My recommendation is that the agencies further consider this matter related to the present CCP and Discharge Permit and ensure the approach for FMI is consistent with that of other sites such as the Copper Flat Project proposal where this matter has undergone additional regulatory scrutiny.

Attachments

LONG TERM CLOSURE COSTS

Regulatory Authority:
43 CFR 3809.552(c) – When BLM identifies a need for it, you must establish a trust fund or other funding mechanism to ensure the continuation of long-term treatment to achieve water quality standards and for other long-term post-mining maintenance requirements.

Time-Frame:
Perpetuity unless can demonstrate otherwise

Funding Mechanisms:
Long-Term Trust Funds (LTTF)

- 500 year period simulates perpetuity since Present Value (PV) approaches $0
- Smaller initial investment opposed to including in Reclamation Cost Estimate

Reclamation Cost Estimate (RCE)

- 500 year period simulates perpetuity
- Larger initial investment than LTTF since funds are all bonded up-front
- Example: $44M in RCE vs. $3M in LTTF @ 1.525% net growth rate (discount rate)

Examples of When Required:
Heap Leach Pad or Tailings Facility

- Evaporation Pond (E- Cell) – Inspection, Repair and Replacement
  - Sludge and substrate disposal, HDPE liners, distribution piping, backfill
  - 100 year replacement frequency
    - More often if TDS calculations justify
- Water Treatment – if Long-Term Draindown rates exceed E- Cell capacity (or not appropriate)
- Wildlife Fencing – Inspection, Repair and Replacement
  - 20 year replacement frequency
- Monitoring – Sampling, Testing, and Reporting

Acid Rock Drainage (ARD)

- Water treatment
- Monitoring - Sampling, Testing, and Reporting

Groundwater Contamination

- Pump-back well operating and maintenance
- Monitoring - Sampling, Testing, and Reporting

Miscellaneous Access/Site Work related to above

- Access road maintenance
- Erosion control
- Other – as identified through time

Options/Future Direction:
Source control – 43 CFR 3809.420(b)(11)(iii) – Long-term, or post mining, effluent capture and treatment are not acceptable substitutes for source and mitigation control, and you may rely on them only after all reasonable source and mitigation control methods have been employed.

ROCHESTER MINE
Pershing County, NV

Post-Closure Maintenance Plan
Plan of Operations Amendment No. 8

December 16, 2010

Rochester Mine
Post-Closure Maintenance Plan
Plan of Operations Amendment No. 8

INTRODUCTION

The Coeur Rochester Mine is located in the historic Rochester Mining District (Figure 1), which experienced several periods of mining beginning in the 1890's. At an elevation of approximately 6,500 feet, the Rochester Mine resumed operations in 1988 as an open-pit mine which utilizes heap leach technology to produce approximately 6.0 million ounces of silver and 60,000 ounces of gold per year. In summer 2007 open pit mine operations were suspended and residual heap leaching continued. In 2009 Coeur Rochester submitted a Plan of Operations Amendment Number 8 (POA #8) for resumption of mining in the Rochester Open pit and continued heap leach metal processing. The key aspects associated with the resumption of mining as proposed under POA 8 include further mining within the existing Rochester open pit, in-pit rock disposal including partial backfill to preclude formation of a long-term pit lake, and construction of a new heap leach facility (Stage III leach pad).

Following successful implementation of the Reclamation and Closure phases of the Rochester Mine, under POA #8 and release of the reclamation financial assurance (bond), the project would move into a long-term care and maintenance (post-closure) phase. This phase is envisioned to involve periodic site inspections, maintenance, and other activities to ensure site stability and post-mining land use function. These tasks are not addressed under the reclamation financial assurance and are the subject of this plan and creation of a long-term financial trust requested by the BLM under 43 CFR 3809.552c.

The Phase I and Phase II closure (Interim fluid management and active evaporation) activities are not expected to extend the reclamation schedule beyond the period of other reclamation activities; e.g. solution evaporation may overlap with the closure/water quality monitoring period, but is not expected to exceed it. Phase III closure will begin when the steady state heap drain-down can be managed within the evaporative cell(s).

Basis of Plan

The regulations at 43 CFR 3809.552(c) allow the US Bureau of Land Management (BLM) to require an operator to establish a trust fund or other funding mechanism available to the BLM to ensure the continuation of any long-term, post-mining treatment or maintenance requirements. The purpose of a trust fund or other long-term funding mechanism is to guarantee the continuation of post-reclamation treatment to achieve water quality objectives and for other long-term, post-mining maintenance requirements.

In determining whether a trust fund or other funding mechanism will be required, the district/field manager should consider the following factors:

- The anticipated post-reclamation obligations (PRO) as identified in the environmental document, record of decision, and/or approved Plan of Operations (POA #8, as amended to include this Plan);
- The reasonable degree of certainty that the obligations will occur based on accepted scientific evidence and/or models; and,
- The operator's financial responsibility for any of those obligations.

The primary intent of this Post-Closure Maintenance Plan (Plan) is to establish the specific activities associated with this post-closure phase for activities included in POA #8 (Figure 2) for the Rochester Mine which include:

- Stage III Heap Leach ~ 50 Million Tons, 132.9 acres lined area;
- Rochester Pit Backfill to 6175' elevation ~ 4.6 Million Cubic Yards, 31.4 acres flat area at base of the pit.
- Rochester Pit Buttress ~ 0.6 Million Cubic Yards, 6.3 total acres, 3.3 "flat" acres;
- Post closure Stage III evaporative ponds; and
- Other appropriate post closure (long-term) site inspections and/or monitoring.

PLAN DETAILS – POA#8

The following description details the activities identified as part of the Post-Closure Maintenance Plan (the Plan) discussed with BLM and NDEP in the outline meeting of February 3, 2010, a document prepared by NDEP titled "Items to Consider in Long-Term Contingency Fund" also published February 3, 2010, BLM guidance in technical meetings and a letter of October 22, 2009 which initiated this Plan, and BLM letter dated August 25, 2010. A summary description of the Plan components is presented in Table 1, and the activities are described in detail as follow:

Monitoring

During the post-closure period, water quality monitoring will consist of sampling, testing and reporting for an estimated seven sites associated with POA #8 (see Figures 2 and 3). These include:

- Two evaporative cell monitoring ports (at low and high ends of the main evaporative cell),
- One monitoring port at the contingency evaporative cell,
- Stage III leak detection system,
- One pit backfill monitoring well, and,
- Two groundwater wells located in the Black Ridge Fault.

The sampling will occur on a semi-annual basis (twice per year) between 2031-2051; then on an annual basis between 2051-2101; then on five-year intervals from 2101-2531. Samples will be analyzed for Profile I constituents.

Additional monitoring/inspection of site fences, culverts, etc. will be completed by a second technician at the same time the water quality monitoring events take place. This same technician will also monitor/inspect in-pit slope stability and slope stability of the Stage III heap site, as well as erosion and general site conditions.

Access/Site Work

Road and Non-closure Specific Repair and Maintenance

This work consists of maintaining and repairing the Stage III heap roads in good condition so that maintenance crews have safe access to the facility. The work involves using equipment such as a small motor grader, backhoe/loader and dump truck. This work is expected to last two days on a five-year interval, between 2036 – 2531. The work includes mobilization/demobilization.

Other repair and maintenance work includes erosion control of the facility (cleaning or replacing culverts, straw bale placement, etc.); diversion channel repair and cleanout (sediment removal, riprap replacement); and pit buttress maintenance. The work involves using a medium-sized excavator and dump truck for five days on a ten-year interval, between 2036 - 2531. The work includes mobilization/demobilization.

Work also consists of maintaining and repairing the Rochester pit haul road. This includes clearing rock fall and maintaining the access road control berms and other features. The work involves using equipment such as a small motor grader, backhoe/loader and dump truck. The work is scheduled for one day on a five-year interval between 2036 – 2531.

Stage III Draindown Management

Solution Management

This work consists of operating a small pump suitable for withdrawing solution stored in the pore space of the Stage III pond, conceptually a submersible pump inserted into one of the 4" monitoring ports of the pond. The pump would be approximately 2.5 hp, capable of delivering ~ 20 gallons per minute to one or several sprinklers on the near face of the Stage III heap, to contribute to evaporative loss and return solution to containment, restoring pore space for pond storage of solution.

A single skilled operator would rent a pump and small generator, roll out purchased 3" HDPE pipe, and install and operate temporary sprinklers annually or in response to on-site inspectors' noticing fluid level nearing capacity in the Stage III pond.

Stage III Pond Fencing

Repair and Replacement

This work consists of maintaining and repairing the chain-link fence surrounding the Stage III closure ponds. The work will require a single technician with pickup truck and hand tools. The work will be performed in response to monitoring observations, assuming a five-year interval between 2036 – 2531.

The entire chain link fence surrounding the Stage III closure pond will be replaced on 20-year intervals between 2051 – 2531.

Stage III Pond

The Stage III closure evaporative ponds will be designed as illustrated in Figures 3 and 4. The ponds will be rehabilitated periodically (every 100 years) to completely replace the pore storage capacity and solution distribution functionality of the shallow evaporative basins. The work includes temporary re-circulation of draindown solution to the heap during pond excavation and reconstruction. This work includes design, installation, generator power, equipment, and labor. This work is completed at the end of the summer when solution storage in the pond is minimized. The work is completed on 100 year intervals between 2041 – 2531. The 100-year interval was chosen due to the half-life (time to reach 50% degradation) of unexposed HDPE at 35°C is 111years (GRI White Paper #6, Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions, Robert M. Koerner, Y. Grace Hsuan and George R. Koerner, Geosynthetic Institute, June 7, 2005).

Specific labor, equipment, and materials required for each of the activities described below and summarized in Table 1 are part of the detailed cost estimate. Refer to the Cost Estimation section below for more information.

