Review and Analysis of
EIS Decommissioning and Closure Plan ("DCP") released by Taseko Mines Limited for the New Prosperity Project, British Columbia, Canada.

Prepared for
Tsilhqot'in National Government
Williams Lake, BC, Canada

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Review and Analysis of DCP for the New Prosperity Project, British Columbia, Canada.

1 Introduction

Taseko Mines Limited, a British Columbia based mining company that owns and operates the Gibraltar Mine near Williams Lake, British Columbia proposes to develop the New Prosperity Gold-Copper Mine Project 125 km to the southwest of Williams Lake. The Project would involve the construction, operation, and closure of a large gold-copper mine which would take two years to build and would operate for 20 years. The main project components include an open pit mine, a 125 km power line, an onsite concentrator, a new 2 km access road and a tailings pond.

1.1 Scope of Review

Kuipers & Associates has been tasked by the Tsilhqot'in National Government to conduct an independent review of Taseko's 2012 New Prosperity Project environmental assessment and render an opinion as to whether it is adequate so as to make a determination of the technical and economic feasibility of the project. Specifically Kuipers & Associates was asked to evaluate:

- The adequacy of the site characterization information presented in the EIS to accurately predict water quality and quantity related impacts to fisheries resources?

- The adequacy of the decommissioning and closure plan presented in the EIS to mitigate water quality and quantity related impacts to fisheries resources?

- The adequacy of any financial security which might be based on the plan presented in the EIS to provide the necessary funding to perform mitigation measures as might be required.

The following documents were reviewed as part of this evaluation:

- *New Prosperity Environmental Impact Statement,* prepared by Taseko Mines Ltd., September 2012. (EIS)

- *Responses to the Technical Information Requests from Taseko Mines Ltd. to the Federal Review Panel Regarding the Environmental Impact Statement for the New Prosperity Gold-Copper Mine Project, British Columbia*, July 17, 2013 (EIS Response July 17, 2013)

1.2 Reviewer Qualifications

Kuipers & Associates, based in Wisdom, Montana, United States of America (US) was formed in 1996 and is an engineering consulting and technical services provider with a variety of US and international clients including local, state, federal and indigenous governments, public interest organizations, and mining industry service providers. Kuipers & Associates specializes in mine reclamation and closure and financial assurance cost estimation. Kuipers & Associates is presently involved as a contractor in: the development of the US Environmental Protection Agency's (EPA) Rule 108b hardrock mine site reclamation and closure financial assurance

regulations and guidance; providing assistance to the Chilean federal regulatory authorities on behalf of US EPA and US Department of Interior Office of Surface Mining (OSM); the New Mexico Copper Mine Discharge Rules stakeholder process developing reclamation and closure requirements for the state in a collaborative process with state and federal regulators and industry representatives; and assisting the Selkirk First Nation in consultation with the Yukon Energy and Mining Regulatory branch in developing site characterization, reclamation and closure and financial security guidance. In addition Kuipers & Associates conducts reviews of environmental assessments, reclamation and closure plans and financial assurance on behalf of US EPA and numerous other clients. Kuipers & Associates was recently awarded a contract to revise US EPA's 1994 Acid Mine Drainage Prediction Technical Report.

James R. Kuipers is the principal consulting engineer with Kuipers & Associates. He has a B.S. in Mineral Process Engineering from Montana College of Mineral Science and Technology (1983). He is a Professional Engineer (PE Mining/Minerals) currently registered in Montana and Colorado in the US. He has more than 30 years of professional experience in the mining industry and mining environmental compliance. A full resume is attached as Appendix A.

2 Background EIS Information

2.1 EIS Water Resource Impact Predictions

TNG has engaged a panel of additional experts tasked to evaluate water quality and quantity issues in the EIS. Their reports describe the water quality and quantity predictions in the EIS and this report relies upon those descriptions as well as their evaluations. The specific reports are identified as:

Freed, 2013	Freed, Rina, Water quality modelling of Fish Lake and other water bodies, New Prosperity gold-copper mine, prepared for Tsilhqot'in National Government by Source Environmental Consultants, July 18, 2013
Morin, 2013	Morin, Kevin A., *New Prosperity Project - Review of Geochemical Source Terms, Water Quality, Metal Leaching, and Acid Rock Drainage, July 2013,* prepared for Tsilhqot'in National Government by Minesite Drainage Assessment Group**,** Surrey, British Columbia, July 18, 2013
Watterson, 2013	Waterson, Dan, *New Prosperity Gold-Copper Mine Environmental Impact Statement Hydrogeology Review*, prepared for Tsilhqot'in National Government by Watterson Geoscience, Inc., July 19, 2013
MacDonald et al, 2013	D.D. Macdonald, A.Schein, and J.Sinclair, Issues and Concerns Related to Water Quality Conditions and Sustainability of Rainbow Trout Populations in the Vicinity of the New Prosperity Gold-Copper Mine Project, British Columbia, July 2013

2.2 EIS Decommissioning Plan Information

The following lists a summary of the proposed primary features requiring reclamation and closure as well as the proposed reclamation and closure measures as contained in Section 2.8.2 of the EIS.

Open Pit (Section 2.8.2.7, p1482)

- 177.2 ha disturbance
- Year 16 – 1200-1600 meter diameter, 525 m depth
- Pit lake formation – permanent water body (natural filling at end of operations in Year 17, water level to 1440 m elevation over 27 years in Year 45) with discharge to Fish Creek if water quality standards are met
- Pit walls exempt from reclamation – permanent disturbance feature

Tailings Storage Facility (Section 2.8.2.6, p 1481)

- Revised size and location
- TSF Pond
  - 405.6 ha
  - Permanent disturbance feature. TSF Pond will overflow to Fish Lake
  - Will contain submerged PAG materials overlain by non-PAG tailings
- TSF Beach
  - 763.9 ha
  - Cover with 50 cm of salvaged and stockpiled soil in one lift, scarify prior to seeding if needed, except for a proposed 100 m wide zone on the beach area measured from the high water mark. Soil replacement is not planned for this zone to prevent erosion of the soil capping material along the shoreline. Establishment of riparian and shoreline vegetation is expected to be successful without soil capping.
- TSF Embankment
  - 123.0 ha
  - Reslope embankments to 2H:1V, cover with 50 cm of salvaged and stockpiled soil, scarify prior to seeding if needed

Non-PAG Waste Rock Pile (Section 2.8.2.5, p1480)

- 132.0 ha disturbance (326 ac)
- Revised location in this EIS
- Reslope embankments to 2H:1V, cap surfaces with 50 cm (19 in) stockpiled soil, scarify prior to seeding if needed

Water Management Plans and Watercourse Re-establishment (Section 2.8.2.8, p1482)

- Revised
- Closure measures to re-establish drainages into original creek channels, remove diversion ditches and pipelines, and stabilize structures to control erosion.
- Decommission the Fish Lake Recirculation System features Years 16 and 45

Ore Stockpile Pad

- 77.5 ha
- 50 cm soil cover
- will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- low-grade ore will be stockpiled and then processed during last 3-4 years

Interior roads and linear disturbances (Section 2.8.2.4, p1479)

- will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Site haul roads will be constructed with non-PAG overburden and waste rock material.
- At mine closure, all haul roads will be reclaimed – rip the running surface, remove culverts, re-establish natural drainage per the post-mining water management system, re-establish grades that blend with natural topography, cap with salvaged soils from adjacent windrows, revegetate (p 1479).