Table 1
Phase IV Plan Summary

Mine Category	Activity	Detailed Description	Schedule
Stage III Process Fluid Stabilization (PFS) – Phase IV	Monitoring	Water quality monitoring: sampling, testing and reporting for estimated 7 sites associated with POA#8. I (3 wells plus monitoring ports at low and high ends of main Evaporative Cell, plus 1 port at the proposed contingency Evaporative Cell (See Figure 3), plus 1 pit backfill monitoring well (See Figure 2) + check leak detection.	Semiannual: 2031-2051 Annual: 2051-2101 5-year intervals: 2101-2531
		Fence, culvert etc. inspection by second technician during water quality events (see above)	Same
		Slope stability in-pit & Stage III, erosion, general site condition inspection by second technician during water quality events (see above)	Same
Access/Site Work	Road and non-closure specific repair and maintenance	Stage III access repair: small motor grader, backhoe/loader and dump truck: 2 days on-site. Mobilization/demobilization.	5-year intervals: 2036-2531
		Erosion control, diversion channel repair and pit buttress maintenance: medium excavator and dump truck for 5 days on-site. Mob/demob.	10-year intervals: 2036-2531
		Rochester pit haul road: clearing rockfall and maintenance of access control berms and other features: same fleet as Stage III access repair: 1 day on-site.	5-year intervals: 2036-2531

Table 1 (continued)
Plan Summary

Mine Category	Activity	Detailed Description	Schedule
Stage III Solution Management	Installation & operation	Purchase ~ 2100 lf of 3" SDR 7.3 HDPE pipe or equivalent.	Single Event: 2031
		Mobilize small pump and generator, roll out pipe, and install and operate sprinklers	Annually: 2031-2040
Stage III Pond fencing	Repair and replacement	Repair damaged fence: single technician with pickup truck and hand tools; response to monitoring observations.	5-year intervals: 2036-2531
		Replace entire 8' chain link deer fence	20-year intervals 2051-2531
Stage III Evaporative Pond	Rehabilitation	Temporary recirculation sump & pump design, import, installation, generator power, & operation by 1 technician occupied 1 day/week average for duration of rehab (pump runs continuously). Recirculate draindown for duration of rehab: assumes end-of-summer work and minimal pond storage.	100-year intervals 2041-2531
		Complete excavation and replacement of Evaporative ponds, solution distribution, leak detection systems, etc.	
		Install double 60-mil HDPE liner with leak detection – contractor at standard cost/sf rates. Replace engineered fill.	
		Reseed Stage III disturbance from excavated material disposal.	

SCHEDULE

A conceptual closure/post-closure schedule for the Stage III leach pad under POA #8 is presented in Table 2 below. Under POA 8 mining operations will extend approximately 6 years or through 2016-2017. Residual heap leaching would continue for an estimated 2-3 additional years (2019) after which final reclamation activities would commence on the Stage III leach pad. Final reclamation on other project components would begin as each area becomes inactive.

The active reclamation phase (covered by the Reclamation Bond) would occur over an estimated 4-5 year period to reduce residual process solution inventory from the Stage III leach pad through approximately 2023 - 2024. Subsequently the event ponds constructed as part of operations of Stage III would be converted to evaporative ponds in year 2025, and solution management duties (covered by the Reclamation Bond) would proceed until 2030. Most remaining reclamation and closure activities to bring the mine to near its post-reclamation state are scheduled for 2025. These activities would include removal of inactive structures, abandoned pipelines, placement of soil covers and final reclamation (seeding) of the leach pads, remaining roads, parking areas and other miscellaneous disturbance.

Table 2. Stage III Closure/Post Closure Schedule POA #8

Stage III Process Fluid Stabilization	Conceptual Schedule
Phase I – Recirculation and Active Evaporation	2017-2019
Phase II – Active Evaporation	2020-2024
Phase III – Evaporative Cell Construction	2025
Closure Monitoring	2025-2030
Phase IV – Passive Evaporation	2031-indefinite

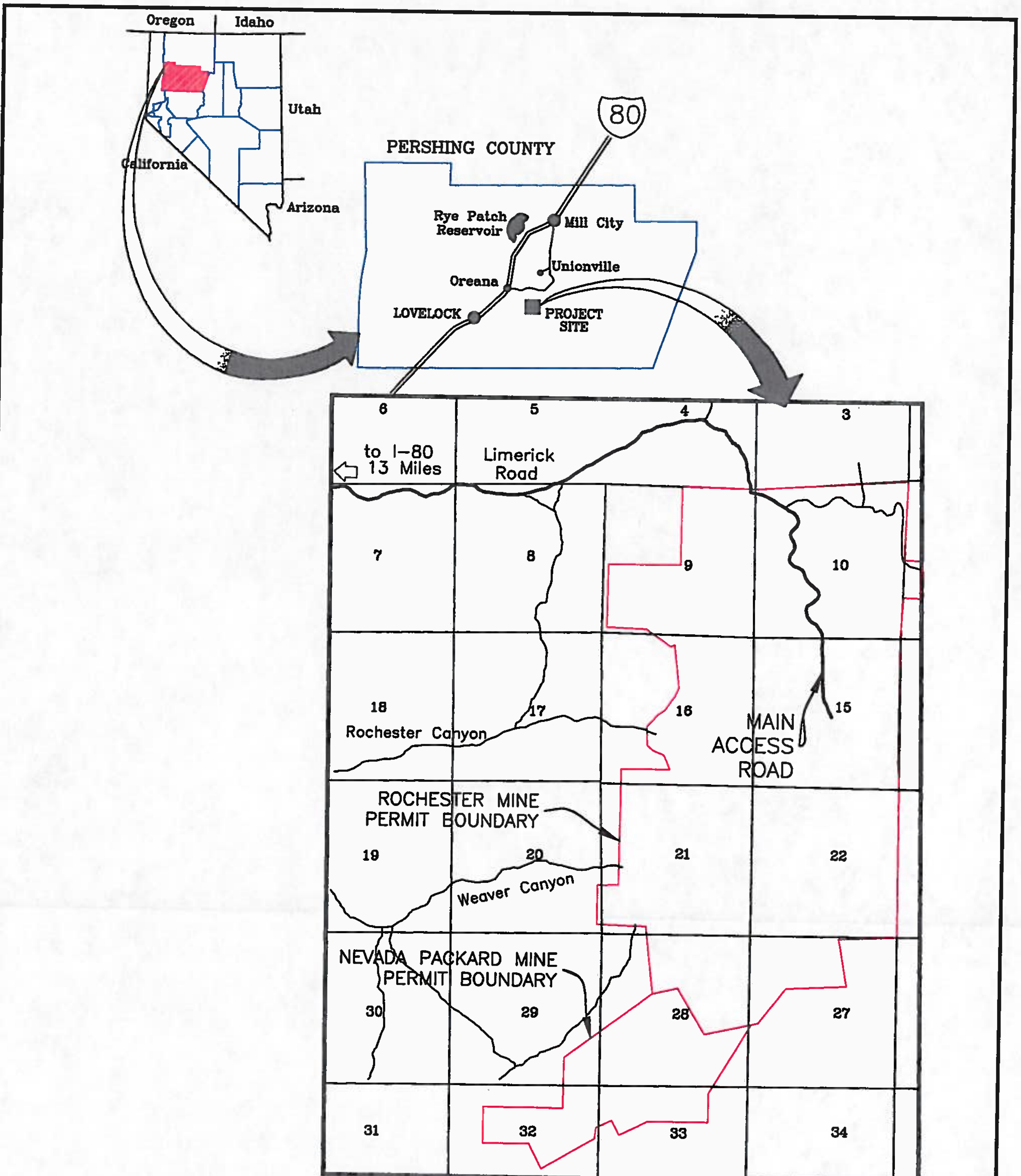
After reclamation is complete, the post-reclamation monitoring would begin (also covered by the Reclamation Bond). This monitoring period is assumed to be four years for revegetation & earthwork stability, and six years for ground- and surface-water monitoring, testing & reporting. This post-reclamation monitoring phase would then end around 2031 with removal of the production and select monitoring wells and the site transition into the long-term care and maintenance phase.

The schedule of activities in this Plan, except for regular monitoring, anticipates 20-year or longer periods between events.

COST ESTIMATION

The Phase I – Phase III reclamation and post-reclamation monitoring phases summarized above are included in the reclamation plan and financial assurance (Bond) and not included in this plan and its estimated costs.

Costs for the post-closure maintenance and monitoring activities have been calculated using the Standardized Reclamation Cost Estimator (SRCE) model version 1.1.2 (unit costs updated August 2010) approved in the State of Nevada, where possible, and in accordance with engineering and industry standards where additional data and calculation methods are necessary. The NPV was calculated following BLM guidance, and the cost details are presented in Attachment A.



A portion of T. 28 N., R. 34 E., M.D.M.

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(775) 273-7995

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NOT TO SCALE

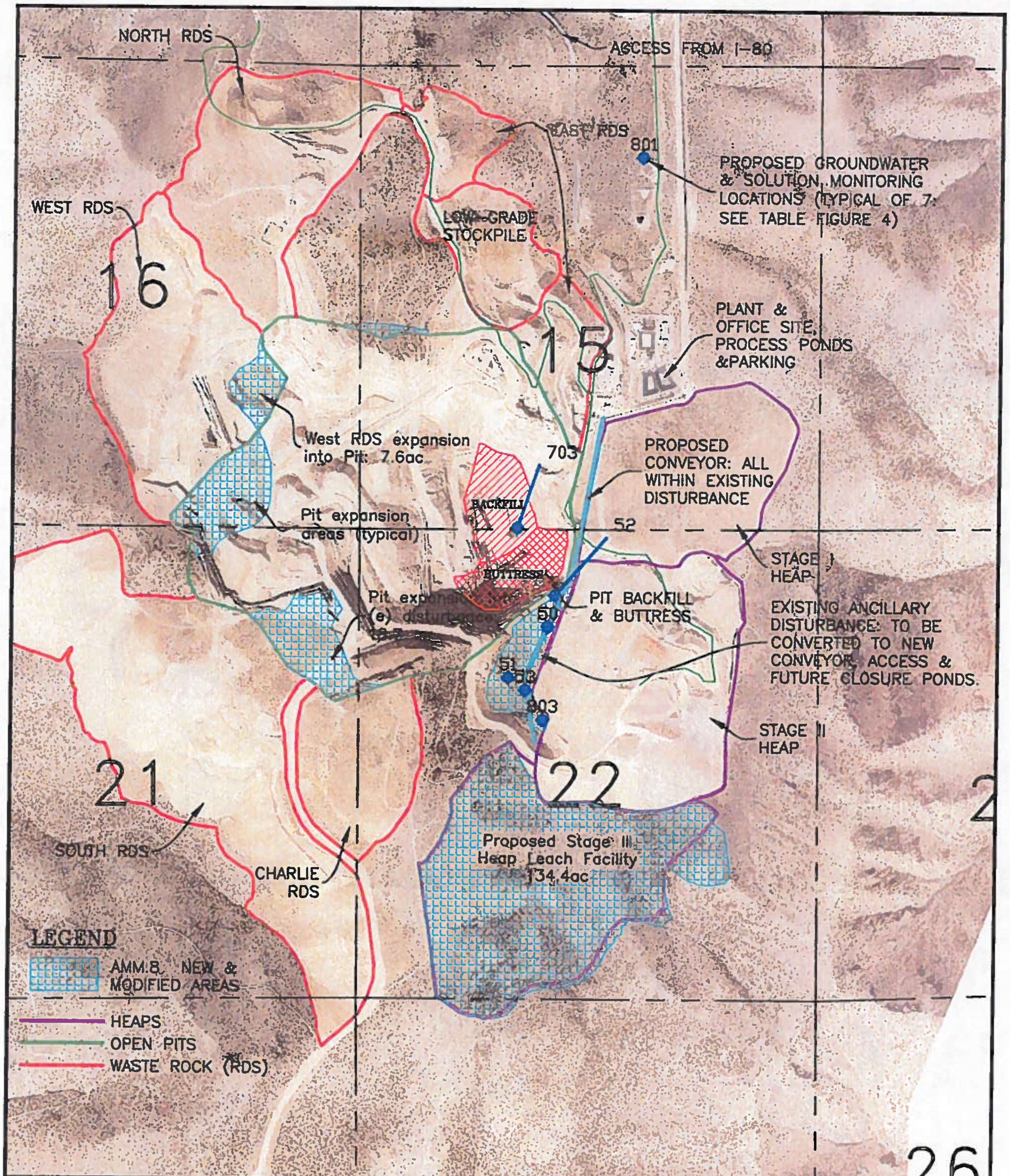
Rochester & NV Packard Mines
Plan of Post-Closure Operations

FIGURE 1
GENERAL LOCATION MAP

PERSHING COUNTY NEVADA

REFERENCE: COEUR, 1995 VICINITY MAP

PROJECT NO. 1-102-08.011



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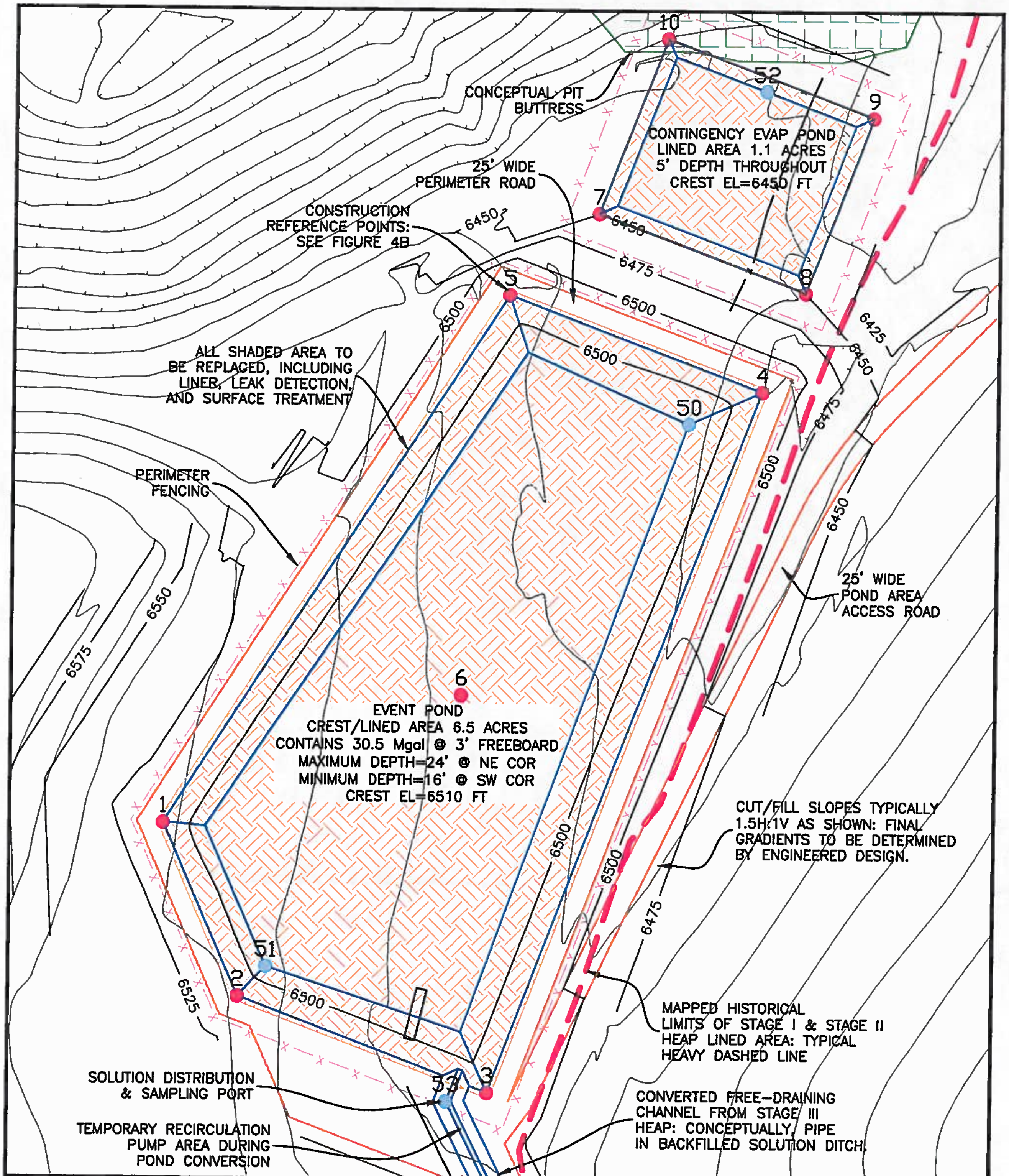
Rochester & NV Packard Mines
Plan of Post-Closure Operations

FIGURE 2
POA#8 MAJOR FEATURES & LONG-TERM MONITORING PLAN

PERSHING COUNTY NEVADA

REFERENCE: COEUR, KNIGHT-PIESOLD 2009 PIT/HEAP PLANS: 2007 AERIAL PHOTO

PROJECT NO. 1-102-08.011



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N

0 75 150
SCALE IN: FEET

Rochester & NV Packard Mines
Plan of Post-Closure Operations

FIGURE 3
EVAPORATION BASIN PLAN

PERSHING COUNTY NEVADA

REFERENCE: ROBISON ENG. STAGE III FREE-DRAIN PLAN 1/26/2010

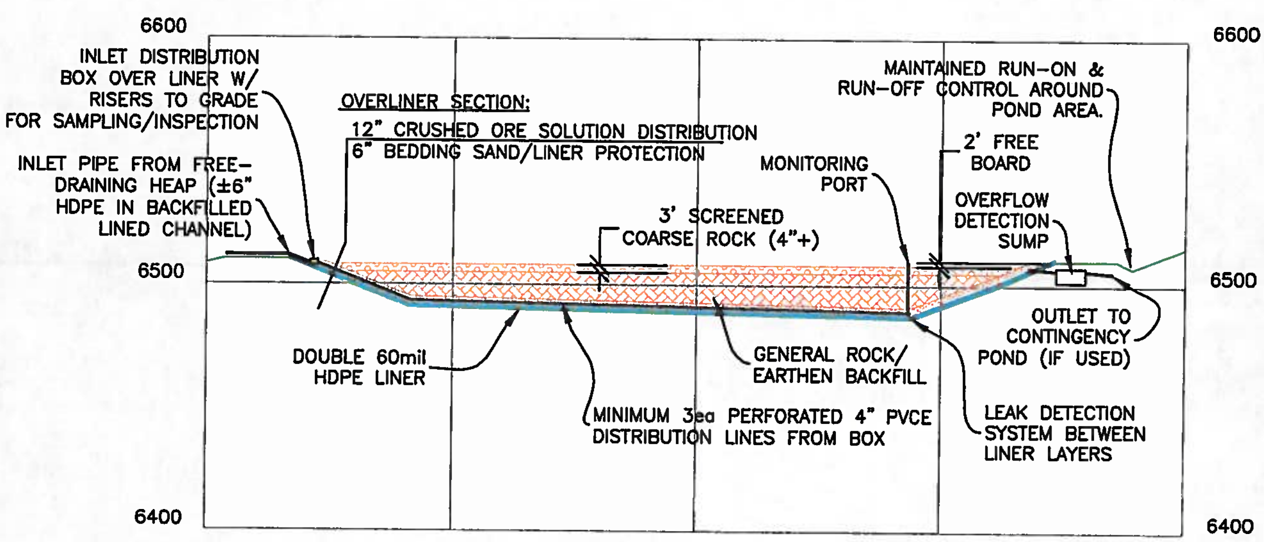
PROJECT NO. 1-102-08.011

List Points Report

File> P:\Coeur Rochester\2010 Reclamation\BLM Long–Term Trust\LTT construction.crd

Fri Sep 03 11:04:38 2010

PointNo.	Northing(Y)	Easting(X)	Elev(Z)	Description
1	13966	22072	6510	POND CORNER
2	13782	22153	6510	POND CORNER
3	13680	22419	6510	POND CORNER
4	14427	22703	6510	POND CORNER
5	14529	22435	6510	POND CORNER
6	14103	22387	6519	POND HIGH POINT
7	14616	22529	6450	POND CORNER
8	14533	22748	6450	POND CORNER
9	14720	22820	6450	POND CORNER
10	14803	22600	6450	POND CORNER
50	14392	22626	6486	EC MW#1
51	13813	22183	6494	EC MW#2
52	14747	22705	6445	EC MW#3
53	13671	22376	6505	ST3 DRAINDOWN MON
703	15504	22270	5990	PIT MW
801	19719	23665	6082	PW–2A
803	13338	22579	6503	PW–4



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0 75 150
SCALE IN: FEET

Rochester & NV Packard Mines
Plan of Post-Closure Operations

FIGURE 4
CONSTRUCTION COORDINATE SUMMARY & EVAPORATION BASIN SECTION

PERSHING COUNTY NEVADA

REFERENCE: ROBISON ENG. STAGE III FREE-DRAIN PLAN 1/26/2010

PROJECT NO. 1–102–08.011

Long Term Trust Fund
Activity Schedule, Net Present Value,
and
Forecasted Commutation Account Balance

Rochester Mine
Pershing County, NV

By: Nathan Earl Robison, PE
Date: 16-Dec-10

Exchange Rate	1.00	US $	1.00	US $

Nominal Interest Rate	3.9%	Annual	10-year
Inflation Rate:	1.8%	Annual	
Real Interest Rate:	2.2%	Annual (used for NPV)	
Nominal Interest Rate	4.5%	Annual	30-year
Inflation Rate:	1.8%	Annual	
Real Interest Rate:	2.7%	Annual (used for NPV)	