- Roads required for maintenance access for any required water management features will be left in semi-permanent deactivated condition – to include removal of culverts and replacement with cross-ditches; installation of ditch blocks at cross ditch locations; installation of waterbars across the road to direct road surface water off the road; removal or breaching of windrows along the road edge; outsloping/insloping of the road surface as appropriate; and revegetation of exposed soil surfaces for erosion and weed establishment control.

Reclamation Monitoring and Maintenance (Section 2.8.2.9, p1484)

- Monitoring and maintenance planned post-closure until a self-sustaining vegetation cover that meets end land use objectives has been established and documented
- Reseeding and planning, monitoring and control of invasive plants, ground and surfaced water quality, geotechnical stability of TSF
- Duration not discussed in this section

Additional Mine Closure Tasks

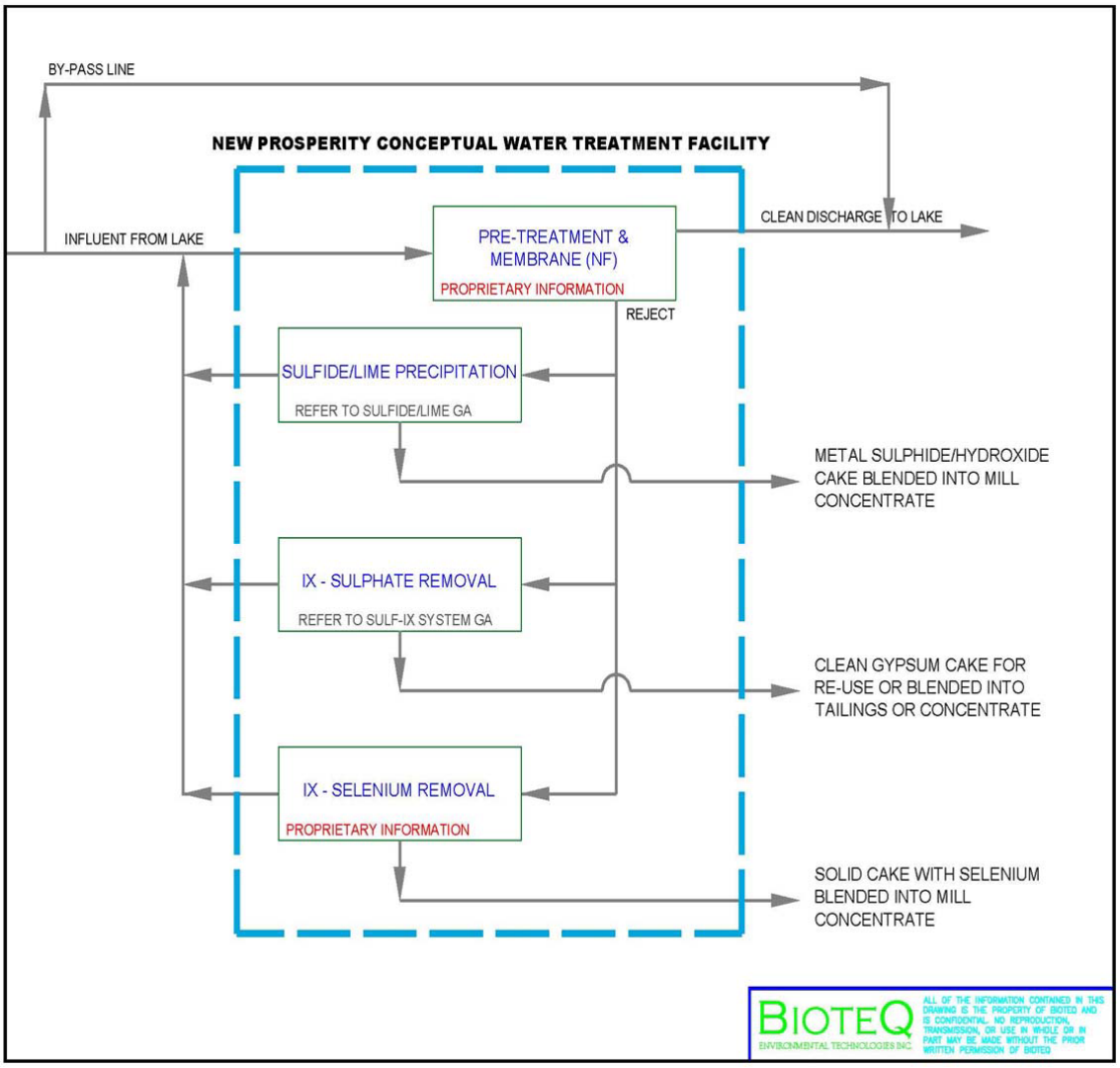
- Soil stockpile footprints
  - 129.5 ha
  - Revised location and number
  - No cover
  - will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Plant Site (p 1453)
  - will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Soil Stockpiles (p 1453)
- Conveyor Line
  - will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Power lines
  - will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Freshwater and site water collection ditches and collection ponds around stockpiles and the plant site
  - will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Explosives Site
  - 1.2 ha
  - 87 cm soil capping depth
  - will be returned to landforms similar to pre-mining and capped with stockpiled or windrowed soil
- Tailings and reclaim pipelines and reclaim barge

In addition, the Bioteq Fish Lake Water Quality Mitigation Plan and TML's EIS Response July 17, 2013 document contain information on the water treatment method for Fish Lake recirculated water which the Proponent has proposed to implement as a contingency measure as part of an

adaptive management approach, if and when monitoring results exceed pre-determined thresholds. The following describes the plant's features:

- Maximum 2 million cubic meters per year (3,800 liters per minute)
- A combination of treatment technologies would be used including membrane Nano-Filtration (NF), sulphide precipitation, and two Ion Exchange (IX) modules. Figure 1 (Figure 3 from EIS Response July 17, 2013) shows the process flow.
    - Mitigation for Metals – Al, Cd, Fe, Ag - Membrane filtration combined with sulphide precipitation
    - Mitigation for Sulphate – Membrane filtration combined with ion-exchange process
    - Mitigation for Selenium - Membrane filtration combined with ion-exchange process

Figure 1. Schematic of Overall Water Treatment Process



3 Site Characterization Adequacy

It is generally recognized that accurate site characterization is key to predicting and effectively managing and mitigating potential water quality impacts from hardrock mine sites. This aspect is emphasized by industry publications such as the Global Acid Rock Drainage (GARD) Guide (http://www.gardguide.com/index.php/Main_Page) and the Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials published by the Canadian Mine Environment Neutral Drainage (MEND) program (http://www.mend-nedem.org/reports/files/1.20.1.pdf).

The reviewer has examined the issue of site characterization with respect to predicted and actual findings in a review of 25 case study mines in the U.S. where EISs were conducted in a report titled *Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements*[1] (Kuipers et al, 2006) (http://www.earthworksaction.org/files/publications/ComparisonsReportFinal.pdf).