	Basic Total Costs by Recurrence Interval						
Reclamation Category	Single Event	Semi-Annual	Annual	5-Year	10-Year	20-year	100-year
Trust Administration Fees			$ 5,000				
Stage III PFS Phase IV Monitoring		$ 4,615	$ 4,615	$ 4,615			
Access & Site Work				$ 11,715	$ 15,310		
Stage III Draindown Management	$4,400		$ 17,120				
Stage III Pond fencing				$ 518		$ 187,596	
Stage III Pond rehabilitation							$ 816,992

Indirect Costs					Include?	Total
1. Engineering, Design and Construction (ED&C) Plan					No	0.0%
2. Contingency					Yes	6.0%
3. Insurance	1.5%	of	50.0%		Yes	0.8%
4. Performance Bond					Yes	3.0%
5. Contractor Profit					Yes	10.0%
6. Contract Administration					Yes	6.0%
7. BLM Indirect Cost	21.0%	of	6.0%		Yes	1.3%
8. Taxes on Trust Fund	15.0%	of	4.5%		Yes	0.7%
9. Trust Administration Fees	$ 5,000	Annual Fees				
Subtotal Add-On Rates						**27.7%**

	Total Costs including Indirect Costs by Recurrence Interval						
Reclamation Category	Single Event	Semi-Annual	Annual	5-Year	10-Year	20-year	100-year
Trust Administration Fees	$ -	$ -	$ 5,000	$ -	$ -	$ -	$ -
Stage III PFS Phase IV Monitoring	$ -	$ 5,892	$ 5,892	$ 5,892	$ -	$ -	$ -
Access & Site Work	$ -	$ -	$ -	$ 14,958	$ 19,548	$ -	$ -
Stage III Draindown Management	$ 5,618	$ -	$ 21,860	$ -	$ -	$ -	$ -
Stage III Pond fencing	$ -	$ -	$ -	$ 661	$ -	$ 239,532	$ -
Stage III Pond rehabilitation	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,043,176
	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Rochester Mine
Pershing County, NV

By: Nathan Earl Robison, PE
Date: 16-Dec-10

Determination of Financial Assurance

NPV Of Care and Maintenance Costs

Current Year: 2011

		Trust Administration Fees		Stage III PFS Phase IV Monitoring		Access & Site Work	
Reclamation Year	Calendar Year	Base Cost	NPV	Base Cost	NPV	Base Cost	NPV
0	2031	$ 5,000	$ 3,236	$ 11,784	$ 7,626	$ -	$ -
1	2032	$ 5,000	$ 3,166	$ 11,784	$ 7,461	$ -	$ -
2	2033	$ 5,000	$ 3,098	$ 11,784	$ 7,301	$ -	$ -
3	2034	$ 5,000	$ 3,031	$ 11,784	$ 7,144	$ -	$ -
4	2035	$ 5,000	$ 2,966	$ 11,784	$ 6,990	$ -	$ -
5	2036	$ 5,000	$ 2,902	$ 11,784	$ 6,839	$ 14,958	$ 8,682
6	2037	$ 5,000	$ 2,840	$ 11,784	$ 6,692	$ -	$ -
7	2038	$ 5,000	$ 2,778	$ 11,784	$ 6,548	$ -	$ -
8	2039	$ 5,000	$ 2,719	$ 11,784	$ 6,407	$ -	$ -
9	2040	$ 5,000	$ 2,660	$ 11,784	$ 6,269	$ -	$ -
10	2041	$ 5,000	$ 2,603	$ 11,784	$ 6,134	$ 34,506	$ 17,963
20	2051	$ 50,000	$ 17,225	$ 117,840	$ 40,595	$ 49,464	$ 17,040
30	2061	$ 50,000	$ 13,196	$ 58,920	$ 15,550	$ 49,464	$ 13,055
40	2071	$ 50,000	$ 10,110	$ 58,920	$ 11,913	$ 49,464	$ 10,001
50	2081	$ 50,000	$ 7,745	$ 58,920	$ 9,127	$ 49,464	$ 7,662
60	2091	$ 50,000	$ 5,934	$ 58,920	$ 6,992	$ 49,464	$ 5,870
70	2101	$ 50,000	$ 4,546	$ 58,920	$ 5,357	$ 49,464	$ 4,497
80	2111	$ 50,000	$ 3,483	$ 11,784	$ 821	$ 49,464	$ 3,445
90	2121	$ 50,000	$ 2,668	$ 11,784	$ 629	$ 49,464	$ 2,640
100	2131	$ 50,000	$ 2,044	$ 11,784	$ 482	$ 49,464	$ 2,022
110	2141	$ 50,000	$ 1,566	$ 11,784	$ 369	$ 49,464	$ 1,549
120	2151	$ 50,000	$ 1,200	$ 11,784	$ 283	$ 49,464	$ 1,187
130	2161	$ 50,000	$ 919	$ 11,784	$ 217	$ 49,464	$ 909
140	2171	$ 50,000	$ 704	$ 11,784	$ 166	$ 49,464	$ 697
150	2181	$ 50,000	$ 540	$ 11,784	$ 127	$ 49,464	$ 534
160	2191	$ 50,000	$ 413	$ 11,784	$ 97	$ 49,464	$ 409
170	2201	$ 50,000	$ 317	$ 11,784	$ 75	$ 49,464	$ 313
180	2211	$ 50,000	$ 243	$ 11,784	$ 57	$ 49,464	$ 240
190	2221	$ 50,000	$ 186	$ 11,784	$ 44	$ 49,464	$ 184
200	2231	$ 50,000	$ 142	$ 11,784	$ 34	$ 49,464	$ 141
220	2251	$ 100,000	$ 167	$ 23,568	$ 39	$ 98,929	$ 165
240	2271	$ 100,000	$ 98	$ 23,568	$ 23	$ 98,929	$ 97
260	2291	$ 100,000	$ 58	$ 23,568	$ 14	$ 98,929	$ 57
280	2311	$ 100,000	$ 34	$ 23,568	$ 8	$ 98,929	$ 33
300	2331	$ 100,000	$ 20	$ 23,568	$ 5	$ 98,929	$ 20
320	2351	$ 100,000	$ 12	$ 23,568	$ 3	$ 98,929	$ 12
340	2371	$ 100,000	$ 7	$ 23,568	$ 2	$ 98,929	$ 7
360	2391	$ 100,000	$ 4	$ 23,568	$ 1	$ 98,929	$ 4
380	2411	$ 100,000	$ 2	$ 23,568	$ 1	$ 98,929	$ 2
400	2431	$ 100,000	$ 1	$ 23,568	$ 0	$ 98,929	$ 1
420	2451	$ 100,000	$ 1	$ 23,568	$ 0	$ 98,929	$ 1
440	2471	$ 100,000	$ 0	$ 23,568	$ 0	$ 98,929	$ 0
460	2491	$ 100,000	$ 0	$ 23,568	$ 0	$ 98,929	$ 0
480	2511	$ 100,000	$ 0	$ 23,568	$ 0	$ 98,929	$ 0
500	2531	$ 100,000	$ 0	$ 23,568	$ 0	$ 98,929	$ 0
	Totals:		$ 105,583		$ 168,443		$ 99,441

By: Nathan Earl Robison, PE
Date: 16-Dec-10

100-Year NPV	$ 696,217
500-Year NPV	$ 724,696

NPV Of Care and Maintenance Costs

Current Year: 2011

Reclama-tion Year	Calendar Year	Stage III Draindown Management		Stage III Pond fencing		Stage III Pond rehabilitation		Commutation Account Balance (NPV)
		Base Cost	NPV	Base Cost	NPV	Base Cost	NPV	
							Initial Deposit:	$ 724,696
0	2031	$ 21,520	$ 13,926	$ -	$ -	$ -	$ -	$ 699,909
1	2032	$ 17,120	$ 10,840	$ -	$ -	$ -	$ -	$ 678,442
2	2033	$ 17,120	$ 10,607	$ -	$ -	$ -	$ -	$ 657,436
3	2034	$ 17,120	$ 10,378	$ -	$ -	$ -	$ -	$ 636,883
4	2035	$ 17,120	$ 10,155	$ -	$ -	$ -	$ -	$ 616,772
5	2036	$ 17,120	$ 9,936	$ 661	$ 384	$ -	$ -	$ 588,028
6	2037	$ 17,120	$ 9,723	$ -	$ -	$ -	$ -	$ 568,774
7	2038	$ 17,120	$ 9,513	$ -	$ -	$ -	$ -	$ 549,934
8	2039	$ 17,120	$ 9,308	$ -	$ -	$ -	$ -	$ 531,500
9	2040	$ 17,120	$ 9,108	$ -	$ -	$ -	$ -	$ 513,463
10	2041	$ -	$ -	$ 661	$ 344	$ -	$ -	$ 486,418
20	2051	$ -	$ -	$ 240,193	$ 82,745	$ -	$ -	$ 328,813
30	2061	$ -	$ -	$ 1,323	$ 349	$ -	$ -	$ 286,662
40	2071	$ -	$ -	$ 240,193	$ 48,566	$ -	$ -	$ 206,071
50	2081	$ -	$ -	$ 1,323	$ 205	$ -	$ -	$ 181,332
60	2091	$ -	$ -	$ 240,193	$ 28,505	$ -	$ -	$ 134,030
70	2101	$ -	$ -	$ 1,323	$ 120	$ -	$ -	$ 119,509
80	2111	$ -	$ -	$ 240,193	$ 16,731	$ -	$ -	$ 95,029
90	2121	$ -	$ -	$ 1,323	$ 71	$ -	$ -	$ 89,022
100	2131	$ -	$ -	$ 240,193	$ 9,820	$ 1,043,176	$ 42,649	$ 32,005
110	2141	$ -	$ -	$ 1,323	$ 41	$ -	$ -	$ 28,480
120	2151	$ -	$ -	$ 240,193	$ 5,764	$ -	$ -	$ 20,046
130	2161	$ -	$ -	$ 1,323	$ 24	$ -	$ -	$ 17,977
140	2171	$ -	$ -	$ 240,193	$ 3,383	$ -	$ -	$ 13,027
150	2181	$ -	$ -	$ 1,323	$ 14	$ -	$ -	$ 11,813
160	2191	$ -	$ -	$ 240,193	$ 1,986	$ -	$ -	$ 8,907
170	2201	$ -	$ -	$ 1,323	$ 8	$ -	$ -	$ 8,194
180	2211	$ -	$ -	$ 240,193	$ 1,165	$ -	$ -	$ 6,489
190	2221	$ -	$ -	$ 1,323	$ 5	$ -	$ -	$ 6,071
200	2231	$ -	$ -	$ 240,193	$ 684	$ 1,043,176	$ 2,971	$ 2,099
220	2251	$ -	$ -	$ 241,516	$ 404	$ -	$ -	$ 1,324
240	2271	$ -	$ -	$ 241,516	$ 237	$ -	$ -	$ 869
260	2291	$ -	$ -	$ 241,516	$ 139	$ -	$ -	$ 601
280	2311	$ -	$ -	$ 241,516	$ 82	$ -	$ -	$ 445
300	2331	$ -	$ -	$ 241,516	$ 48	$ 1,043,176	$ 207	$ 146
320	2351	$ -	$ -	$ 241,516	$ 28	$ -	$ -	$ 92
340	2371	$ -	$ -	$ 241,516	$ 17	$ -	$ -	$ 60
360	2391	$ -	$ -	$ 241,516	$ 10	$ -	$ -	$ 41
380	2411	$ -	$ -	$ 241,516	$ 6	$ -	$ -	$ 30
400	2431	$ -	$ -	$ 241,516	$ 3	$ 1,043,176	$ 14	$ 9
420	2451	$ -	$ -	$ 241,516	$ 2	$ -	$ -	$ 6
440	2471	$ -	$ -	$ 241,516	$ 1	$ -	$ -	$ 4
460	2491	$ -	$ -	$ 241,516	$ 1	$ -	$ -	$ 2
480	2511	$ -	$ -	$ 241,516	$ 0	$ -	$ -	$ 1
500	2531	$ -	$ -	$ 241,516	$ 0	$ 1,043,176	$ 1	$ 0
			$ 103,495		$ 201,892		$ 45,842	