The report showed that:

- The majority of the case study mines (18/25 or 72%) predicted low potential for acid drainage in one or more EISs.
    - Of the 25 case study mines, 36% have developed acid drainage on site to date.
    - Of these 9 mines, 8 (89%) predicted low acid drainage potential initially or had no information on acid drainage potential.
    - Nearly all the mines that developed acid drainage either underestimated or ignored the potential for acid drainage in their EISs.

- Of the 25 case study mines, 19 (76%) had mining-related exceedences in surface water or groundwater.
    - Nearly half of the mines with exceedences (8/19 or 42%) predicted low contaminant leaching potential in their EISs.
    - The constituents that most often exceeded standards or that had increasing concentrations in groundwater or surface water included toxic heavy metals such as copper, cadmium, lead, mercury, nickel, or zinc (12/19 or 63% of mines), arsenic and sulfate (11/19 or 58% of mines for each).

The report, which has recently undergone peer review by the U.S. EPA, concludes that:

- Actual water quality impacts are closer to potential (pre-mitigation) rather than predicted (post-mitigation) impacts in EISs; therefore, the threshold for significance determinations, and thus EIS (rather than EA) analysis, should be potential rather than predicted impacts.

- Mines with close proximity or discharges to water resources, moderate to high acid drainage and/or contaminant leaching potential should undergo more scrutiny by agencies in the permitting process than mines with low inherent water quality impact factors.

[1] Kuipers, J.R., Maest, A.S., MacHardy, K.A., and Lawson, G. 2006.

- Hydrologic characterization failures are most often caused by over-estimation of dilution, failure to recognize hydrologic features and underestimation of water production quantities. They can be addressed by requiring adequate hydrologic characterizations and making environmentally conservative assumptions about water quality and quantity.

- Lack of adequate geochemical characterization is the single-most identifiable root cause of water quality prediction failures. Improvements in geochemical characterization can provide the greatest contribution to ensuring accurate water quality predictions at hardrock mine sites. As noted in the companion report, the same geochemical test units should be used for testing of all sources and parameters used to predict water quality impacts. In addition, more extensive information on mineralogy and mineralization should be included in EISs, and more attention should be paid to uncertainties in geochemical and hydrologic characterization.

The experts hired by the TNG to review the New Prosperity Project EIS have provided the following conclusions with respect to the site characterization and predictions which have been performed in support of the EIS.

- The proponent's EIS and supporting documents are based on inadequate baseline hydrogeologic characterization, and use an overly simplistic conceptual hydrogeologic model with aggressively nonconservative hydraulic parameters and limited sensitivity analyses (Watterson, 2013).

- The New Prosperity EIS provides unreasonably low predictions of project effects on water quality, water contamination, and aqueous concentrations in seepage from the TSF and other minesite components, Trib 1, Fish Lake, and other lakes (Morin, 2013).

- Based on the results of this review, it is concluded that the existing water quality data are insufficient to document baseline conditions in the vicinity of the site. The sediment data collected were also insufficient to characterize baseline conditions. The description of methods for the mass balance model used to predict monthly concentrations of water quality variables was severely lacking because the underlying assumptions, model inputs, source terms, and an uncertainty analysis were not fully described. (MacDonald et al, 2013)

Conclusions

The New Prosperity Project EIS identifies significant contaminant leaching potential from acid and/or neutral drainage and other contaminants and identifies the potential need to treat for sulphate, selenium, aluminum, cadmium, iron and silver. The EIS also identifies the site as having extremely close proximity to groundwater and surface water resources indicating both numerous pathways to critical receptors such as fisheries. However, in contradiction to those indications, based on inadequate hydrogeologic and geochemical characterization as observed by

Watterson, Morin and others, the EIS suggests that there will be no significant impacts to either water resources or fisheries.

It is our conclusion that, given the inherent tendency by proponents to underestimate water quality in EISs, and as demonstrated in this case, together with the site-specific characteristics of significant contaminant leaching potential and near proximity water resources and fisheries to the proposed project, it is highly likely, if not certain, that the proponent has underestimated the extent and severity of water quality and related fisheries impacts for the proposed project in the EIS.

4 Decommissioning and Closure Plan Adequacy

The Decommissioning and Closure Plan (DCP) in EIS Sec.2.8.2 describes the various reclamation and other mitigation measures, previously described in this report, which the proponent purports to utilize to address any post-mining impacts, including impacts to water resources and related fisheries.

As shown in our report (Kuipers et al, 2006), mitigation measures were determined to result in inaccurate predictions at a majority of mines. Sixteen of 25 mines exhibited failures in mitigation measures.

- At three of the mines mitigation was not identified, inadequate, or not installed.
- At four of the mines waste rock mixing and segregation was not effective.
- At nine of the mines liner leaks, embankment failures or tailings spills caused impacts to water resources.

The report concludes that:

- Mixing and segregation mitigation failures occur at a moderate frequency and are typically caused by using too little neutralizing material and not effectively isolating acid generating material from nearby water resources. This can be addressed in EISs by requiring adequate geochemical and hydrologic characterization and minimizing transport along hydrologic pathways.

- Mitigation frequently fails to perform according to plan. It is important to consider the likelihood and consequences of mitigation failure in EISs and identify additional mitigation measures that can be installed if failure occurs. Multiple mitigation measures (e.g., installation of liner and leachate collection system or pump-back system) should be required in most cases and planned for in the design phase.

- Improvements are needed in the prediction of appropriate mitigation measures. Preventive mitigation measures are more cost effective and environmentally protective than remediation after impacts have occurred.

- EISs for new mines should include comprehensive baseline water quality, hydrologic, and geochemical evaluations and careful and supportable identification of mitigation measures, including an evaluation of potential mitigation failures.

Conclusions

General Approach to Mitigation

To the best of our knowledge and based on our professional experience there are no examples of where a large copper and/or gold mine comparable to the proposed Project have been operated and closed using the minimal methods described in the EIS that have successfully mitigated water resource and fisheries impacts as proposed in the EIS. Many similar sites have instead

resulted in onerous reclamation and closure as well as long-term operation, maintenance and monitoring tasks and in many cases have resulted in long-term environmental and public taxpayer liabilities as well as environmental, socioeconomic and social impacts. Examples include the Keno Mine in the Yukon, Equity Silver in British Columbia, and the Butte-Silver Bow Superfund site in Montana, to name a few.

In particular, the need to protect water quality from a fisheries standpoint presents a challenge to the simplified and ideal closure plan presented in the EIS. Meeting extremely low levels of contaminant discharge, in many cases to below detectable levels consistent with baseline (e.g. pre-mining) water quality, in nearly all cases has resulted in a requirement for active water treatment rather than the passive treatment approach proposed for the Project. And in many cases, initial approaches to active treatment such as comparatively simple lime-precipitation heavy density sludge (HDS) processes have proven to be inadequate and additional more complex and expensive treatment using reverse osmosis or ion exchange have been required. The proponent acknowledges that this might be required in its EIS Response July 17, 2013.

Our conclusions with respect to Taseko's overall approach in the DCP therefore are:

- The closure conditions and achievements contained in the DCP are highly simplistic and idealized and represent a best case outcome and do not reflect the actual likely outcomes for the site.
    - Rather than recommend "best practices" including engineered covers to limit or prevent infiltration and subsequent seepage, the EIS recommends minimal 0.5m soil covers.
    - Rather than capture and treat seepage at the source (e.g. tailings/PAG facility, waste rock, open pit), the proposal allows for commingling and dilution of the seepage in Fish Lake.

- The approach relies upon the simplest and least cost mitigation primarily by utilizing dilution of potential contaminants in Fish Lake and other water resources with fisheries values. In order for the plan to be reliable and consistent with a precautionary approach to potential risks, the proponent in the EIS should rather have taken a more modern, progressive and preventative approach which would focus on source controls and capture and treatment at the source rather than dilution.

Water Treatment

Based on the information contained in the EIS, together with that presented herein, a more appropriate precautionary approach to the DCP would have recognized that active water treatment is most likely a required component of the proposal. In order to protect fisheries resources it is highly likely that the active addition of lime to maintain the pit lake in a circum-neutral condition protective of wildlife will be required during the filling stage. Similarly, it is highly likely that active water treatment will be required for a significant period of time for any discharge from the pit lake. It is also highly likely that discharge from the tailings and PAG as well as potentially non-PAG waste rock will also require more aggressive capture and treatment methods than have been proposed to protect Fish Lake. In our professional opinion because the

proposal does not incorporate preventative approaches and assumes dilution of contamination into a water resource with fisheries values is inconsistent with accepted best practices and modern regulatory approaches.

In the proponent's EIS Response July 17, 2013, and as previously described, they propose active treatment only for water recirculated from Fish Lake. The BioteQ system will treat water after it has seeped into Fish Lake and been diluted. In order to effectively do so they utilize pre-treatment and membrane (nano-filtration) technology together with metals removal, sulfate removal and selenium removal. The membrane technology becomes necessary due to the relatively weak concentration removed from Fish Lake for treatment following dilution. As indicated by Freed (2013), water quality modeling by Source showed that even with the proposed treatment system in place, the BCWQG for cadmium would be exceeded in Fish Lake.

The proponents rely upon so called "proprietary" technologies to treat for selenium and for the membrane (nano-filtration) process technologies indicated in their response. It is widely acknowledged that treatment for selenium is very problematic and expensive (CH2MHill, 2010[2]) (http://www.namc.org/docs/00062756.PDF), and any proposal that does not provide the necessary detail to ensure the proposed process is both technically and economically feasible should be viewed with a high degree of skepticism.

Our conclusions with respect to water treatment are therefore:

- The water treatment for pit lake discharge as proposed in the EIS is a contingency measure and should instead have been proposed as a primary treatment measure.
- For the Fish Lake water treatment system the EIS should have provided to the Panel sufficient and additional information on how water treatment for all water quality objectives would be achieved relying on other than unproven and undemonstrated "proprietary" technologies.
- The EIS should have provided to the Panel a demonstration of the technical and economic feasibility of the technologies instead of relying on incomplete capital and operating cost information and proprietary technologies.

Adaptive Management Plan

The proponent describes the concept of Adaptive Management Planning in detail in the EIS (p. 1499-1505). According to the EIS, adaptive management is expected to be a valuable tool for monitoring project effects and for making adjustments in order to continuously improve and ensure the Project functions as predicted. AMPs have been identified in concept only and their development will proceed with the permitting phase of the Project.

It is our conclusion that:

[2] Review of Available Technologies for the Removal of Selenium from Water, prepared for North American Metals Council, by CH2MHill, June 2010.

- Demonstration of an effective Adaptive Management Planning approach at the EA stage is critical for this project due to the idealized conceptual approach by the proponent that is almost certainly likely to require significant additional mitigation measures if the project as proposed were to become a reality. For that reason an adaptive management plan should be considered a critical part of the DCP, and at a minimum the DCP should have committed to a substantive protocol that could demonstrate viability of the plans, rather than propose to develop a plan in the future.

- The Risk Assessment contained in Taseko's response to Information Request #48 conducted by Taseko essentially constitutes what is commonly known as a Failure Modes Effect Analysis (FMEA). The goal is to provide a useful analysis technique that can be used to assess the potential for, or likelihood of, failure of structures, equipment or processes and the effects of such failures on the larger systems, of which they form a part, and on the surrounding ecosystem, including human health and safety. The reliability of the estimate is substantially dependent on the available information, expertise, skill, experience and good judgment of the experts. All significant stakeholders may need to participate in all or part of these evaluations and accounts must be taken of their values and concerns. (Mine Closure, Dr. A. Robertson) (http://www.infomine.com/library/publications/docs/e-book%2002%20mine%20closure.pdf)

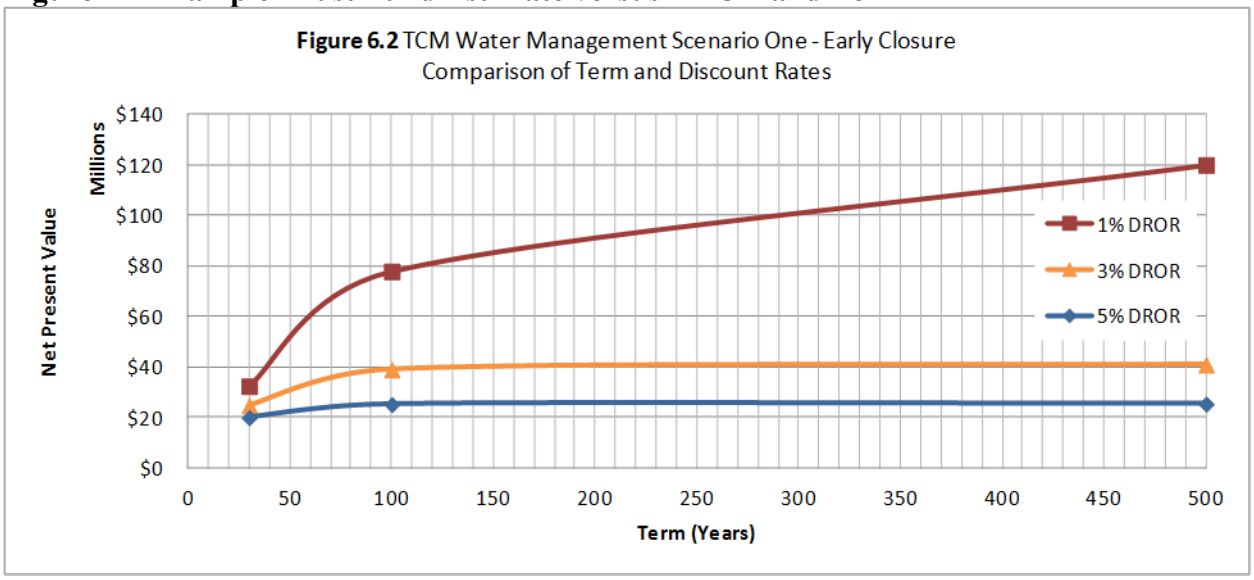
  The risk assessment conducted by Taseko purposefully underestimates both the likelihood as well as the consequences of potential failure modes. The response is highly biased and appears to be based on internal opinions rather than highly qualified and experienced independent third-parties. Were an appropriately qualified stakeholder group of experts to be convened it would certainly be recognized that a much higher likelihood of adverse circumstances exists for this project, which would have required a precautionary approach to be taken, and would have included pre-emptive financial security for active capture and treatment measures and an adaptive management plan that would ensure early detection of problems and identify viable mitigation measures to immediately available to deal with other than ideal outcomes for this project.