Standardized Reclamation Cost Estimator (SRCE) Model
Basis of LTT Costs

STANDARDIZED RECLAMATION COST ESTIMATOR

Version 1.1.2 (updated 03 February, 2008)

COST DATA FILE INFORMATION

File Name:	2-LTT Items ONLY Bond Cost.xls
Cost Data File:	cost_data-std-nv2010.xls
Cost Data Date:	August 1, 2010
Cost Data Basis:	Standardized Data
Author/Source:	Nevada Division of Environmental Protection (NDEP) & NV BLM

PROJECT INFORMATION

Project Name:	Rochester Mine Plan of Post-Closure Operations
Date of Submittal:	December 16, 2010
Select One:	☐ Notice or Sm Exploration Plan ☐ Lg Exploration Plan ☑ Mine Plan of Operations
Select One:	☐ Private Land ☑ Public or Public/Private
Cost Basis Category:	Northern Nevada
Cost Basis Description:	**Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, Washoe, and White Pine Counties**

This version has been validated and verified by the NDEP and BLM for use in Nevada as of 04 February 2008.

Bond Calculation
Process Ponds

Project Name: Rochester Mine Plan of Post-Closure Operations - Reclamation Plan
Date of Submittal: December 16, 2010
File Name: 2-LTT Items ONLY Bond Cost.xls
Model Version: Version 1.1.2 (updated 03 February, 2008)
Cost Data: Standardized Data
Cost Data File: cost_data-std-nv2010.xls

Process Ponds - Cost Summary

	Labor	Equipment	Materials	Totals
Backfilling Costs	$4,101	$10,571	N/A	$14,672
Growth Media Placement Costs			N/A	$0
Liner Cutting & Folding Costs				$0
Subtotal Earthworks	*$4,101*	*$10,571*	*$0*	*$14,672*
Revegetation Costs				$0
TOTALS	$4,101	$10,571	$0	$14,672

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

Process Ponds - User Input

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

			Pond Dimensions [1]					Backfill [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	*Stage III Event Pond*		*809*	*427*	*20*	*2.5*	*6.54*	*33%*	*1,500*	*2*	*25,994*	*0*	*1,500*	*2*
2	*Contingency Pond*		*200*	*200*	*5*	*2.5*	*1.08*	*33%*	*2,200*	*2*	*4,539*	*0*	*2,200*	*2*

(1) All Pond Dimension and Backfill parameters must be input even if manual overrides for volume or area are used.

Process Ponds - User Input (cont.)

		Liner	Backfill		Growth Media		Revegetation		
	Description (required)	Crew Cut & Fold Time hrs	Backfill Material Type (select)	Backfill Equipment Fleet (select)	Growth Media Material Type (select)	Growth Media Placement Equipment Fleet (select)	Seed Mix (select)	Mulch (select)	Fertilizer (select)
1	*Stage III Event Pond*	*0*	Gravel	Small Truck	Alluvium	Small Truck	None	None	None
2	*Contingency Pond*	*0*	Gravel	Small Truck	Alluvium	Small Truck	None	None	None

Bond Calculation
Process Ponds

Project Name: Rochester Mine Plan of Post-Closure Operations - Reclamation Plan
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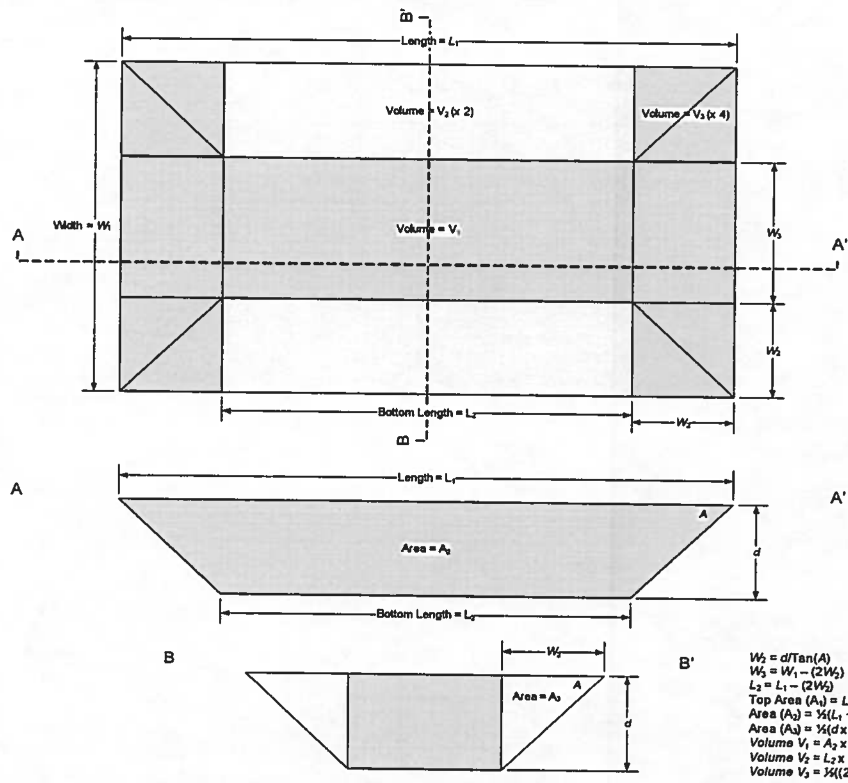
Process Ponds - Calculations

Pond Volume Calculation



$W_2 = d/\tan(A)$
$W_3 = W_1 - (2W_2)$
$L_2 = L_1 - (2W_2)$
Top Area (A_1) = $L_1 \times W_1$
Area (A_2) = $\frac{1}{2}(L_1 + L_2) \times d$
Area (A_3) = $\frac{1}{2}(d \times W_2)$
Volume $V_1 = A_2 \times W_3$ [volume of a 3D trapezoid]
Volume $V_2 = L_2 \times W_2 \times d$ [volume of a prism x 2]
Volume $V_3 = \frac{1}{3}((2W_2)^2 \times d)$ [volume of a right pyramid]

Revegetation Calculations

Minimum 1 acre revegetation crew time per area

Bond Calculation
Process Ponds

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Process Ponds - Liner Cutting and Folding

	Description (required)	Crew Hours hrs	Total Labor Cost $	Total Equipment Cost $	Total Liner Removal Cost $
1	*Stage III Event Pond*	0.0	$0	$0	$0
2	*Contingency Pond*	0.0	$0	$0	$0

Process Ponds - Backfill and Growth Media Costs

	Description (required)	Pond Backfill								Growth Media							
		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 $	Topsoil Volume cy	Topsoil Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Topsoiling Cost $
0																	
1	*Stage III Event Pond*	8,578	Small Truck	508	2	16.9	$3,448	$8,888	$12,336								$0
2	*Contingency Pond*	1,498	Small Truck	465	2	3.2	$653	$1,683	$2,336								$0
		10,076				20.1	$4,101	$10,571	$14,672								

Process Ponds - Revegetation Costs

	Description (required)	Flat Area acres	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	*Stage III Event Pond*	6.5				
2	*Contingency Pond*	1.1				
		7.6				

Bond Calculation
Misc. Costs

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Miscellaneous Cost Summary

		Labor	Equipment	Materials	Totals
	Fence Removal	$8,100	$3,420	N/A	$11,520
	Fence Installation	$15,984	$5,292	$154,800	$176,076
	Pipe & Culvert Removal			N/A	
	Powerlines		N/A	N/A	
	Substations/Tranformers		N/A	N/A	
	Rip-rap, rock lining, gabions				
	Other Costs				
	TOTALS	$24,084	$8,712	$154,800	$187,596

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

Fence Removal

You must fill in ALL green and blue cells

	Description (required)	Input: Length ft	Input: Type (select type)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Total Cost $
1	*Closure Pond*	*2,500*	Chain link 8-10 ft (2.5-3	$5,625	$2,375	$8,000
2	*Contingency Pond*	*1,100*	Chain link 8-10 ft (2.5-3	$2,475	$1,045	$3,520
3						
4						
				$8,100	$3,420	$11,520

Notes:

Fence Installation

You must fill in ALL green and blue cells

	Description (required)	Input: Length ft	Input: Type (select type)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Material Cost ($)	Costs: Total Cost $
1	*Closure Pond*	*2,500*	Chain link 8-10ft (2.5-3n	$11,100	$3,675	$107,500	$122,275
2	*Contingency Pond*	*1,100*	Chain link 8-10ft (2.5-3n	$4,884	$1,617	$47,300	$53,801
				$15,984	$5,292	$154,800	$176,076