5 Financial Security Adequacy

It is critical at the environmental assessment stage that a reasonable liability estimate of a 'worst-case' closure scenario be provided so that the assessor can gauge the risk posed by potential undermining of the economic feasibility of the proposed reclamation and closure measures. For example, an analysis for identifying an estimate of financial security for a reasonable worst-case outcome in the New Prosperity situation, requiring completion of unfinished operational activities, additional source controls, and two active water treatment systems, might easily reach $250M. Present British Columbia guidance is that projects with on-going costs such as those associated with acid rock drainage (ARD) are to be estimated for financial security purposes based on a constant payment in-perpetuity calculation using a 3% net discounted rate of return (interest earned minus inflation). This approach conforms within current regulatory practice in Canada and the United States. The 3% rate is relatively conservative, however it is based on steady-state economic conditions which can be impacted by periods of increased inflation. In addition, the amount initially needed in the trust fund is influenced by the length of time necessary.

Figure 1 shows an example of how a trust fund amount calculated to be approximately $40M based on 100 years duration and 3% net discounted rate of return is affected by either the duration or discount rate used. As shown, if a 1% discount rate is used, the amount of the trust fund would need to be $80M. Similarly, if the duration was increased and a 1% discount rate is used, the amount of the trust fund would need to be $120M. For this reason, the amount provided in a trust fund under these conditions required by British Columbia is likely to fund operations for from 30-100 years while the actual requirements are likely to last for greater than 1,000 years.

Figure 1 – Example Trust Fund Estimate versus DROR and Term



The EIS does not contain an adequate discussion of the project's potential need for long term post-closure treatment and corresponding financial security. The EIS does not contain any information in regards to the nature of the long-term post-closure activities that the site may

require, nor the projected costs associated with these activities. The reviewer is, therefore, unable to determine the extent to which the project may represent a long term financial liability. In order for the panel to have gained any reasonable understanding of the long-term financial risks posed by the project, it is our conclusion that:

- The EIS should have identified and provided more detailed information on the project's realistic need for long term operations and management and adequate financial assurance.
- The EIS should have summarized all post-closure activities that might be anticipated and their associated costs.
- The EIS should have provided a draft financial assurance cost estimate, and should have addressed how financial assurance requirements would be obtained if the project proponent were no longer financially viable following the unplanned cessation or planned conclusion of operations.

In our experience the provision of financial security, for projects such as this with clear long-term obligations, should be viewed as a critical stop or go decision point. If the project will otherwise result in long-term liabilities it is not clear if any financial security structure currently in use (or even at all) can provide that assurance.

6 Final Conclusions

Based on our evaluation contained herein the following response is provided to the questions originally posed by TNG for this report:

The adequacy of the site characterization information presented in the EIS to accurately predict water quality and quantity related impacts to fisheries resources?

As discussed in our earlier conclusions the geochemical and hydrogeological site characterization and water quality predictions information in the EIS is inadequate and the approach taken significantly underestimates the potential for substantive water resource related impacts to fisheries resources.

The adequacy of the decommissioning and closure plan presented in the EIS to mitigate water quality and quantity related impacts to fisheries resources?

As a result of the shortcoming in the site characterization and predictions, and the inherent trait of the proponent to over-estimate the effectiveness of mitigation measures, the mitigation measures proposed in the EIS are likely to be insufficient so as to protect water and related fisheries resources and additional source control as well as capture and treatment methods should have been proposed. The lack of information on the proposed contingency water treatment process for mine water discharge at closure does not allow for a meaningful evaluation and it should have been included as a primary component of the plan and described in detail including all cost related information. Similarly, for the proposed BioteQ water treatment system for Fish Lake recirculation is highly speculative and neither technically or economically proven.

The adequacy of any financial security which might be based on the plan presented in the EIS to provide the necessary funding to perform mitigation measures as might be required.

Based on our experience any financial security based on the plan as contained in the EIS would most likely be an order-of-magnitude lower than required to provide for actual mitigation activities and present a major shortcoming for the project. This, together with there being no absolute way to ensure against long-term liability in the face of the potential for significant impacts to fisheries resources without a long-term/permanent form of guarantee, suggests a critical project flaw.

The New Prosperity EIS does not provide an adequate assessment of existing or future site conditions upon which to base its predictions and findings of no significant impacts. Similarly, it does not provide adequate information for a reviewer to ascertain the technical and economic feasibility of the proposed project or the more likely alternative outcomes to the project as proposed.

Appendix A

James R. Kuipers – Resume

JAMES R. KUIPERS, P.E.
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SUMMARY OF EXPERIENCE

Over 30 years experience in mining and environmental process engineering design, operations management, regulatory compliance, waste remediation, reclamation and closure, and financial assurance. Over 15 years experience providing technical assistance to public interest groups and tribal, local, state and federal governments on technical aspects of mining and environmental issues.

EDUCATION

Montana College of Mineral Science and Technology, B.S. Mineral Process Engineering, 1983.

PROFESSIONAL REGISTRATION

Professional Engineer (PE Mining/Minerals): Colorado (No. 30262), Montana (No. 7809 & Corp. No. 197)

PROFESSIONAL EXPERIENCE

1996 to Present **Kuipers & Associates/J. Kuipers Engineering, Butte, MT.**

- *ABN AMRO Bank, Netherlands*: Consulting Engineer, confidential mine evaluation.
- *Amigos Bravos, Taos, NM*: Consulting Engineer, Molycorp Questa Mine, technical review committee and working group member in reclamation and closure/closeout permitting and bonding process.
- *Anaconda Deer Lodge County, MT*: Consulting Engineer/Project Manager, Anaconda Superfund Site, provide technical services related to institutional controls, property conveyance and redevelopment, property and facility operation and maintenance, review of regulatory documents, renewable energy development , air and water monitoring and other tasks related to county involvement in Superfund activities.
- *Bannock Technologies, Pocatello, ID*: Consulting Engineer, Shoshone Bannock Tribe mining oversight project studies.
- *Blackfoot Legacy, Lincoln, MT:* Consulting Engineer, McDonald Project, review of project feasibility and environmental issues.
- *Border Ecology Project, Santa Fe, NM:* Consulting Engineer, Cananea Project (Mexico), consulting engineer mine reclamation and closure planning.
- *Cabinet Resource Group, Noxon, MT*: Consulting Engineer, Rock Creek Project, review of proposed tailing impoundment.
- *Clark Fork River Technical Advisory Committee, Missoula, MT*: Technical Advisor, Clark Fork River and Milltown Reservoir Operable Units, Upper Clark Fork Basin Superfund Sites.

- *Center for Science in Public Participation, Bozeman, MT:* See separate description below.

- *Citizens' Technical Environmental Committee, Butte, MT:* Technical Advisor, Butte-Silver Bow Site Operable Units, Upper Clark Fork Basin Superfund Sites.

- *Cottonwood Resource Council, Big Timber, MT:* Consulting Engineer, Lodestar Mine and Mill, review of operating and MPDES permits, financial assurance and operations data.

- *Earthjustice, Bozeman, MT:* Consulting Engineer, Montanore and Rock Creek Projects permitting process.

- *Earthworks, Washington, D.C.:* Project Manager and co-author, Water Quality Predictions and NEPA/EIS Studies.

- *Environmental Defender Law Center, Bozeman, MT*: Expert Witness and Consulting Engineer, Boliden Promel, Chile arsenic waste disposal.

- *Gila Resources Information Project, Silver City, NM:* Consulting Engineer, Phelps Dodge Chino, Cobre and Tyrone Mines, reclamation and closure/closeout permitting and bonding process.

- *Great Basin Mine Watch, Reno, NV:* Expert Witness and Consulting Engineer, various NV projects, permitting and reclamation and closure/closeout permitting and bonding process.

- *ICF International, Stafford, VA*: Consulting Engineer, 108(b) rulemaking technical support contract including financial assurance cost estimation model evaluations.

- *Johnson County, KS:* Consulting Engineer, Sunflower Limestone Mine reclamation plan and financial assurance.

- *Little Salmon Carmacks First Nation, Yukon Territory, Canada*: Expert Witness and Consulting Engineer, Carmacks Copper Project.

- *Montana Attorney Generals Office, Helena, MT:* Consulting Engineer, assist in defense of I-137 Open Pit Cyanide Mine Ban appeals.

- *Montana Department of Environmental Quality, Helena, MT*: General Contractor, Pony Mill Site Reclamation.

- *Montana Environmental Information Center, Helena, MT and National Wildlife Federation, Missoula, MT*: Expert Witness and Consulting Engineer, Golden Sunlight Mine, EIS Review and assist appeal of State operating permit.

- *Montana Environmental Information Center, Helena, MT*: Expert Witness, Bull Mountain Coal Mine appeal.

- *Montana Trout Unlimited, Missoula, MT*: Consulting Engineer, Trout Unlimited's Four Mines Campaign, review and provide technical assistance on McDonald, Crandon, New World and Rock Creek Mines.

- *Natural Resources Defense Council*; New York State: Consulting Engineer, review of Oil & Gas Draft EIS.

- *New Mexico Environmental Law Center, Santa Fe, NM*: Consulting Engineer, Oglebay Norton Mica Mine reclamation and financial assurance; New Mexico Environment Department Copper Rules Stakeholder Process.

- *Northern Plains Resource Council, Cottonwood Resource Council, Stillwater Protective Association, Billings. MT:* Consulting Engineer, Stillwater Mining Company Nye and East Boulder Mines, facilitate and perform technical aspects of Good Neighbor Agreement.

- *Northern Plains Resouce Council, Billings, MT; Wyoming Outdoor Council, Sheridan, WY:* Consulting Engineer, Montana Statewide and Wyoming Powder River Basin Coal Bed Methane EIS.

- *Northern Plains Resouce Council, Billings, MT:* Project Manager and co-author, Coal Bed Methane Produced Water Studies.

- *Northern Alaska Environmental Council, Fairbanks, AK:* Consulting Engineer, Pogo Mine NPDES permit negotiations.

- *Picuris Pueblo, Penasco, NM:* US Hill Mica Mine Reclamation Plan and financial assurance cost estimate and site reclamation project management.

- *Powder River Basin Resource Council, Sheridan, WY/Steven Adami, Buffalo, WY:* Expert Witness, Kennedy Oil IMADA POD appeals.

- *Rock Creek Alliance, Missoula, MT:* Expert Witness and Consulting Engineer, Rock Creek and Montanore Mines permitting.

- *Selkirk First Nation, Yukon Territory, Canada:* Expert Witness and Consulting Engineer, Minto Mine Project reclamation and closure and financial assurance.

- *Sheep Mountain Alliance, Telluride, CO*: Expert Witness and Consulting Engineer, Silver Bell Tailings remediation.

- *Shoshone-Paiute Tribes of the Duck Valley Reservation, NV:* Consulting Engineer, Rio Tinto Mine Reclamation and Closure.

- *Sierra Club and Mineral Policy Center:* Expert Witness, Cripple Creek and Victor Mining Company Clean Water Act case.

- *SKEO, Charlottesville, VA*: Consulting Engineer, 108(b) rulemaking technical support contract and EPA Region NEPA review and financial assurance support.

- *Southern Environmental Law Center, Charleston, SC*: Consulting Engineer, Haile Gold Mine permitting.

- *Systems Research and Applications Corporation, Fairfax, VA:* Consulting Engineer, mine cleanup and financial assurance guidelines subcontract to EPA.

- *Montana Trout Unlimited, Missoula, MT:* Consulting Engineer, I-147 initiative campaign.

- *Tohono O'odham Nation, San Xavier District, AZ:* Consulting Engineer, Mission Mine reclamation plan and financial assurance.

- *Trust for Public Lands, San Francisco, CA:* Consulting Engineer, Viceroy Castle Mountain Mine, evaluated pit backfill and reclamation alternatives for settlement agreement trust fund determination.

- *Walz and Associates, Albuquerque, NM:* Expert Witness and Consulting Engineer, assist in defense of New Mexico Environment Department and Mining and Minerals Division permitting and takings case (Manning v. NM).

- *Western Organization of Resource Councils, Billings, MT:* Oil and gas reclamation and financial assurance guide.

- *Western Resource Advocates, Salt Lake City, UT*: Expert Witness and Consulting Engineer, Red Leaf Resources oil shale project permitting.

1997 to 2005 **Center for Science in Public Participation, Bozeman, MT.**

- *Canadian Earthcare Society, Vancouver, BC*: Consulting Engineer, Brenda Mine, assist appeal of reclamation and closure permit.

- *CEE Bankwatch, Budapest, Hungary*: Consulting Engineer, Rosario Montana Mine (Romania), economic feasibility study of mine proposal.

- *Friends of the Similkameen, Hedley, BC*: Consulting Engineer, Candorado Mine, assist appeal of reclamation and closure permit.

- *Fort Belknap Tribal Council and Environment Department, Fort Belknap,MT*: Consulting Engineer, Zortman and Landusky Mines, Alternative Reclamation and Closure Plan, multiple accounts analysis working group member and technical advisor during supplemental environmental impact statement.

- *Guardians of the Rural Environment, Yarnell, AZ*: Consulting Engineer, Yarnell Project, EIS review and assist appeal of State operating permit.

- *Mineral Policy Center, Washington, D.C.*: Technical Advisor on general mining issues and Author of MPC Issue Paper.

- *National Wildlife Federation, Boulder, CO*: Consulting Engineer authoring report on Hardrock Mining Reclamation and Closure Bonding Practices in the Western United States.

- *Sakoagan Chippewa Tribes, Mole Lake Reservation, Wisconsin*. Consulting Engineer, Crandon Project, permitting process review.

1993 - 1995 **Denver Mineral Engineers, Inc., Littleton, CO.**

- Manager, Process Engineering Department.

- Manager, Mining and Environmental Wastewater Treatment Program

- *Arrowhead Industrial Water Co., San Jose, CA*: Project Manager, evaluation of reverse osmosis for mine wastewater treatment.

- *Barrick Goldstrike, USA, Elko, NV*: Project Engineer, engineering design, construction and installation of 1.5 M oz/year stainless steel electrowinning system.