Notes:

Bond Calculation
Monitoring

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Reclamation Monitoring & Maintenance - Cost Summary

	Labor	Equipment	Materials/ Laboratory	Totals
Revegetation Maintenance				
Reclamation Monitoring	$810	$265		$1,075
Subtotal Reclamation Monitoring	*$810*	*$265*		*$1,075*
Water Quality Monitoring	$843	$387	$2,310	$3,540
TOTAL MONITORING	$1,653	$652	$2,310	$4,615

Reclamation Maintenance

Description	Total Revegetation Surface Area [1] acres	% Area Requiring Reseeding	Seed Mix (select)	Area Requiring Reseeding acres	Seed $/acres	Labor $/acres	Equipment $/acres	Totals $
Revegetation Maintenance	7.60			0.00	$0.00	$83.94	$72.10	
Labor								
Equipment								
Materials								
Cost/Acre								
Subtotal								

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

Reclamation Monitoring

Description	Hrs/Day	Days/Year	Number of Years	Rate $/hr				Totals
Field Work								
Field Geologist/Engineer	8	1	1	$101				$810
Range Scientist				$101				
Reporting								
Field Geologist/Engineer				$101				
Range Scientist				$101				
Subtotal								$810
Travel								
	Hrs/Trip hr	Trips/Year	Years	Truck Cost $/hr				
Travel	8	1	1	$33.07				$265
Subtotal								$265

Total Reclamation Monitoring: $1,075

Notes: *Fence, culvert, slope stability monitoring PER EVENT: see LTT calculations for event/year scheduling*

Bond Calculation
Monitoring

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Ground & Surface Water Monitoring

Field work

Description	No. of staff	Hrs/Day	Days/event	Events/Year	No. Years	Man-hours/ year	Rate $/hr	Cost $
Field Tech/Sampler	1	8	1	1	1	8	$80.00	$640
Pickup Truck	1				1	8	$21.68	$173
Pump (purchased)	0.1						$2,140	$214
							Subtotal Field Work	$1,027

Water and Rock Sample Analysis

Description	Samples #	Events/Year	No. Years	Analysis Cost $/sample	Supplies $/sample	Lab Cost $	Material Cost $	Cost $
Water Analysis (Profile I) (1)	7	1	1	$325.00	$5.00	$2,275.00	$35.00	$2,310
							Subotal Sample Analysis	$2,310

Reporting

Description	Hrs/Event	Rate $/hr	Events/Year	Man-hours/ year	No. Years		Cost $
Field Geologist/Engineer	2	$101.25	1	2	1		$203
						Subtotal Reporting	$203

Total Water Quality Monitoring $3,540

Notes: *Sampling PER EVENT: see LTT calculations for event/year scheduling*

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Light construction costs breakdown:

Labor	Equip	Materials
50%	40%	10%

Pond Backfill Screening

Item	No.	Units	Unit Cost	Total
2-stage Screens	2	each	$ 4,500	$ 9,000
Medium Loader (972G)	27	hours	$ 108	$ 2,929
Mob/Demob	1	ea/event	$ 382	$ 382
			Total:	$ 12,311
		Labor	Equip	Materials
		$ 6,156	$ 4,924	$ 1,231

Loader Production, double handling, 150-ft cycle arcs: 740 cy/hour & 10,076 total CY per Ponds tab

Access Maintenance: Stage III and Rochester pit access

Item	No.	Units	Unit Cost	Total	Notes
Stage III roads: Crew#2	20	hours/event	$ 358	$ 7,167	1
Rochester Pit: Crew#2	10	hours/event	$ 358	$ 3,583	2
Mob/Demob	1	ea/event	$ 965	$ 965	
			Total:	$ 11,715	
		Labor	Equip	Materials	
		$ 5,857	$ 4,686	$ 1,171	

1 - Road maintenance Crew #2

Item:	420 Backhoe	14g Grader	10cy dump truc	Operator	Total
No in Team:	1	1	1	2	
Hourly Rate:	$ 31.21	$ 111.52	$ 100.12	$ 57.74	$ 358.33

Erosion control, diversion channel and pit buttress maintenance

Item	No.	Units	Unit Cost	Total	Notes
Crew #3 overall availability	50	hours/event	$ 285	$ 14,273	1
Mob/Demob	1	ea/event	$ 1,037	$ 1,037	2
			Total:	$ 15,310	
		Labor	Equip	Materials	
		$ 7,655	$ 6,124	$ 1,531	

1 - medium earthwork Crew #3

				Total
Item:	345 Excav	10cy dump truc	Operator	
No in Team:	1	1	2	
Hourly Rate:	$ 69.27	$ 100.12	$ 58.03	$ 285.45

Stage III Draindown Management

Item	No.	Units	Unit Cost	Total	Notes
2.5 HP pump to sprinklers	720	hours/year	$ 3	$ 2,160	1
Site foreman: 1 month contract	240	hours/year	$ 57	$ 13,680	2
Generator & pump rental	30	days/year	$ 26	$ 780	
Misc fittings & costs	1	each/year	$ 500	$ 500	
				$ -	
			Total:	$ 17,120	
		Labor	Equip	Materials	
		$ 8,560	$ 6,848	$ 1,712	

Work performed:
Annual transfer of excess solution drainage (1.77) gpm rate (year 11 minus ET Cell capacity) = 0.93 MG total
1-month constant operation during warm season pumped to wobber sprinklers on Stage III heap north face = 22 gpm pump
required. Include gas generator @ 1 gal/hour: fuel cost = $ 3.00 per gallon. See pipe flow calculations.
Initial piping purchage estimate: $200 sprinklers + $2 per lf total pipe/fittings = $4,400

Stage III Pond Fencing maintenance

Item	No.	Units	Unit Cost	Total
Skilled technician	10	hours	$ 34	$ 345
Pickup	10	hours	$ 17	$ 173
			Total:	$ 518
		Labor	Equip	Materials
		$ 259	$ 207	$ 52

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ROCHESTER CLOSURE POND CONSTRUCTION

Design Factor: 1 for all quantities vs. 7% MAP rate heretofore assumed

	Top area	Depth	Base Area	Est. Volume (Mg)	Develop. Cost/sf*	Exc. MCY	Cost/CY**	Included?
Stage III Closure Pond	284,700	3	183,200	5.25	$ 2.25	0.025994	$ 1.44	yes
Contingency Pond	46,900	3	34,800	0.92	$ 2.25	0.004539	$ 1.44	yes

Cost breakdown: 60% equip, 30% labor, 10% mat's
Backfilled ponds for E/T Cell? Yes

		Process Component Activity		
EXCAVATION / DEMO	**Total**	Labor	Equipment	Materials
Stage III Closure Pond	$ 37,382	$ 11,215	$ 22,429	$ 3,738
Contingency Pond	$ 6,527	$ 1,958	$ 3,916	$ 653
LINER, LEAK DETECTION & SOLUTION DISTRIBUTION				
Stage III Closure Pond	$ 640,575	$ 192,173	$ 64,058	$ 384,345
Contingency Pond	$ 105,525	$ 31,658	$ 10,553	$ 63,315
TOTAL PONDS	**$790,009**	**$237,003**	**$100,955**	**$452,051**

* Rochester 2010 quote for test pond: includes dbl 60mil liner, solution distribution & leak detection system + geotextile overliner for Evap ponds

** Productivity: 345B excavator w/38" rock ripping bucket = 1.25 cy/pass ~ 225 cy/hour (moderate range): hourly cost for heavy earthwork fleet per SRCE

Mobilization-Demobilization Costs

2009 MOB/DEMOB using R.S. MEANS and SRCE equipment and DAVIS-BACON wages

blue font is for project specific user input

Miles one way from Washoe County Courthouse	118
Miles to project, one way	72
Hours travel time @ 55 MPH	1.31

Rochester Mine, Pershing Co. NV In-Pit Monitoring Wells

Equipment	Mobilization $/hour (1)	$ Flat Rate load & unload (2)	$/hour Deadhead (empth 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	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
D7R	$ 101	$ 101	$ 101	$ -	$ 25	$ 74		$ -	$ -
D8R	$ 141	$ 141	$ 141	$ -	$ 25	$ 148		$ -	$ -
D9R	$ 141	$ 141	$ 141	$ 5,000	$ 25	$ 148		$ -	$ -
D10R	$ 141	$ 141	$ 141	$ 5,000	$ 25	$ 222		$ -	$ -
D11R (two transports) (7)	$ 141	$ 141	$ 141	$ 5,000	$ 25	$ 148		$ -	$ -
Motor Graders									
14G/H	$ 72	$ 72	$ 72	$ -	$ -	$ -	1	$ 166	$ 332
16G/H	$ 101	$ 101	$ 101	$ -	$ 25	$ 74		$ -	$ -
Track Excavators									
320C	$ 101	$ 101	$ 101	$ -	$ -	$ -		$ -	$ -
325C	$ 101	$ 101	$ 101	$ -	$ -	$ -	1	$ 234	$ 468
345B	$ 141	$ 141	$ 141	$ -	$ 25	$ 148	1	$ 499	$ 998
385BL	$ 141	$ 141	$ 141	$ 13,000	$ 25	$ 148		$ -	$ -
Scrapers									
631G	$ 141	$ 141	$ 141	$ -	$ 25	$ 148		$ -	$ -
637G PP	$ 141	$ 141	$ 141	$ -	$ 25	$ 148		$ -	$ -
Wheeled Loaders									
928G	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
966G	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
972G	$ 101	$ 101	$ 101	$ -	$ -	$ -	1	$ 234	$ 468
988G	$ 101	$ 101	$ 101	$ 5,000	$ 25	$ 74		$ -	$ -
992G (two transports) (7)	$ 141	$ 141	$ 141	$ 20,000	$ 25	$ 148		$ -	$ -
Hydrauilc Hammers									
H-120 (fits 325) no charge, mobilize with ma	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -
H-160 (fits 345) no charge, mobilize with ma	$ -	$ -	$ -	$ -	$ -	$ -	1	$ -	$ -
H-180 (fits 365/385) no charge, mobilize wit	$ -	$ -	$ -	$ -	$ -	$ -		$ -	$ -

Other Equipment									
420D 4WD Backhoe	$ 72	$ 72	$ 72	$ -	$ -	$ -	1	$ 166	$ 332
CS563E Vibratory Roller	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
Light Truck - 1.5 Ton	$ 57	$ 57	$ 57	$ -	$ -	$ -		$ -	$ -
Supervisor's Truck	$ 49	$ 49	$ 49	$ -	$ -	$ -		$ -	$ -
Air Compressor + tools	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
Welding Equipment	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
Heavy Duty Drill Rig	$ 390	$ 390	$ 390	$ -	$ -	$ -		$ -	$ -
Pump (plugging) Drill Rig	$ 390	$ 390	$ 390	$ -	$ -	$ -		$ -	$ -
Concrete Pump	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
Gas Engine Vibrator	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
Generator 5KW	$ 72	$ 72	$ 72	$ -	$ -	$ -	1	$ 166	$ 332
HDEP Welder (pipe or liner)	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
5 Ton Crane Truck	$ 95	$ 95	$ 95	$ -	$ -	$ -		$ -	$ -
25 Ton Crane	$ 151	$ 151	$ 151	$ -	$ -	$ -		$ -	$ -
Trucks									
769D	$ 101	$ 101	$ 101	$ -	$ 25	$ 148	1	$ 407	$ 814
777D (two transports) (8)	$ 141	$ 141	$ 141	$ 20,000	$ 25	$ 222		$ -	$ -
613E (5,000 gal) Water Wagon	$ 141	$ 141	$ 141	$ -	$ -	$ -		$ -	$ -
621E (8,000 gal) Water Wagon	$ 141	$ 141	$ 141	$ -	$ 25	$ 148		$ -	$ -
Dump Truck (10-12 yd^3)	$ 110	$ 110	$ 110	$ -	$ -	$ -	1	$ 254	$ 509
Miscellaneous									
Equipment for dry hole abandonment (420D 4	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
Pilot car (Light Truck)	$ 50	$ 50	$ 50	$ -	$ -	$ -		$ -	$ -
Truck Tractor + Lowbed Trailer 75 ton	$ 141	$ 141	$ 141	$ -	$ -	$ -		$ -	$ -
Truck Tractor + Flatbed Trailer 40 ton	$ 101	$ 101	$ 101	$ -	$ -	$ -		$ -	$ -
Light Truck + Flatbed Trailer 25 ton	$ 72	$ 72	$ 72	$ -	$ -	$ -		$ -	$ -
							9		$ 4,252

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) Pilot Car costs based on SRCE light truck costs and Davis-Bacon wages
(10) SRCE costs based on July 2009 vendor quotes.
(11) RS Means costs based on R.S. Means Heavy Construction Cost Data, 2009
(12) Davis_Bacon wages based on July 3, 2009 determination.

Heap-Leach Draindown Estimator (HLDE) Model
Stage III Predicted Draindown

Company : **Coeur-Rochester, Inc.**
Project : **Stage III**

Revised: **14-Dec-10**

Total Area of Heap Leach Pad	ft²	5,787,925
	acres	133
Area of Actively Used Heap Leach Pad	ft²	1,250,000
Area of Historically Used Heap Leach Pad	ft²	4,537,925
Operational Draindown Rate	gpm	5,000
Application Rate	gpm/ft²	0.004
Height of Heap Leach Pad	ft	169
Saturated Hydraulic Conductivity (K_s)	ft/day	3.08
Residual Water Content (θr)	Decimal	0.12
θs (saturated moisture content)	Decimal	0.29
θapp (active application moisture content)	Decimal	0.28
θhist (moisture content of historic part at PFS start)	Decimal	0.23
γ (empirical drainage parameter)	unitless	19.60
Time unit of interest		Days

Precipitation			
Total Annual Precip	13.41	inches	
Uncovered Infiltration Rate	21%		
Covered Infiltration Rate	7.00%		
Monthly portion			
	%	inches/mo.	inches/day
January	15%	1.94	0.063
February	12%	1.66	0.059
March	10%	1.38	0.045
April	11%	1.45	0.048
May	12%	1.61	0.052
June	7%	0.99	0.033
July	2%	0.27	0.009
August	2%	0.27	0.009
September	4%	0.59	0.020
October	5%	0.70	0.022
November	9%	1.22	0.041
December	10%	1.33	0.043
Total (must equal 100%)	**100%**	**13.41**	

Pond Capacity Data		
Pond Capacity Data²	31,420,000	gal
	4,200,535	ft3
Beginning Pond Level	0	gal
	0	ft3

Recirculators		
Pump Capacity	160	gpm
	30,802	ft³/day
Pond Volume that Triggers Recirculation	15,710,000	gal
	2,100,267	ft3

Monthly Evaporation Data		
	Pan Evap.	
	inches/mo.	inches/day
January	-	0.00
February	-	0.00
March	0.15	0.00
April	1.74	0.06
May	4.24	0.14
June	6.61	0.22
July	9.06	0.29
August	7.35	0.24
September	4.51	0.15
October	1.78	0.06
November	-	0.00
December	-	0.00
Total	**35.44**	

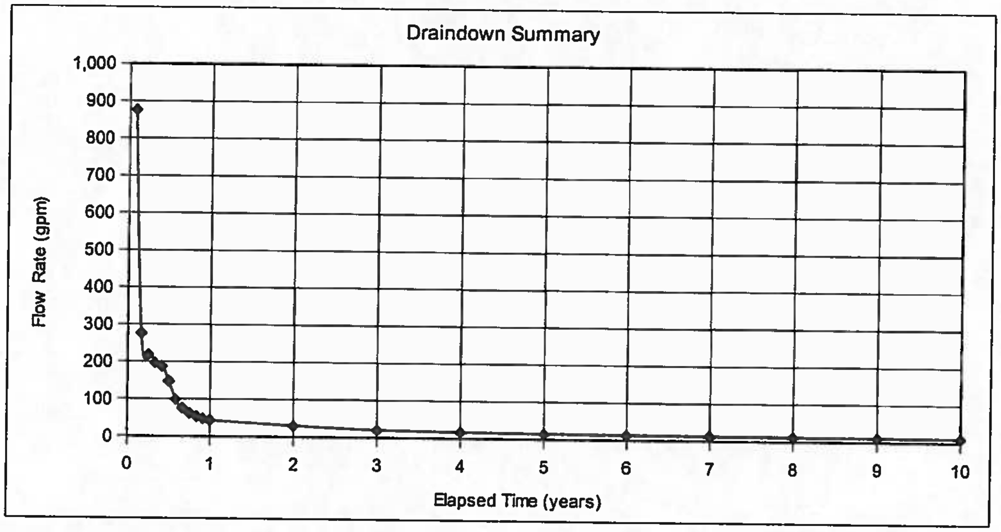
Evaporators		
Number of Evaporators on Day 1	5	
Evaporator Pumping Capacity	160	gpm
Evaporator Operating Time	12	hr/day
	Efficiency	Effective Evaporation
	%	ft³/day
January	0%	0
February	0%	0
March	32%	24,719
April	37%	28,261
May	44%	33,728
June	52%	40,120
July	61%	46,973
August	59%	45,125
September	49%	37,348
October	38%	29,416
November	0%	0
December	0%	0
Averages	31%	11,904

ET Cell Data		
Total Existing ET Cell Area[1]	331,655	ft²
	7.61	ac
Total Flow Capacity of ET Cell	1.00	gpm/ac
	7.61	gpm

[1]Only double-lined processs ponds may be used for pond capacity/ET cell capacity.

Summary of Draindown Rates

	Months	Years		Average Monthly Flow	
Ave Flow	1	0.08	=	875.54	GPM
Ave Flow	2	0.17	=	276.35	GPM
Ave Flow	3	0.25	=	218.34	GPM
Ave Flow	4	0.33	=	196.57	GPM
Ave Flow	5	0.42	=	187.58	GPM
Ave Flow	6	0.50	=	147.10	GPM
Ave Flow	7	0.58	=	98.77	GPM
Ave Flow	8	0.67	=	75.36	GPM
Ave Flow	9	0.75	=	61.97	GPM
Ave Flow	10	0.83	=	53.23	GPM
Ave Flow	11	0.92	=	47.09	GPM
Ave Flow	12	1	=	42.57	GPM
Ave Flow		2	=	29.38	GPM
Ave Flow		3	=	19.90	GPM
Ave Flow		4	=	16.21	GPM
Ave Flow		5	=	14.11	GPM
Ave Flow		6	=	12.75	GPM
Ave Flow		7	=	11.71	GPM
Ave Flow		8	=	10.92	GPM
Ave Flow		9	=	10.30	GPM
Ave Flow		10	=	9.79	GPM
Ave Flow		11	=	9.38	GPM
Ave Flow		12	=	9.03	GPM
Ave Flow		13	=	8.73	GPM
Ave Flow		14	=	8.48	GPM
Ave Flow		15	=	8.26	GPM
Ave Flow		16	=	8.07	GPM
Ave Flow		17	=	7.90	GPM
Ave Flow		18	=	7.76	GPM
Ave Flow		19	=	7.63	GPM
Ave Flow		20	=	7.51	GPM
Ave Flow		21	=	7.41	GPM
Ave Flow		22	=	7.32	GPM
Ave Flow		23	=	7.24	GPM
Ave Flow		24	=	7.16	GPM
Ave Flow		25	=	7.10	GPM
Ave Flow		26	=	7.04	GPM
Ave Flow		27	=	6.98	GPM
Ave Flow		28	=	6.93	GPM
Ave Flow		29	=	6.89	GPM
Ave Flow		30	=	6.85	GPM



Total Volume of Water to drain out in 1 year	99,954,198 gal
Total Volume of Water to drain out in 2 years	115,398,635 gal
Total Volume of Water to drain out in 3 years	125,859,844 gal
Total Volume of Water to drain out in 4 years	134,381,345 gal
Total Volume of Water to drain out in 5 years	141,795,621 gal
Total Volume of Water to drain out in 10 years	170,946,183 gal
Total Volume of Water to drain out in 20 years	214,430,509 gal
Total Volume of Water to drain out in 30 years	251,702,554 gal
Total Volume of Water Actively Evaporated in 1 year	50,184,444 gal
Total Volume of Water Actively Evaporated in 2 years	62,177,062 gal
Total Volume of Water Actively Evaporated in 3 years	68,599,267 gal
Total Volume of Water Actively Evaporated in 4 years	73,327,730 gal
Total Volume of Water Actively Evaporated in 5 years	77,224,906 gal
Total Volume of Water Actively Evaporated in 6 years	77,335,702 gal
Total Volume of Water Actively Evaporated in 10 years	77,690,680 gal
Total Volume of Water Actively Evaporated in 20 years	78,268,966 gal
Total Volume of Water Actively Evaporated in 30 years	78,268,966 gal
Total Volume of Water Recirculated to Pad	33,177,600 gal