- *Battle Mountain Gold, Co., Battle Mountain, NV*: Project Manager, evaluation, pilot testing, and preliminary feasibility study of wastewater treatment options for groundwater remediation of Fortitude Mine tailings area.

- *Commerce Group Corporation, Milwaukee, WI*: Project Manager, San Sebastian Gold Project, El Salvador.

- *Independence Mining Corp, Jerritt Canyon, NV*: Project Manager, technical evaluation and feasibility study of column flotation for beneficiation of refractory ores.

- *Kennecott Utah Copper, Bingham Canyon, UT*: Project Manager, design and construct stainless steel solvent extraction mixer settlers for prototype SX/EW plant.

- *Israeli Chemical Corp., Beersheeba, Israel*: Project Manager, evaluation of bromine as an alternative to cyanide gold leaching and prototype design.

- *Marston and Marston, St Louis, MO*: Project Manager, Kommunar Gold Mill Modernization Project, Kommunar, Siberia, Russia (CIS) and Suzak Polymetal Leach Circuit Evaluation and Feasibility Study, Kazakhstan (CIS).

- *Nevada Goldfields Mining Co., Denver, CO*: Project Manager, Nixon Fork Mine Preliminary Engineering Design and Feasibility Study, Concentrate Marketing Study, and environmental permitting studies.

- *Southern Pacific Railroad, Denver, CO*: Project Manager, design, construction and installation of dissolved air flotation wastewater treatment system.

1991 - 1992 **Western States Minerals Corp.**

- Project Manager, Northumberland Gold Mine, Round Mountain, NV.

- Corporate Senior Metallurgist, Wheat Ridge, CO. Engineering design and feasibility evaluations.

1986 - 1991 **Western Gold Exploration and Mining Co. (WESTGOLD)/Minorco**

- Corporate Senior Metallurgist / Project Manager, WESTGOLD, Golden, CO. Acquisitions and engineering design and feasibility evaluations, corporate acquisitions and business development group.

- Project Manager, Shamrock Resources (WESTGOLD Subs.), Reno, NV. Evaluation, engineering design and feasibility study, and prototype plant operation of refractory gold ore bioleaching technology program.

- Project Manager, Balmerton Mine, Ontario: Refractory gold ore bioleaching project and feasibility evaluation.

- Project Engineer, Johannesburg South Africa: Evaluation of Anglo American Corp. Pumpcell Technology.

- Mill Superintendent, Austin Gold Venture (WESTGOLD), Austin, NV.

- Shift Foreman, Inspiration Consolidated Copper Co, Globe, AZ.

1984 - 1985 **Canyonlands 21st Century Corporation**

- Director of Metallurgy, Blanding, UT. Project Manager, Jarbidge, NV.

1983 - 1984 **Cumberland Mining Corporation**

- Mill Superintendent / Head Metallurgist, Basin and Virginia City, MT.

1974 – 1980 **Huckaba Construction**

- Summer employment as Underground and Surface Miner, Millwright, Mill Operator, Fire Assayer, Whitehall and Cooke City, MT. Family owned small mining operation.

PRESENTATIONS and PUBLICATIONS

- *Financial Assurance Regulations and Cost Estimation at US Hardrock Mines,* U.S. Chile Mining Financial Assurance Seminar, US Office of Surface Mining and Environmental Protection agency and Chilean Ministry of Mining, Santiago, Chile, May 2012.

- *Mining Reclamation and Closure Regulations and Best Practices*, 2012 International Conference on Mining in Mindanao, Ateneo de Davao University, Davao City, Philippines, January 26-27, 2012.

- *Beyond the Global Acid Rock Drainage Guide,* Lake Superior Binational Program, Mining in the Lake Superior Basin Webinar Series, Environmental Impacts of Mining in the Lake Superior Basin, October 27, 2009

- *Characterizing, Predicting, and Modeling Water at Mine Sites,* California Environmental Protection Agency, California Water Board Training Academy**,** May 18 - 21, 2009

- *Mitigating Mining Impacts: Principles and Practices,* Lake Superior Binational Program, Mining in the Lake Superior Basin Webinar Series, Environmental Impacts of Mining in the Lake Superior Basin, March 24, 2009

- *Long-term Requirements & Financial Assurance at Superfund & Other Mine Sites*, Mine Design, Operations and Closure Conference, Fairmont Hot Springs, MT, April 2008.

- *The Effects of Coalbed Methane Production on Surface and Ground Water Resources*, Committee on Earth Resources, Board on Earth Sciences and Resources, National Research Council, Meeting on the Status of Data and Management Regarding the Effects of Coalbed Methane Production on Surface and Ground Water Resources, Denver, Colorado, April 2008.

- *Reclamation Planning and Financial Assurance Practice in the United States,* Kamchatka Mining Conference, Kamchatka Oblast People's Council of Deputies, the Committee on Ecology and Resource Management of Kamchatsky Krai, the Rosprirodnadzor Division of Kamchatka Oblast and Koryaksky Autonomous Okrug, the Division for Minerals Management for Kamchatka Krai, and the Kamchatka Oblast Council of the All-Russia Society for Nature Protection, Petropavlovsk-Kamchatsky, Russia, October 2007.

- *The Good Neighbour Agreement: A Proactive Approach to Water Management through Community Enforcement of Site-Specific Standards*, w Sarah Zuzulock, Greener Management International, Issue 53, Spring 2006, Greenleaf Publishing. 2007.

- *Sustainable Development at the Anaconda Superfund Site,* Mine Design, Operations and Closure Conference, Fairmont Hot Springs, MT, April 2007.

- *Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements* with A. Maest, K. MacHardy, G. Lawson. *Predicting Water Quality at Hardrock Mines: Methods and Models, Uncertainties, and State-of-the-Art* with A. Maest, Final Report Release December 2006.

- *Reclamation and Bonding in Copper Mining,* U.S. EPA Hardrock 2006: Sustainable Modern Mining Applications, Tucson, Arizona , November 2006.

- *Sustainable Development at the Anaconda Superfund Site:* U.S. EPA Hardrock 2006: Sustainable Modern Mining Applications, Tucson, Arizona , November 2006.

- *U.S. Perspective on Financial Assurance for Mine Cleanup*, presented at International Bar Association Conference, Chicago, Illinois, September 2006.

- *Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements* with A. Maest, K. MacHardy, G. Lawson, presented at Mine Design, Operations and Closure Conference, Fairmont Hot Springs, MT, April 2006.

- *Predicted Versus Actual Water Quality at Hardrock Mine Sites: Effect of Inherent Geochemical and Hydrological Characteristics* with A. Maest, K. MacHardy, and G. Lawson at International Congress on Acid Rock Drainage (ICARD), March 2006, St. Louis, MS.

- *Oil, Gas and Coal Bed Methane Reclamation and Financial Assurance Guide*, with Kimberley MacHardy and Victoria Lynne, November 2005; 12th International Petroleum Environmental Conference, Houston, TX.

- *Approaches to Abandoned Mine Site Assessment and Remedy Selection in the U.S.,* NOAMI Workshop on Assessing Liabilities and Funding Options, November 2, 2005 Ottawa, Canada

- *Filling the Gaps: How to Improve Oil and Gas Reclamation and Reduce Taxpayer Liability*, Kuipers & Associates for Western Organization of Resource Councils, August 2005.

- *The Environmental Legacy of Mining in New Mexico*, Mining in New Mexico: The Environment, Water, Economics and Sustainable Development, New Mexico Bureau of Geology and Mineral Resources, Decision-Makers Field Conference 2005, L. Greer Price et al Editors.

- *Financial Assurance and Bonding*, 2005 Decision-Makers Field Conference, Mining in New Mexico: The Environment, Water, Economics and Sustainable Development, New Mexico Bureau of Geology and Mineral Resources, May 2005.

- *Evaluation of the NEPA Process for Estimating Water Quality Impacts at Hardrock Mine Sites* with A. Maest, K. MacHardy, G. Lawson, for Earthworks, presented at Society of Mining Engineers Annual Conference, Salt Lake City, UT, March 2005 and Mine Design, Operations and Closure Conference, Polson, MT, April 2005.

- *Evaluation of Methods and Models Used to Predict Water Quality at Hardrock Mine Sites: Sources of uncertainty and recommendations for improvement* with A. Maest, C. Travers and D. Atkins, for Earthworks, presented at Society of Mining Engineers Annual Conference, Salt Lake City, UT, March 2005 and Mine Design, Operations and Closure Conference, Polson, MT, April 2005.

- *Coal Bed Methane-Produced Water: Management Options for Sustainable Development,* co-authored with K. MacHardy, W. Merschat and T. Myers, presented at Coal Bed Natural Gas Research, Monitoring and Applications Conference, Laramie, WY, August 2004; 11th International Petroleum Environmental Conference, Albuquerque, NM, October 2004; Northern Plains Resource Council Annual Meeting, November 2004.

- *Technology-Based Effluent Limitations for Coal Bed Methane-Produced Wastewater Discharges in the Powder River Basin of Montana and Wyoming,* Northern Plains Resource Council, Billings, MT, November 2004.

- *Financial Assurance Guidelines for Hardrock Mine Cleanup*, Mine Design, Operations and Closure Conference, Polson, MT, April 2004.

- *Introduction to Mine Water Treatment*, Mine Discharge Water Treatment Short Course, Mine Design, Operations and Closure Conference, Polson, MT, April 2004.

- *Coal Bed Methane: A Design and Process Overview of Production and Produced Water*, presented as short course at Joint Engineers Conference, Helena, MT, November 2003.

- *The Good Neighbor Agreement between Stillwater Mining Company and Northern Plains Resource Councils: An Example of Industry and Citizen Cooperation*, presented as a short course at Joint Engineers Conference, Helena, MT, November 2003.

- *Reclamation and Financial Assurance for Mines on or Impacting Tribal Land*, presented at U.S. EPA Workshop on Mining Impacted Native American Lands, Reno, NV, September 2003.

- *Reclamation and Financial Assurance from a Public Interest Perspective*, presented at U.S. Forest Service National Geofest, Park City, UT, September 2003.

- *U.S. State and Federal Policies on Financial Assurance Forms for Hardrock Mines,* presented at New Mexico Financial Assurance Forum, Santa Fe, NM, May 2003.

- *Public Interest Perspective on Land Application Disposal*, presented at Mine Design, Operations and Closure Conference, Polson, MT, April 2003.

- *Putting a Price on Pollution: Financial Assurance for Mine Reclamation and Closure*, Mineral Policy Center, Washington, D.C., March 2003.

- Testimony to the Subcommittee on Energy and Mineral Resources, Committee on Resources, U.S. House of Representatives, Hearing on "Availability of Bonds to Meet Federal Requirements for Mining, Oil and Gas Projects." Washington, D.C., July 23, 2002.

- *Mine Closure and Financial Assurance: Can the Mining Industry Afford It's Legacy?*, presented at Global Mining Initiative Conference, Toronto, Canada, May 2002.

- *The Role of the Center for Science in Public Participation in Mining Environmental Issues, with Perspective for Regulators and Industry*, presented at Canadian Institute of Mining and Metallurgical Engineers Conference, Vancouver, Canada, May 2002 and U.S. EPA Hardrock Mining Conference, Denver, Colorado, May 2002.

- *The Good Neighbor Agreement between Stillwater Mining Company and the Northern Plains Resource Councils: The Formation and Implementation of a New Approach to Addressing Environmental and Community Relations Issues,* presented at U.S. EPA Hardrock Mining Conference, Denver, Colorado, May 2002.

- *Underground Hard-Rock Mining: Subsidence and Hydrologic Environmental Impacts,* Center for Science in Public Participation, Bozeman, MT, February 2002. Co-authored with S. Blodgett.

- *Review of the Multiple Accounts Analysis Alternatives Evaluation Process Completed for the Reclamation of the Zortman and Landusky Mine Sites*; presented at National Association of Abandoned Mine Lands Annual Conference, Athens, Ohio, August 2001. Co-authored with S.C.Shaw, A.M. Robertson, W.C. Maehl and S. Haight.

- *Full Reclamation and Closure Plan, Phelps Dodge Tyrone Mine, Grant County, NM;* Gila Resources Information Project, Silver City, NM, July 2001. Co-authored with S. Blodgett.

- *Reclamation Bonding for Hardrock Metal Mines Workshop*; presented by CSP2 at Juneau and Fairbanks, AK, July 2001.

- *Full Reclamation and Closure Plan, Phelps Dodge Chino Mine, Grant County, NM;* Gila Resources Information Project, Silver City, NM, June 2001. Co-authored with S. Blodgett.

- *Reclamation Bonding in Montana;* Montana Environmental Information Center, Helena, MT, November 2000. Co-authored with S. Levit.

- *Full Reclamation and Closure Plan, Molycorp Questa Mine, NM;* Amigos Bravos, Taos, NM, May 2000.

- *Hardrock Mining Reclamation and Bonding Practices in the Western United States*: National Wildlife Federation, Boulder, CO, February 2000.

- *An Economic Evaluation of the McDonald Gold Project*; Blackfoot Legacy, Lincoln, MT, February 2000..

- *Restoring the Upper Clark Fork: Guidelines for Action*; Trout Unlimited, Missoula, MT, April 1999. Co-authored with D. Workman, B. Farling and P. Callahan.

- *Alternative Final Reclamation and Closure Plan, Zortman and Landusky Mines, MT:* Indian Law Resource Center, Helena, MT, January 1999.

- *Reclamation Bonding Regulations of Precious Metal Heap Leach Facilities in the Western United States:* Presented at the workshop on Closure, Remediation and Management of Precious Metals Heap Leach Facilities, University of Nevada, Reno, Jan 15, 1999.

- *Wastewater Treatment Methods for Base and Precious Metal Mines*: Public Education for Water Quality Project, Northern Plains Resource Council, Billings, MT, 1996.

- *Bacterial Leaching Pilot Study – Oxidation of a Refractory Gold Bearing High Arsenic Sulphide Concentrate:* Randol Gold Forum, Squaw Valley, 1990. Co-authored with J. Chapman, B. Marchant, R. Lawrence, R. Knopp.

- *Novel Aspects of Gold Recovery Using Column Flotation at Austin Gold Venture*: Gold and Silver Recovery Innovations, Phase IV Workshop, Randol International Ltd, Sacramento, CA, 1989.