Stage III Area Meteorology And Pond Summary

Rochester Mine, Pershing Co, NV
Meteorology

POA #8

ROBISON ENGINEERING COMPANY
Prepared: Nathan Earl Robison, PE
Date: 14-Dec-10

Weather station data from: http://www.wrcc.dri.edu/Climsum.html unless indicated otherwise
Probabilistic Storm events from: http://hdsc.nws.noaa.gov/hdsc/pfds/
Elevation, location, slope aspect and pond data from GIS or site map sources

Reference Weather Station

1	Gold Rock Ranch		
2	Mine Grid	6,895	m, Easting
		7,940	m, Northing
3	Distance from Site	2.8	miles
4	Elevation	6,525	ft amsl
5	100-yr, 24-hr Storm Event	3.11	inches
6	Annual Average Precipitation	13.41	inches
7	**Monthly Meteorology**	Precip (in)	Avg. High Temp. (F)
	January	1.94	31.0
	February	1.66	36.5
	March	1.39	43.9
	April	1.44	50.1
	May	1.61	58.3
	June	1.00	66.2
	July	0.27	73.6
	August	0.27	71.7
	September	0.58	62.9
	October	0.70	51.9
	November	1.22	38.6
	December	1.32	30.4
8	Recording Perioc	18	years
9	Similar slope aspect?	YES	

Predicted Site Meteorology

	Slope Aspect	SW					
10	UTM Location	6,843	m, Easting				
		3,469	m, Northing				
11	Site ground Elev	6,955	ft amsl	2,120 m			
12	100-yr, 24-hr Storm Event	3.11	inches				
13	Predicted Annual Precipitation	13.41	inches				
14	PET Correction Factor	0.90					
15	**Predicted Meteorology**	**Precip (in)**	**Percent by Month**	**Avg. High Temp (F)**	**Evap (in)**	**Atomizer Efficiency**	**Sprinker Efficiency**
	January	1.94	14%	28.5	-	0.0%	4.0%
	February	1.66	12%	34.0	-	0.0%	4.6%
	March	1.39	10%	41.4	0.15	32.1%	5.6%
	April	1.44	11%	47.6	1.74	36.7%	6.5%
	May	1.61	12%	55.8	4.24	43.8%	8.1%
	June	1.00	7%	63.7	6.61	52.1%	10.0%
	July	0.27	2%	71.1	9.06	61.0%	12.0%
	August	0.27	2%	69.2	7.35	58.6%	11.5%
	September	0.58	4%	60.4	4.51	48.5%	9.1%
	October	0.70	5%	49.4	1.78	38.2%	6.9%
	November	1.22	9%	36.1	-	0.0%	4.9%
	December	1.32	10%	27.9	-	0.0%	3.9%
	Total/Average:	13.41	100%	48.76	35.44	30.9%	7.3%

PET Correction Factor Table

Slope Aspect	Factor
NE	0.95
E	0.98
SE	1.03
S	1.10
SW	1.05
W	1.02
NW	0.97
N	0.90

Covered Net Infiltration	7.0%	estimate
Long-Term Draindown	0.048	gpm/acre

Pond Volume Estimates

Pond No	St.III	St.III Cont	-	-	-	Total	
Crest Area	284,738	46,917				331,655	sq ft
Average Long dimension	799	235					feet
Calc. Short dimension	356	200					feet
	6.5	1.1	-	-	-	7.6	acres
Toe Area	183,246	34,780			-	218,026	sq ft
Depth (net of freeboard)	20	3			-		
Volume	4.68E+06	1.23E+05	0.00E+00	0.00E+00	0.00E+00	4.80E+06	cf
	173,327	4,539	0	0	0	177,866	cy
	107.43	2.81	0.00	0.00	0.00	110.25	Ac-ft
	35.01	0.92	0.00	0.00	0.00	35.92	Mgal

Stage III Pond Solution Return Pump Pressure Pipe Design

ROBISON ENGINEERING COMPANY
CALCULATIONS: **Pipe Flow**

By: Nathan Earl Robison, PE
Date: 12/16/2010

Client: Coeur-Rochester Inc
Project No. 1-102-09.019

General Pipe flow calculations
* Unit values and equations from White, Frank M, 1994 *Fluid Mechanics*

Pipe roughness table (average of White, Table 6.1)	ft	mm
Concrete	016-221-021	1.65E+00
Cast iron	016-231-001	2.60E-01
Galvanized iron	016-221-22 (	1.50E-01
Steel or wrought iron	1.5E-04	4.60E-02
drawn tubing	4.9E-06	1.50E-03
PVC	9.8E-06	2.99E-03

Minor Loss Resistance Coefficients Table (after White, Table 6.5)

Pipe size:	1"	2"	4"	6"	10"
Valves (fully open)					
Globe	13.000	8.500	6.000	5.900	5.700
Gate	0.800	0.350	0.160	0.110	0.050
Check	2.000	2.000	2.000	2.000	2.000
Elbows					
15	0.070	0.067	0.063	0.060	0.050
45	0.210	0.200	0.190	0.180	0.150
90	0.400	0.300	0.190	0.170	0.130
Tees					
Branch flow	1.000	0.800	0.640	0.600	0.560
Line flow	0.240	0.190	0.140	0.120	0.090

Route Description & Notes:
1) HDPE Stage III pond area to top of Stage III heap
2) not used
3) not used
4) not used

Route No.	1	2	3	4		
Required flow, Q	22				gpm	
Pump HP, BHP	2.5				TOTAL horsepower (nom.), if applicable	
Operating Efficiency, Eff	94%				assumed UNO	
Fluid specific gravity, SG	1.0				relative to water	
Inlet Head, HI	0.0				PSI from supplier or installation	
Initial Pump Head, HP	423				ft = BHP*3960*Eff/(Q*SG)	
Residual pressure req'd	30				psi	
Adjusted flow req'd	22				gpm	see Notes
Initial pressure	183.3				psi = HI + HP	
Segment 1						
Inlet elevation	6510				ft amsl (ground level)	
Outlet elevation	6750				ft amsl (ground level)	
No. of tees (line flow)	-				ea	Minor Losses
No. of tees (branch flow)	-				ea	(See table)
No. of valves (gate)	-				ea	
No. of valves (check)	-				ea	
No. of 15-d bends	-				ea	
No. of 45-d bends	-				ea	
No. of 90-d bends	-				ea	
Total minor losses, K	-				reistance coefficient	
Pipe ID, D	2.1				in	PVC (200psi rating) ID, 6" nom
flow rate, Q	0.05				cfs	
velocity, V	1.98				ft/s	
gravity acceleration, g	32.4				ft/s2	
Minor head loss	0.00				ft	$= K*V^2/2g$
PIPE LENGTH	2200				ft	length of subject pipe section
Reynold's Number	25,006					$= VD/v$ ($v = 1.407 \times 10\text{-}5$ ft^2/s)
roughness coefficient, ε	9.8E-06				ft	see Table
Darcy friction factor, f	0.02446					$= (-1.8\log(6.9/Re + ((\varepsilon/d)/3.7)^{1.11}))^{-2}$
friction head loss	18.41				ft	$= f*(L/D)*(V^2/2g)$
Elevation head loss(gain)	240.00				ft from plan	
total head loss, psi	111.98				psi	converted to psi @ 62.4 lbs/cf
	71.32				psi	**residual pressure @ end of segment**

HDPE Pipe Pressure Design

Pipe Route No.	1	2	3	
Required Pressure, P	183			psi from Initial Pressure, below
Hyd.Design Basis, HDB	1,600			psi from literature, see below
Design Factor, DF	0.60			FOS from literature, see below
Max. service temp.	65.00			degrees est. from solution
Svc. Temp Factor, Ft	1.00			from literature, see below
Required DR	11.47			=[(2*HDB x DF x Ft)/P]+1
(note, DR=Do/t)				
Applied SDR	7.3			Standard Dim.Ratio > Req'd DR
Do, Ext. Diameter	3.000			Inches
t=wall thickness	0.4			inches = Do/SDR
Di, Int. Diameter	2.1			inches = Do - 2.12t
HDPE density	59.3			lbs/cubic foot
Weight	1.4			lbs/ft

HDB Table (@ 73 deg.F: max 140 deg.F recommended temperature)

PE 3408	1600 psi
PE 2406	1250 psi

DF Table by Pipe Environment

Aqueous	0.50
Chemical	0.25

Ft Table by Continuous Service Temperature

<80	<90	<100	<110	<120
1.00	0.90	0.78	0.75	0.63

Standard Dimension Ratios (SDR) available

41	32.5	26	21	17	13.5	11	9	7.3

OMB Circular A-94
Appendix C
Discount Rates

OFFICE OF
MANAGEMENT AND BUDGET

OMB Circular No. A-94

APPENDIX C
Revised December 2009

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DISCOUNT RATES FOR COST-EFFECTIVENESS, LEASE PURCHASE, AND RELATED ANALYSES

Effective Dates. This appendix is updated annually. This version of the appendix is valid for calendar year 2010. A copy of the updated appendix can be obtained in electronic form through the OMB home page at http://www.whitehouse.gov/omb/circulars_a094_a94_appx-c/ the text of the main body of the Circular is found at http://www.whitehouse.gov/omb/assets/a94/a094.pdf, and a table of past years' rates is located at http://www.whitehouse.gov/omb/assets/a94/dischist.pdf. Updates of the appendix are also available upon request from OMB's Office of Economic Policy (202-395-3381).

Nominal Discount Rates. A forecast of nominal or market interest rates for 2010 based on the economic assumptions for the Fiscal Year 2011 Budget are presented below. These nominal rates are to be used for discounting nominal flows, which are often encountered in lease-purchase analysis.

Nominal Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
2.3	3.1	3.5	3.9	4.4	4.5

Real Discount Rates. A forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions from the 2011 Budget is presented below. These real rates are to be used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis.

Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
0.9	1.6	1.9	2.2	2.7	2.7

Analyses of programs with terms different from those presented above may use a linear interpolation. For example, a four-year project can be evaluated with a rate equal to the average of the three-year and five-year rates. Programs with durations longer than 30 years may use the 30-year interest rate.

Other Documents

Text of OMB Circular No. A-94 in HTML or PDF (22 pages, 78 kb)
Table of Past Years Discount Rates from Appendix C of OMB Circular No. A-94 (2 pages, 26 kb)

Memorandum M-10-07, 2010 Discount Rates for OMB Circular No. A-94 (2 pages, 36 kb)